US Army Corps of Engineers®

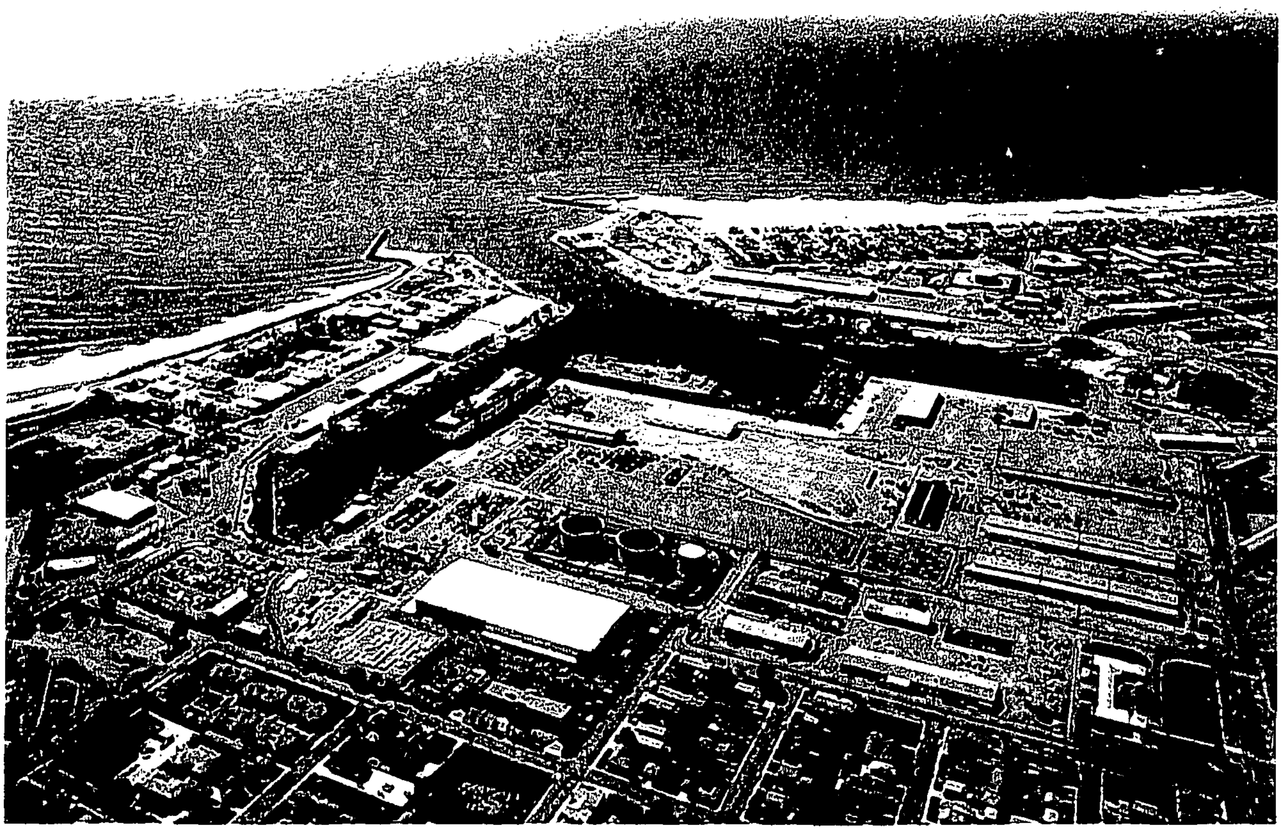
Los Angeles District

Port of Hueneme

OXNARD HARBOR DISTRICT

The Port of Hueneme, California

Deep Draft Navigation Feasibility Study
Draft Feasibility Report



February 1999

Volume I- Main Report and Environmental Assessment

THE PORT OF HUENEME, PORT HUENEME, CALIFORNIA
DRAFT FEASIBILITY STUDY

Guide to Volume I

FEBRUARY 1999

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study

EXECUTIVE SUMMARY

Authority and Purpose

The Port of Hueneme Feasibility Study was authorized by a June 10, 1992 Resolution of the Committee on Public Works and Transportation of the House of Representatives. The Port of Hueneme Feasibility Study was conducted to investigate the feasibility and economic justification of modifying the existing Federal Project to improve navigation and meet the projected navigation needs of the Port.

The feasibility study was conducted in accordance with all applicable Federal water resources laws and policies, and is consistent with all U. S. Army Corps of Engineers regulations, policies and guidelines relating to the conduct of Federal harbor and navigation feasibility studies. Principal guidance was taken from Engineer Regulation (ER) 1105-2-100, Planning Guidance, dated 28 December, 1990.

Study Participants

The feasibility study was prepared by the Los Angeles District, U.S. Army Corps of Engineers, in coordination with the Oxnard Harbor District and the U.S. Navy, consistent with ER 1105-2-100. The Non-Federal Sponsor of this project is the Oxnard Harbor District.

Problem Description

The Oxnard Harbor District believes that a deepening project at the port is necessary to improve the efficiency of existing and future cargo movements. Handy-sized bulk carriers and tankers, like the ones currently calling on the port (wood pulp, liquid fertilizer imports), have fully loaded drafts of up to 10.7 meters (35 feet). However, since the fleet of handy-sized vessels are getting older, with many being turned into scrap metal, the Oxnard Harbor District feels that Panamax-sized ships will call on the port more frequently in the future. Currently, Panamax sized tankers or bulk carriers with fully loaded drafts of up to 12.2 meters (40 feet) that call on Port Hueneme must be sufficiently light loaded to enter the Harbor even with the use of tides. This light-loading and tidal delay will result in inefficient cargo movements at the Port of Hueneme in the future.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study

Draft Feasibility Report
February 1999

Prepared by:

U.S. Army Corps of Engineers
Los Angeles District
Los Angeles, California
and
Oxnard Harbor District
Port Hueneme, California

The Port of Hueneme Feasibility Study

Table of Contents

The Port of Hueneme Feasibility Study

List of Tables

The Port of Hueneme Feasibility Study

List of Figures

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 1. Introduction

1.1 Authority

The Port of Hueneme Feasibility Study was authorized by a June 10, 1992 Resolution of the Committee on Public Works and Transportation of the House of Representatives, as follows:

"Resolved by the Committee on Public Works and Transportation of the United States of House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Port Hueneme, Ventura County, California Navigation Study published as House Document 362, Ninetieth Congress, Second Session and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of navigation and other related purposes."

1.2 Purpose and Scope

The Port of Hueneme Feasibility Study was conducted to investigate the feasibility and economic justification of modifying the existing Federal Project to improve navigation and meet the projected navigation needs of the port.

The feasibility study was conducted in accordance with all applicable Federal water resources laws and policies, and is consistent with all U. S. Army Corps of Engineers regulations, policies and guidelines relating to the conduct of Federal harbor and navigation feasibility studies. Principal guidance was taken from Engineer Regulation (ER) 1105-2-100, Planning Guidance, dated 28 December, 1990.

1.3 Study Participants

The feasibility study was prepared by the Los Angeles District, U.S. Army Corps of Engineers, in coordination with the Oxnard Harbor District and the U.S. Navy, consistent with ER 1105-2-100. The Non-Federal Sponsor of this project is the Oxnard Harbor District. During the preparation of this report, consultation with the U.S. Navy was conducted through the Port Planning and Mobilization Office of the Naval Construction Battalion Center, Port Hueneme. The study includes preliminary engineering, economic and environmental studies using available information and interviews with agency and public interests to define problems, needs, solutions and potential impacts of alternative solutions.

1.4 Prior Reports and Activities

An unpublished report was prepared in June 1936 titled "Preliminary Examination Report on Port Hueneme, Ventura County, California." The district engineer concluded that:

> *"...the construction of an artificial land-locked harbor at Hueneme, California, has no justification in the interest of navigation, that benefits to be derived are principally local in character and that savings to accrue are not commensurate with cost of improvement."*

The harbor at Port Hueneme was constructed by local interests in 1939 and 1940. After which, an unpublished report titled "Beach Erosion Report on Preliminary Examination of Harbor at Port Hueneme, California," and dated January 15, 1947, was prepared. This report examined the beach erosion downcoast from the entrance to Port Hueneme Harbor. As a result of the examination, the District Engineer recommended that a survey of the harbor, with a view to shore protection, be made at Federal expense.

The survey report was published as part of House Document 362, Eighty-third Congress, Second Session. In that document, consideration was given to a plan of improvement combining shore protection with small-craft navigation features. The District Engineer's recommendations read, in part, as follows:

> *"...the district engineer recommends that a project be adopted to establish shore protection works and a small-craft harbor at Port Hueneme, California..."*

In that document, the Board of Engineers for Rivers and Harbors and the Chief of Engineers concurred with the recommendation of the District Engineer. Public Law 780, Eighty-third Congress, approved September 3, 1954, authorized construction of the recommended project.

In a favorable preliminary report on harbors for light-draft vessels, coast of Southern California, submitted June 30, 1947, a small-craft harbor facility at Port Hueneme, using the Navy entrance channel at Port Hueneme Harbor, was considered. This harbor was proposed in the low area immediately north of Port Hueneme, with an entrance channel entering Port Hueneme Harbor midway between the west jetty and the inner entrance channel.

A definite project report titled "Design Memorandum Number 1, General Design for Harbor and Shore Protection Works Near Port Hueneme, California" and dated May 1957, was prepared (U.S. Army, 1957). In that report, a plan of improvement for shore protection downcoast from Port Hueneme to remedy the erosion caused by the deep-draft harbor's interruption of littoral drift and for construction of Channel Islands light-draft harbor was presented. It was determined that necessary beach restoration material could best be obtained by dredging a separate entrance channel to the small-craft harbor. The small-craft harbor (Channel Islands Harbor), constructed according to the plan set forth in that report, is detached and separate from Port Hueneme Harbor and has an entrance channel about 1.6 kilometers (1 mile) upcoast from the entrance to Port Hueneme Harbor.

In 1968, the Corps of Engineers considered the need for a deep-draft, commercial harbor at Port Hueneme based upon a review of the engineering and economic feasibility of improvements to meet the demands of present and prospective commerce (U.S. Army, 1968). The district engineer recommended that the existing harbor be adopted as a Federal project and that modernization and expansion of the Harbor be authorized. Accordingly, the Corps of Engineers was authorized to maintain the east and west jetties, the approach channel, the entrance channel, the central basin and Channel "A". Improvements were recommended to widen and deepen Channel "A" from 150 feet wide and 1,850 feet long to 275 feet wide and 2,830 feet long at a depth of 35 feet, MLLW.

Design Memorandum Number 1, completed in 1974, presented the design details for the authorized improvements to the Central Basin and Channel "A" (U.S. Army, 1974). The recommended development was specified in a two-phase construction program. A third phase was proposed to further expand Channel "A" in a dog-leg plan to add additional wharf space. This component was recommended for deferral. Hydraulic model studies were conducted by the Waterways Experiment Station to study the effects of the improvements on mooring conditions in the Harbor resulting from long-period waves. No significant effects were considered to occur based upon the model study findings (U.S. Army, 1975).

In 1985, an appraisal report was prepared to study beach erosion problems at Port Hueneme Beach and to determine the need for shore protection (U.S. Army, 1985a). The study concluded that none of the alternatives evaluated were economically justified; therefore, no further study was recommended at that time.

A review of the Port Hueneme jetties was conducted in 1985 under the auspices of the Lessons Learned Program (U.S. Army, 1985b). Initiated after the severe 1982 - 1983 winter storm episode, the program was intended to compare these storm wave conditions with past experiences and assess causes of damage or lack thereof. The investigation concluded that Port Hueneme Harbor is well protected from wave activity by virtue of its location at the head of the Hueneme Submarine Canyon. Nearshore wave transformation effects induced by the adjacent deep bathymetry attenuated the 1982 - 1983 storm waves to heights well within the existing jetty design criteria.

A detailed inventory of the Port Hueneme facilities was provided in the 1985 Port Series Number 28 (U.S. Army, 1985c). Prepared by the Water Resources Support Center, the document described the existing harbor and channel improvements including the piers, wharves and docks.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study

Chapter 2. The Study Area

2.1 Port of Hueneme Development History

Circa 1870, private interests constructed a pier on the open coast at Hueneme (pronounced Y-nee-mee) across which agricultural products were exported and supplies were imported for a number of years. After a rail line was constructed between Oxnard and Los Angeles in 1904, commerce over the pier declined to occasional shipments.

In 1939 and 1940, the Oxnard Harbor District constructed Port Hueneme Harbor by dredging more than 4,000,000 cubic yards in the area and constructing two jetties to provide 55 acres of protected water. Upon completion of construction, the port was opened to commercial navigation. The U.S. Navy acquired the entire facility by condemnation in 1942 and subsequently added more wharfage and terminal facilities.

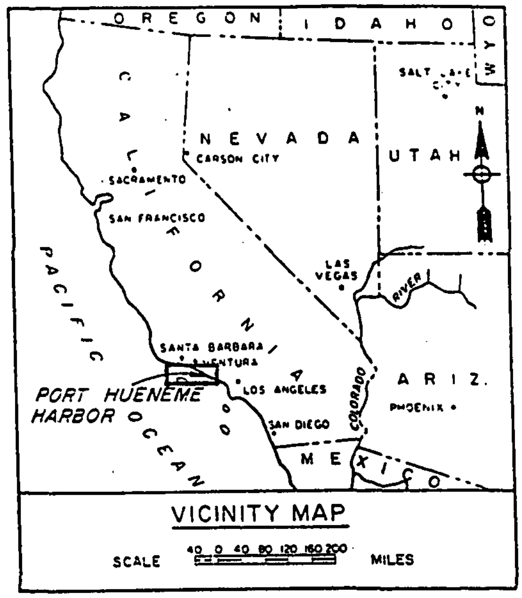
In 1947, the Navy leased the original wharf and some contiguous land area to the Oxnard Harbor District for commercial use. In 1961, these facilities were conveyed to the Oxnard Harbor District returning to the local interests 22 acres of land and all the terminal facilities and wharfage originally constructed by them. The Navy retained all facilities and wharfage constructed by them and all of the land abutting those terminal facilities. In 1971, part of the Harbor was dredged to a depth of 35 feet. The remainder was dredged to that same depth in 1975. Local interests are now operating limited shore-based facilities served by navigable waterways belonging to the United States and administered by the U.S. Navy (U.S. Army, 1985d).

2.2 Harbor Description

Port Hueneme Harbor is a deep-draft commercial and military harbor located approximately 105 kilometers (65 miles) northwest of Los Angeles in Ventura County. The facilities occupy an area within the western portion of the City of Port Hueneme. Channel Islands Harbor and the cities of Oxnard and Ventura are also near the port as shown in **Figure 2-1.**

2.3 Navigation Features

The harbor, shown in **Figure 2-2**, consists of two jetties about 244 m (800 ft) and 305 m (1,000 ft) long; an approach channel about 244 m (800 ft) long by 183 m (600 ft) wide with a depth of -12.2 m (-40 feet) MLLW; a 472 m (1,550 ft) long entrance channel, 100.6 m (330 ft)



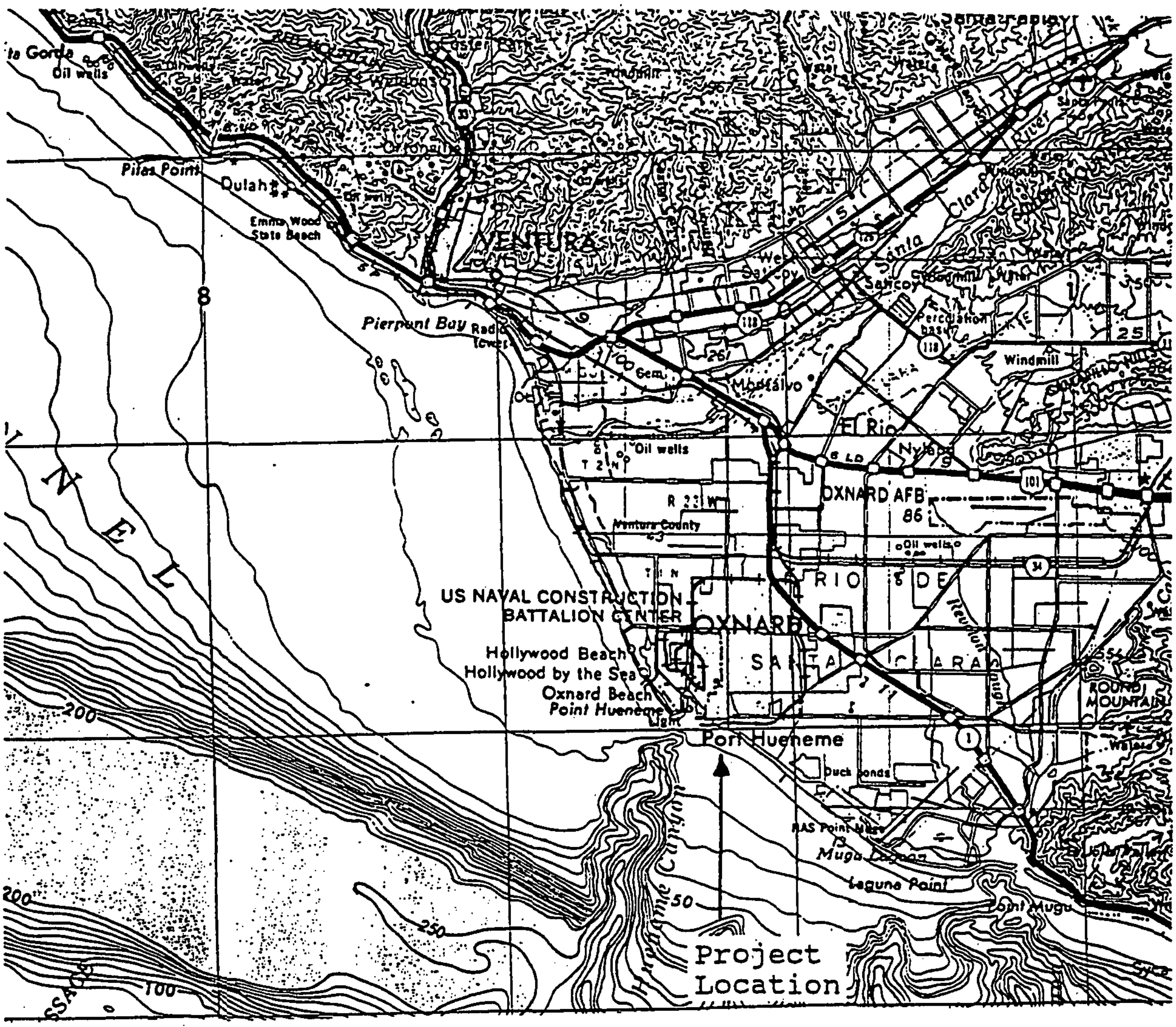


Figure 2-1 Vicinity Map
No Scale

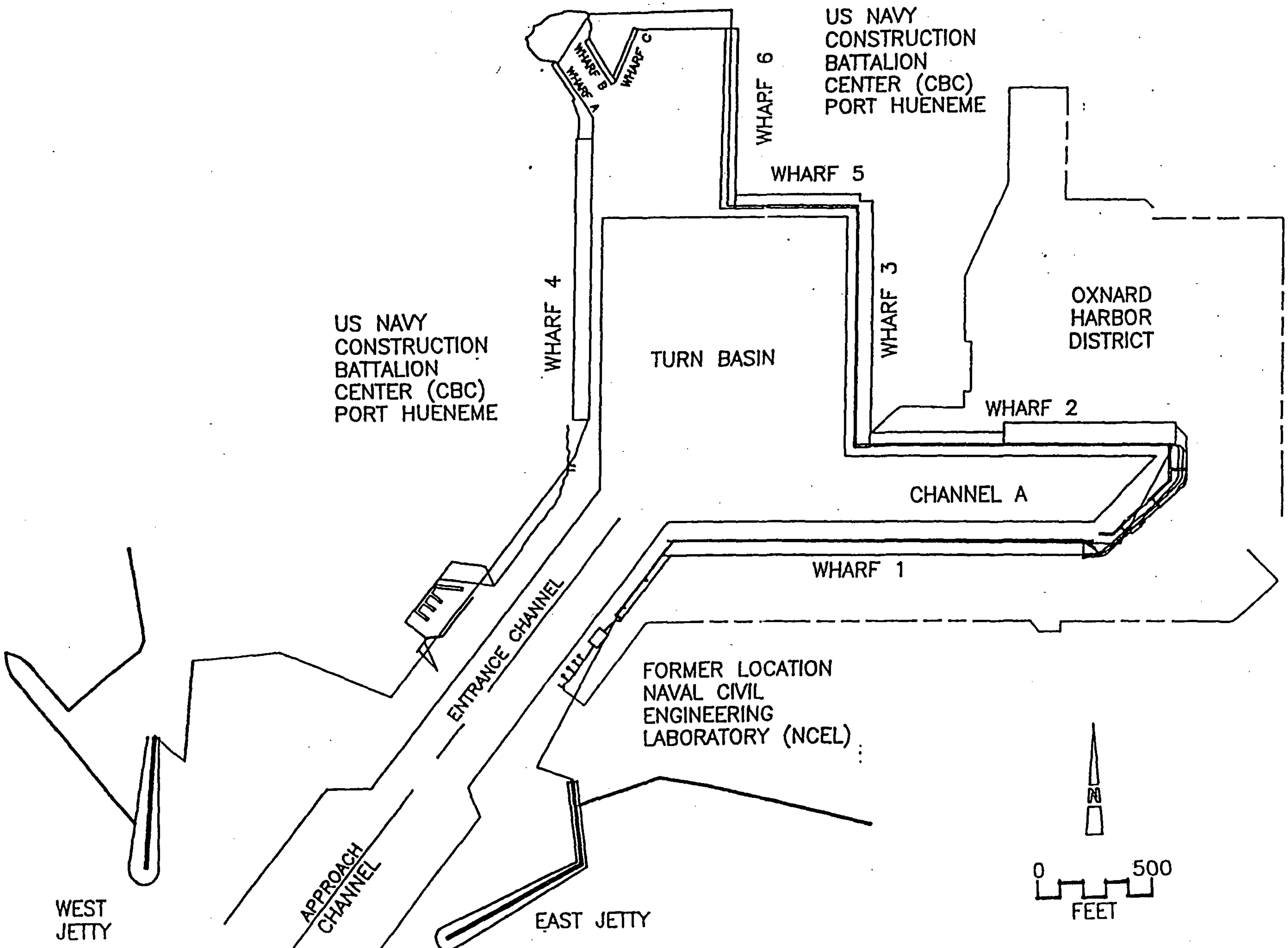


Figure 2-2. Existing Harbor Plan

wide at a depth of -11 m (-36 ft) MLLW; a turning basin 329 m (1,080 ft) long and 311 m (1,020 feet) wide with a depth of -10.7 (-35 ft) MLLW; and Channel "A" which is 707 m (2,320 ft) long, 84 m (275 ft) wide, and a depth of -10.7 (-35 ft) MLLW. [Note- Phase three of the construction plan to increase the length of Channel "A" to 2,830 feet (dog-leg plan) was never implemented.]

The approach to Port Hueneme generally follows the alignment of the Hueneme Submarine Canyon via a shipping safety fairway that is 1.8 to 2.8 km (1 to 1.5 naut.mi) wide. Navigation into the harbor proceeds between the two rubble mound jetties through a dredged channel. Pilotage is controlled by the narrowest width of the entrance channel which is 100.6 m (330 ft). Consequently, only one way traffic is permitted for large ships at the discretion of the U.S. Navy and the Oxnard Harbor District.

2.4 Port Operations

Port Hueneme is a combined military and commercial port that presently supports a variety of deep draft shipping uses. The Oxnard Harbor District and the U.S. Navy administer the joint-use harbor complex. The existing pier facilities plan is illustrated in **Figure 2-3**. In March 1997, the Oxnard Harbor District obtained approximately 33 acres of backland located south of Channel "A" which was formerly the site of the Naval Civil Engineering Lab (NCEL). The Oxnard Harbor District is currently developing that land for commercial use. **Figure 2-4** illustrates the District's port expansion project which includes reefer storage, cargo and container storage and storage tanks.

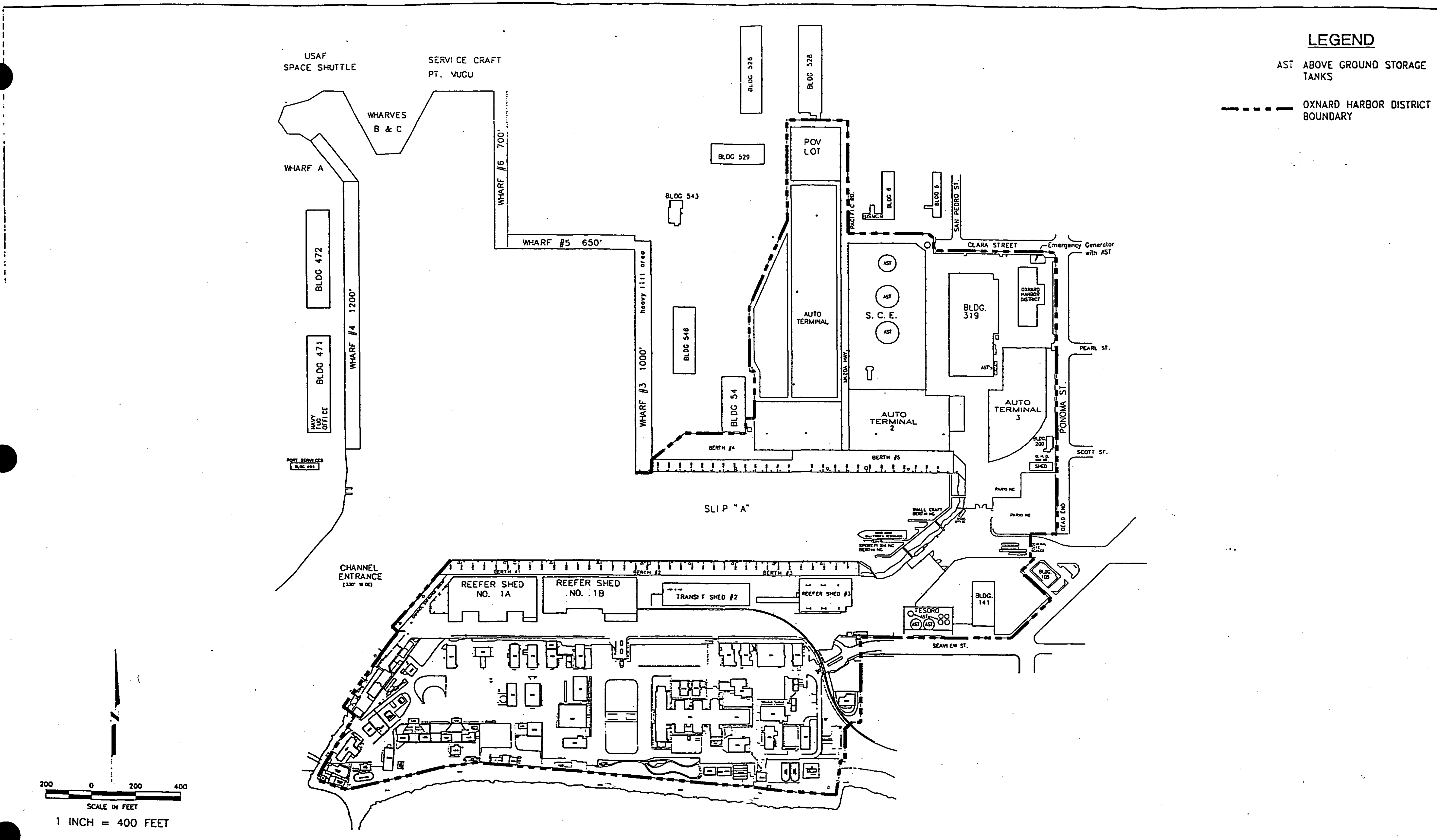
2.5 Harbor Importance

The Port of Hueneme is the only deep water port between Los Angeles and San Francisco. The facility is a shared commercial and naval facility. The port is the only Port of Entry in Ventura County and is also the only Foreign-Trade Zone in California's Central Coast Region. The port services a wide variety of international ocean shippers through its U.S. Port of Entry status. Additionally, the Foreign-Trade Zone designation enables the port to add flexibility and convenience to its current customers, as well as importers throughout the region. The port ranks among the top seaports in California for general cargo throughput. The port is now the top seaport in the U.S. for citrus exports and ranks among the top ten ports for automobile imports. The port also serves as a major support facility for the offshore oil industry in the Santa Barbara Channel and the California coastal area.

2.6 Commercial Activities

The Oxnard Harbor District maintains five berths in Channel "A" for deep draft mooring

Figure 2-3. Oxnard Harbor District Terminal Facilities Plan



DRAWN: JCM	PROJECT NO: 38055.1
ENGINEER:	SCALE: AS SHOWN
CHECKED:	APPROVED: AVK
DATE: 9/97	DATE: 9/97

Harding Lawson Associates
Engineering and Environmental Services
351 ROLLING OAKS DRIVE, SUITE 100
THOUSAND OAKS, CALIFORNIA 91361
(805) 494-7725

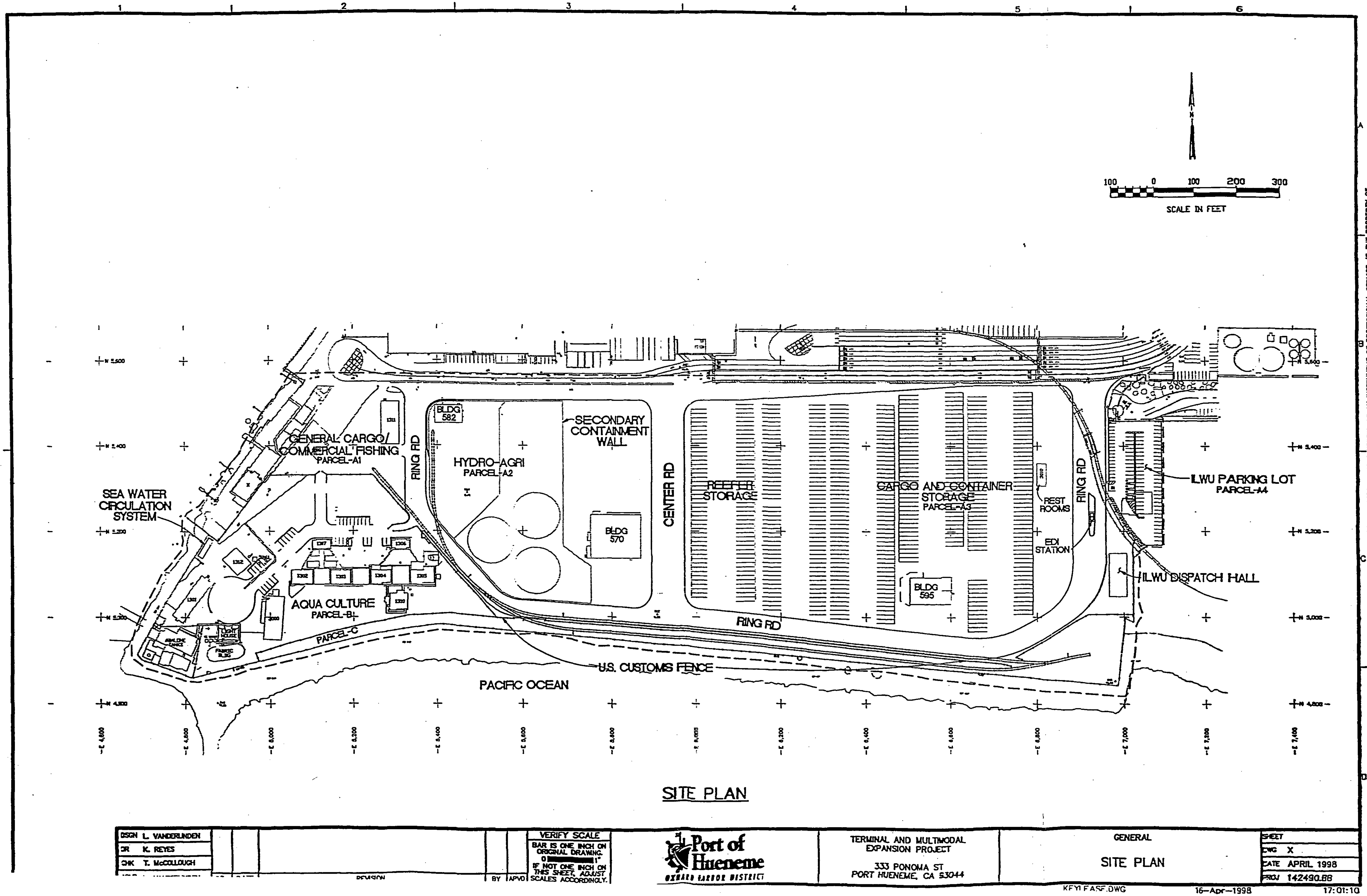
OXNARD HARBOR DISTRICT

SITE PLAN

OXNARD HARBOR DISTRICT - SWMRP
PORT HUENEME, CALIFORNIA

DWG-PLT 1
SHEET: 1 OF 5
REVISION NUMBER: 0
DATE: 9/97

Figure 2-4. Oxnard Harbor District Terminal Expansion Plan



and cargo transfer. Figures 2-2 and 2-3 show the location of the berths and associated facilities. Berths 1, 2 and 3 are designated along a 548.6 m long (1,800 ft) concrete wharf (Wharf 1) adjacent to transit sheds that handle refrigerated and breakbulk commodities. Breakbulk cargo is handled by onboard ship cranes that primarily load and unload alongside these berths. Shipments handled at these berths consist mainly of banana and tropical fruit imports, citrus and fresh produce exports, and general cargo movements.

Berths 4 and 5 on the opposite side of Channel "A" are located along a 410 meter long (1,345 ft) timber and concrete wharf (Wharf 2). Vehicle carriers and roll-on/roll-off (RO/RO) vessels moor at these berths. The cargo is driven on or off ship under its own power. Occasionally, use of Wharf 3 is made to off-load auto carriers if commercial wharfage is occupied. This berthing arrangement is preferred by some carriers since it affords more direct access to backlands staging space that is leased from the Navy by the importer directly.

At the east end of Channel "A" are 18 small craft berths as well as a special mooring facility for the oil spill response vessel "California Responder". The ship is on call to respond to regional marine oil spill emergencies. Plans are under consideration by the Oxnard Harbor District to relocate this vessel closer to the harbor entrance. Other commercial facilities include a livestock loading ramp, automobile terminals, Southern California Edison storage tanks, office and maintenance buildings, and parking lots.

Satellite facilities located about .8 to 2.4 km (0.5 to 1.5 mi) east of the harbor consist of Harbor District and privately held lands that contain administrative office space and storage for commodity carriers and marine service enterprises. In addition, auto storage lots are located approximately 1.6 km (1 mi) from the harbor on Naval Construction Battalion Center (NCBC) property, and also on land approximately 3 km (1.5 mi) east of the harbor.

2.7 Naval Activities

The U.S. Navy exercises overall control of the Naval Construction Battalion Center (NCBC), usually referred to as Seabee. The military operates four deep water wharves, covered and open storage facilities, and a variety of material handling equipment to support the various cargo operations. **Table 2-1** summarizes the Navy's port inventory.

The Seabee base provides maritime support for the Navy Construction Force. Dock facilities and equipment include seven wharves, four maintained at 10.7 m (35 ft) and three for small ship operations, 250 acres of staging area, over 280,000 square feet of covered storage, a 100 ton floating crane, four mobile cranes ranging in capacity from 24 to 140 tons, and 80 forklifts ranging in capacity from 2 to 40 tons.

Table 2-1. Navy Port Inventory

Wharf	Draft	Apron	Berth	Deck	RORO	No. of	Transit
3	35	14	1,025	600	Straight/angle	00	Yes
4	35	14	1,202	600	Angle	0	Yes
5	35	14	600	600	Straight/angle	0	Yes
6	35	14	784	600	Straight	0	Yes
A	16	Small ship operations only					
B	18						
C	23						

Staging and Storage

Location	Area, sf	Type
Adjacent to Wharves 3 and 5	1,524,600 (35 ac)	Open staging
Distributed throughout base	8,058,600 (185 ac)	Open staging
Northeast of Wharf 5	435,600 (10 ac)	Helicopter access
Pacific Road and 23rd Avenue	871,200 (20 ac)	Helicopter access
Near Wharf 3 and 5	105,090	Covered Storage
On base	176,000	Covered Storage

Equipment

Type	Capacity, tons	Quantity
Floating Crane	112	1
Mobile Crane	140	1
	50	1
	24	1
Forklift	40	1
	24	1
	10	8
	7.5	17
	5	2
	3	31
	2	12
	2	8

The major NCBC Port Hueneme customers are:

- Naval Construction Force (NCF)
- Military Transportation Management Command (MTMC)
- Military Sealift Command (MSC)
- United States Marine Corps (USMC)

Three major tenant commands occupy space in the Navy port area:

- Naval Surface Warfare Command (NSWC)
- Naval Facilities Engineering Service Center (NFESC)
- Naval Air Weapons Command (NAWC)

Other tenants include:

- Naval Support Force Antarctica (NSFA)
- Naval Research Laboratory (NRL)
- Underwater Construction Team TWO (UCT-2)
- Military Traffic Management Command
- Military Sealift Command/MARAD
- Naval Construction Training Center

The Navy also has a licensing agreement with the Oxnard Harbor District for the use of military wharves on a space available basis. As part of this agreement, the Navy retains a percentage of the fees charged by the Oxnard Harbor District for their use.

The Navy handles breakbulk, RO-RO, containerized and barge cargo in fulfillment of its military mission. Wharf 3 is currently the most compatible terminal for the varied material that is processed at the port. The NCBC performs container stuffing at various locations on base, and all warehouses and transit sheds are used for material and pre-positioned war material in support of construction force developments and fleet operations. Wharves 3, 4, 5 and 6 are served by 35 acres of asphalt covered open storage adjacent to the port area and another 185 acres located throughout the base.

2.8 Transportation

The port may be accessed by two main highways; the Ventura Freeway (US Route 101) and the Pacific Coast Highway (US Route 1). The port is supported by a rail system provided by the Ventura County Railroad which connects directly with the Union Pacific Railroad.

2.9 Physical Setting

The coastline around Port Hueneme is a broad alluvial plain reaching from Ventura to Point Mugu. The shoreline contains some of the widest sandy beaches within the Santa Barbara/Ventura region. Most of it is publicly owned and available for recreation. The low backshore areas support a variety of land uses including commercial, residential, petroleum production, recreation and military uses.

2.10 Climate

The Port Hueneme Harbor area has a mild and equitable climate. The climate is characterized by moderate summer temperatures, mild winters, frequent morning coastal stratus clouds, infrequent rainfall confined mainly from late fall to early spring, and moderate onshore breezes. The National Weather Service records at the facility indicate an average annual temperature of 15° C (59° F). Winds across the site travel in two distinct directions: 1) a strong onshore wind by day which is strongest in the summer, and 2) a weak offshore wind which is strongest in winter when nights are long and the land becomes cooler than the ocean.

Sea fog hampers navigation most often from July through October. August and September are considered the worst months for fog occurrence. Visibilities fall below 1 km (0.5mi) about 5 to 10 days per month during the fog season (NOS 1980). Generally, visibility is at its lowest in the early morning hours when the air is coolest. As the air warms, the cloud basis slowly rise and visibility increases to a maximum in the mid afternoon.

2.11 Topography

The Port of Hueneme is located on the southwest edge of the Oxnard plain. The terrain which borders the Pacific Ocean, has an average width of about 16 km (10 mi) and is relatively flat lowland. The plain slopes southwest from the Camarillo Hills with a gradient of 2.5V:1000H (12 to 15 feet per mi). Average elevations over the facility range from +4.0 to +5.5 m (+13 to +18ft) MLLW datum.

2.12 Foundation Conditions

Foundation explorations conducted in 1965, 1971 and 1983 logged subsurface soil conditions throughout the Harbor channels and basins. The materials encountered were naturally-deposited soils which classified as silty sands, sand-silty sands, gravelly silty sands and borderline sand-silty sands. The largest cobble encountered was 20 cm (8 in). No beds with large percentages of cobbles were encountered. In general, the foundation conditions were considered suitable for port development, and no unusual difficulty was anticipated in hydraulic dredging operations. It is estimated that approximately 350 cut-off timber piles are located in the area to be dredged. The piles are remnants of a wooden wharf built during the original construction of the harbor in the late 1930's. The piles were cut off at approximately -10.7 m (-35 ft) MLLW in 1971, during the early stages of deepening and widening Channel "A". The piles are typically about 0.2 m to 0.3 m (9 to 11 in) in diameter, and extend to approximate tip elevation of -15 to -16 meters (-49 to -53 ft) MLLW.

2.13 Bathymetry

The area offshore of Port Hueneme was last surveyed by the National Ocean Service in 1976. **Figure 2-5** shows measured surroundings in fathoms and shows the Harbor entrance's close proximity to the head of the Hueneme submarine canyon. The bottom slope for the first 152- m (500 ft) immediately offshore of the jetties parallel to the navigation channel is about 1V:50H. However, further offshore the profile steepens to about 1V:9H as the presence of the canyon becomes more dominant.

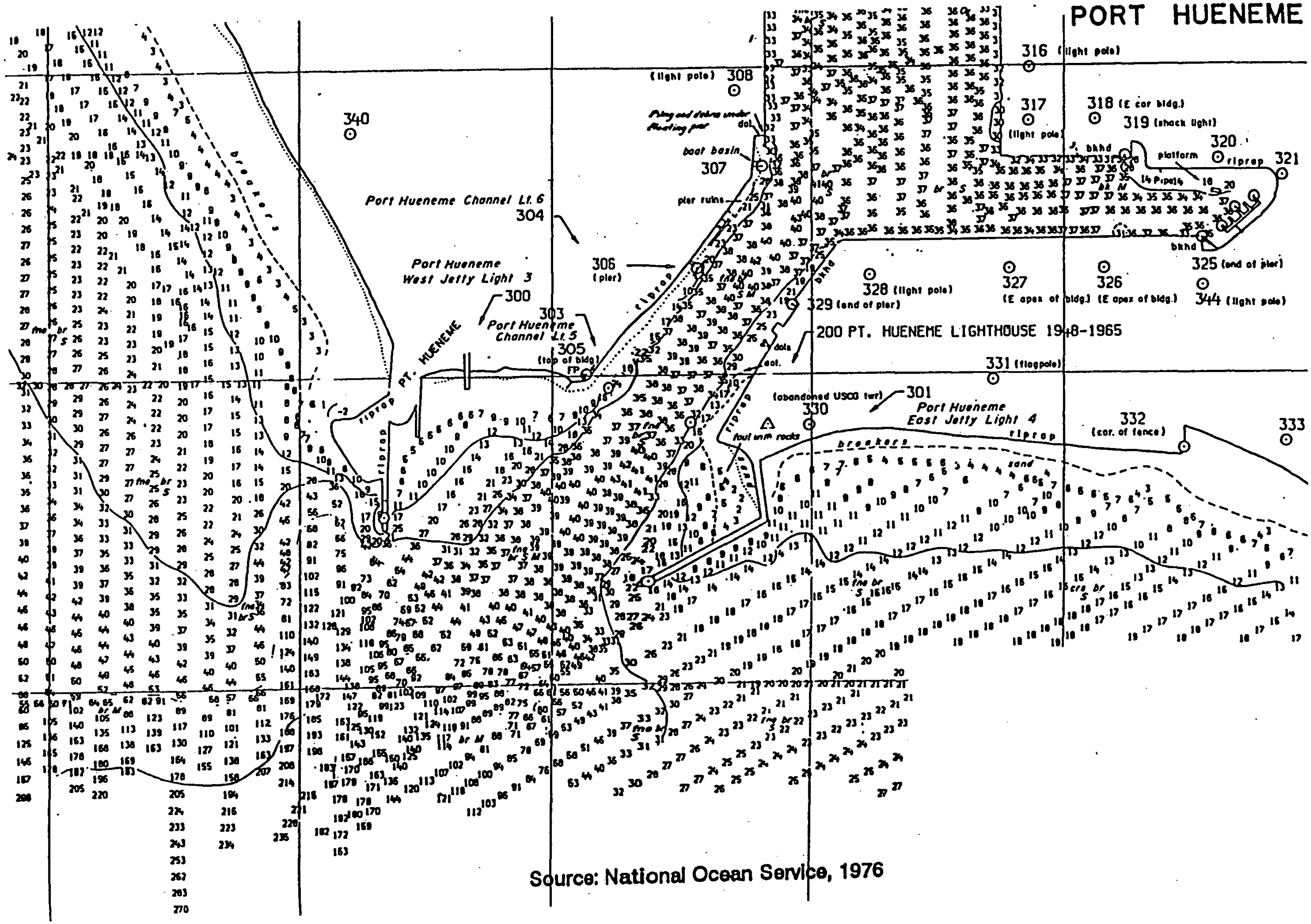
2.14 Tides

Port Hueneme Harbor experiences tides of diurnal inequality. Tidal characteristics with reference to datum of MLLW, equal to 0.0 feet, were obtained from NOAA publication of tidal datums taken at Port Hueneme, dated 10 December 1984. Tidal characteristics are summarized in **Table 2-2**. Storm surge is relatively small (less than .3 m) along the Southern California coast when compared with tidal fluctuations.

Table 2-2: Tides

Tidal Characteristics	m (ft) MLLW
Extreme High Observed (2/4/58)	2.3 (7.7)
Mean Higher High Water (MHHW)	1.7 (5.5)
Mean High Water (MHW)	1.4 (4.7)
Mean Tide Level (MTL)	0.87 (2.8)
Mean Low Water (MLW)	0.30 (.98)
Lowest Observed Water Level (1/7/51)	-0.71 (-2.3)

Source: NOAA 1984



Source: National Ocean Service, 1976

Figure 2-5. Nearshore Bathymetry

2.15 Waves

Port Hueneme Harbor is partially sheltered from waves by the adjacent coast of offshore islands. Deep water swell can approach the Harbor from the southwest through Anacapa passage and from the south through the south opening of Santa Barbara Channel. The largest waves propagate to the site from the west through Santa Barbara Channel. Due to the geometry of the channel, these waves are restricted to a narrow bank of directional approach.

Analysis of historic hindcast and measured data sets is available from the dates of 1956 through 1958, 1956 through 1975, 1958 through 1988, and 1969 through 1978. The predominant and average wave direction is from 270 degrees azimuth. During the summer months deep water swells can approach from the southern sections. Southerly waves generated locally can also occur during prefrontal winds associated with winter extra-tropical weather fronts. See Coastal Engineering Appendix for a detailed analysis on waves.

2.16 Coastal Processes

Port Hueneme is located within the Santa Barbara littoral cell that is bounded by Point Conception and Point Mugu. The 155 km (96 mi) cell is the longest shoreline unit in Southern California. The Harbor area is bounded by the Silver Strand Beach and Hueneme Submarine Canyon.

Littoral transport of sand along the Santa Barbara cell is most influenced by the wave climate and material source. The dominant direction of movement is from north to south in response to an alongshore component of wave energy that is oriented downcoast during 94 percent of an average year. The net total transport volume from north to south at the Channel Island Harbor is about 918,000 cu m (1,200,000 cu yd) per year on average. Silver Strand Beach, located between Channel Islands Harbor and Port Hueneme, has been relatively stable over the past 50 years. Historical data indicates that since 1973, an average of about 50,000 cu m (65,000 cy) per year has been placed on Silver Strand. From Port Hueneme to Point Mugu, it was estimated that about 700,000 cu m (900,000 cu yd) per year is transported downcoast (Bailard 1985, Noble 1989).

2.17 Entrance Channel Shoaling

Minimum shoaling has been observed within the approach and the entrance channel in the past. Maintenance dredging within the channel area is infrequent. The last recorded maintenance dredging was completed in January 1991, when approximately 125,400 cu m (164,000 cu yd) of sand was removed from the approach and entrance channels. Comparisons of the post survey in January 1991 and condition surveys in July 1992 and February 1993 indicate that very minor shoaling had occurred immediately adjacent to the west jetty and parts of the approach channel. This observed shoaling may be attributed to overspill of the longshore sediment at the west jetty and the reverse longshore transport from south of the harbor, where the dredged sediment from the maintenance dredging at the Channel Island Harbor is disposed. Prior to this work, the area was dredged in 1983, which translates to an average annual accumulation rate of about 15,300 to 19,000 cu m (20,000 to 25,000 cu yd) per year.

2.18 Environmental Conditions

2.18.1 Biological Resources

Common Species

Although the harbor area is developed, a fairly diverse community of marine resources populates the area. Planktonic organisms drift with the currents and include phytoplankton and zooplankton. Vegetation species diversity and density in the study area is expected to be low due to the fine-grained sand habitat and the fact that the harbor is dredged periodically for maintenance purposes. Invertebrates likely in the study area include bivalves, tube worms, clams, seastars and sand dollars. In addition, different species of crabs may also be present. Common pier piling organisms are likely to include different species of mussels, barnacles, worms, and anemones. Pismo clams, a state-listed sensitive species are likely to be found in the sandy intertidal zone. The California Department of Fish and Game regulates recreational catch and prohibits commercial harvest.

Common fishes recorded in shallow offshore environments near Channel Islands Harbor included thornback rays, lizard fish, speckled sanddab, (Dames and Moore 1980) northern anchovy, white croaker, and walleye surf perch (MBC 1975). These species are also likely to exist in the Port of Hueneme Harbor and adjacent coastal waters. The breakwater and jetties support additional foraging opportunities for the following fishes: Garibaldi, sargo, opaleye, black perch, rock wrasse, seniorita, half moons and kelp bass. Between March and September the California grunion (Leuresthes tenuis) may spawn on Hueneme Beach. This fish is unique in its spawning behavior and regulated by the California Department of Fish and Game. Peak grunion spawning activity occurs between April and June.

The harbor and coastal waters provide habitat for a variety of shorebirds and waterfowl, including loons, Bonapart's gull, western gull, Brandt's Pelagic and Double-crested cormorants, grebes, surf scoters, ruddy ducks, black turnstones, black oystercatchers, wandering tattlers, and

California brown pelicans. The beach environment provides for a variety of shorebirds including black-bellied plover, willet, whimbrel, long-billed curlew, marbled godwit, sanderling, western sandpiper and gulls.

Several species of marine mammals are frequently seen offshore including several species of whales, dolphins, porpoises, harbor seals and sea lions. The California geay whale, which was recently removed from the Endangered Species List, is occasionally observed offshore during its seasonal migrations. Only the California sea lion and the harbor seal are likely to forage in the harbor waters and haul-out on the breakwater and jetties.

Endangered and Threatened Species

California brown pelican (Pelecanus occidentalis californicus). The federally listed endangered California brown pelican frequents the harbor and vicinity. This species does not nest on the mainland of California.

California least tern (Sturna antillarum browni). The federally listed endangered California least tern nests on Ormond Beach, downcoast of the project site, and may occasionally feed in the waters of the harbor. This species is migratory, and is expected in the project area from April through August or early September.

Western snowy plover (Charadrius alexandrinus nivosus). The federally listed Threatened western snowy plover nests in the Ormond Beach dunes.

Other Endangered and Threatened Species.

Other Endangered and Threatened species may occur near the project area, but not within the boundaries of the proposed project. These include: Belding's savannah sparrow, saltmarsh bird's beak, tidewater goby, long-billed curlew, coastal black-tailes gnatcatcher, tri-colored blackbird, globose dune beetle, ventura marsh locoweed, beach spectacle pod, and coast wallflower.

2.18.2 Cultural Resources

In 1994, the entrance channel and disposal beaches were cleared for cultural resources (Corps 1994). A prehistoric site and the historic Port Hueneme Wharf, built in 1871, were destroyed in the 1940's, when the entrance channel was excavated. The original Wharf 1, which was built between 1939-1940 when the harbor was originally excavated was replaced in the early 1970's when the harbor was widened and deepened. Some of the pilings were removed, while others were left in place and cut-off at the mudline. The remaining pilings have no historical value since there is no integrity of association with the original wharf.

2.18.3 Land and Water Use

Port Hueneme Harbor is used primarily by Commercial cargo ships and Navy craft. Three areas are used for recreational fishing, and charter fishing boats also operate out of the harbor. Beaches in the vicinity are used for swimming, surfing, and other recreation. Land use adjacent to the port is primarily military and commercial.

2.18.4 Water Resources/Water Quality

Water quality in the Port Hueneme Harbor ranges from fairly good in the approach and entrance channels to relatively poor in the turning basin. Dissolved oxygen levels generally remain above 5 mg/l which is the threshold set by the Regional Water Quality Control Board (RWQCB) and is considered the minimum level necessary to sustain biological life. Water temperatures in the Santa Barbara Channel vary between 12 and 17° C. Temperatures in the port Hueneme Harbor are expected to be slightly warmer than those recorded in the Santa Barbara Channel. Salinity ranges between 33 and 34.5 parts per thousand; pH ranges between 7.5 and 8.6; and clarity ranges between 13 and 15 feet.

2.18.5 Air Quality

Data from monitoring stations located near the study area show recurring violations of the hourly standard for ozone and occasional violations of the total suspended particulate standard based on the California Ambient Air Quality Standards, which are more stringent than the National Standards. No violations of the standards for nitrogen dioxide, sulfur dioxide, or carbon monoxide have been reported at these sites. While the coastal area summer ozone levels are occasionally unhealthful, they are certainly lower than in inland valleys of the County where the combination of locally generated emissions and recirculated pollutants from western Los Angeles County results in elevated pollutant levels.

2.18.6 Noise

Sources of noise in the project area include ship engines, ship maintenance equipment, cargo loading and unloading activities, motor vehicles, and construction equipment associated with Navy missions and activities.

2.18.7 Traffic and Safety

Traffic along the roads in the port vicinity ranges from light to moderate during daylight hours, and generally light during evening and night hours.

2.19 Social and Economic Conditions

Currently, the U.S. Naval Construction Battalion Center and the Port of Hueneme account for 14,364 jobs according to information obtained from the Port Hueneme Chamber of Commerce. The two are the largest local employers with a combined payroll of $339 million. Direct and induced activity from the Navy and the port account for more than 28,070 jobs and $1.1 billion in combined economic impact throughout Ventura County.

In 1989, according to 1990 U.S. Census data, the major industries in Port Hueneme were Wholesale/Retail Trade, Professional and related services, Manufacturing and Public Administration. The largest of these industries, Wholesale/Retail Trade, employed approximately 20% of the labor force in Port Hueneme City.

In 1989, Ventura County had a population of approximately 670,000. The per capita income in Ventura County was $17,861. This is slightly higher than the per capita income for the State of California which was approximately $16,409. Per capita incomes for Port Hueneme City and nearby City of Oxnard fall below that of the County and State at $13,552 and $12,096 respectively.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 3. Problem Definition

3.1 Existing Conditions Without Project

3.1.1 Navigation Constraints

Port Hueneme Harbor consists of two jetties about 244 m (800 ft) and 305 m (1,000 ft) long; an approach channel about 244 m (800 ft) long by 183 m (600 ft) wide with a depth of -12.2 m (-40 feet) MLLW; a 472 m (1,550 ft) long entrance channel, 100.6 m (330 ft) wide at a depth of -11 m (-36 ft) MLLW; a turning basin 329 m (1,080 ft) long and 311 m (1,020 feet) wide with a depth of -10.7 (-35 ft) MLLW; and Channel "A" which is 707 m (2,320 ft) long, 84 m (275 ft) wide, and a depth of -10.7 (-35 ft) MLLW. The navigation constraints are related to water depths. There does not appear to be any significant constraints related to the widths of the Harbor.

3.1.2 Facilities Constraints

The Port of Hueneme is a combined military and commercial port. The Oxnard Harbor District and the U.S. Navy administer the joint-use harbor complex. The Oxnard Harbor District maintains five berths in Channel "A" for deep draft mooring and cargo transfer. The Oxnard Harbor District owns 120 acres of land at Port Hueneme which they use for commercial operations. Commercial operations in the Harbor are constrained by the Navy's use of the remaining land and four deep water wharves. The Navy leases approximately 70 acres of land to the Mazda Motor Corporation for automobile and equipment storage. A joint use agreement is currently being negotiated between the Navy and the Oxnard Harbor District to utilize more Naval property and wharves for commercial purposes.

3.1.3 Problem Description

The Oxnard Harbor District believes that a deepening project at the port is necessary to improve the efficiency of existing and future cargo movements. Handy-sized bulk carriers and tankers, like the ones currently calling on the port (wood pulp, liquid fertilizer imports), have fully loaded drafts of up to 10.7 meters (35 feet). However, since the fleet of handy-sized vessels are getting older, with many being turned into scrap metal, the Oxnard Harbor District feels that Panamax-sized ships will call on the port more frequently in the future. Currently, Panamax sized tankers or bulk carriers with fully loaded drafts of up to 12.2 meters (40 feet) that call on Port Hueneme must be sufficiently light loaded to enter the Harbor even with the use of tides. This light-loading and tidal delay will result in inefficient cargo movements at the Port of Hueneme in the future.

3.1.4 Historic Cargo Throughput

Cargo moving through Port Hueneme declined substantially in the 1980's relative to the 1970's. Most of this decrease was attributable to declines in fuel oil imports. This was precipitated by the 1982 modification of the SCE powerplant (located in Ormond Beach) to allow it to burn natural gas. A sharp drop in fuel oil imports from 1981 to 1982 was followed by an increase in other commodity shipments until 1989. Although waterborne commerce decreased from 1989 through 1991, it has since rebounded significantly. Cargo movements for 1994 were at the highest level since 1985, and data obtained from the Waterborne Commerce Statistics Center indicates additional increases in both imports and exports were experienced in 1995. Table 3-1, provides a breakdown among imports, exports and domestic tonnage from 1988 through 1996.

Table 3-1 Historic Cargo Movements
(1,000s of Short Tons)

Year	Imports	Exports	Domestic	Total
1988	299	84	240	623
1989	330	62	357	749
1990	312	100	161	574
1991	357	13	46	416
1992	386	60	28	474
1993	513	33	150	696
1994	481	268	65	814
1995	552	337	186	1,076
1996	566	214	163	943

As shown above, cargo movements through the port increased steadily from 1991 through 1995. Increases in 1994 and 1995 were due primarily to a large increase in exports of citrus and fresh produce. Increases in receipts of fuel oil and fish led to the rebound in domestic tonnage for 1995. The overall decline in tonnage in 1996 was primarily attributable to a decrease in fruit exports. As shown above, cargo movements through the port have increased steadily since 1991. Increases in 1994 and 1995 were due primarily to a large increase in exports of citrus and fresh produce.

Currently, the most important commodity movements at Port Hueneme are imports of petroleum and petroleum products, motor vehicles, bananas and wood pulp and exports of fresh citrus and produce. The following presents an analysis of these commodity movements.

3.1.4.1 Petroleum & Petroleum Products

The following table presents petroleum product movements through the port for the period 1988 through 1996. This table includes domestic as well as foreign traffic.

Table 3-2 Petroleum & Petroleum Product Movements (1,000s of Short Tons)

Year	Petroleum Products
1988	92
1989	248
1990	105
1991	0
1992	0
1993	132
1994	35
1995	113
1996	82

During 1994, 1995 and 1996, inbound bunker fuel shipments totaled 27,000, 84,000, and 56,000 short tons, respectively. Tesoro Petroleum Company is the company which supplies bunker fuel to Port Hueneme. Currently, barges are utilized to transport bunker fuel from the port of Long Beach to Port Hueneme. Tesoro purchases bunker fuel from refiners in the San Pedro area and barges the fuel a distance of approximately 65 nautical miles to Port Hueneme. Historical records furnished by the Oxnard Harbor District show that approximately 300,000 barrels per year (or 25,000 barrels per month) of bunker fuel are barged into the Port. A sample of shipment data during 1994 and 1995 shows an average of 31,543 barrels per barge.

Tesoro has attributed fluctuations in demand primarily to its largest customer at Port Hueneme; Cool Carriers. Cool Carriers is a primary ocean carrier for Sunkist, which distributes fruit to the Far East and ports along the West Coast. A Tesoro representative indicated that Cool Carriers reduced the number of ships used on its Far East trade route in 1996, while apparently increasing the volume transported per delivery, resulting in a reduction in bunker fuel demand.

3.1.4.2 Motor Vehicles

Motor vehicles and parts are shipped to Port Hueneme from Japan and Europe on vehicle carriers or ro-ro vessels. Current motor vehicle imports include Mazda and Mitsubishi vehicles shipped from ports in Japan, and liner shipments of BMW, Jaguar, Land Rover, Mercedes, and

Volvo vehicles from Europe. The liners travel through Europe, loading vehicles from various ports, then travel south along the east coast of the U.S., off-loading vehicles. The liners travel through the Panama Canal, then move up the west coast of the U.S., off-loading additional vehicles. Once the motor vehicles are unloaded at Port Hueneme, they are moved to staging areas and then on to preparation plants a few miles away, or directly to the preparation plants. The following table presents historical imports of motor vehicles at Port Hueneme.

Table 3-3 Motor Vehicle Imports
(1,000s of Short Tons)

Year	Total	Year	Total
1985	120	1991	143
1986	144	1992	125
1987	110	1993	137
1988	125	1994	185
1989	164	1995	159
1990	139	1996	159

Data for 1994 shipments show that the vessels used to import vehicles tend to range from 10,000 to 28,000 deadweight tons (DWT), with lengths of 176 to 198 m (577 to 650 ft), beams of 27.7 to 32.3 m (91 to 106 ft), and design drafts of 8.2 to 11.6 m (27 to 38 ft). During 1995, loaded drafts ranged from 5.8 to 9.5 m (19 to 31 ft), with an average of 7.9 m (26 ft). In 1995, approximately 104 shipments of motor vehicles were imported on 61 vessels. Only one shipment arrived during the year with a draft exceeding 9 meters (one at 9.5 m). The average weight imported per vessel was approximately 1,520 short tons.

3.1.4.3 Bananas & Tropical Fruit

Bananas and other tropical fruit including coconuts and pineapples are imported from Chile, Ecuador, Mexico, Costa Rica and Columbia on refrigerated cargo vessels (reefers). Most of the tropical fruit imports are bananas. They arrive in cartons and on pallets, and are unloaded into transit sheds for a short time until they can be trucked to their final West Coast destination (from the Mexican border to Vancouver B.C.). Occasionally, the bananas are not yet sold when the reefers arrive from South or Central America. Under those circumstances, the ships may remain anchored at sea or tied up at the dock until the bananas are sold and can be unloaded. Usually, the ships are unloaded and dispatched as fast as possible due to daily vessel costs. Bananas and tropical fruit are held in cold storage until sold. Banana imports are expected to increase by 150,000 tons in fiscal year 1998-99 due to a major contract the Port signed in October 1997 with Noboa Group, a large banana exporter based in Equador.

The following table presents the historical tonnage of tropical fruit imports.

Table 3-4 Banana/Tropical Fruit Imports
(1,000s of Short Tons)

Year	Total	Year	Total
1985	181	1991	183
1986	112	1992	199
1987	233	1993	222
1988	116	1994	208
1989	101	1995	272
1990	123	1996	293

In 1994, the reefers coming into the port with tropical fruit ranged in size from 5,440 to 16,950 DWT, with lengths of 109 to 170 m (358 to 558 ft), beams of 16.4 to 25.9 m (54 to 85 ft), and design drafts of 7.6 to 10.1 m (25 to 33 ft). These vessels unloaded an average of over 3,000 short tons of tropical fruit. WCSC data for 1995 shows loaded drafts for vessels importing tropical fruit ranged from 5.2 to 8.8 m (17 to 29 ft), with an average of about 7 meters (23 ft).

3.1.4.4 Fruit Exports

Historically, fresh fruit exports totaled less than 50,000 short tons. However, fresh fruit exports jumped to 242,000 short tons in 1994 and about 264,000 in 1995. This increase was attributable to the completion of the Port's new large refrigerated storage facilities, which attracted Cool Carriers, primary ocean carrier for Sunkist, to relocate its citrus export operations from Long Beach to Port Hueneme. However, the port lost some of its increased business in 1996, as Pacific Express Line moved its mostly breakbulk operations to Los Angeles. This arrangement lasted only briefly as Pacific Express Line has since closed its operations. Their market is currently being serviced by Cool Carriers who have brought this business back to Port Hueneme. Most of the citrus is exported to Japan on reefer vessels.

As with tropical fruit imports, fruit exports are transported on reefer vessels. The vessel sizes described earlier for banana imports also apply to vessels exporting citrus. During 1995, the loaded drafts of reefers exporting fruit ranged from 4.9 to 10.7 m (16 to 35 ft), with an average of about 7.6 m (25 ft).

Table 3-5 Fruit Exports
(1,000s of Short Tons)

Year	Total	Year	Total
1987	10	1992	50
1988	34	1993	17
1989	49	1994	242
1990	32	1995	264
1991	10	1996	188

3.1.4.5 Wood Pulp

- Historical Operations

Aracruz Cellulose, S.A. (Aracruz) is a large manufacturer of bleached wood pulp (used for tissue and paper products) located in Esprito Santo, Brazil. Historically, Aracruz has utilized Norsul Internacional, S.A. (Norsul) to import wood pulp to Port Hueneme. Norsul is a Brazilian flag shipping company which operates a break-bulk parcel service to and from the west coast of North America and the east coast of South America (primarily Brazil). Aracruz's primary customer in Port Hueneme is Proctor & Gamble (P&G). P&G has a nearby plant which manufactures bathroom tissue and paper towels.

Shipments of wood pulp originate at Portocel, Brazil. Portocel is a private port jointly owned by Aracruz and Nippon Brazil, S.A. and is only about one mile from Aracruz's pulp manufacturing mill. According to *Lloyd's Ports of the World (1994)*, Portocel has a channel with a depth of 11 meters (36 feet) and a turning basin with a depth of 10 meters (32.8 feet). Vessels arrive at Portocel already loaded with other cargo (primarily steel) loaded at prior ports of loading in Brazil. Portocel is the final port of loading. The loaded bulk carriers continue up the east coast of Brazil and cross to the west coast through the Panama Canal, which allows vessels with a maximum depth of 12 m (39.5 ft). In most instances, the first port of call has been Long Beach. Up to 15,000 metric tons of steel is off loaded in Long Beach before the vessels call on Port Hueneme. Subsequent ports of discharge include Portland, Oregon, Seattle and Vancouver, Washington and ports in British Columbia. The following table summarizes wood pulp imports to Port Hueneme from 1985 to 1995.

Table 3-6 Wood Pulp Imports (1,000s of Short Tons)			
Year	Total	Year	Total
1985	35	1991	29
1986	46	1992	35
1987	42	1993	26
1988	37	1994	35
1989	51	1995	87
1990	39	1996	69

Historically, imports of wood pulp averaged about 37,500 short tons per year. However, an expansion of the P&G plant has resulted in a twofold increase in demand. This demand has been met primarily through more frequent shipments. Information regarding the plant's material and storage and handling capacity was not available.

3.2 Future Conditions Without Project

3.2.1 Future Commodities/Fleet

The needs of smaller West Coast ports are driven in large part by the needs at the Ports of Los Angeles and Long Beach. The Ports of Los Angeles and Long Beach (LA/LB) together comprise the nation's largest port complex. Cargo throughput at LA/LB has been growing in double digit rates for several years. This year LA/LB is expected to handle record numbers of containers. The ports have responded to this sharp increase in container demand by expanding and building new container terminals. The ports are currently looking for ways to expand even more to keep up with the demand of their container line customers.

In addition to containers, the port handles neo-bulk and break-bulk cargoes. These cargoes consist of iron and steel products, fruit and produce, forest products (plywood, lumber, paper), tractor parts and alloys. Imports of these products are much larger than exports in tonnage and terminal requirements. Most break-bulk/neo-bulk imports entering LA/LB are non-containerized. Most arrive on Panamax bulk carriers that have a design draft of 12.2 m (40 ft) MLLW.

An earlier study by VZM (VZM, 1991, West Coast Ports Comparison Study) indicated that even if full build-out of new facilities at LA/LB were completed (which is taking place), there would still be a roughly 14 percent shortfall in West Coast breakbulk and neobulk capacity in

2010 (while being roughly at capacity in 2000). In addition, LA/LB favors containers over neo-bulk/break-bulk cargoes since containers are less land intensive and have a higher revenue potential. It is likely that the ships being squeezed out of LA/LB will call on Port Hueneme. Furthermore, as this trend toward container cargo continues at LA/LB, the 1991 VZM study states that the local Southern California market for neobulk/breakbulk commodities will be served by Port Hueneme and/or San Diego. It is important to note that both ports have expressed their commitment to preserve their neobulk and breakbulk business, however it will be increasingly more difficult to do so in the future as the ports reach full capacity.

A comprehensive aggregate demand forecast entitled, "Future Channel Requirements for Port Hueneme" and dated 7 November 1997, was prepared by VZM/Transistem to examine potential cargo increases at the Port of Hueneme. The forecast was done for both imports and exports. According to the report, justification for growth in various cargoes comes from a variety of sources. The first is general economic growth, both in U.S. and in Southern California. The second is for specific commodities that currently or potentially could flow through Port Hueneme. The last is the diversion of cargo from the Ports of Los Angeles and Long Beach.

Forecasts taken from the above referenced report for specific import and export commodities are shown on Tables 3-7 and 3-8. Table 3-7 shows growth/regression rates for specific import and export cargoes for base year (Average 1990-1996) and projected growth/regression rates for 2010 and 2020. The table projects growth for all import cargoes with the exception of automobiles. In addition, the table shows that Port Hueneme will retain its share of the regional market for some cargo imports and gain market share for others. Of particular interest is the projection for lumber & plywood, fertilizer, and steel products imports. These represent potential new markets for Port Hueneme. Similarly, Port Hueneme is expected to retain or gain market share for certain cargo exports by 2020.

Table 3-8 shows cargo flow forecasts for Port Hueneme to 2020. Of major significance is the growth in steel imports. Estimates in tonnage are 1.5 million metric tons (MT) by 2000, with growth rates in the 5% per year range thereafter. This suggests that by 2010, steel may potentially represent the Port's largest import cargo.

The figures projected for steel depend largely on the relocation of the Rio Doce Pasha (RDP) terminals from the Port of Los Angeles to Port Hueneme. There has been no commitment to date; however, officials at RDP stated that they are considering the Port of Hueneme for its LA basin terminal when its current lease with the Port of Los Angeles expires in 2000. The terminal would be used for steel and wood products imports. Steel slab would move from Port Hueneme to a California Steel industries mill in Fontana, California. At this time, however; there is not a sufficient foundation for projecting that the bulk cargoes identified in the VZM report, specifically steel, will be forced to relocate to Port Hueneme.

Table 3-7 PORT HUENEME FORECAST TRAFFIC FOR SELECTED COMMODITY GROUPS (FY1996-2020) - WORKSHEET

IMPORTS

	MEAT	BANANAS	FRUITS & NUTS	WOOD PULP	LUMBER, PLYWOOD & PARTBD.	AUTOS	OTHER VEHICLES	STEEL PRODUCTS	FERTILIZERS	GYPSUM
	01	02	03	06	07	10	11	12	13	14
U.S. TOTAL										
Average Annual Traffic Growth										
1990-1996 Average (Regression)	-6.8%	3.2%	3.4%	0.3%	6.0%	-4.4%	-9.0%	11.4%	7.3%	4.8%
Projections to 2020	2.2%	3.2%	3.4%	1.8%	1.8%	-1.0%	-1.0%	2.9%	5.5%	1.8%
Total Vessel Traffic (MT)										
1996 *	642,074	4,060,269	1,330,734	849,200	2,577,893	2,690,497	1,991,742	19,342,396	4,440,619	11,435,252
2000	700,469	4,605,466	1,521,165	912,013	2,768,573	2,584,480	1,913,259	21,685,616	5,501,148	12,296,750
2010	870,759	6,310,598	2,125,097	1,090,131	3,309,282	2,337,358	1,730,317	28,861,939	9,396,755	14,745,240
2020	1,082,447	8,647,041	2,968,822	1,303,037	3,955,593	2,113,864	1,564,868	38,413,091	16,051,015	17,681,265
LOS ANGELES/SAN DIEGO CUSTOMS DISTRICT TOTAL										
Share of U.S. Total										
Average 1990-1996	18.3%	22.3%	14.4%	7.7%	9.3%	22.4%	26.7%	14.9%	3.1%	4.5%
Baseline (Average 1995-1996)	23.1%	22.9%	15.6%	12.1%	8.6%	25.1%	25.7%	12.5%	2.2%	4.0%
2000 (Estimate)	25.0%	22.9%	15.6%	12.1%	8.6%	25.1%	25.7%	12.5%	5.0%	4.0%
2010 (Estimate)	25.0%	22.9%	15.6%	12.1%	8.6%	25.1%	25.7%	12.5%	10.0%	4.0%
2020 (Estimate)	25.0%	22.9%	15.6%	12.1%	8.6%	25.1%	25.7%	12.5%	10.0%	4.0%
Total Vessel Traffic (MT)										
1996 *	147,354	930,681	207,485	102,371	221,664	675,603	508,392	2,393,811	98,281	459,535
2000	175,117	1,055,638	236,875	109,989	238,025	649,013	492,613	2,700,083	275,057	493,798
2010	217,690	1,446,479	330,921	131,470	284,512	586,955	445,510	3,593,609	939,676	592,122
2020	270,612	1,982,024	462,306	157,147	340,078	530,832	402,911	4,782,826	1,605,102	710,023
Annual Average Growth Rates										
1990-1996 Average (Regression)	3.8%	4.2%	6.4%	20.3%	0.4%	-2.1%	-12.8%	2.7%	2.7%	-0.9%
1996-2010	2.8%	3.2%	3.4%	1.8%	1.8%	-1.0%	-0.9%	2.9%	17.5%	1.8%
2010-2020	2.2%	3.2%	3.4%	1.8%	1.8%	-1.0%	-1.0%	2.9%	5.5%	1.8%
PORT OF HUENEME										
Share of Regional Total										
Average 1991-1996	7.5%	21.4%	4.6%	95.8%	0.0%	19.9%	1.2%	0.2%	0.0%	0.0%
Baseline (Average 1995-1996)	0.0%	26.4%	7.4%	89.9%	0.0%	18.2%	2.9%	0.2%	0.0%	0.0%
2000 (Estimate)	5.0%	47.5%	8.0%	89.9%	2.5%	18.2%	2.9%	0.2%	10.0%	65.0%
2010 (Estimate)	10.0%	47.5%	9.0%	89.9%	5.0%	18.2%	2.9%	59.0%	15.0%	65.0%
2020 (Estimate)	15.0%	47.5%	10.0%	89.9%	10.0%	18.2%	2.9%	64.0%	20.0%	65.0%
Total Vessel Traffic (MT)										
1996 *	0	245,610	15,331	92,080	0	122,935	14,648	4,660	0	0
2000	8,756	501,456	18,950	98,932	5,951	118,096	14,194	5,266	27,506	320,969
2010	21,769	687,115	29,783	118,253	14,226	106,804	12,836	2,120,229	140,951	384,879
2020	40,592	941,514	46,231	141,349	34,008	96,592	11,609	3,061,009	321,020	461,515
Annual Average Growth Rates										
1990-1996 Average (Regression)	NA	NA	NA	NA	NA	1.2%	182.3%	NA	NA	NA
1996-2010	NA	7.6%	4.9%	1.8%	NA	-1.0%	-0.9%	54.8%	NA	NA
2010-2020	6.4%	3.2%	4.5%	1.8%	9.1%	-1.0%	-1.0%	3.7%	8.6%	1.8%

* Baseline estimates are for fiscal year ending in June; CY data converted based on average of 2 years.

PORT HUENEME FORECAST TRAFFIC FOR SELECTED COMMODITY GROUPS (FY1996-2020) - WORKSHEET

EXPORTS

	MEAT	FRUITS & NUTS	SEEDS	HAY	WASTE PAPER	COTTON	AUTOS	OTHER VEHICLES
	01	03	04	05	08	09	10	11
U.S. TOTAL								
Average Annual Traffic Growth								
1990-1996 Average (Regression)	24.6%	5.8%	13.9%	5.5%	1.3%	0.8%	6.6%	8.0%
Projections to 2020	4.8%	3.5%	5.0%	4.0%	1.3%	0.8%	3.0%	5.0%
Total Vessel Traffic (MT)								
1996 *	3,219,101	2,271,861	320,067	2,748,999	4,991,336	1,696,297	878,501	916,570
2000	3,883,110	2,607,013	389,043	3,216,940	5,255,990	1,751,234	988,761	1,114,097
2010	6,205,725	3,677,449	633,710	4,760,376	5,980,658	1,896,485	1,328,812	1,814,746
2020	9,917,571	5,187,406	1,032,246	7,046,520	6,805,240	2,053,784	1,785,812	2,956,030
LOS ANGELES/SAN DIEGO CUSTOMS DISTRICT TOTAL								
Share of U.S. Total								
Average 1990-1996	15.9%	34.3%	7.4%	27.5%	31.1%	53.6%	14.1%	14.5%
Baseline (Average 1995-1996)	13.7%	33.0%	7.6%	28.2%	32.9%	57.8%	17.8%	15.3%
2000 (Estimate)	13.7%	33.0%	7.6%	28.2%	33.0%	57.8%	18.0%	16.0%
2010 (Estimate)	13.7%	33.0%	7.6%	28.2%	34.0%	57.8%	19.0%	18.0%
2020 (Estimate)	13.7%	33.0%	7.6%	28.2%	35.0%	57.8%	20.0%	20.0%
Total Vessel Traffic (MT)								
1996 *	439,505	749,144	17,525	776,489	1,639,314	980,344	156,418	139,964
2000	530,564	859,521	29,388	907,837	1,734,477	1,011,659	177,977	178,255
2010	847,912	1,212,440	47,870	1,343,820	2,033,424	1,095,568	252,474	326,654
2020	1,355,076	1,710,266	77,975	1,989,182	2,381,834	1,186,437	357,162	591,206
Annual Average Growth Rates								
1990-1996 Average (Regression)	15.9%	4.9%	7.3%	5.7%	4.4%	4.4%	13.7%	5.4%
1996-2010	4.8%	3.5%	7.4%	4.0%	1.6%	0.8%	3.5%	6.2%
2010-2020	4.8%	3.5%	5.0%	4.0%	1.6%	0.8%	3.5%	6.1%
PORT OF HUENEME								
Share of Regional Total								
Average 1991-1996	0.0%	16.9%	0.0%	0.0%	0.0%	0.0%	8.7%	0.6%
Baseline (Average 1995-1996)	0.0%	29.9%	0.0%	0.0%	0.0%	0.0%	7.7%	1.0%
2000 (Estimate)	0.0%	31.0%	5.0%	0.0%	0.0%	0.0%	15.0%	5.0%
2010 (Estimate)	0.0%	33.0%	10.0%	0.0%	0.0%	0.0%	20.0%	10.0%
2020 (Estimate)	0.0%	35.0%	15.0%	0.0%	0.0%	0.0%	20.0%	15.0%
Total Vessel Traffic (MT)								
1996 *	0	223,720	0	0	0	0	12,114	1,401
2000	0	266,452	1,469	0	0	0	26,697	8,913
2010	0	400,105	4,787	0	0	0	50,495	32,665
2020	0	598,593	11,696	0	0	0	71,432	88,681
Annual Average Growth Rates								
1990-1996 Average (Regression)	NA	57.8%	NA	NA	NA	NA	26.8%	182.3%
1996-2010	NA	4.2%	NA	NA	NA	NA	10.7%	25.2%
2010-2020	NA	4.1%	9.3%	NA	NA	NA	3.5%	10.5%

* Baseline estimates are for fiscal year ending in June; CY data converted based on average of 2 years.

Table 3-8 THE PORT OF HUENEME CARGO FLOW FORECASTS TO 2020

(All Weights in Metric Tons)

		Baseline	Forecast (Unconstrained)			Average Annual Growth		Forecast (Constrained)		
Fiscal Year:		1996	2000	2010	2020	1996-2010	2010-2020	2000	2010	2020
Target Commodities - Exports										
Reefer										
Meat	01	0	0	0	0	NA	NA	0	0	0
Fruits & Nuts	03	223,720	266,452	400,105	598,593	4.2%	4.1%	266,452	400,105	598,593
		223,720	266,452	400,105	598,593	4.2%	4.1%	266,452	400,105	598,593
Other Breakbulk										
Seeds	04	0	1,469	4,787	11,696	NA	9.3%	1,469	4,787	11,696
Hay	05	0	0	0	0	NA	NA	0	0	0
Waste Paper	08	0	0	0	0	NA	NA	0	0	0
Cotton	09	0	0	0	0	NA	NA	0	0	0
		0	1,469	4,787	11,696	NA	9.3%	1,469	4,787	11,696
Ro-Ro										
Autos	10	12,114	26,697	50,495	71,432	10.7%	3.5%	26,697	50,495	71,432
Other Vehicles	11	1,401	8,913	32,665	88,681	25.2%	10.5%	8,913	32,665	88,681
		13,515	35,609	83,160	160,113	13.9%	6.8%	35,609	83,160	160,113
Target Commodities - Imports										
Reefer										
Meat	01	0	8,756	21,769	40,592	NA	6.4%	8,756	21,769	40,592
Bananas	02	245,610	501,456	687,115	941,514	7.6%	3.2%	501,456	687,115	941,514
Fruits & Nuts	03	15,331	18,950	29,783	46,231	4.9%	4.5%	18,950	29,783	46,231
		260,941	529,162	738,667	1,028,336	7.7%	3.4%	529,162	738,667	1,028,336
Other Breakbulk										
Wood Pulp	06	92,080	98,932	118,253	141,349	1.8%	1.8%	49,466	59,127	70,674
Lumber, Plywood & Partbd.	07	0	5,951	14,226	34,008	NA	9.1%	0	0	0
		92,080	104,882	132,479	175,356	2.6%	2.8%	49,466	59,127	70,674
Ro-Ro										
Autos	10	122,935	118,096	106,804	96,592	-1.0%	-1.0%	118,096	106,804	96,592
Other Vehicles	11	14,648	14,194	12,836	11,609	-0.9%	-1.0%	14,194	12,836	11,609
		137,583	132,290	119,640	108,201	-1.0%	-1.0%	132,290	119,640	108,201
Neobulk/Bulk										
Steel Products *	12	4,660	5,256	2,120,229	3,061,009	54.8%	3.7%	0	0	0
Fertilizers	13	0	27,506	140,951	321,020	NA	8.6%	0	0	0
Gypsum	14	0	320,969	384,879	461,515	NA	1.8%	215,049	257,869	309,215
		4,660	353,731	2,646,060	3,843,544	57.3%	3.8%	215,049	257,869	309,215
All Other										
Misc. Exports/Imports *		20,711	23,807	22,878	26,297	1.0%	1.0%	23,807	22,878	26,297
Coastwise		137,286	157,807	151,649	174,317	1.0%	1.0%	157,807	151,649	174,317
Grains		0	0	0	0	1.0%	1.0%	0	0	0
Liquid Bulk		105,311	121,052	116,329	133,717	1.0%	1.0%	121,052	116,329	133,717
		263,308	302,666	290,856	334,331	0.7%	1.4%	302,666	290,856	334,331
Total - All Commodities		995,807	1,726,261	4,415,755	6,260,171	11.2%	3.6%	1,532,163	1,954,212	2,621,160

Two companies have expressed their desire to import products into Port Hueneme in the future. The first, Hydro Agri International (HAI), has made a commitment to import liquid fertilizer into Port Hueneme from Europe. The second, Charles E. Boyd & Associates (CEB), has expressed its intention to import gypsum into Port Hueneme from Mexico.

Liquid Fertilizer

HAI is a subsidiary of Nosrk Hydro, ASA (Hydro), a Norwegian conglomerate with over 38,000 employees. Hydro manufactures and distributes products in a number of business segments, including agriculture, oil and gas, light metals, and petrochemicals. Hydro Agri Europe and HAI are the two business units in the agricultural segment.

HAI is one of the world's leading producers of mineral fertilizer, with a world-wide distribution and marketing network. The company has 20 fertilizer production plants located in various countries (although none in the U.S.). HAI sells a wide range of fertilizer products in more than 100 countries and is a leader in the nitrogen fertilizer market.

HAI has made a commitment to sell liquid nitrogen-based fertilizer through Port Hueneme. Construction will soon be underway on three storage tanks, including two 16,000 metric ton (MT) tanks and one 18,000 MT tank (for a total storage capacity of 50,000 MT). In addition, a pipeline connecting to the storage tanks will be constructed, as well as office facilities. The company is anticipating commencing operations at the port by early 1999.

The company currently sells fertilizer to Northern California agricultural customers through the Port of Stockton. Port Hueneme was identified as an ideal port to extend the company's market throughout Southern California.

- Supply

Liquid fertilizer sold through Port Hueneme will be supplied by HAI's manufacturing plants in Poland, Norway and Germany. Vessels chartered by HAI will deliver the product a distance of approximately 8,400 nautical miles from ports in Gdansk, Poland, Porsgrunn, Norway and Rostock, Germany directly to Port Hueneme via the Panama Canal. Currently, vessels import fertilizer from these ports into the Port of Stockton, California. In the future, vessels will first stop off in Port Hueneme to unload product and then proceed to the Port of Stockton.

In general, the European ports discussed above can accommodate vessels drafting up to 12.2 meters (40 ft). However, due to draft constraints at Stockton, smaller vessels have been used. Some of these vessels have included:

	DWT	Draft (M)	Draft (ft)	Built
Champion Trader	30,990	10.96 M	35.96 ft	1/78
Iver Splendor	29,820	± 10.9 M	35.8 ft	1/81
Empress Trader	24,221	9.69 M	31.8 ft	1/71
Champion	25,200	9.94 M	32.6 ft	1/74
Chavchavadze	16,231	± 9.0 M	29.5 ft	1/88

In general, these vessels have been in the 25,000-35,000 dead weight ton (DWT) range, with drafts generally less than 10.7 meters (35 ft). The Port of Stockton has an available depth of 10.7 meters (35 ft). However, assuming a required underkeel clearance at MLLW of about 0.91 meters (three ft), vessels drafting in the 10.7 meter (35 ft) range (such as the Champion Trader and Iver Splendor) are required to enter the port light loaded at MLLW. WCSC data shows no vessels entering or exiting Stockton in 1996 with a draft exceeding 9.8 meters (32 ft).

Company representatives have indicated that smaller tanker vessels, such as the Empress Trader and Champion, are getting older, with many being turned into scrap metal. Note that these vessels were built in the early 1970's. As these older ships are being phased out, they are being replaced with larger, deeper-draft vessels. It is assumed that these smaller vessels will not be readily available in the future. Under without project conditions, it is assumed that 35,000 DWT vessels will be the minimum size available for this trade route. IWR statistics specify that foreign tankers of this size generally have maximum drafts of about 10.7 meters (35 ft).

- Demand

Hydro's agriculture sales have increased significantly over the past few years. The average compound growth rate between 1995 and 1997 was about 7.5 percent. The company anticipates continued strong fertilizer sales growth. Sales outside Western Europe are projected to double between 1996 and 2005, according to Hydro's 1997 Annual Report.

Fertilizer sales in the Northern California market have been experiencing rapid growth, as demonstrated by the following detail of fertilizer imports through the Port of Stockton:

Fertilizer Imports	Short Tons	Metric Tons
1996	166,000	151,000
1995	133,000	121,000
1994	101,000	92,000
1993	31,000	28,000
1992	86,000	78,000
1991	38,000	34,000

The above data show an average compound growth rate of over 34 percent. The company estimates that 1998 demand through Stockton will be approximately 200,000 MT. First-year demand at Port Hueneme has been estimated at about 44,000 MT. Sales are expected to reach over 60,000 MT after the first few years of operations.

Liquid fertilizer has experienced significant sales growth and continued growth is anticipated. In the past, dry fertilizers were used exclusively. Liquid fertilizer is easier to apply than dry fertilizer, since it can be applied through irrigation systems. Liquid fertilizer cannot displace dry fertilizer, since it does not contain all of the nutrients supplied by dry fertilizers. However, it provides a highly efficient method of applying nitrogen to crops, which is a key nutrient. Hence, while the dry fertilizer market is anticipated to experience slow growth, liquid fertilizer is expected to experience a much higher growth rate.

Based upon historical growth trends, industry analysis and information furnished by the Company, the following growth projections have been assumed for this analysis:

	Stockton (MT)		Port Hueneme (MT)
1998	200,000	1999	44,000
1998-2000	10%	1999-2002	13%
2001-2005	5%	2003-2007	8%
2006-2020	3%	2008-2020	3%

Due to the significant uncertainty regarding future fertilization methods, the size of the California agricultural industry, etc., demand beyond the year 2020 has been held constant. **Table 3-9** below summarizes projected growth over the period of analysis for both Stockton and Port Hueneme.

Table 3-9 Projected Demand Fertilizer Imports
(1,000s of Metric Tons)

Year	Stockton	PH	Total
2000	242	50	292
2010	358	108	466
2020-2049	481	151	632

Gypsum

Charles E. Boyd & Associates (CEB) is a cargo broker involved in import, export and distribution services. They arrange transportation with charter vessels, and provide transportation terminal services. Most of the business' customers are under contracts, as opposed to spot market customers.

CEB has indicated that it intends to import gypsum from Mexico into Port Hueneme. Gypsum would be transported from ports in San Marcos Island (which is the site of a gypsum quarry producing about 2.7 million MT annually) and Manzanillo, Mexico. CEB is currently importing a small amount of gypsum from these ports into the ports of Stockton, Los Angeles, Long Beach and Redwood City. Port Hueneme is a desired port of entry since the gypsum would be sold primarily to agricultural users, many of which are in close proximity to the port. WCSC data shows that approximately 26,000 MT of gypsum was imported into Stockton during 1996, with no imports shown for prior years. Most gypsum imported into the Southern California area comes into the Port of Long Beach. WCSC shows gypsum imported into Long Beach has fluctuated between 390,000 and 487,000 MT between 1991 and 1996.

CEB is currently trying to secure deals with shipping companies, grinding mills (to process the gypsum) and fertilizer companies. It is uncertain when CEB will begin importing gypsum into the port. However, company officials have stated that they intend to commence operations as soon as possible, regardless of whether the port is deepened.

- Supply

As described above, gypsum would be obtained from quarries in Mexico. San Marcos Island and Manzanillo were identified as ports of loading. San Marcos Island has a depth alongside pier of about 12.8 meters (42 feet). The Port of Manzanillo has at least one terminal with a similar depth. Hence, these ports have deeper depths and can accommodate larger vessels than Port Hueneme.

Bulk carriers would be used to transport the gypsum. Based upon current depth limitations at Port Hueneme, the company has determined vessels such as the following could be utilized.under without project conditions:

Vessel	DWT	Draft (M)	Draft (ft)
Cabo	31,364	10.91	35.8'
Hai Wang Xing	37,944	10.82	35.5'

These vessels both fall within the general IWR specifications for 35,000 ton bulk vessels, with indicated maximum drafts of 10.7 meters (35 ft). Under without project conditions, it is assumed that this vessel size will be used for the trade route.

- Demand

Gypsum is sold primarily to cement grinders, wallboard manufacturers and agricultural users. Gypsum imported into Port Hueneme would be sold to agricultural users, primarily in the Oxnard area and California's central valley. Once ground finely, gypsum can be applied along with fertilizer to crops. It has the beneficial effect of improving soil structure and permeability, according to the *Center for Irrigation Technology's* internet pages. Port Hueneme is considered an ideal port to import gypsum due to its proximity to both potential customers in California's central valley and gypsum grinders in the Bakersfield, California area.

CEB anticipates high initial demand and strong growth once operations begin. The company attributed this to the high quality of Mexican gypsum compared to domestic sources. They also stated that domestically produced gypsum from Nevada and California is typically more expensive. The company projects initial demand could be as high as 150,000 tons and that its market share could eventually reach 300,000 tons.

For purposes of this analysis, the following demand projections have been utilized:

	Demand (MT)
1999	100,000
1999-2002	10%
2003-2007	5%
2008-2020	3%

Due to the significant uncertainty regarding future fertilization methods, the size of the California agricultural industry, etc., demand beyond the year 2020 has been held constant. Table 3-10 below summarizes projected growth over the period of analysis.

Table 3-10 Projected Demand Gypsum Imports
(1,000s of Metric Tons)

Year	Total
2000	110
2010	186
2020-2049	249

3.2.2 Without Project Transportation Costs

Liquid Fertilizer

The total transportation costs for supplying both the Stockton and Port Hueneme markets with liquid fertilizer have been projected. Transportation costs were calculated for supplying both markets, since the vessels importing product into Port Hueneme would be continuing up the coast to Stockton. Any improvements to Port Hueneme allowing deeper draft vessels could reduce the number of vessel trips required to service both of these markets. Under without project conditions, it is assumed that 35,000 DWT vessels will be the minimum size available for this trade route.

The following table summarizes projected transportation costs over the period of analysis:

Table 3-11 Fertilizer Imports Projected Transportation Costs
(Without Project Conditions)

Year	Demand (MT)	Trips/Yr	Miles/Yr	Hrs/Yr	Total
2000	292,000	9	79,200	5,657	$4,359,000
2010	466,000	15	132,000	9,429	$7,265,000
2020-2049	632,000	22	176,000	12,571	$9,686,000

As shown on Table 3-11, transportation costs are projected to more than double over the period of analysis. The net present value (NPV) of these transportation costs is about $96.8 million. Annualized transportation costs for liquid fertilizer imports total $7.122 million.

Gypsum

The total transportation costs for supplying the Port Hueneme market with gypsum have been calculated. Any improvements to Port Hueneme allowing deeper draft vessels could reduce the number of vessel trips required to service the market. Under without project conditions, it is assumed that a 35,000 DWT vessel will be used for the trade route.

The following table summarizes projected transportation costs over the period of analysis:

Table 3-12 Gypsum Imports Projected Transportation Costs
(Without Project Conditions)

Year	Demand (MT)	Trips/Yr	Miles/Yr	Hrs/Yr	Total
2000	110,000	4	5,100	361	$213,000
2010	186,000	6	7,600	542	$319,000
2020-2049	249,000	8	10,100	723	$426,000

As shown on Table 3-12, transportation costs are projected to more than double over the period of analysis. The net present value (NPV) of these transportation costs is about $4.4 million. Annualized transportation costs for gypsum imports total $326,000.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 4. Federal Project Plan Formulation

4.1 General

The Federal interest in navigation is derived from the Commerce Clause of the Constitution and is limited to the navigable waters of the United States. Federal navigation improvements in or on these waters are in the general public interest and must be open to the use of all on equal terms. When facilities to accommodate and service vessels or load and unload cargo are required as associated facilities to achieve the benefits of a Federal project, they are entirely the responsibility of local interests.

The general navigation features in harbor areas considered eligible for Federal participation include channels, jetties and breakwaters, and basins or water areas for vessel maneuvering, turning, passing, mooring, or anchoring incidental to transit of the channels. Navigation improvements also include activities such as removal of wrecks and obstructions, snagging and clearing for navigation, drift and debris removal, bridge replacement or modification, and mitigation of project induced shore damage.

4.2 Planning Objectives and Evaluation Measures

4.2.1 Planning Objectives

Based on the analysis of the identified problems and opportunities and the existing physical, human and environmental conditions of the study area, planning objectives were identified to direct formulation and evaluation of alternative plans.

1. Optimize the efficiency of transporting existing and future commerce through the Port of Hueneme.

2. Preserve and improve environmental resources to the maximum extent practicable.

Objective 1 is fundamental to improving the efficiencies of existing and future operations with respect to transportation costs. These objectives are consistent with Federal planning guidelines and the primary goal of contributing to the Nation's economic development (NED).

Objective 2 includes the specific objectives of alleviating existing and future air quality and vessel traffic impacts resulting from inefficient cargo handling operations. It also relates to meeting the NED objective in a manner that is consistent with applicable environmental laws, regulations, and policy. This reflects conformance with Federal, state, and local environmental statutes, regulations, and policies. If a potential impact is predicted to occur or result in a violation of one of the significance criteria as defined in Section 5 of the Environmental Assessment, the impact will be considered significant. If significant impacts are predicted, mitigation measures will be developed to minimize the impact, and the impact will be re-evaluated. For an alternative with unmitigable significant impacts, the alternative will be dismissed or the alternative will be recommended for re-assessment with an Environmental Impact Statement, pursuant with the NEPA.

4.2.2 Plan Formulation Approach

The approach taken in formulating a project involved several steps that screened or narrowed the development and consideration of alternative plans towards selection of the best project to meet the stated objectives. These steps included: (1) Determination of the most viable measures to provide positive contributions to the planning objectives; (2) Determination of channel improvement requirements; (3) Determination of viable options for disposal of dredged material; (4) Optimization of channel improvements based on NED and environmental consideration; and (5) Evaluation of final channel improvements and disposal alternatives and selection of the best plan.

The assessment of measures and plans is based on comparisons under without project and with project conditions and addresses national economic development, regional economic, environmental, and other social effect considerations in accordance with Federal law and Corps of Engineers Planning policies and procedures.

4.3 No Action Plan (Without Project Condition)

The No Action Plan reflects the existing and most probable future physical, economic, environmental and other conditions of the port assuming no Federal or non-Federal action is taken towards addressing the stated planning objectives. The No Action Plan establishes the without project condition that is used as the basis for assessing economic, environmental and other impacts of any proposed improvement.

In regard to the first planning objective, the No Action Plan reflects the existing and the most probable future cargo movements through the Port of Hueneme. The No Action Plan is based on the continued most efficient cargo movements of the Port's existing customers given the constraints of the existing channel depths including future cargo projections as indicated in the previous section. Liquid fertilizer will be delivered to the port utilizing 35,000 DWT tankers. In order to service the demand, these vessels will load to capacity, drafting 10.7 m (35 feet). To enter the port safely, these vessels will incur tidal delays. Similarly, gypsum will be delivered to the port utilizing 35,000 DWT bulk carriers. These vessels will also load to capacity to service the demand and incur tidal delays.

In regard to the second objective, water quality in the Port of Hueneme would remain essentially the same. Air emissions would increase as larger vessels wait for favorable tides to enter the harbor. This queuing plus the partial loading of cargo ships would result in inefficiencies in cargo movement. These inefficiencies would result in higher emissions per unit of cargo throughput over the period of analysis.

4.4 Measures Considered to meet the Planning Objectives

The formulation of plans to meet the needs of the port examined all viable structural and non-structural measures primarily focusing on addressing the primary planning objective. Non-structural objectives would involve changing operations such as (1) use of tides; (2) lightering; and (3) use of other ports. Structural measures are actions which involve construction or modification of improvements to meet the primary objective. Analysis of structural measures was limited to deepening and widening channels. Based on examination of the alternative measures considered viable to improve the efficiency of operations at the Port of Hueneme, the following conclusions were made.

4.4.1 Non-Structural Measures

1. **Use of Tides.** Deep draft wood pulp vessels presently have had to wait for favorable tides before entering the Harbor. This situation occurs when scheduling does not permit them to stop at Long Beach first and off-load cargo. Approximately 2-3 wood pulp vessels per year have incurred tidal delays. This number can be expected to rise sharply in the future when HAI and CEB begin utilizing Panamax-sized vessels to call on the Port. Use of tides results in slower cargo movements and queuing which increases the cost of transportation per unit of cargo. Strict use of tides is considered economically inefficient and was thus, eliminated from further consideration; however, using tides in concert with other improvement measures such as channel deepening was carried forward.

2. **Lightering.** Lightering involves providing or designating an area with adequate depth to allow a fully loaded vessel to transfer part of its load to other, smaller vessels until the vessel draft is at a depth it can enter the harbor. The extra cost of lightering including use of smaller vessels can be considerable. In addition, the use of smaller vessels increases air emissions. Accordingly, lightering was eliminated from consideration for economic and environmental reasons.

3. **Use of Other West Coast Ports.** HAI currently sells liquid fertilizer to Northern California through the Port of Stockton. The company has chosen Port Hueneme as an ideal port to extend its market to Southern California. Port Hueneme is the desired port of entry for CEB since the gypsum the company supplies would be sold to agricultural users in close proximity to the Port. Therefore, the use of other west coast ports was not considered for further consideration.

4.4.2 Structural Measures

1. **Channel Improvement.** Improvements to the approach channel, entrance channel, turning basin and Channel "A" are viable options that warrant consideration, since this would allow vessels to come in more fully loaded and allow larger vessels to call on the Port.

Based on the above, the measures considered feasible involve improvements to the approach channel, entrance channel, turning basin and Channel "A". Use of tides was considered when developing the final array of alternatives.

4.5 Channel Requirements

The second step in formulating a plan involves defining channel requirements needed to obtain economy of scale transportation savings from deeper loaded and larger vessels. This includes assessing channel dimensions, determining dredging requirements and analyzing the characteristics and quality of the material to be removed to create the designed improvements.

4.5.1 Basis for Design

The design of general navigation features was accomplished in accordance with Corps criteria, procedures and standards, and reflects the actual and projected vessels calling on the Port of Hueneme and their operating procedures as discussed with the shippers, pilots, and officials from the Oxnard Harbor District.

4.5.2 Design Vessels

Preliminary channel designs for this report were based on the dimensions of vessels proposed by Hydro Agri International to transport liquid fertilizer to Port Hueneme. HAI proposes the use of a 50,000 DWT tanker to bring liquid fertilizer into the Port. Based upon U.S. Army Corps of Engineers Headquarters memorandum dated 24 April 1996, subject: Economic Guidance Memorandum 95-2 (Revision): Fiscal Year 1995 Deep Draft Vessel Operating Cost Estimates. Appendix A of this memorandum provides estimated Tanker (Double Hull and Non-Double Hull), ship characteristics. For a 50,000 DWT tanker, the ship characteristics are: 206 m

(676 ft) length overall, 12.2 m (40 ft) draft, and a 31.4 m (103 ft) beam. The volumetric displacement is approximately 45,900 cu m (60,000 cu yd), and the ship block coefficient (the ratio of the ship's volumetric displacement to the product of the ship's beam, length and draft) is 0.6.

Although the channel designs are based on the design vessel specified above. these dimensions will also accommodate 50,000 DWT bulk carriers with design drafts of 12.2 m such as those proposed to be used by CEB.

4.6 Channel Dimensions

Discussions of the channel width, depth and length follow. All discussions and calculations regarding dimensions are guided by draft EM 1110-2-1613, dated 8 Jan 1994, titled "Hydraulic Design of Deep Draft Navigation Projects", unless otherwise specified.

4.6.1 Channel Depth Criteria

Channel depth is based on the loaded draft of the design vessel plus underkeel clearance. The underkeel clearance is determined by considering vessel squat, the potential dynamic effects upon the vessel, and safety clearance. Therefore, the deepest vessel that could safely use the existing harbor at MLLW would draw about 10 m (33 ft) at it's lowest point. Vessels drafting 10.5 m (34 ft) or more at the lowest point may incur tidal delays.

Trim

Trim is the relation of a ship's floating attitude to the water, considered from bow to stern. When properly trimmed, the stern is usually lower in the water than the bow, or, in other words, the bow draft is less than the stern draft. Trim is not included as part of the underkeel clearance determination, since underkeel clearance is measured from the lowest point of the vessel as a whole.

Squat

As stated in the draft EM 1110-2-1613: "A ship in motion will be lowered (ship sinkage vertically) below the still water surface because of the increased velocity past the ship causing the pressure on the ship hull to be decreased. This phenomena occurs in deep, open water situations such as out at sea as well as in shallow water."

It is assumed that the vessel speeds will be as follows:

Channel Reach	Speed
Approach	11 km/hr (6 knots)
Entrance	2 km/hr (1 knot)
Turning Basin	2 km/hr (1 knot)
Slip	2 km/hr (1 knot)

Squat measurement is dependent on the ship block coefficient, ship length, beam, draft, and depth Froude number, as well as the dimensions of the channel. A WES computer program was used to calculate squat, with varied depth of the channels, the loaded draft of the ship, and the speed of the vessel. In the approach channel, for depths ranging from 12.5 m (41.0 ft) to 13.5 m (44.3 ft), the squat remained around 0.25 m (0.8 ft). Varying the entrance channel's depths from 11.5 m (37.7 ft) to 12.5 m (41.0 ft) resulted in a squat that was 0.1 m (0.3 ft) and below. The turning basin was tested with the same depths as the entrance channel and the squat was approximately 0.005 m (0.02 ft).

Vertical Effects from Wave Motion

Based upon a kinematic model and a case study on the Columbia Rivermouth, a recommended value of ship vertical movement below the still water surface is about 1.2 times the wave height. If the average wave height in and around the approach channel is assumed to be 1 m (3.3 ft), then the vertical motion will be approximately 1.2 m (3.9 ft). In the entrance channel, waves are very small, perhaps 0.25 m (0.8 ft), so the vertical motion is around 0.3 m (1 ft). The waves in the turning basin are, for practical purposes, negligible, so vertical effects from waves here are estimated to be 0.1 m (0.3 ft).

Safety Clearance

As stated in EM 1110-2-1613: "In the interest of safety, a clearance of at least [0.6 m] two feet is normally provided between the bottom of a ship and the design channel bottom to avoid damage to ship hull, propellers, and rudders from bottom irregularities and debris. When the bottom of the channel is hard consisting of rock, consolidated sand, or clay, the clearance should be increased to at least [0.9 m] three feet." Since the bottom of the channel is not expected to be hard, it is recommended that [0.6 m] two feet be allowed for safety clearance, inside and outside the breakwaters. This represents 5.1% of the vessel fully-loaded draft.

Underkeel Clearance

Underkeel clearance is the vertical distance below the lowest point of the vessel. The gross underkeel clearance is the sum of the effects of fresh water, squat, vertical motion from waves, and safety clearance, as summarized on **Table 4-1**. The resultant recommended underkeel clearance for the vessels approaching the harbor is 2.0 m (6.6 ft), or 17 % of the vessel's fully-loaded draft. The recommended underkeel clearance in the entrance channel is 1.0 m (3 ft), or 8 % of the draft. And in the turning basin, the recommended underkeel clearance is approximately 0.7 m (2.3 ft), 6 % of the draft.

Table 4-1 Underkeel Clearance

	Approach Channel meters (feet)	Entrance Channel meters (feet)	Turning Basin meters (feet)
Squat	0.25 (0.82)	0.09 (0.30)	0.005 (0.016)
Vertical Motion	1.2 (3.9)	0.3 (1.0)	0.1 (0.3)
Safety Clearance	0.6 (2.0)	0.6 (2.0)	0.6 (2.0)
Total	2.05 (6.72)	0.99 (3.3)	0.705 (2.32)
Recommended Clearance	2.0 (6.6)	1.0 (3.3)	1.0 (3.3)

4.6.2 Pilots' Strategy

The pilots' strategy for entering the port is of concern in determining the channel design because it outlines the factors that the pilot looks for in ensuring the safety of the vessel. The strategy is based on experience, and should be used in combination with the EM guidelines as support.

During a visit to Port Hueneme by Corps of Engineers representatives (Risko 1996), Port Pilot Captain Andrew M. Harvey discussed his navigation strategy for entering Port Hueneme. Upon entering the approach channel, tug boats are tied to the vessel. The approach is normally made at 3.09 m/s (6 knots). A Venturi effect in the approach channel sometimes requires speeds of nearly 5.1 m/s (10 knots) to overcome. Once the jetties are cleared, engines are stopped near Buoys 5 and 6 of the entrance channel. At the end of the entrance channel, engines are backed down with the aid of the tugs to 'kill' vessel way (momentum). Backing down the engines will sometimes result in the bow dropping 1 m (3 ft). By the end of the entrance channel, upon entering the turning basin, the vessel is guided by the tugs at about 0.5 m/s (1 knot). In docking at the Harbor District's wharves, the pilot usually docks the tankers bow first. After unloading, the vessel is backed out into the turning basin, turned by the tugs, and exits the harbor.

Of primary concern to the pilot when entering the harbor are the wind conditions. Wind speeds have to be less than 12.9 m/s (25 knots) for the pilot to attempt to enter the harbor. The sea and currents are generally not factors to consider presently when deciding whether to approach the channel. However, as deeper-draft vessels are brought into port, cross currents become more of a significant factor, indicating a need to widen the harbor's approach channel by approximately one beam length (30 m). Tides are not of concern for vessels with less than 9.75 m (32 ft) draft.

4.6.3 Ship Simulation Studies

A ship simulation study was conducted at the Star Center Training and Research facility, located in Dania, Florida from 26 to 30 July 1993, for Port Hueneme. The design vessel used was a 288.6 m (947 ft) FSL-7 cargo ship, assisted by four tugs. Turning in the basin with current dimensions was ruled out due to the ship's size. The following conditions needed to be met by the simulator, according to the study, in order for the ship to enter safely:

- wind < 6.2 m/s (12 knots)
- current < 0.3 m/s (0.5 knots)
- daylight operations only
- 0.9 m (3 ft) keel clearance
- 4 tug use required
- 2 pilots aboard
- no more than 1 ship at Wharves 5 and 6
- no more than 1 ship at Wharf 1 east of the channel line
- no ship or watercraft on Wharf 4
- 8.0 km (5 mi) visibility inbound/ 4.8 km (3 mi) outbound
- 0600 arrival time ideal

It was also recommended by the study that a wind measurement system be placed on the jetties, that a current measurement system be placed in the buoys at 4.6 m (15 ft) and 6.1 m (20 ft) depths, and that the wider harbor channel would expand safety margins of operations and operational parameters.

4.6.4 Channel Width Criteria

Traffic Requirements

Both the approach and the entrance channels are designed to handle only one-way traffic.

Width for Straight Sections Inside the Breakwater

For channel width design criteria, aforementioned guidance (EM 1110-2-1613) recommends multipliers of the design vessel beam based upon maximum currents, channel cross-section, and aids-to-navigation. The maximum current ranges from 0 to 0.25 m/s (0.5 knots). The channel cross-section is dredged (trench) type. The design vessel beam is 31.4 m (103 ft). If the aids-to-navigation are rated as best, the multiplier is 2.75, resulting in a channel width of 86.4 m (283 ft). This is 14.2 m (47 ft) less than the existing entrance channel width of 100.6 m (330 ft), about 14% less. If the aids-to-navigation are rated as average due to the interference during certain hours from the sun, and interference from increasing numbers of city lights, the multiplier is 3.5, resulting in a channel width of 109.9 m (361 ft). This is 9.3 m (31 ft) more than the existing entrance channel width of 100.6 m (330 ft), about 10% more. These differences are not considered significant, and an adjustment in entrance channel width is not recommended.

Turning Basin Criteria

Turning basins are required only when absolutely necessary, such as when the distance required to back a ship into berth is more than four or five berth lengths, or where an oil tanker has to be turned around to be moored with its bow heading out for safety reasons.

Turning Basin Dimensions

The size of the turning basin should call for a minimum turning diameter of 1.2 times the length overall for a low current (<0.26 m/s or 0.5 knots). The design vessel's length overall is 206 m (676 ft), so the turning diameter should be at least 247.2 m (811 ft). The actual basin dimensions of 329.2 m (1080 ft) by 310.9 m (1020 ft) satisfy the requirement.

4.7 Channel Design

Since the existing channel dimensions, other than the depth, are all reasonably close to the recommended measurements, only the depth of the harbor is recommended to be changed. Existing dimensions are again listed below:

Existing Navigation Features

- two jetties about 244 m (800 ft) and 305 m (1,000 ft) long;
- an approach channel about 244 m (800 ft) long by 183 m (600 ft) wide with a depth of -12.2 m (-40 feet), Mean Lower Low Water Datum (MLLW);
- a 472 m (1,550 ft) long entrance channel 91 m (330 ft) wide at a depth of -11 m (-36 ft), MLLW;

- a central basin 329 m (1,080 ft) long and 311 m (1,020 feet) wide with a depth of -10.7 (-35 ft) MLLW;
- and Channel "A" which is 707 m (2,320 ft) long, 84 m (275 ft) wide, and a depth of
-10.7 (-35 ft) MLLW.

4.8 Final Alternative Plans

Four alternate deepening plans were evaluated based on the underkeel clearance requirements presented previously. Channel and turning basin dimensions were maintained to the limits of the existing project since these dimensions are fairly close to the requirements obtained using the "design" vessel and guidance in EM-1110-2-1613. **Table 4-2** lists the four alternate deepening plans which were considered for further evaluation. **Figure 4-1** depicts the design of the harbor and the alternative depths.

Table 4-2 Alternative Plans - meters (ft) -MLLW

Alternative	Approach	Entrance	Turning Basin	Channel "A"
No Action (Existing)	12.2 (40)	11 (36)	10.7 (35)	10.7 (35)
1	12.5 (41)	11.5 (37.7)	11.5 (37.7)	11.5 (37.7)
2	13 (42.2)	12 (39.4)	12 (39.4)	12 (39.4)
3	13.5 (44.3)	12.5 (41)	12.5 (41)	12.5 (41)
4	14 (45.9)	13 (42.2)	13 (42.2)	13 (42.2)

Alternative 1- consists of dredging the Approach Channel to -12.5 m (-41 ft) MLLW and dredging the Entrance Channel, Turning Basin and Channel "A" to a depth of -11.5m (-37.7ft).

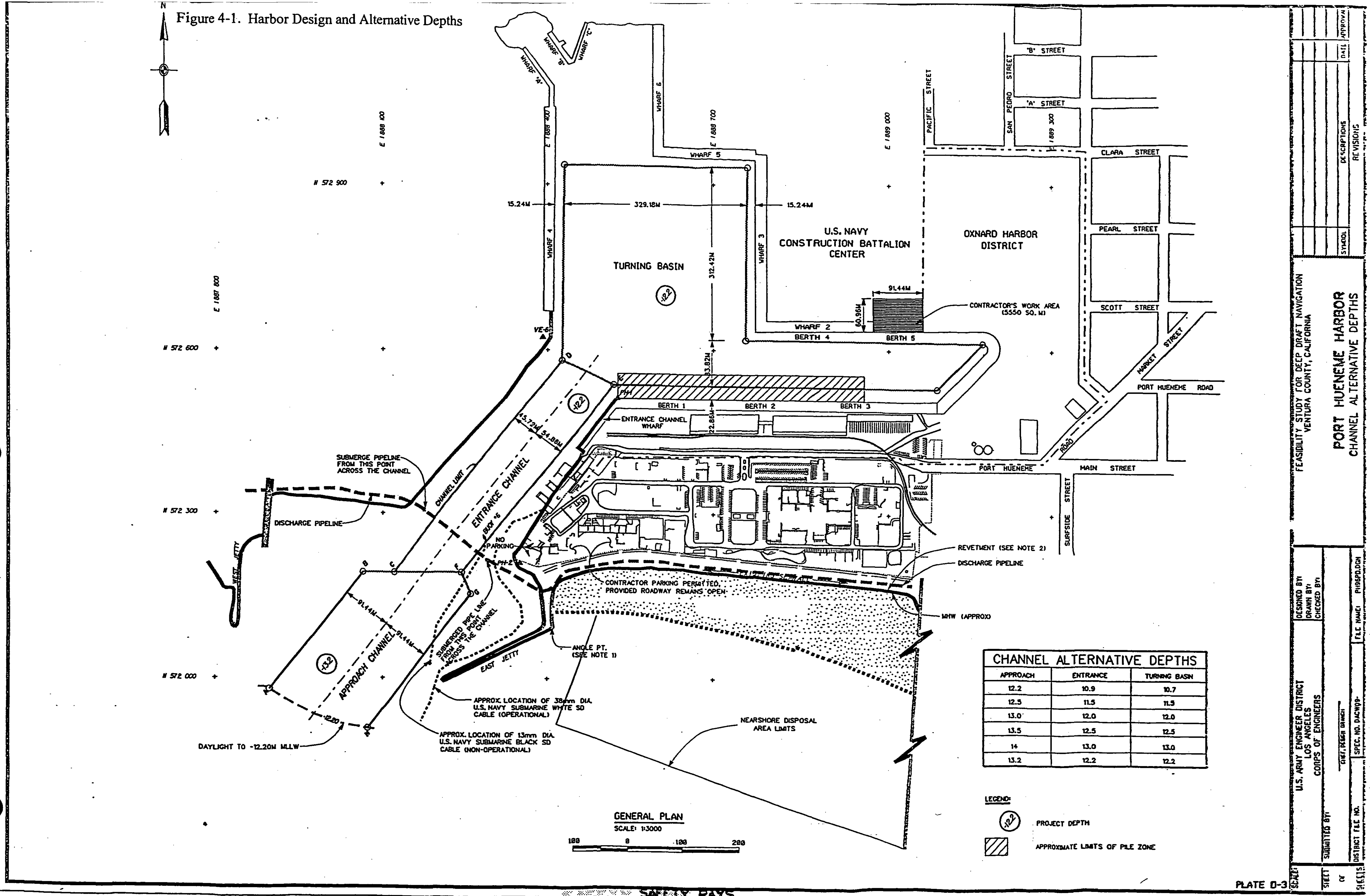
Alternative 2- consists of dredging the Approach Channel to -13m (-42.2ft) MLLW and dredging the Entrance Channel, Turning Basin and Channel "A" to a depth of -12m (-39.4ft).

Alternative 3- consists of dredging the Approach Channel to -13.5m (-44.3ft) MLLW and dredging the Entrance Channel, Turning Basin and Channel "A" to a depth of -12.5m (-41ft).

Alternative 4- consists of dredging the Approach Channel to -14m (-45.9ft) MLLW and dredging the Entrance Channel, Turning Basin and Channel "A" to a depth of -13m (-42.2).

Alternatives with depths greater than Alternative 4 were not considered since drafts for

Figure 4-1. Harbor Design and Alternative Depths



CHANNEL ALTERNATIVE DEPTHS

APPROACH	ENTRANCE	TURNING BASIN
12.2	10.9	10.7
12.5	11.5	11.5
13.0	12.0	12.0
13.5	12.5	12.5
14	13.0	13.0
13.2	12.2	12.2

vessels carrying liquid fertilizer are constrained by the depths of the Panama Canal at -39.5 feet MLLW or approximately -12 meters MLLW.

4.9 Dredged Materials

4.9.1 Soils Investigation

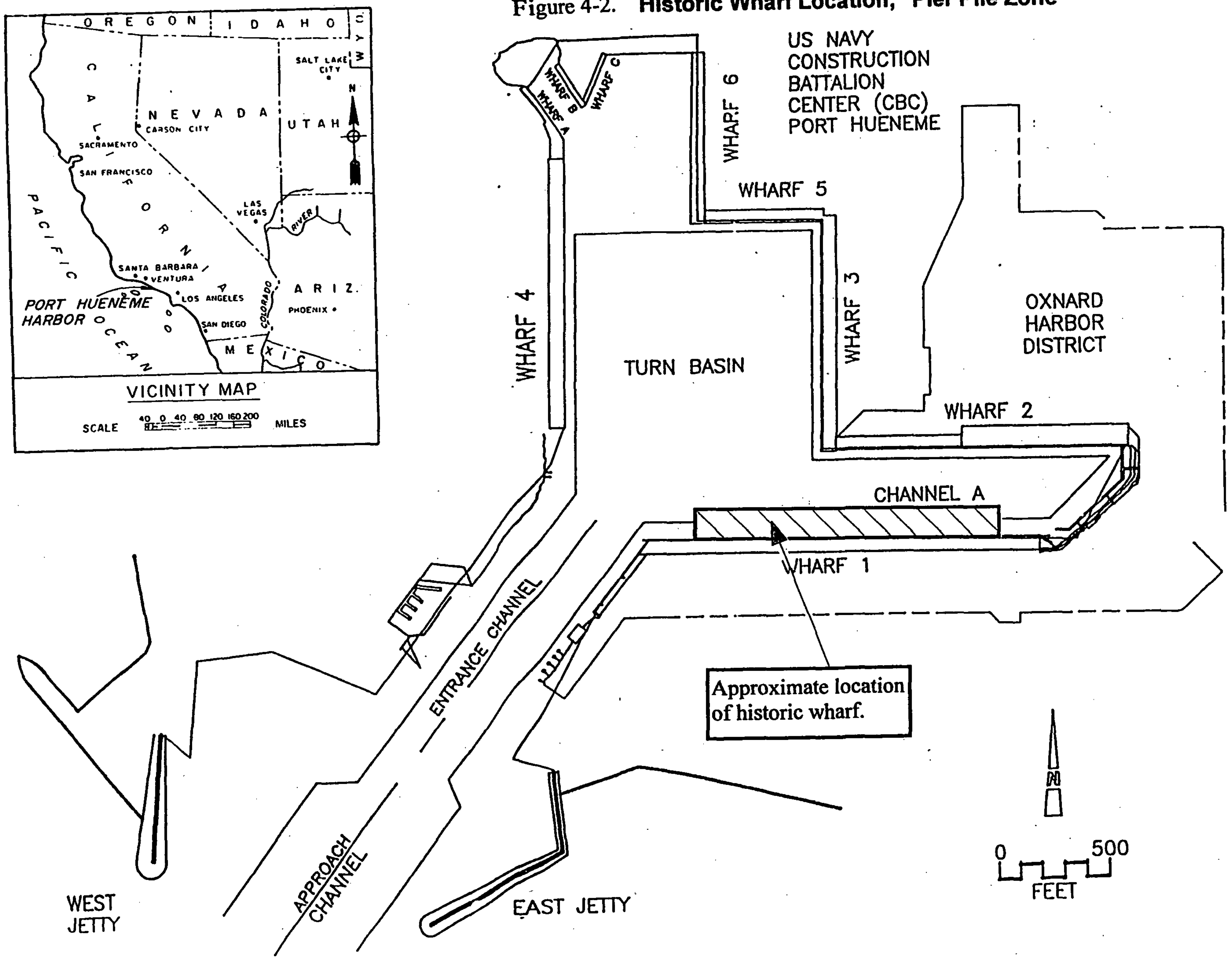
Previous sediment sampling was performed by the Corps in 1983. 43 holes scattered throughout the harbor complex were sampled. The materials encountered during this exploration were sands and silty sands with an occasional surface layer of a soft black silt. No bedrock was encountered.

The latest soil samples were collected in March, 1996 from 12 test holes that covered the Approach Channel, Entrance Channel, and Turning Basin. During the soil sample collecting operation, divers had encountered a layer of dense material with thickness varying from 0.3 to 1.8m throughout the project site. This discovery raised a concern about unknown obstacles that may be buried underneath the mudline and would be hazardous to the dredge operation. Therefore, diver surveys were performed on May 20, 1996 to verify the size, continuity and depth of the hard layers or objects below mudline near the west end of wharf 1 and to resample the 12 locations to collect samples for organotin testing. The organotins required retesting because the initial tests failed laboratory quality control criteria. The results of the survey indicated that the layer encountered is probably a small pocket/layer of gravel and possibly small cobbles. Debris such as stone to 0.3 m dia., sheet metals, wood debris, trash, tires and Mooring and Howser lines were found in the survey area.

4.9.2 "Pile Zone"

During the May 1996 explorations, numerous cutoff piles up to an estimated 460 mm in diameter were observed protruding from the channel bottom. A subsequent literature search revealed that the piles are likely the remains of the original timber wharf built along the south side of the harbor when the harbor was constructed in 1939-1940. **Figure 4-2** shows the approximate location of the historic wharf. This wharf, along with its modern replacement is commonly designated Wharf 1. The wharf was removed in the early 1970's under a contract administered by the Oxnard Harbor District at the same time as the construction of the replacement wharf 1, the widening and lengthening of channel "A" and the overall deepening of the harbor. Some of the piles appear to have been removed while others were snapped off or cutoff at or slightly above the mudline. The initial quantity of the piles was estimated at 1,536 based on the plan view of the harbor from the Appraisal Report, dated 17 November 1938. In order to identify the locations, and quantities of the piles inside the dredging area, a field investigation was conducted on 5 August 1997. Based on diver observations, it is estimated that approximately 350 piles remain.

Figure 4-2. **Historic Wharf Location; "Pier Pile Zone"**



Two piles were pulled during the investigation for further examination. The following information was collected regarding the piles:

	Length (meter)	Top Dia. (mm)	Top Elev. (meter)	Tip Dia. (mm)	Tip Elev. (meter)	Max. Force to pull the pile (KN)
Pile 1	3.58	229	11.43	178	15.01	53-62
Pile 2	4.65	267	11.43	191	16.08	80

Based on the findings of the field investigation, a hydraulic cutterhead dredge or a clamshell dredge could be used to dredge the "pile zone".

4.9.3 Dredged Material Quantities

Table 4-3 shows the estimated material quantities, in cubic meters, for deepening the harbor approach channel, entrance channel and turning basin to various depths, in meters. Dredge quantities are based on depth conditions within the harbor that existed at the time of the March 1996 condition survey, and include a 0.5 m overdepth dredging allowance. Quantities include the amount needed for maintenance dredging. The first set of rows show the quantities for the existing project depth. The remaining sets present the quantity required to deepen the project depth in one-half meter increments.

Table 4-4 displays the quantity of material for deepening the berthing areas to the four alternative depths. Bathymetric data was only available at the berth along the Wharf 1 area. So dredge quantities for the berths along the other wharf areas were proportioned by surface area comparison to the berth along Wharf 1 area. "Pile Zone" quantities were also proportioned by surface area comparison to the turning basin surface area.

4.10 Disposal of Dredged Material

4.10.1 General

Material dredged from the project area will be transported and deposited within the limits of the disposal area (Hueneme Beach). The character of materials, i.e. physical grain size, will allow the direct placement of dredge material on the beach for the beneficial effects of beach nourishment. An optional nearshore disposal site may be provided to allow flexibility in the selection of construction equipment while still realizing beneficial use of the dredge material. Debris and other unsuitable material, including wooden piles, encountered will become property of the Contractor and removed from the site. Disposal of material above elevations indicated on the drawings will not be permitted.

4.10.2 Sediment Quality

Bulk sediment chemistry test results revealed that local sediments do not contain high concentrations of organic chemicals or metals (see Environmental Assessment, Section 4.1.1.3) that would prohibit the disposal of dredged sediments on the downcoast beaches. Results of the organotin tests indicate that the material is suitable for beach nourishment.

4.10.3 Disposal Site

The dredged material will be deposited at Hueneme Beach, immediately downcoast of the East Jetty of Port Hueneme Harbor, as indicated in the disposal plan drawings, or in an optional nearshore disposal site. The wooden piles will be deposited at a suitable land disposal site.

4.10.4 Method of Disposal

The dredged material could be moved using a hydraulic cutter suction pipeline dredge, a hopper dredge, or a clamshell dredge. Material could be placed on the beach or be deposited in such a way as to create an offshore berm approximately parallel to the shoreline. The berm would be located between the -3.0 m (-10 ft) and -9.1 (-30 ft) MLLW contours. The wooden piles will need to be removed and disposed of separate from the sediment.

4.11 Project Cost Estimates

4.11.1 General Navigation Features

Cost estimates were developed in accordance with accepted construction cost estimating practices. Unit cost rates were estimated based on dredging quantities, equipment, material, and labor requirements, site-specific conditions, and scope of work. Overhead, profit, and bond were computed and distributed to the unit costs. Results were compared to historical bid abstracts where possible. Planning, Engineering and Design includes costs to produce design documents, plans and specifications, and any model testing necessary for the final design. The cost is based on a preliminary estimate coordinated with appropriate elements of the Los Angeles District. Supervision and Administration costs cover the administration of the contract during construction. The cost is also coordinated with appropriate elements of the Los Angeles District. Engineering Regulation ER 1110-2-1302, dated 31 March 1994, recommends a 25% contingency for the Feasibility study phase.

Table 4-3 Approach Channel, Entrance Channel and Turning Basin[1] Dredging Quantities

PROJECT AREA	DEPTH	QUANTITY	OVERDEPTH	SECTION TOTAL	TOTAL	TOTAL W/ WHARF
	m MLLW	cu m	cu m (0.5 m)	cu m	cu m	cu m
Approach	12.2	13,500	24,200	37,700		
Entrance	10.9	11,300	17,900	29,200		
T-Basin	10.7	12,600	46,600	59,200		
Total (Entire Cutter)		37,400	88,700		126,100	
Approach	12.5	25,200	29,400	54,600		
Entrance	11.5	38,600	23,000	61,600		
T-Basin (Total)	11.5	98,200	66,300	164,500		
Pile Zone (6%)	11.5	5,892	3,978	9,870	9,870	25,320
T-Basin Remain	11.5	92,308	62,322	154,630		
Total(Cutter Portion)		156,108	114,722		270,830	305,180
Total (Entire Cutter)		162,000	118,700		280,700	330,500
Approach	13	51,500	32,100	83,600		
Entrance	12	64,100	23,000	87,100		
T-Basin (Total)	12	168,100	70,600	238,700		
Pile Zone (6%)	12	10,086	4,236	14,322	14,322	34,497
T-Basin Remain	12	158,014	66,364	224,378		
Total(Cutter Portion)		273,614	121,464		395,078	439,303
Total (Entire Cutter)		283,700	125,700		409,400	473,800
Approach	13.5	79,500	33,800	113,300		
Entrance	12.5	96,000	23,000	119,000		
T-Basin (Total)	12.5	243,400	73,000	316,400		
Pile Zone (6%)	12.5	14,604	4,380	18,984	18,984	43,959
T-Basin Remain	12.5	228,796	68,620	297,416		
Total(Cutter Portion)		404,296	125,420		529,716	585,241
Total (Entire Cutter)		418,900	129,800		548,700	629,200
Approach	14	108,200	35,500	143,700		
Entrance	13	130,700	23,000	153,700		
T-Basin (Total)	13	322,200	75,800	398,000		
Pile Zone (6%)	13	19,332	4,548	23,880	23,880	53,580
T-Basin Remain	13	302,868	71,252	374,120		
Total(Cutter Portion)		541,768	129,752		671,520	737,520
Total (Entire Cutter)		561,100	134,300		695,400	791,100

[1] Turning Basin includes Channel A.

Table 4-4 Berthing Area Dredging Quantities

PROJECT AREA	DEPTH	AREA	AREA FACTOR	QUANTITY	OVERDEPTH	SECTION TOTAL
	m MLLW	sq m		cu m	cu m (0.5 m)	cu m
Wharf #1	11.5	12941	1	14,100	6,500	20,600
(Berths 1-2-3)	12			20,400	6,500	26,900
	12.5			26,800	6,500	33,300
	13			33,100	6,500	39,600
Pile Zone	11.5	9765	0.75	10,575	4,875	15,450
within Wharf #1	12			15,300	4,875	20,175
(Clamshell	12.5			20,100	4,875	24,975
Portion)	13			24,825	4,875	29,700
Remaining	11.5	3176	0.25	3,525	1,625	5,150
Wharf #1	12			5,100	1,625	6,725
(Cutter-Suction)	12.5			6,700	1,625	8,325
Portion)	13			8,275	1,625	9,900
Wharf #2	11.5	5537	0.43	6,100	2,800	8,900
	12			8,100	2,800	10,900
	12.5			11,500	2,800	14,300
	13			14,200	2,800	17,000
Wharf #3	11.5	5129	0.4	5,600	2,600	8,200
	12			8,200	2,600	10,800
	12.5			10,700	2,600	13,300
	13			13,200	2,600	15,800
Wharf #5	11.5	2827	0.22	3,100	1,400	4,500
	12			4,500	1,400	5,900
	12.5			5,900	1,400	7,300
	13			7,300	1,400	8,700
Wharf #4	11.5	4795	0.37	5,200	2,400	7,600
	12			7,500	2,400	9,900
	12.5			9,900	2,400	12,300
	13			12,200	2,400	14,600
BERTH AREA TOTAL			Cutter Portion	Clam Portion	Entire Cutter	
	11.5		34,350	15,450	49,800	
	12		44,225	20,175	64,400	
	12.5		55,525	24,975	80,500	
	13		66,000	29,700	95,700	

4.11.2 Construction Method

Two construction methods were compared in terms of economic efficiency and environmental acceptability. Method 1 is the use of a hydraulic pipeline dredge for the entire project. Method 2 is the use of a hydraulic pipeline dredge for the harbor excluding the "pile zone" area. In the pile zone, a mechanical clamshell dredge would be used to dredge to the project depth.

Method 1- A pipeline would be used to convey dredged material from the hydraulic cutterhead dredge to the beach disposal site located downcoast of the East Jetty of Port Hueneme Harbor. When dredging in the pile zone, the cutter-head would chop the piles into small chunks which will travel through the dredge and onto the beach. The pile zone material would be separated from other dredged material in a bermed area. All wood debris would be screened and separated prior to removing the berm and grading the beach. This operation may cause considerable down time for the dredge, since the equipment used to clean the beach can only clean a 6" layer of material. If all the pile zone material was placed in the bermed area at one time, the screening equipment could only clean the top 6" layer which would leave wood debris buried. Due to tidal and seasonal fluctuations of the beach, these materials would eventually be exposed causing a potential safety risk to recreational users of Hueneme Beach and the beaches immediately upcoast and downcoast. Therefore, only a limited amount of material could be pumped into the bermed area before the dredge would be shut down to allow the water drain so the screening equipment could remove the wood debris. To decrease the amount of down time for the dredge, more than one bermed area could be constructed on the beach so that the dredge would only need to shut down long enough to move the pipeline to another bermed area. Material could be pumped into one area while waiting for water to drain from another and the screening equipment to remove the debris. Even with more than one bermed area, however, this construction method is considered economically inefficient due to the time and cost of constructing the bermed area and amount of dredge down time. Further, it would be difficult to ensure that all the wood debris would be removed from the pile zone material prior to grading of the beach. Any debris not removed may pose a safety risk for beach users. For these reasons, this construction method was not considered further.

Method 2- A clamshell dredge would be used to dredge the pile zone. If the dredge encounters a submerged pile, it will either clamp onto it and pull it out whole, in which case the clamshell head would not fully close, allowing any sediment to fall out while pulling the pile. The pile would be placed in an on-dock staging area while awaiting transport by tractor trailer to an upland disposal site. Or the clamshell will sheer the pile, in which case the clamshell head would close trapping the sediment and the sheered off pile. The dredge would place the load on a hopper barge where the pile piece could be removed and placed with the whole piles in the on-dock staging area. Once the barge is full, it would be manuevered nearshore of Hueneme Beach for placement of the material in the nearshore zone. This method was found to be cost efficient and environmentally acceptable, therefore, the cost estimates shown in the following section were developed based on this construction method.

The quantity tables, Tables 4-3 and 4-4, show quantities for these two methods. Quantities for dredging the entire area with cutter-suction pipeline dredge are indicated by "entire cutter"; and quantities for dredging with both clamshell and cutter-suction pipeline dredges are indicated by titles "pile zone" and "clam portion", or "cutter portion", respectively.

4.11.3 Associated Costs

Associated costs were defined as those costs necessary for implementation of the plan and realization of the benefits, but not part of the general navigation features. These costs include costs to deepen the berthing areas at Berth 1, located along Wharf 1, and Berth 5, located along Wharf 2, and costs associated with modification of the entrance channel wharf, Wharf 1 and Wharf 2. Modification of the entrance channel wharf is needed to stabilize the structure as the entrance channel is deepened. Modifications for Wharves 1 and 2 are needed to stabilize the structures as the berthing areas are deepened. Dredged material quantities for the berthing areas are shown on the quantity tables; Tables 4-3 and 4-4. These quantities were used to calculate associated berthing area dredging costs as shown on the project cost estimates. Cost estimates and preliminary designs for wharf modification are described in the Cost Appendix and Geotechnical Appendix respectively. Wharf Modification costs are shown as a "lump sum" line item cost in the project cost estimates (see Tables 4-5 through 4-8).

4.11.4 Maintenance Requirements

Existing maintenance at Port Hueneme Harbor consists of the removal of approximately 175,000 cubic meters every 8 years at an estimated cost of $300,000 and is timed to coincide with the maintenance of Channel Islands Harbor located upcoast of Port Hueneme. Significant savings in mobilization/de-mobilization costs and unit costs are realized by combining the maintenance of both harbors. By averaging the estimated dredge costs over an 8 year period; the average annual maintenance costs for the existing harbor totals $37,500. For each alternative, the periodic maintenance requirement is equal to the existing project maintenance requirement; therefore, no additional maintenance is expected with any of the proposed alternatives.

4.11.5 First Costs

Tables 4-5 through 4-8 show the total first cost for each alternative including the general navigation features and the associated costs of dredging the berthing areas and wharf modification.

ALTERNATIVE 1

Table 4-5

PORT HUEMENE HARBOR DEEPENING PROJECT
PRELIMINARY COST ESTIMATE FOR FEASIBILITY STUDY

CODE OF ACCT	DESCRIPTION	QUANTITY	UNIT	OVERDEPTH QUANTITY m3(0.5m)	UNIT	UNIT PRICE	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	Note (3) CONTINGENCY PERCENT
	DREDGING COSTS									
120A	MOB/DEMOB	1	JOB		LS	$900,000	$900,000	$225,000	$1,125,000	25.0%
1203B	PROJECT AREA - DEPTH (m) MLLW									
	APPROACH CHANNEL 12.5	25,200	m3	29,400	m3	$3.65	$199,290	$49,800	$249,090	25.0%
	ENTRANCE CHANNEL 11.5	38,600	m3	23,000	m3	$3.60	$221,760	$55,400	$277,160	25.0%
	TURNING BASIN 11.5	92,308	m3	62,322	m3	$3.50	$541,205	$135,300	$676,505	25.0%
	TURNING BASIN (Pile Zone) 11.5	5,892	m3	3,978	m3	$10.99	$108,471	$27,100	$135,571	25.0%
	GENERAL NAVIGATION FEATURES DREDGING COST						$1,970,726	$492,600	$2,463,326	
	Wharf #1 (Berth 1 only, pile zone) 11.5	4,700	m3	2,167	m3	$10.99	$75,468	$18,900	$94,368	25.0%
	Wharf #2 (Berth 5 is 1/2 of Wharf 2) 11.5	3,050	m3	1,400	m3	$4.65	$20,693	$5,200	$25,893	25.0%
	BERTHING AREA DREDGING COST						$96,161	$24,100	$120,261	
	TOTAL DREDGE COST						$2,066,887	$516,700	$2,583,587	
12--	ASSOC COST (Wharf Modification)	1	JB		LS		$2,570,670	$642,668	$3,213,338	25.0%
	SUBTOTAL						$4,637,557	$1,159,368	$5,796,925	
30--	PE&D	1	LS						$637,662	11.0%
31--	S&A	1	LS						$376,800	6.5%
	TOTAL PROJECT COST								$6,811,386	

NOTES:

(1) m - Depth in Meters (MLLW)

(2) m3-Volume in Cubic Meters

(3) Contingency percentage is based on ER 1110-2-1302 dated 31 March 1994, recomendation of 25% contingency factor which represents a reasonable percentage for the construction feature of the cost estimate for a feasiblity phase.

(4) Eleven percent (11%) of Total Construction for PE&D.

(5) Six and a half percent (6.5%) of Total Construction for S&A.

(6) This cost estimate was developed based on the use of a hydraulic pipeline dredge for the harbor project, and the use of a clamshell dredge in the "Pile Zone."

Revised Mob/Demob per review comment, E-MAIL, dtd 10/24/97, ED-Cost Engineering.

** Wharf Modification includes Berths 1 (183m) & Berth 5 (233m) and Channel Entrance Wharf (91.5m), A-E Noble Consultants, Inc.

ALTERNATIVE 2

Table 4-6

PORT HUEMENE HARBOR DEEPENING PROJECT
PRELIMINARY COST ESTIMATE FOR FEASIBILITY STUDY

CODE OF ACCT	DESCRIPTION	QUANTITY	UNIT	OVERDEPTH QUANTITY m3(0.5m)	UNIT	UNIT PRICE	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	Note (3) CONTINGENCY PERCENT
	DREDGING COSTS									
120A	MOB/DEMOB	1	JOB	0	LS	$900,000	$900,000	$225,000	$1,125,000	25.0%
1203B	PROJECT AREA - DEPTH (m) MLLW									
	APPROACH CHANNEL 13	51,500	m3	32,100	m3	$3.50	$292,600	$73,200	$365,800	25.0%
	ENTRANCE CHANNEL 12	64,100	m3	23,000	m3	$3.55	$309,205	$77,300	$386,505	25.0%
	TURNING BASIN 12	158,014	m3	66,364	m3	$3.50	$785,323	$196,300	$981,623	25.0%
	TURNING BASIN (PILE ZONE) 12	10,086	m3	4,236	m3	$9.90	$141,788	$35,400	$177,188	25.0%
	GENERAL NAVIGATION FEATURES DREGDING COST						$2,428,916	$607,200	$3,036,116	
	Wharf #1 (Berth 1 only, pile zone) 11.5	7,300	m3	2,167	m3	$9.90	$93,723	$23,400	$117,123	25.0%
	Wharf #2 (Berth 5 is 1/2 of Wharf 2) 11.5	4,500	m3	1,400	m3	$4.55	$26,845	$6,700	$33,545	25.0%
	BERTHING AREA DREDGING COST						$120,568	$30,100	$150,668	
	TOTAL DREDGE COST						$2,549,484	$637,300	$3,186,784	
12--	ASSOC COST (Wharf Modification **)	1	JB		LS		$2,570,670	$642,668	$3,213,338	25.0%
	SUBTOTAL						$5,120,154	$1,279,968	$6,400,122	
30--	PE&D	1	LS						$704,013	11.0%
31--	S&A	1	LS						$416,008	6.5%
	TOTAL PROJECT COST								$7,520,143	

NOTES:
(1) m - Depth in Meters (MLLW)
(2) m3-Volume in Cubic Meters
(3) Contingency percentage is based on ER 1110-2-1302 dated 31 March 1994, recomendation of 25% contingency factor which represents a reasonable percentage for the construction feature of the cost estimate for a feasiblity phase.
(4) Eleven percent (11%) of Total Construction for PE&D.
(5) Six and a half percent (6.5%) of Total Construction for S&A.
(6) This cost estimate was developed based on the use of a hydraulic pipeline dredge for the harbor project, and the use of a clamshell dredge in the "Pile Zone."
Revised Mob/Demob per review comment, E-MAIL, dtd 10/24/97, ED-Cost Engineering.
** Wharf Modification includes Berths 1 (183m) & Berth 5 (233m) and Channel Entrance Wharf (91.5m), A-E Noble Consultants, Inc.

ALTERNATIVE 3

Table 4-7

PORT HUEMENE HARBOR DEEPENING PROJECT PRELIMINARY COST ESTIMATE FOR FEASIBILITY STUDY										
CODE OF ACCT	DESCRIPTION	QUANTITY	UNIT	OVERDEPTH QUANTITY m3(0.5m)	UNIT	UNIT PRICE	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	Note (3) CONTINGENCY PERCENT
	DREDGING COSTS									
120A	MOB/DEMOB	1	JOB	0	LS	$900,000	$900,000	$225,000	$1,125,000	25.0%
1203B	PROJECT AREA - DEPTH (m) MLLW									
	APPROACH CHANNEL 13.5	79,500	m3	33,800	m3	$3.50	$396,550	$99,100	$495,650	25.0%
	ENTRANCE CHANNEL 12.5	96,000	m3	23,000	m3	$3.53	$420,070	$105,000	$525,070	25.0%
	TURNING BASIN 12.5	228,796	m3	68,620	m3	$3.45	$1,026,085	$256,500	$1,282,585	25.0%
	TURNING BASIN (PILE ZONE) 12.5	14,604	m3	4,380	m3	$9.31	$176,741	$44,200	$220,941	25.0%
	GENERAL NAVIGATION FEATURES DREDGING COST						$2,919,446	$729,800	$3,649,246	
	Wharf #1 (Berth 1 only, pile zone) 12.5	9,900	m3	2,167	m3	$9.31	$112,344	$28,100	$140,444	25.0%
	Wharf #2 (Berth 5 is 1/2 ofWharf 2) 12.5	6,500	m3	1,400	m3	$4.00	$31,600	$7,900	$39,500	25.0%
	BERTHING AREA DREDGING COST						$143,944	$36,000	$179,944	
	TOTAL DREDGE COST						$3,063,390	$765,800	$3,829,190	
12--	ASSOC COST (Wharf Modification **)	1	JB		LS		$2,570,670	$642,668	$3,213,338	25.0%
	SUBTOTAL						$5,634,060	$1,408,468	$7,042,528	
30--	PE&D (Federal cost)	1	LS						$774,678	11.0%
31--	S&A (Federal cost)	1	LS						$457,764	6.5%
	TOTAL PROJECT COST								$8,274,970	

NOTES:

(1) m - Depth in Meters (MLLW)

(2) m3-Volume in Cubic Meters

(3) Contingency percentage is based on ER 1110-2-1302 dated 31 March 1994, recomendation of 25% contingency factor which represents a reasonable percentage for the construction feature of the cost estimate for a feasiblity phase.

(4) Eleven percent (11%) of Total Construction for PE&D.

(5) Six and a half percent (6.5%) of Total Construction for S&A.

(7) This cost estimate was developed based on the use of a hydraulic pipeline dredge for the harbor project, and the use of a clamshell dredge in the "Pile Zone."

Revised Mob/Demob per review comment, E-MAIL, dtd 10/24/97, ED-Cost Engineering.

** Wharf Modification includes Berths 1 (183m) & Berth 5 (233m) and Channel Entrance Wharf (91.5m), A-E Noble Consultants, Inc.

ALTERNATIVE 4

Table 4-8

PORT HUEMENE HARBOR DEEPENING PROJECT
PRELIMINARY COST ESTIMATE FOR FEASIBILITY STUDY

CODE OF ACCT	DESCRIPTION	QUANTITY	UNIT	OVERDEPTH QUANTITY m3(0.5m)	UNIT	UNIT PRICE	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	Note (3) CONTINGENCY PERCENT
	DREDGING COSTS									
120A	MOB/DEMOB	1	JOB	0	LS	$900,000	$900,000	$225,000	$1,125,000	25.0%
1203B	PROJECT AREA - DEPTH (m) MLLW									
	APPROACH CHANNEL 14	108,200	m3	35,500	m3	$3.50	$502,950	$125,700	$628,650	25.0%
	ENTRANCE CHANNEL 13	130,700	m3	23,000	m3	$3.50	$537,950	$134,500	$672,450	25.0%
	TURNING BASIN 13	302,868	m3	71,252	m3	$3.45	$1,290,714	$322,700	$1,613,414	25.0%
	TURNING BASIN (PILE ZONE) 13	19,332	m3	4,548	m3	$8.91	$212,771	$53,200	$265,971	25.0%
	GENERAL NAVIGATION FEATURES DREDGING COST						$3,444,385	$861,100	$4,305,485	
	Wharf #1 (Berth 1 only, pile zone) 13	11,000	m3	2,167	m3	$8.91	$117,318	$29,300	$146,618	25.0%
	Wharf #2 (Berth 5 is 1/2 ofWharf 2) 13	7,100	m3	1,400	m3	$3.85	$32,725	$8,200	$40,925	25.0%
	BERTHING AREA DREDGING COST						$150,043	$37,500	$187,543	
	TOTAL DREDGE COST						$3,594,428	$898,600	$4,493,028	
12--	ASSOC COST (Wharf Modification, See	1	JB		LS		$2,570,670	$642,668	$3,213,338	25.0%
	SUBTOTAL						$6,165,098	$1,541,268	$7,706,365	
30--	PE&D (Federal cost)	1	LS						$847,700	11.0%
31--	S&A (Federal cost)	1	LS						$500,914	6.5%
	TOTAL PROJECT COST								$9,054,979	

NOTES:

(1) m - Depth in Meters (MLLW)

(2) m3-Volume in Cubic Meters

(3) Contingency percentage is based on ER 1110-2-1302 dated 31 March 1994, recomendation of 25% contingency factor which represents a reasonable percentage for the construction feature of the cost estimate for a feasiblity phase.

(4) Eleven percent (11%) of Total Construction for PE&D.

(5) Six and a half percent (6.5%) of Total Construction for S&A.

(6) This cost estimate was developed based on the use of a hydraulic pipeline dredge for the harbor project, and the use of a clamshell dredge in the "Pile Zone."

Revised Mob/Demob per review comment, E-MAIL, dtd 10/24/97, ED-Cost Engineering.

** Wharf Modification includes Berths 1 (183m) & Berth 5 (233m) and Channel Entrance Wharf (91.5m), A-E Noble Consultants, Inc.

The following is a summary of construction first costs ($1,000) by alternatives:

	ALT 1	ALT 2	ALT 3	ALT 4
Federal Channel				
Mob/Demob	$900	$900	$900	$900
Channel Dredging	$1,070	$1,529	$2,019	$2,544
Contingency	$493	$607	$730	$861
Subtotal	$2,463	$3,036	$3,649	$4,305
Associated Costs				
Wharf Modification	$2,571	$2,571	$2,571	$2,571
Berthing Area Dredging	$96	$120	$144	$150
Contingency	$667	$673	$679	$680
Subtotal	$3,334	$3,364	$3,394	$3,401
PE&D 11%	$638	$704	$775	$848
S&A 6.5%	$377	$416	$458	$501
Total First Costs	$6,811	$7,520	$8,275	$9,055

4.11.6 Annual Costs

The **Table 4-9** summarizes the annualized construction cost for each alternative:

Table 4-9 Expected Annual Costs by Alternative
($1,000s)

	Alt 1	Alt 2	Alt 3	Alt 4
Total First Cost	$6,811	$7,520	$8,275	$9,055
IDC (1 Yr Const. Period)	$212	$234	$258	$282
Gross Investment	$7,023	$7,754	$8,533	$9,337
Annual Cost (50 yrs, 6 7/8%)	$501	$553	$609	$666
O&M	--	--	--	--
Total Annual Cost	$501	$553	$609	$666

4.12 Project Benefits

For the commodities which have historically been imported into and exported out of Port Hueneme, the current depth and configuration at the port does not appear to be constraining operations. Current and projected vessel requirements for these commodities show that existing depths are adequate. It appears that deepening the harbor would have little, if any, impact on transportation costs for these commodities.

Two new commodities; liquid fertilizer and gypsum, will be imported into the port in the near future. In fact, the first shipment of liquid fertilizer was off-loaded at the port in December 1998. Analysis indicates that deepening the channel and turning basin at the port could reduce transportation costs for these commodities by allowing deeper draft vessels to be utilized, potentially reducing the number of vessel trips required.

4.12.1 Transportation Cost Savings

Benefits are derived by calculating the transportation costs under without project conditions and comparing them to transportation costs with project improvements. Benefits from the different deepening alternatives derive from the ability to either load vessels more fully or utilize larger vessels, thus reducing the number of vessel trips required to supply the market area.

4.12.2 Economic Analysis

Current Corps policy as defined in ER 1105-2-100 describes the Recommended Plan or NED Plan as the plan that:

1- Has a benefit-to-cost ratio greater than 1;
2- Maximizes net benefits; and
3- Where two cost-effective plans produce no significantly different levels of net benefits, the less costly plan is to be the NED plan even though the level of outputs may be less.

An economic analysis of the total plan costs and benefits for each of the final alternative plans was conducted by comparing the cost for implementation with expected benefits of the plan on an annual basis. This determines the optimized NED depth based on maximizing annual net NED benefits. See Economic Appendix for detailed economic analysis of the final alternate deepening plans. Table 4-10 summarizes the annualized construction costs and transportation savings for each alternative plan and computes the net NED benefits.

Table 4-10 Benefit/Cost Analysis ($1,000s)				
	Alt 1	Alt 2	Alt 3	Alt 4
Expected Annual Benefits	$1,115	$1,496	$1,555	$1,569
Expected Annual Costs	$502	$553	$609	$666
Net Benefits	$613	$943	$946	$903
Benefit/Cost Ratio	2.22	2.71	2.55	2.36

As shown on the above table, all of the alternatives analyzed have benefit-to-cost ratios greater than 1; and, Alternatives 2 and 3 produce roughly the same annual net benefits. Since the costs for Alternative 2 are less than the costs for Alternative 3, Alternative 2 would be selected as the Recommended Plan.

The difference in net benefits between Alternative 2 and Alternative 3 are derived by the increase in loading capacity and to a lesser extent, the decrease in tidal delays associated with Alternative 3. Alternative 3 allows the gypsum bulk vessels to load to their maximum design capacity (12.2 meters or 40 feet). Tankers carrying liquid fertilizer must transit the Panama Canal which, as described earlier, allows a maximum draft of 39.5 feet. Under Alternative 3, depths at Port Hueneme are not a constraint for liquid fertilizer tankers. Under Alternative 2, design vessels entering the port fully loaded must make maximum use of tides and incur an average tidal delay of 4 hours/trip. Under Alternative 3, tidal delays are reduced to approximately 2 hours/trip.

In an attempt to capture the economies of scale of Alternative 3 without significantly increasing the cost of the Recommended Plan, the depths of the Recommended Plan have been modified from 13 Meters (42.2 feet) to 13.2 meters (43.3 feet) in the Approach Channel and from 12 meters (39.4 feet) to 12.2 meters (40 feet) in the Entrance Channel, Turning Basin and Channel "A". This modification will allow the gypsum vessels to enter the harbor fully loaded utilizing 1 meter (approximately 3 feet) of tide; and, also allow the liquid fertilizer tankers to load to the maximum draft allowable for safe transit through the Panama Canal.

Table 4-11 Expected Annual Costs NED Plan (in $1,000s)	
Mob/Demob	$900
Construction	$2,571
Dredging	$2,021
Subtotal	$5,492
Contingency (25%)	$1,373
Subtotal	$6,865
PE&D (11%)	$755
S&A (6.5%)	$446
Total First Cost	$8,066
IDC (1 Yr Const. Period)	$251
Gross Investment	$8,318
Annual Cost	$593
O&M	--
Total Annual Cost	$593

4.12.3 Benefit/Cost Analysis

Expected annual benefits and costs for the Recommended Plan total $1,541,000 and $593,000, respectively. Net benefits equal $947,000, and the benefit/cost ratio is 2.60. This alternative is the NED plan, since it maximizes net benefits.

4.13 Environmental Quality

The environmental quality is another means of evaluating the alternatives to assist in making a plan recommendation. Implementation of the proposed project would necessitate short-term use of the environment during the construction phase. Potential environmental impacts associated with this use of the environment are discussed in Chapter 7 of the Environmental Assessment. Noise impacts from the driving of sheet piles will require mitigation during construction of the wharf modifications. By implementing the appropriate mitigation measures developed to minimize noise impacts, all environmental impacts associated with construction of the project would be of relatively short duration and insignificant.

There would be no long term significant adverse impacts. In fact, there would be long-term beneficial impacts on biological resources due to the removal of the existing approximate 350 creosote lined pier pilings. Although habitat will be temporarily lost for some encrusting organisms, new habitat will be provided by the new fender system. The new fender system would be exposed to greater depth which would provide more habitat area than the existing system. For the wharf modifications, the piles are not lined with creosote. In addition, there would be long-term beneficial impacts on air quality and vessel transportation due to more efficient vessel and cargo handling operations at the port. In this respect, the deepened channels would enhance the long-term productivity of the port and its commercial users.

In summary, the short-term use of the environment necessary during construction of the project would not result in any significant long-term adverse impacts on the productivity of the environment.

4.14 Associated Evaluation Criteria

The planning criteria are used to evaluate how different plans satisfy Federal guidelines. They also provide the guidelines for successive narrowing of the alternatives to selection of a recommended plan. The four main criteria used in Corps plan formulation are effectiveness, efficiency, completeness and acceptability. In the following sections, each alternative will be evaluated based on these criteria.

Completeness

Completeness is a determination of whether or not the alternative includes all elements necessary to achieve the objectives of the project plan. All alternative plans are complete. Each plan will, however require measures to be implemented by the local sponsor during initial construction of the project. These measures include modification of the berthing areas along Wharves 1, 2 and the approach channel wharf and dredging of the berthing areas.

Effectiveness

Effectiveness is defined as a measure of the extent to which a plan achieves its objectives. All alternative plans address the objectives of improving efficiency of shipping operations and preserving environmental resources.

Efficiency

Efficiency is the cost effectiveness of the plan expressed in net economic benefits.

Alternative 2a (modified) optimizes net benefits and is, therefore the most efficient.

Acceptability

Acceptability is defined as acceptance of the plan by the local sponsor and the concerned public. Alternatives 2, 2a, 3, and 4 are acceptable to the local sponsor as each will allow 50,000 DWT tankers and bulk vessels to enter the port.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 5. Recommended Plan

5.1 General

The Recommended Plan is the NED Plan which includes deepening the harbor approach channel, entrance channel, turning basin and the commercial Channel "A"; stabilizing the entrance channel wharf as well as portions of Wharves 1 and 2; and dredging Berths 1 and 5. This chapter presents specific information to describe the features, costs, benefits, and environmental considerations related to the Recommended Plan.

5.2 Recommended Plan Description

The Recommended Plan is shown in Figure 5-1. The Plan provides for increasing the depth of the entrance channel and inner harbor from -10.7 meters (35 feet) MLLW to 12.2 meters (40 feet) MLLW. The Plan includes stabilizing the entrance channel wharf as well as portions of wharves 1 and 2 and dredging berthing areas 1 and 5 which are located along Wharves 1 and 2. Dredged material will be placed on or nearshore of Hueneme Beach, located south of Channel "A".

5.2.1 General Navigation Features

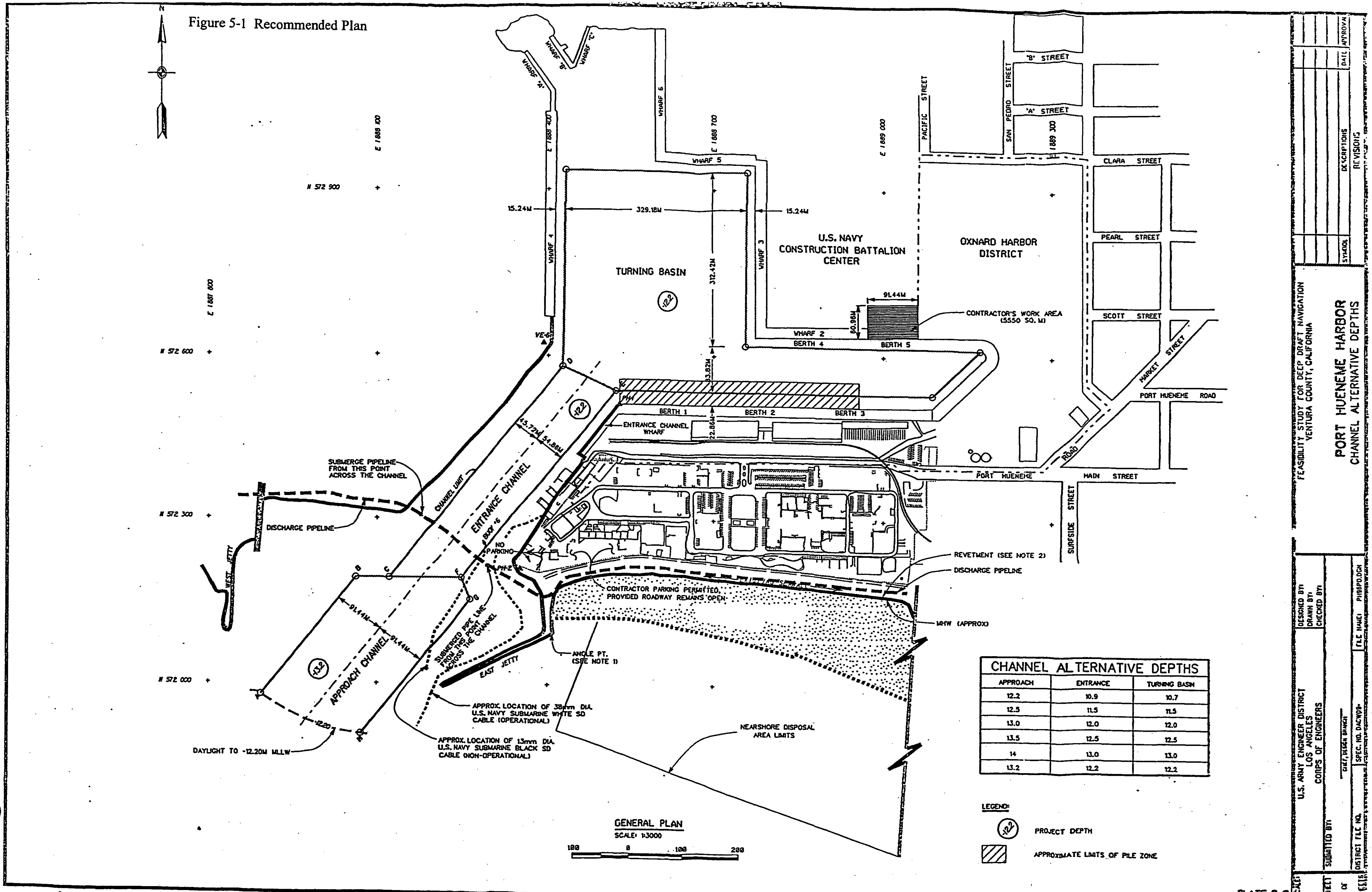
The Plan consists of deepening the existing Federal approach channel to a depth of -13.2 meters (43.3 feet) MLLW and deepening the entrance channel, turning basin and Channel "A" to 12.2 meters (40 feet). MLLW.

All dredged material will be disposed of on or nearshore of Hueneme Beach located just south of Channel "A". Dredged material quantities for the entire Recommended Plan are itemized as follows:

Approach Channel	95,000m3
Entrance Channel	100,000m3
Turning Basin	270,000m3
Berth 1	10,000m3
Berth 5	6,500m3

Dredge material quantities including the berthing areas totals approximately 485,000 cubic meters (630,000 cubic yards).

Figure 5-1 Recommended Plan



CHANNEL ALTERNATIVE DEPTHS

APPROACH	ENTRANCE	TURNING BASIN
12.2	10.9	10.7
12.5	11.5	11.5
13.0	12.0	12.0
13.5	12.5	12.5
14	13.0	13.0
13.2	12.2	12.2

5.2.2 Associated Features

The associated features of the Recommended Plan consist of deepening Berths 1 and 5 along Wharves 1 and 2 respectively to a depth of 12.2 meters (40 feet) MLLW. In addition, modifications are needed to stabilize Wharves 1 and 2 and the entrance channel wharf to allow for dredging of the entrance channel and berthing areas. Berths 2 and 3 along Wharf 1 and Berth 4 along Wharf 2 will not be dredged to the new project depth. The project benefits will be fully supported by only deepening Berths 1 and 5. The Oxnard Harbor District has expressed interest in dredging these commercial berths in the future. Although the costs associated with dredging and stabilizing Berths 2, 3 and 4 were not included in the total costs of the project, the construction of these non-essential features was included in the impact analysis contained in the Environmental Assessment.

5.2.3 Maintenance Requirements

As previuosly discussed in Section 4.11.4, the periodic maintenance requirement for the Recommended Plan is equal to the existing project maintenance requirement; therefore, no additional maintenance is expected.

5.2.4 Real Estate Requirements

The Real Estate requirements associated with the Recommended Plan include:

a. Channel lands. The approach channel and entrance channel are under the jurisdiction of the U.S. Navy. Channel "A" is under the jurisdiction of the Oxnard Harbor District.

b. Disposal areas. The dredged materials will be disposed on or nearshore of Hueneme Beach which is under the jurisdiction of the City of Port Hueneme.

c. Construction staging areas. It is expected that 1 to 2 acres of land will be needed for contractor's office and equipment during the 1 year construction period. These lands as well as access to wharf areas for refueling will be provided on the existing facilities owned and operated by the Oxnard Harbor District.

d. Utility relocations. There are no utility or other facility relocations required as a result of the Recommended Plan.

5.3 Project costs

Table 5-1 presents a summary of the project costs for the Recommended Plan The cost estimate includes a 25% contingency which is in accordance with guidance contained in ER 1110-2-1302 dated March 1994. The estimate also includes costs for Pre-construction Engineering and Design (PE&D) and Supervision and Administration (S&A) during construction. The cost to modify Berth 1 was estimated to be $1,053,350 (with contingency). This figure was calculated based on 1/3 the estimated cost to modify the entire Wharf 1 which includes Berths 1, 2 and 3.

5.4 Project Benefits

The benefits of the Recommended Plan are based on transportation savings and reflect the economy of scale resulting from vessels being able to load deeper and larger vessels to be used on long distance trade routes. The benefits are based on 1998 ship operating costs provided by the Institute for Water resources (IWR).

5.5 Economic Analysis

Table 5-2 presents the economic analysis for the Recommended Plan based on comparison of costs and benefits on an equivalent annual basis. The average annual cost of the project totals $593,000, and the average annual benefits are $1,541,000. The project, therefore has a benefit-to-cost ratio of 2.6 to 1, with average annual net benefits of $947,000.

5.6 Beneficial Uses of Dredged Material

Although the economic benefits of beach renourishment have not been quantified in this analysis, the City of Port Hueneme will receive benefits from the disposal of beach compatible material on and nearshore of Hueneme Beach. It is estimated that the beach will receive approximately 485,000 cubic meters of clean material.

RECOMMENDED PLAN

Table 5-1

PORT HUEMENE HARBOR DEEPENING PROJECT
PRELIMINARY COST ESTIMATE FOR FEASIBILITY STUDY

CODE OF ACCT	DESCRIPTION	QUANTITY	UNIT	OVERDEPTH QUANTITY m3(0.5m)	UNIT	UNIT PRICE	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	Note (3) CONTINGENCY PERCENT
	DREDGING COSTS									
120A	MOB/DEMOB	1	JOB	0	LS	$900,000	$900,000	$225,000	$1,125,000	25.0%
1203B	PROJECT AREA - DEPTH (m) MLLW									
	APPROACH CHANNEL 13.2	62,000	m3	33,000	m3	$3.85	$365,750	$91,400	$457,150	25.0%
	ENTRANCE CHANNEL 12.2	77,000	m3	23,000	m3	$4.00	$400,000	$100,000	$500,000	25.0%
	TURNING BASIN 12.2	188,000	m3	67,680	m3	$3.80	$971,584	$242,900	$1,214,484	25.0%
	TURNING BASIN (PILE ZONE) 12.2	12,000	m3	4,320	m3	$9.50	$155,040	$38,800	$193,840	25.0%
	GENERAL NAVIGATION FEATURES DREDGING COST						$2,792,374	$698,100	$3,490,474	
	Wharf #1 (Berth 1 only, pile zone) 12.2	7,653	m3	2,167	m3	$9.50	$93,290	$23,300	$116,590	25.0%
								$0		25.0%
	Wharf #2 (Berth 5 is 1/2 ofWharf 2) 12.2	4,935	m3	1,400	m3	$5.65	$35,793	$8,900	$44,693	25.0%
	BERTHING AREA DREDGING COST						$129,083	$32,200	$161,283	
	TOTAL DREDGE COST						$2,921,457	$730,300	$3,651,757	
12--	ASSOC COST (Wharf Modification **)	1	JB		LS		$2,570,670	$642,668	$3,213,338	25.0%
	SUBTOTAL						$5,492,127	$1,372,968	$6,865,094	
30--	PE&D	1	LS						$755,160	11.0%
31--	S&A	1	LS						$446,231	6.5%
	TOTAL PROJECT COST								$8,066,486	

NOTES:
(1) m - Depth in Meters (MLLW)
(2) m3-Volume in Cubic Meters
(3) Contingency percentage is based on ER 1110-2-1302 dated 31 March 1994, recomendation of 25% contingency factor which represents a reasonable percentage for the construction feature of the cost estimate for a feasiblity phase.
(4) Eleven percent (11%) of Total Construction for PE&D.
(5) Six and a half percent (6.5%) of Total Construction for S&A.
(6) This cost estimate was developed based on the use of a hydraulic pipeline dredge for the harbor project, and the use of a clamshell dredge in the "Pile Zone."
Revised Mob/Demob per review comment, E-MAIL, dtd 10/24/97, ED-Cost Engineering.
** Wharf Modification includes Berths 1 (183m) & Berth 5 (233m) and Channel Entrance Wharf (91.5m), A-E Noble Consultants, Inc.

Table 5-2 Economic Analysis of Recommended Plan

ITEM	RECOMMENDED PLAN
PROJECT ECONOMIC COSTS	
FIRST COST	$8,066,486
INTEREST DURING CONSTRUCTION	$251,000
TOTAL PROJECT ECONOMIC COSTS	$8,317,486
ANNUAL COST	
INTEREST AND AMORTIZATION	$593,000
OPERATION AND MAINTENANCE	$0
TOTAL ANNUAL COST	$593,000
ANNUAL BENEFITS	
TRANSPORTATION SAVINGS	$1,541,000
TOTAL ANNUAL BENEFITS	$1,541,000
NET ANNUAL BENEFITS	$948,000
BENEFIT/COST RATIO	**2.6:1**

5.6 Environmental Impacts

The environmental impacts and mitigation plans associated with the Recommended Plan are presented in detail in the Environmental Assessment (EA) included in the Feasibility Report. A summary of the impacts is given below. The analysis was based on without and with project assessment of impacts to environmental resources and attributes, regional economic development, and other considerations including cultural and historical resources, infrastructure facilities, transportation, and community functions and activities.

Environmental resources and attributes addressed in the EA include: topography and geology, oceanography and water quality, marine resources, air quality, noise, cultural resources, land and water use, ground transportation, vessel transportation, socioeconomic effects, and aesthetics.

Environmental impacts were evaluated for the dredge site and the potential placement sites (see EA). There are no long-term unavoidable significant impacts resulting from implementation of the Recommended Plan The only significant unavoidable impacts would be a short-term impact on noise during construction. All other resources addressed in this document would experience either adverse but insignificant impacts or no impact during construction. Due to potential biological concerns related with the presence of grunion being onsite for a portion of the year, construction activities have been planned to occur during the time when these species are not present, between October 1 and March 1. This construction window also applies to Federally listed least terns and snowy plovers. To avoid the potential impacts to the Pismo clam, onshore dredged material placement will be above +0 meter MLLW and nearshore placement will be below -3.0 meter MLLW. This method has been used successfully during past maintenance dredging episodes. This placement technique is not expected to have an impact on the cost of the proposed project. With implementation of the above plan, significant impacts are not expected to the local Pismo clam populations.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 6. Plan Implementation

6.1 General

The Federal Government through the Corps of Engineers and in partnership with the Oxnard Harbor District will be responsible for implementing and maintaining the general navigation features of the project.

6.2 Cost Apportionment

Apportionment of total project costs between Federal and non-Federal interests for the Recommended plan were derived in accordance with the provisions of Section 101 of the Water Resources Development Act of 1986 (Public Law 99-662), and applicable policies and regulations contained in Engineering Regulation 1105-2-100 dated 28 December 1990, and other Corps of Engineers guidance.

6.3 Cost-Sharing Requirements

Section 101 of the 1986 Water Resources Development Act specifies non-Federal Cost Sharing for general commercial navigation features that varies according to water depth. The requirements for cost-sharing are listed in Table 6-1.

6.3.1 Repayment

In addition to the above cost-sharing requirement, Section 101 of the 1986 Water Resources Development Act requires non-Federal interests to repay 10 percent of project costs with interest over a period not to exceed 30 years. This would apply to the construction costs for the general navigation features and any associated mitigation. The non-Federal interest may receive credit towards this 10 percent repayment for costs for lands, easements, rights-of-way, relocations, and disposal areas.

Table 6-1 Non-Federal Share Of Costs, Commercial Navigation Required by 1986 Water Resources Development Act

	Up to 20 Feet	Greater than 20 Feet to 45 Feet	Greater than 45 Feet
Construction			
General Navigation Features	10%	25%	50%
Aids to Navigation	0	0	0
Mitigation (Environmental)	10%	25%	50%
Fish & Wildlife Enhancement	0-25%	0-25%	0-25%
Service Facilities	100%	100%	100%
Lands, Easements, Rights of Way, Relocations, Disposal	100%	100%	100%
Operation & Maintenance			
General Navigation Features	0	0	50%
Aids to Navigation	0	0	0
Mitigation (Environmental)	0	0	50%
Fish & Wildlife Enhancement	0-25%	0-25%	0-25%
Service Facilities	100%	100%	100%

6.4 Cost Apportionment for the Recommended Plan

Table 6-2 presents the Federal and non-Federal costs of the Recommended Plan. The table indicates that Total Project Costs are $8,066,562; of which, Federal costs total $2,665,845 and non-Federal costs total $5,400,717.

Table 6-2 Recommended Plan Cost Sharing

DESCRIPTION	RECOMMENDED PLAN
General Navigation Features	
Mob/Demob	$900,000
Channel Dredging	$1,892,374
Contingency (25%)	$698,094
Subtotal	$3,490,468
PE&D (11%)	$383,951
S&A (6.5%)	$226,880
Total GNF	**$4,101,299**
Initial Federal Share (75%)	$3,075,974
Initial Non-Federal Share (25%)	$1,025,325
Non-Federal Reimbursement (10%)	$410,130
less LLERD's	
Total Federal Share GNF (75%-10%)	$2,665,845
Total Non-Federal Share GNF	$1,435,455
Associated Costs	
Wharf Modification	$2,570,670
Berthing Area Dredging	$129,083
Contingency (25%)	$674,938
Subtotal	$3,374,691
PE&D (11%)	$371,216
S&A (6.5%)	$219,355
Total AC	**$3,965,262**
Total Federal Share (0%)	$0
Total Non-Federal Share (100%)	$3,965,262
Total Project Cost	**$8,066,562**
Total Federal Cost (65% GNF)	$2,665,845
Total Non-Federal Cost	$5,400,717
(35% GNF+100% AC)	

6.5 Division of Plan Responsibilities

The Federal Government and the Oxnard Harbor District are responsible for implementation of the Recommended Plan, including the sharing of costs and maintenance. In addition certain responsibilities are required by each party in accordance with Federal law.

6.5.1 Federal Responsibilities

Responsibilities of the Federal Government for implementation of the Recommended Plan include:

a. Sharing a percentage of the costs for Planning, Engineering and Design (PED), including preparation of the Plans and Specifications, which is cost shared at the same percentage that applies to construction of the general navigation features.

b. Sharing a percentage of construction costs for general navigation features (i.e. channel dredging). Cost sharing percentage will be based on the percentage for dredging to depths between 20 and 45 feet. See Table 6-1.

c. Administering contracts for construction and supervision of the project after authorization funding, and receipt of non-Federal assurances.

d. Providing 100% of the cost of operation and maintenance of the general navigation and mitigation features for work in 45-foot depths or less.

6.5.2 Non-Federal Responsibilities

Federal law requires that a local non-Federal sponsor provide and guarantee certain local cooperation items to ensure equitable participation in a project and to ensure continual maintenance and public receipt of the intended benefits. The particulars of the Recommended Plan were carefully reviewed and a set of applicable local cooperation items established to include cost sharing of the Project as prescribed in the above paragraphs. Oxnard Harbor District as the local non-Federal sponsor will:

a. Pay during the period of construction of each increment 25 percent of the cost of construction of the general navigation features for the Recommended plan.

b. Pay with interest over a period not to exceed 30 years following completion of construction an additional 10 percent of the total cost of construction of the general navigation features of the NED Plan, the interest to be determined pursuant to Section 106 of Public Law 99-662. The value of lands, easements, rights-of-way, relocations (other than utility relocations), and borrow and dredged or excavated material disposal areas and costs of utility relocations borne by the sponsor for the Recommended plan shall be credited toward this required payment;

c. Provide all lands, easements, and rights-of way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

d. Provide or pay the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project;

e. Hold and save the United States free from all damages due to the construction, operation, and maintenance of the project, except for damages due to the fault or negligence of the United States or its contractors;

f. Assume responsibility for construction and installation of all non-Federal project features of each project increment, concurrent with construction of Federal project general navigation features of the Recommended Plan including appurtenant facilities and services;

g. Provide and maintain adequate public terminal and transfer facilities open to all on equal terms and with such depths from the Federal channel line to and between the wharves at the terminal (berthing areas) as may be required for accommodation of vessels at the terminal, consistent with the Federal project;

h. Prohibit erection of any structures or berthing of any vessels that would encroach on the authorized general navigation features;

i. Perform prior to initiation of construction, and thereafter as determined necessary, environmental investigations to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, in or under all lands, easements and rights of way necessary for construction, operation, and maintenance of the project;

j. Assume complete financial responsibility for cleanup and response costs of any CERCLA regulated materials located in, on or under lands, easements, or rights of way necessary for the construction, operation, and maintenance of the project; and be responsible for operating, maintaining, repairing, replacing, and rehabilitating the project in a manner so that liability will not arise under CERCLA;

k. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, all project features other than those for general navigation;

l. Grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project;

m. Keep, and maintain, books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs;

n. Comply with all applicable Federal and State laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive 5500,II issued pursuant thereto and published in Part 300 of Title 32, case of Federal Regulations, as well as Army Regulation 66-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army, "

6.6 Corps Continuing Authorities Program Section 107- Navigation

6.6.1 General

Corps Continuing Authorities Program authorizes the Secretary of the Army, acting through the Chief of Engineers to plan, design, and construct certain types of water resources improvements without specific congressional authorization. There are six legislative authorities which make up the Continuing Authorities Program. Section 107, River and Harbor Act of 1960, as amended, gives the Secretary the authority to plan, design and construct improvements to navigation. Participation in this program is limited to those projects with Federal study and implementation costs not exceeding $4,000,000.

6.6.2 Applicability

The Recommended Plan as discussed in the previous chapter consists of deepening the approach channel from its current authorized depth of -12.2 meters (40 feet) MLLW to a depth of -13.2 meters (43.3 feet); deepening the entrance channel from its current authorized depth of -11 meters (36 feet) MLLW to a depth of -12.2 meters (40 feet), and deepening the turning basin and

Channel "A" from their current authorized depth of 10.7 meters (35 feet) MLLW to -12.2 meters (40 feet) MLLW. As shown on Table 6-2, the Federal cost to implement the project falls within the limit of the Continuing Authorities Program, Section 107.

6.7 Project Approval and Implementation

Once the District receives HQUSACE approval of the final report and guidance to implement the project under Section 107 of the Continuing Authorities Program, no further effort will be required to address the study authorization by Congress. At that time, the District will request funds to initiate the Plans and Specifications Phase. Since the project costs exceed $2,000,000, a value engineering study will be conducted during the Plans and Specifications Phase in accordance with current Corps' guidance.

6.8 Project Cooperation Agreement

Prior to advertisement for the Construction Contract, a Project Cooperation Agreement will be required to be signed by the Federal Government and the Oxnard Harbor District committing each party to the responsibilities for implementing and maintaining the project. This agreement will be prepared and negotiated during the Plans and Specifications Phase. Construction would be initiated with Federal and non-Federal contributed funds, once the construction project is advertised and awarded.

6.8.1 Implementation Schedule

The implementation schedule for the Recommended Plan is presented in Table 6-3.

Table 6-3 Milestones for Implementation of Recommended Plan

MILESTONE NUMBER	DESCRIPTION	SCHEDULE
170	COMPLETE FEASIBILITY REPORT/DE NOTICE	July 1999
30	REPORT OF THE CHIEF OF ENGINEERS	September 1999
590	APPROVAL OF P&S	June 2000
680	PCA APPROVED BY OASA(CW)	July 2000
690	PCA EXECUTED	October 2000
950	CONSTRUCTION CONTRACT ADVERTISED	November 2000
960	CONSTRUCTION CONTRACT AWARDED	December 2000
999	PROJECT COMPLETE	31 March 2001

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 7. Coordination and Public Views

Public workshops, scoping meetings, and coordination with Federal, State, and local agencies have been accomplished to aid in the formulation and evaluation of the proposed Recommended Plan.

A Fish and Wildlife Coordination Act Report (CAR) is included in the draft EA. The CAR indicates no opposition to the project, but recommends additional sediment testing prior to construction to refine existing data on levels of contaminants. The CAR also outlines ways to minimize disturbances to western snowy plover, Pismo clams and hard-substrate marine communities. The draft EA addresses the concerns of the U.S. Fish and Wildlife Service and is consistent with their recommendations.

The draft Feasibility Report/EA will be coordinated with representatives from EPA, US Fish and Wildlife Service, National Marine Fisheries, California State Fish and Game, and the City of Port Hueneme.

To comply with Corps' policy of full public coordination, a public workshop will be held following the release of this draft report to present the proposed recommended plan. A Public Notice will be mailed to local residents and other interested parties including Federal, state and local agencies. The date of the workshop will be announced in local newspapers and copies of this draft report will be sent to local libraries for public viewing.

Public concerns addressed at the Public Workshop as well as comments submitted following the Public Review period will be carefully considered and incorporated into the final Feasibility Report/EA.

The Port of Hueneme, Port Hueneme, California
Deep Draft Navigation Feasibility Study
Chapter 8. Recommendation

Based on our analysis of the problems and needs to meet present and future demands for commodity movements through the Port of Hueneme and evaluation of all viable alternatives with full consideration of engineering, economic, environmental, social and other aspects in the overall public interest, I recommend that the existing project at Port Hueneme, authorized by the River and Harbor Act of 13 August 1968, be modified to provide for deepening the depth of the approach channel to a depth of -13.2 meters (43.3 feet) MLLW; and deepening the entrance channel, turning basin and Channel "A" to a depth of 12.2 meters (40 feet) MLLW in accordance with the plan selected herein.

I further recommend that this project be authorized under the Continuing Authorities Program, Section 107 and that the final Feasibility Report be accepted as the equivalent of a Detailed Project Report (DPR), which is the decision document in the feasibility phase of the Continuing Authorities Program. Authorizing the project under the Continuing Authorities Program will enable the District to initiate Plans and Specifications immediately following HQUSACE approval of the final DPR. In addition, it would also expedite the Construction timetable since no specific Congressional authorization would be required.

The final Feasibility Report will both satisfy the Congressional Resolution to study the Federal interest in improvements to the existing Federal Project at the Port of Hueneme and be a vehicle to implement the project under Section 107 of the Continuing Authorities Program. No further effort is required to address the study authorization by Congress.

This recommendation is made with the provision that prior to implementation, Oxnard Harbor District as the local non-Federal interest will, in accordance with the general requirements of law for this type of project, agree to comply with the following requirements (see Table 8-1 for cost breakdown):

a. Pay during the period of construction of each increment 25 percent of the cost of construction of the general navigation features for the Recommended plan, for a total first cost to the sponsor of $1,025,325 towards general navigation features;

b. Pay with interest over a period not to exceed 30 years following completion of construction an additional 10 percent of the total cost of construction of the general navigation features of the NED Plan, the interest to be determined pursuant to Section 106 of Public Law 99-662. The value of lands, easements, rights-of-way, relocations (other than utility relocations), and borrow and dredged or excavated material disposal areas and costs of utility relocations borne by the sponsor for the Recommended plan shall be credited toward this required payment for a total local sponsor payment of $410,130, to be paid over 30 years;

c. Provide all lands, easements, and rights-of way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

d. Provide or pay the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project;

e. Hold and save the United States free from all damages due to the construction, operation, and maintenance of the project, except for damages due to the fault or negligence of the United States or its contractors;

f. Assume responsibility for construction and installation of all non-Federal project features of each project increment, concurrent with construction of Federal project general navigation features of the Recommended Plan including appurtenant facilities and services;

g. Provide and maintain adequate public terminal and transfer facilities open to all on equal terms and with such depths from the Federal channel line to and between the wharves at the terminal (berthing areas) as may be required for accommodation of vessels at the terminal, consistent with the Federal project;

h. Prohibit erection of any structures or berthing of any vessels that would encroach on the authorized general navigation features;

i. Perform prior to initiation of construction, and thereafter as determined necessary, environmental investigations to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, in or under all lands, easements and rights of way necessary for construction, operation, and maintenance of the project;

j. Assume complete financial responsibility for cleanup and response costs of any CERCLA regulated materials located in, on or under lands, easements, or rights of way necessary for the construction, operation, and maintenance of the project; and be responsible for operating, maintaining, repairing, replacing, and rehabilitating the project in a manner so that liability will not arise under CERCLA;

k. Provide, operate, maintain, repair, replace, and rehabilitate, at its own expense, all project features other than those for general navigation;

l. Grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project;

m. Keep, and maintain, books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs;

n. Comply with all applicable Federal and State laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive 5500,II issued pursuant thereto and published in Part 300 of Title 32, case of Federal Regulations, as well as Army Regulation 66-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army, "

The Plan is recommended with such further modifications thereto as in the discretion of the Chief of Engineers may be advisable.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch.

John P. Carroll
Colonel, Corps of Engineers
District Engineer

DRAFT
ENVIRONMENTAL ASSESSMENT

FOR THE

PORT OF HUENEME

HARBOR DEEPENING PROJECT

VENTURA COUNTY, CALIFORNIA

Department of the Army
Los Angeles District Corps of Engineers

FEBRUARY 1999

-Draft-

FINDING OF NO SIGNIFICANT IMPACT

PORT OF HUENEME HARBOR (POHH) DEEPENING PROJECT
VENTURA COUNTY CALIFORNIA

I have reviewed the attached Environmental Assessment (EA) that has been prepared for the deepening the Port of Hueneme Harbor (PoHH) in Ventura County California. The project purpose is to efficiently accommodate larger, deep-draft vessels, increase cargo efficiency of product delivery and reduce overall transit costs.

Port modifications involve dredging the approach and entrance channels, the turning basin, channel A, and channel A berthing areas. Under the Recommended Plan, the Main Approach Channel would be dredged to -13.2 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -12.2 m MLLW. Approximately 485,000 m^3 of material would be dredged over a period 3.5 months. Dredged material will be placed at Hueneme Beach for beach replenishment. Material may be placed either onshore, if dredged with a hydraulic clamshell dredge, or near shore, if dredged with a hopper or clamshell dredge. Pilings from the historic pier will be removed by clamshell. Wharf modifications at berths 1-5 may be needed to stabilize the structures as the berthing areas are deepened. Construction time for wharf modifications is estimated at 5-6 months, and activities include removal of the existing fender system, driving sheet pile toe wall, and installing the new timber fender system. Demolition materials and pilings from the old pier will be disposed at a landfill.

Project construction is scheduled to occur during the winter months, thus avoiding impacts to Threatened, Endangered, and sensitive species and minimizing impacts to recreation. No significant impacts to oceanography and water quality, land and water uses, transportation, or aesthetics are anticipated. No impacts to cultural resources are anticipated. If a hydraulic cutterhead dredge is used as the primary means of sediment removal, appropriate mitigation measures will be implemented to maintain air quality impacts at a less than significant level. Mitigation will also be implemented during wharf modification to maintain noise levels significance threshold levels at the nearest residences.

I have considered the information available in the EA, and it is my determination that no significant impacts to the quality of the environment will result from the proposed action. Preparation of an Environmental Impact Statement, therefore, is not required.

DATE

(Not for signature)
JOHN P. CARROLL
Colonel, Corps of Engineers
District Engineer

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

SECTION 1 - PROPOSED ACTION SUMMARY

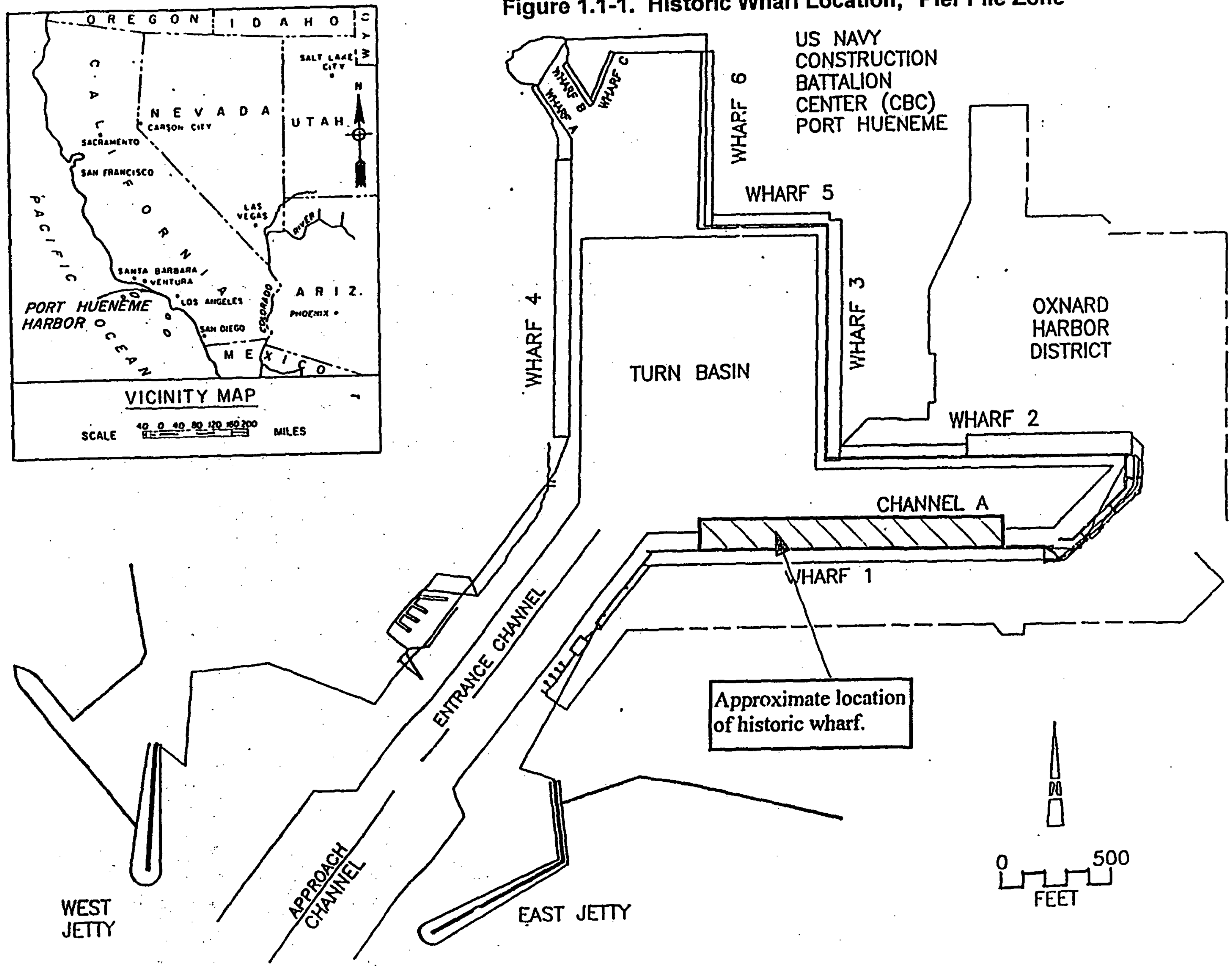
1.1 SUMMARY OF ENVIRONMENTAL PROCESS

The Oxnard Harbor District (OHD) has requested the U.S. Army Corps of Engineers (Corps), Los Angeles District to assess the feasibility of deepening the Port of Hueneme Harbor (PoHH). The PoHH is located in the city of Port Hueneme, Ventura County, California, as shown in Figure 1.1-1. As a part of the overall process, the Corps has prepared this Environmental Assessment (EA) to inventory baseline conditions, identify future Port needs, evaluate future "no action" conditions, address potential impacts associated with different deepening alternatives, and comply with the National Environmental Policy Act (NEPA) of 1969.

Port Hueneme is the only deep water Port between Los Angeles and San Francisco. It is the only Foreign Trade Zone in California's Central Coast Region and supports international ocean shippers through its US Port of Entry status. The OHD maintains five (5) berths, which are located in Channel A, for deep draft mooring and cargo transfer. On occasion, the OHD will use the Navy's Wharf 3 also for off-loading and transfer of product. Product includes: citrus fruits, banana/tropical fruits, petroleum products, automobiles, and wood pulp and wood products. In addition to these commodities, the Port recently signed an agreement with Hydro Agri International (HAI) to begin servicing liquid fertilizer imports. HAI is one of the world's largest producers of fertilizers. To support planned shipping requirements, HAI has constructed an additional three (3) storage tanks and pipelines to Berths 1, 2 and 3. HAI is scheduled to initiate operations in January 1999. HAI will use 35,000 Dead Weight Tonnage (DWT) tankers for product delivery. With product, these tankers can create a maximum draft of 10.7 M (35 feet). Product will be imported from Europe through the Panama Canal. Due to long travel distances, HAI will eventually shift use to the 50,000 DWT tankers to further increase efficiencies in overall product delivery; these tankers, fully loaded, will create drafts of 12.2 M (40 feet). Along with HAI, Charles E. Boyd and Associates (CEB) have expressed interest in importing gypsum from Mexico to the Port. This product is used locally to support the agricultural industry. (Gypsum is a compound used to supplement fertilizer materials; it enhances soil structure and permeability.) Product transport will likely require use of a fleet of 35,000 DWT bulk vessels.

As vessels are currently required to light load and use tides to call on Port Hueneme, existing operations are inefficient. As product volumes are predicted to increase over time in the future, the existing harbor conditions will continue to force large, deep draft vessels to light load and enter on tides. Due to these conditions, future product delivery will become more inefficient than current levels. The proposed project is to evaluate different alternatives and identify a recommended plan to allow the Port to efficiently accommodate larger, deep-draft vessels. Preliminary findings (Corps 1998) indicate that lightering is not economically feasible and predicted to have incremental safety concerns due to the expected increased vessel calls required to meet future projected product volumes. To meet these requirements and to minimize vessel safety transit concerns, increase cargo efficiency of product delivery and reduce overall transit costs, the Corps proposes to deepen the PoHH's main approach channel, entrance channel, turn basin, channel A, and channel A berthing areas. Potential dredge depths to be assessed for this project vary between -14 M and -11.5 M MLLW. Preliminary analyses indicate that optimized

Figure 1.1-1. Historic Wharf Location; "Pier Pile Zone"



depths vary between -12 M and -12.5 M MLLW. Material disposal will incorporate beneficial uses, such as, beach nourishment at Hueneme Beach. Congressional Authorization supports the use of the materials recovered from PoHH, if suitable, first for beach nourishment of the downcoast beaches requiring materials to minimize erosion and provide additional protection for private property owners along the shoreline in risk of loss of property or life.

In the late 1930s/early 1940s, an approximate 1300 by 100-foot wooden wharf was constructed to support harbor activities(Figure 1.1-1). Approximately 1,536 piles were placed to support the wharf. Records reveal that the wooden wharf was removed in the early 1970's due to the lack of integrity of the structure. When removed, some of the supporting pier piles were completely removed while others were cut at the mud line. Corps' dive surveys were performed in August 1997 to document existing conditions. Based on diver observations, it is estimated that approximately 350 piles remain, with an estimated average pile diameter of 25.4 cm. Remaining piles now extend about 0.5 meter above the mud line. As additional depth is required in this area to support the new operations planned for this area, these piles will be removed for safety purposes. Piles will be disposed at an approved landfill site. Dredge (sand) material will be used for beach nourishment. In order to deepen the harbor berthing areas, additional support structures will be placed to ensure the integrity of the existing structures in Berths 1 and 5 remains acceptable. Modifications will include removal of the existing fender system, reinforcement of the sheet pile toe wall, and installation of a new timber fender system. (Figure 1.1-2 shows the wharf modifications for Berths 1-3, and Figure 1.1-3 shows the wharf modifications for Berth 5.) Based on projected future needs, the wharf structure modifications will accommodate existing and new operations.

The Corps is the Federal lead agency for the proposed project, and has prepared this EA in compliance with NEPA, which requires Federal agencies to consider the environmental effects of their discretionary actions.

1.2 COORDINATION EFFORTS AND COMPLIANCE REQUIREMENTS

Public comment on the proposed project was solicited pursuant to Federal requirements. Public or agency concerns identified that are pertinent to the proposed project included the following:

- Characterization of the existing water quality, marine resources, and habitats within and adjacent to the dredge and placement areas, and associated potential short- and long-term impacts on these resources.

- The need for a water quality certification from the RWQCB.

- The need for a consistency determination from the California Coastal Commission, including documentation of the need for the project; disposal alternatives considered; and potential impacts on water quality, marine resources, endangered species, and coastal recreation at and adjacent to the dredge and placement sites.

- Potential impacts on vessel transportation associated with OHD and Navy uses.
- Interest in use of the dredged sediment for beach nourishment.
- Potential impacts on hydrologic regime within OHD with removal of dredged material.

Following the public scoping meeting, a series of coordination meetings/discussions were conducted by the Corps with the Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), California Coastal Commission (CCC), Regional Water Quality Control Board (RWQCB), State Historic Preservation Office (SHPO), local municipalities, and other interested parties. In addition, the USFWS was contracted to prepare a Coordination Act Report (CAR) for the project; the CAR is included in Appendix A.

The Corps developed a testing plan to evaluate the sediment chemistry of the proposed dredge area materials and coordinated it with EPA. This plan was developed to sample the entire suite of constituents routinely tested for dredging projects, as recommended by the Regional Implementation Plan and the Ocean Disposal Plan for the Evaluation of Dredged Material (Corps and EPA 1991). Test results were analyzed and coordinated also with EPA. Upon review of the data and comparison with other data sets, such as the Long & Morgan data, most elements were determined suitable for beach nourishment activities. Additional discussion of sediment chemistry is found in section 4-1 of this EA. The Corps will develop and implement a water quality monitoring plan to ensure compliance with RWQCB measures. Prior to construction, the plan will be coordinated with and approved by the RWQCB. Appendix B includes a copy of the Section 404(b)(1) analysis. Recent grain size analyses indicate that materials are compatible with Hueneme Beach sediments and suitable for nourishment activities at local beaches.

Another issue included disposal of existing pier piles near Berths 1, 2 and 3. As the piles were originally treated with creosote, the Corps prepared an Administrative EA to remove 3 piles to assess pile integrity and composition of creosote within the piles. The Administrative EA was approved on 2 April 1997, pursuant with NEPA, and the Negative Determination on 15 April 1997, pursuant with the Coastal Zone Management Act (CZMA) of 1976. Three piles were removed by a clamshell operation. Piles remained intact during the removal process. Chemistry of the piles was analyzed on 8 August 1997. The samples were evaluated for semi-volatile organic compounds by EPA Method 8270 (Pace Analytical Services 1997). Data findings indicated that significant statistical differences existed among the data sets for different polynuclear aromatic compounds (PACs). Based on these findings, piles are recommended for removal to prevent future potential leaching of the PACs into the ocean waters and sediments. To minimize potential leaching of the contaminants during the pile removal process, piles will be removed by a clamshell operation, not by hydraulic methods. Upon removal, piles (and other associated wood debris) will be loaded onto a truck and transported to an approved landfill site for disposal. At this time, the piles have not been tested and thus are not suitable for ocean disposal. As the previously removed piles remained intact, it is expected that other piles to be removed will remain intact also during the removal process. Construction activities are not expected to release significant amounts of PAC's into the water column or to make these compounds biologically available to marine species. Neighboring sediments were chemically tested also. Data findings indicated the sediment chemistry is relatively free of metals and organics, and sediments are suitable for disposal on the beach.

The CAR (USFWS 1997, Appendix A) indicates that the loss of habitat from the pier piles may be a significant impact and recommends avoidance of the area. Although some hard substrate habitat will be lost by the removal of the pier piles, testing data supports that piles still contain creosote (which includes high levels of PACs) and neighboring sediments do not show signs of chemical leaching from the pier piles, thus it is recommended that the piles be removed from this environment and properly disposed of. As wharf modifications will be constructed with untreated creosote timber piles and sheet piling, additional habitat will be provided for a pier piling community. Each pile will be exposed to approximately 12 to 13 M of water column, depending on the tidal stage. As the new piles will not introduce (leach) contaminants over time and will provide some replacement hard habitat, pier-piling community impacts will be adverse and short term only.

As the project was presented to the USFWS, the CAR (USFWS 1997, Appendix A) indicates that potential concerns, depending upon recommended construction methodologies and time frames, for the following special status species: California least tern, Western snowy plover, Pismo clam, and California grunion. Potential impacts on the least tern, the plover and the grunion will be avoided by implementing construction timing stipulations. As these species nest, forage and/or spawn in the local area between mid March and late August, construction will not be permitted during this time frame. Construction will be permitted to occur between 1 September and 15 March. If construction is proposed to occur outside of this window, additional resource agency coordination and environmental documentation will be required pursuant to NEPA and the Endangered Species Act prior to construction. Pismo clam and grunion impacts will be minimized and/or avoided by placement techniques. In the past, the Corps has coordinated with the Resource Agencies and developed the following strategies to minimize potential impacts on Pismo clam populations and to allow for both on- and nearshore disposal operations. For Onshore Placement, a hydraulic cutter pipeline dredge with pumpout capability will be used to place material between 0 and +4.9 M MLLW, then material will be graded to match the existing beach profile. For Nearshore Placement, a bottom dump scow or barge will be used to place sediment in a mound parallel to the shore in the littoral zone, at depths ranging from -6.1 to -10.6 M MLLW. Therefore, impacts on sensitive species are not anticipated.

Potential navigation impacts, as related to construction, were discussed with the OHD. Construction activities will be coordinated appropriately with the OHD, the U.S. Coast Guard, and the Navy. Prior to construction, the local area will be posted with proper notifications informing marine users of upcoming construction events. The contractor will submit a safety plan to minimize potential navigation transit conflicts. The plan will be reviewed and approved by the Corps and other appropriate maritime agencies prior to construction. The plan shall identify: dredge activities, sequencing events, and timing requirements. Plan maps shall indicate where safety buoys and/or caution flags shall be placed and how equipment will be marked. In addition, the dredging contractor will conduct/participate in an orientation session prior to construction, ensuring coordination protocols with port and navy pilots so existing vessel traffic in the project area can be safely accomplished without vessel transit impacts.

A summary of project compliance is presented in Table 1.2-1.

1.3 ALTERNATIVES CONSIDERED

The project purpose is to efficiently accommodate larger, deep-draft vessels, increase cargo efficiency of product delivery and reduce overall transit costs. Alternatives developed to achieve the project purpose include lightering, port modifications, other potential uses, and no action.

Lightering involves offloading a portion of a fully loaded vessel's cargo onto another, smaller vessel outside the terminal until the incoming vessel's draft has been reduced to where it can safely transit to the terminal. Because lightering is not economically feasible nor safe, it is dismissed from further consideration.

Port modifications involve dredging the approach and entrance channels, the turning basin, channel A, and channel A berthing areas, and placing the material at an offshore, onshore, nearshore, or inland site. Originally, a broad array of depths were assessed generally to determine specific requirements that meet project goals and objectives. The depths between -14 meters (m) and -11.5 m mean lower low water (MLLW) were determined most feasible for allowing vessel traffic to enter the channel fully loaded. Potential alternatives evaluated in detail are presented in Table 1.3-1. For material placement, a site screening process was implemented to test material suitability for beach compatibility. The results indicate that project sediments are physically and chemically compatible with beach sediments at Hueneme Beach. Thus, offshore and inland alternatives are eliminated from further consideration.

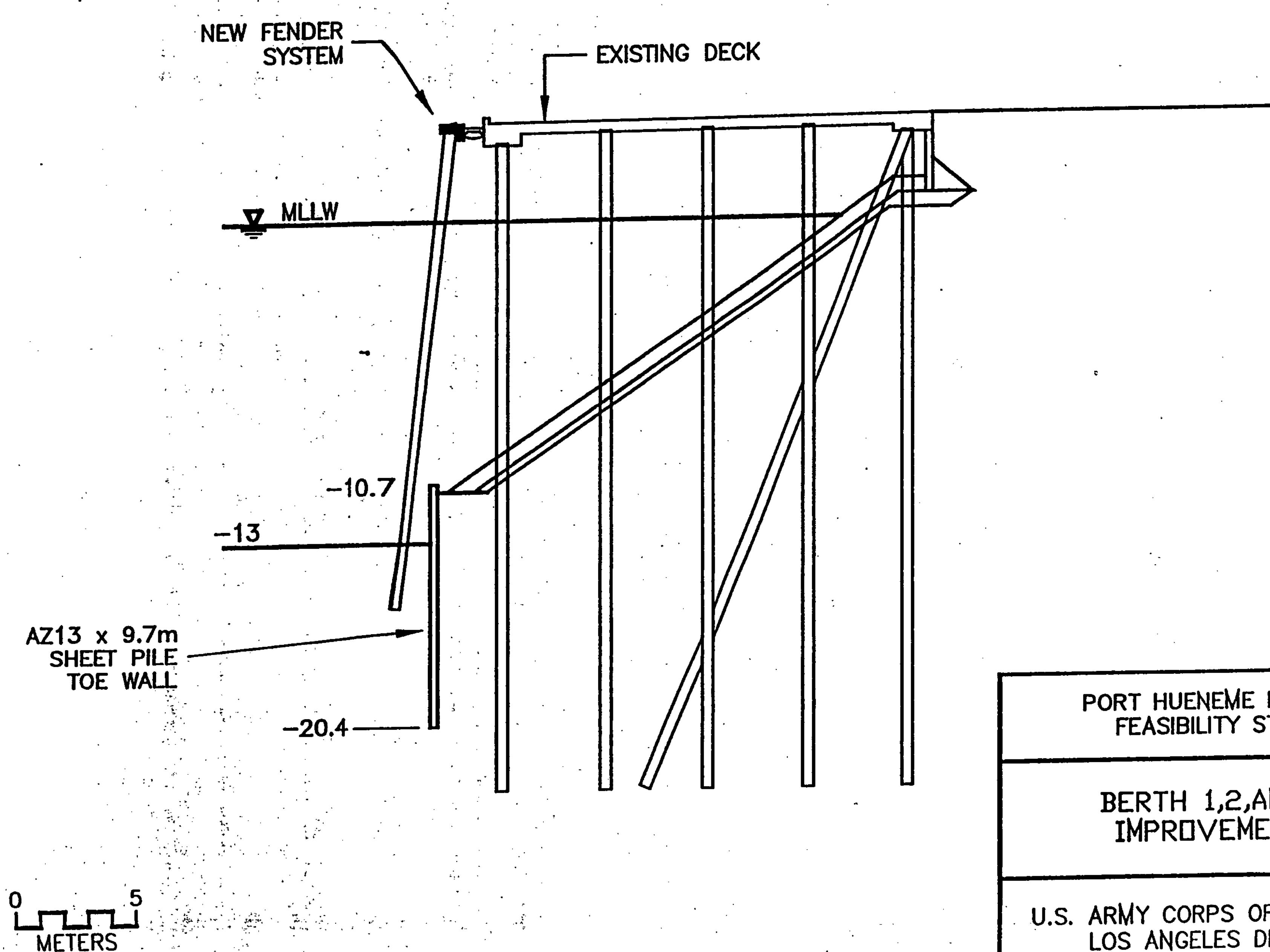
The no-action alternative was described also. The proposed deepening project would not occur, and the controlling depth would remain at -11 m MLLW, which would require large, deep-draft tankers to enter the PoHH light-loaded on tides.

Projected project impacts of the proposed project and alternatives are summarized in Table 1.3-2, with more detailed analyses in Sections 6 and 7. Where required, appropriate mitigation measures are outlined.

1.4 RECOMMENDED PROJECT

The Corps and the OHD propose to deepen the PoHH's main approach channel, entrance channel, turn basin, channel A, and channel A berthing areas. Although potential dredge depths to be assessed for this project vary between -14 m and -11.5 m MLLW, the recommended depths are -13.2 m MLLW for the Main Approach Channel and -12.2 m MLLW for the Entrance Channel, Turn Basin, Channel A, and Berthing Area. Dredged material would be placed at Hueneme Beach. As a part of the project, approximately 350 wooden pier piles will be removed

Table 1.2-1. Summary of Environmental Compliance.	
Statutes	**Status of Compliance**
National Environmental Policy Act (NEPA)	This Environmental Assessment (EA) has been prepared in compliance with NEPA. Upon public review closure, public comments will be addressed, a Final EA/FONSI prepared. Compliance with NEPA will be complete with the signing of the FONSI.
Coastal Zone Management Act (CZMA)	The Coastal Consistency Determination (Appendix C) has been completed and submitted to the Coastal Commission for concurrence with the Draft EA. A finding of concurrence will be obtained from the Commission prior to construction.
Clean Water Act (C.A..)	A Section 404(b)(1) evaluation has been completed to document the project action (Appendix B). A request for Section 401 Waiver will be submitted to the Ventura RWQCB. To show compliance with the Clean Water Act, certification or a waiver is needed prior to construction. It is anticipated that the waiver will be granted prior to the signing of the FONSI.
Rivers and Harbors Act of 1899 (33 U.S.C. 403 et seq.).	Section 10 of the Act prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from the Corps. The proposed action involves work in navigable waters; however, the proposed action is a Corps project; therefore, no permit is required.
Fish and Wildlife Coordination Act (FWCA)	The Corps has initiated the coordination process with the Resource Agencies. In support of the proposed action. The USFWS has prepared a Coordination Act Report in compliance with the FWCA (Appendix A)..
Endangered Species Act (ESA)	Applicable recommendations have been incorporated into the project designs. Applicable resource agency recommendations have been incorporated to avoid impacts to listed species.
Marine Protection, Research, and Sanctuaries Act of 1972 (Ocean Dumping Act) (33 U.S.C. 1401 et seq	Regulates the transportation and disposal of material in the ocean, prohibits ocean disposal of certain wastes without a permit, and prohibits the disposal of certain materials entirely. Dredged materials will be disposed on-shore or near-shore; therefore, this act does not apply.
Migratory Bird Treaty Act of 1972 (16 U.S.C. 703 et seq.).	This Act protects certain migratory birds by limiting the hunting, capturing, selling, purchasing, transporting, importing, exporting, killing, or possession of these birds or their nests or eggs. The proposed action does not violate the Act.
National Historic Preservation Act (NHPA)	Before the project may proceed, it needs to be in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800). A letter dated February 9, 1999 was sent to the State Historic Preservation Officer (SHPO) stating that the proposed project as planned will have no affect on cultural resources that are included in or, are eligible for inclusion for the National Register of Historic Places. Upon concurrence with our determination by the SHPO, the project will be in compliance with Section 106 and may proceed.
Clean Air Act (CAA)	Projected emissions are under the Federal De Minimis Standards. Contractor will acquire local air permits, pursuant with Ventura County Air Pollution Control District.
Acquisition and implementation of all state and local permits (and permit stipulations) will be the responsibility of the contractor. All state and local permits will be obtained prior to construction.	

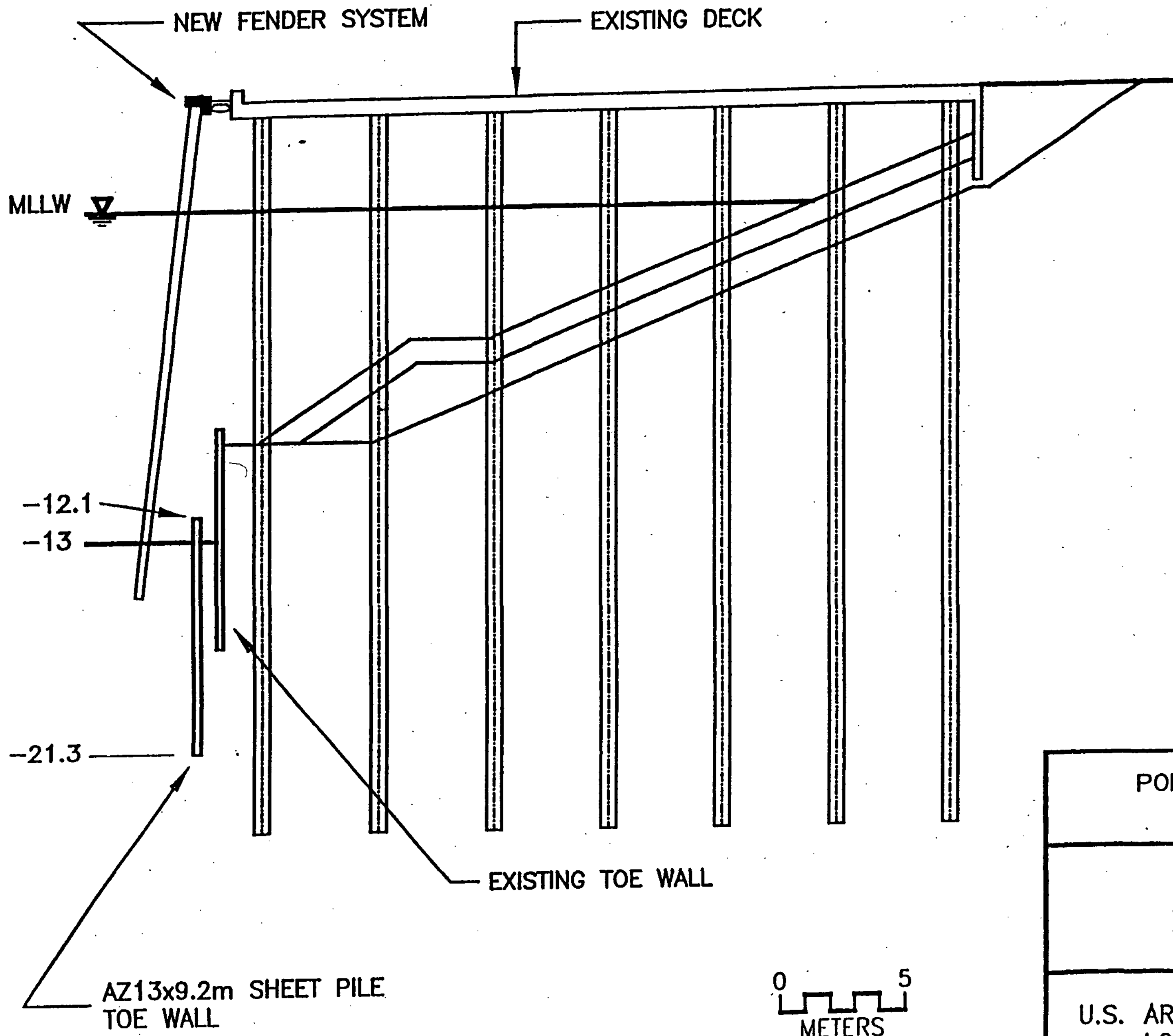


PORT HUENEME HARBOR FEASIBILITY STUDY

BERTH 1,2,AND 3 IMPROVEMENTS

U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

Figure 1.1-2



PORT HUENEME HARBOR
FEASIBILITY STUDY

BERTH 5
IMPROVEMENTS

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Table 1.3-1 PROPOSED PROJECT ALTERNATIVES & FEATURES			
Alternatives	Main Approach Channel	Entrance Channel, Turn Basin, Channel A, & Berth Area Depths	Dredge Volume (m^3)/ Construction Period
Alternative 1	-12.5 m MLLW	-11.5 m MLLW	300,000 2.5 months
Alternative 2	-13 m MLLW	-12 m MLLW	450,000 3 months
Alternative 2a (Recommended Plan)	-13.2 m MLLW	-12.2 m MLLW	485,000 3.5 months
Alternative 3	-13.5 m MLLW	-12.5 m MLLW	600,000 4 months
Alternative 4	-14 m MLLW	-113 m MLLW	750,000 4.5 months
Notes: m - meters; m^3 - cubic meters; MLLW mean lower low water. Each alternative includes a 0.5 m overdraft. O&M is scheduled on a 6 to 10 year cycle, with removal of 200,000 m^3 of material/event. Work period based on removal of 10,000 m^3 of sand/day. 1 month is allotted for mob/demobilization activities.			

Table 1.3-2. **Summary of Impacts and Mitigation Requirements.**

Environmental Resource Category		No Action		Alts. 2 and 2a		Alts. 3 and 4	
		ST	LT	ST	LT	ST	LT
Ocean Impacts	Geological	4	4	4	4	4	4
	Physical	3	2	3	2	3	2
	Chemical	3	2	2	4	2	4
Mitigation Requirements		Implement Alt 2, 2a or 3		Develop, coordinate & implement water quality testing plan. For violations, operations will be modified to meet compliance requirements. Long term O&M responsibilities will require supplemental environmental (NEPA) documentation.			
Marine Biology Impacts		4	2	3	5	3	5
Mitigation Requirements		Implement Alt 2, 2a, or 3		Construction window and placement zone requirements. Prior to construction, relocate kelp wrack material in project area downcoast. Material shall be placed near the inter-/supra-tidal boundary. Construct between 1 Sep & 15 Mar. Onshore placement zone between 0 & 4.9 M MLLW, Near-shore zone between -6.1 & -10.6 M MLLW.			
Use Impacts	Land	4	2/1	4	4	4	4
	Water	3	2	4	4	4	4
	Recreation	3	2/1	3	4	3	4
Mitigation Requirements		Implement Alt 2a		Pier piles to be removed by clamshell dredge and disposed at an approved landfill site.			
Cultural Resource Impacts		4	4	4	4	4	4
Mitigation Requirements		None		If previously unknown cultural resources are identified during project implementation all activity will cease until the requirements of 36 CFR 800.11, *Discovery of Properties During Implementation of an Undertaking*, are met.			
Transportation Impacts	Ground	4	2	3	5	3	5
	Water	4	2	2	5	2	5
Mitigation Requirements		Implement Alt 2, 2a, or 3		Coordinate & approve contractor navigation/safety plan. Requirements include formal coordination with maritime agencies to discuss dredging plan, notification procedures, daily operations during construction, coordination requirements during construction, emergency operations. For on beach disposal activities, contractor will provide a flagperson to direct pedestrian access.			
Air Quality Impacts		3	1	3	5	2	5
Mitigation Requirements		Alt 2, 2a, or 3		If Alt.3 or 4 is selected, use clamshell and/or hopper dredge only _or_ purchase offsets of emissions elsewhere in the county _or_ retard injection timing of diesel-powered equipment by 2 degrees _or_ use selective catalytic reduction (SCR).			
Noise Impacts		4	3	2	4	2	4
Mitigation Requirements		None		Install sound barrier or use other sound reduction techniques at wharf construction site to reduce the noise to a level that is not significant at residential areas			

Notes: (1) - Non-mitigable, significant adverse impact. (2) - Mitigable significant adverse impact to not significant. (3) - Adverse impact, but insignificant. (4) - No impact. (5) - Beneficial impact. ST - Short Term, LT - Long Term.

and properly disposed of at an approved landfill site. In addition, wharf modifications will be required to support existing structures at the new berthing depths. O&M is anticipated to occur on a 6 to 10 year cycle, with removal of 200,000 m^3 of material/event.

1.5 AREAS OF CONCERN

Areas of environmental concern with the proposed project are limited to the pulling of the pier piles and potential resuspension and bioavailability of creosote. Test results indicate that sediments adjacent to the pilings are not contaminated, and that removal is not expected to significantly increase bioavailability.

1.6 UNRESOLVED ISSUES.

No remaining unresolved issues have been identified for this project.

SECTION 2 - NEED FOR AND OBJECTIVES OF PROPOSED ACTION

2.1 DESCRIPTION OF PROPOSED PROJECT AREA

The proposed navigation deepening project is located in the PoHH, which is located in the city of Port Hueneme, Ventura County, California. The PoHH is located on the coast approximately 105 kilometers (km) northwest of Los Angeles. The project area is shown on Figure 2.1-1.

The PoHH consists of a west and east jetty, an approach channel, an entrance channel, a central turning basin and Channel "A". The approach channel is approximately 240 m in length and 180 m in width. The entrance channel is approximately 470 m in length and 100 m in width, with an authorized depth of -11 m MLLW. The turning basin is 329 m in length and 311 m in width with an authorized depth of -10.7 m MLLW, and Channel "A" is 707 m in length and 84 m in width with an authorized depth of -10.7 m MLLW. The PoHH complex is shown on Figure 2.1-2.

Navigation into the PoHH proceeds between two rubble-mound jetties through a dredged channel. Pilotage is controlled by the narrowest width of the entrance channel, which is 100 m. The main navigation channel inside the harbor is maintained at -10.7 m MLLW.

2.2 PURPOSE AND NEED

Due to existing shallow bottom depths, deep-draft vessels entering the PoHH are required to limit the amount of cargo product that can be brought in for berthing. The project purpose is to more efficiently accommodate larger, deep-draft vessels, increase cargo efficiency of product delivery and reduce overall transportation costs.

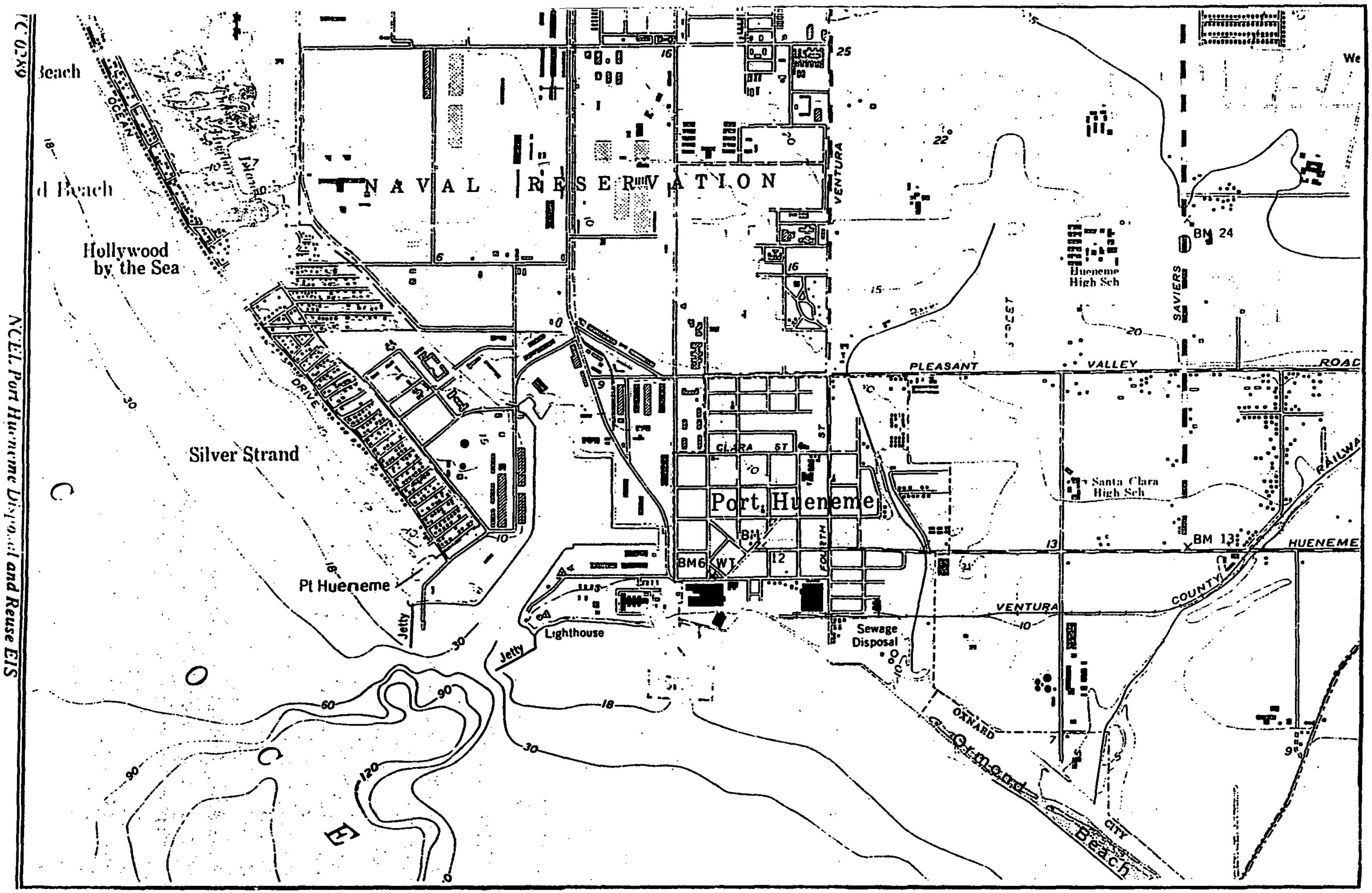
Existing Conditions

The PoHH supports a variety of deep-draft shipping uses for both military (U.S. Navy) and commercial purposes. The Port's niche cargoes include: Citrus fruit exports, Banana/tropical fruit imports, Petroleum products, Imported automobiles, Wood pulp and wood products imports.

For the commodities which have historically been imported into and exported out of Port Hueneme, the current depth and configuration at the port does not appear to be constraining operations. Current and projected vessel requirements for these commodities show that existing depths are adequate. It appears that deepening the harbor would have little, if any, impact on transportation costs for these commodities.

Future Conditions

Two new commodities; liquid fertilizer and gypsum, will be imported into the port in the near future. In fact, the first shipment of liquid fertilizer was off-loaded at the port in December 1998. Analysis indicates that deepening the channel and turning basin at the port could reduce transportation costs for these commodities by allowing deeper draft vessels to be utilized, potentially reducing the number of vessel trips required.



The NCEL property is surrounded
the City of Port Hueneme, the
Harbor District, NCBC
and the Pacific Ocean

Local Area Map

N

0 1,000 2,000
Approximate Scale in Feet

Port Hueneme, CA

Figure 2.1-1

Source: U.S. Geological Survey, 7.5 minute quadrangle, Oxnard, 1967

HAI, one of the worlds largest producers of fertilizers, has recently completed construction of three storage tanks and pipelines to berths 1, 2 and 3 on the land south of Channel A which was recently acquired from the Navy by the OHD. HAI has begun operations at the port utilizing chartered 35,000 DWT tankers with maximum drafts of 10.7 meters (35 feet) to import liquid fertilizer from Europe through the Panama Canal first stopping at Port Hueneme, then moving upcoast to the Port of Stockton. Charles E. Boyd and Assoc. (CEB) has also expressed its desire to begin importing gypsum from Mexico into Port Hueneme. Port Hueneme is a desired Port of Entry because the gypsum product will be sold primarily to agricultural users in close proximity to the Port. CEB intends to utilize 35,000 DWT bulk vessels with maximum drafts of 10.7 meters (35 feet) to import gypsum into the Port.

The vessels described above which will be utilized by HAI and CEB both have fully loaded drafts of 10.7 meters (35 feet). In order for a vessel this size to navigate the existing harbor safely, it must either light load or use the tides. Further, HAI executives have indicated that they intend on using 50,000 DWT tankers with fully loaded drafts of 12.2 meters (40 feet) in the near future. These vessels must be sufficiently light loaded to call on Port Hueneme even with the use of tides. This light loading and dwell time resulting from having to wait for sufficient tides will result in inefficient cargo movements at Port Hueneme in the future.

Based on the existing PoHH configuration, the deepest vessel that could safely use the harbor at MLLW would draw about 10 m at its lowest point. Vessels drafting more than 10 m may incur tidal delays or be required to enter the PoHH partially loaded (referred to as "light loaded") due to channel depth constraints.

2.3 PROJECT OBJECTIVE

The objective of this project is to increase the efficiency of cargo product throughput in a way that maximizes net benefits to the national economy, while having the least impact on the environment.

SECTION 3 - ALTERNATIVES AND ECONOMIC ANALYSIS

This chapter describes the considerations that determined the preliminary alternatives that were initially considered, the alternatives that are analyzed in detail, and the proposed construction methods, timing considerations, and maintenance requirements.

3.1 PLAN FORMULATION

The formulation of plans to meet the needs of the port examined all viable structural and non-structural measures primarily focusing on addressing the primary planning objective. Non-structural objectives would involve changing operations such as (1) use of tides; (2) lightering; and (3) use of other ports. Structural measures are actions which involve construction or modification of improvements to meet the primary objective. Analysis of structural measures was limited to deepening and widening channels. Based on examination of the alternative measures considered viable to improve the efficiency of operations at the Port of Hueneme, the following conclusions were made.

3.1.1 Alternatives Considered and Rejected

Lightering.

Lightering involves providing or designating an area with adequate depth to allow a fully loaded vessel to transfer part of its load to other, smaller vessels until the vessel draft is at a depth it can enter the harbor. The extra cost of lightering including use of smaller vessels can be considerable. In addition, the use of smaller vessels increases air emissions. Accordingly, lightering was eliminated from consideration for economic and environmental reasons (see Section 4.4, Main Feasibility Report).

Use of Other West Coast Ports.

HAI currently sells liquid fertilizer to Northern California through the Port of Stockton. The company has chosen Port Hueneme as an ideal port to extend its market to Southern California. Port Hueneme is the desired port of entry for CEB since the gypsum the company supplies would be sold to agricultural users in close proximity to the Port. Therefore, the use of other west coast ports was not considered further.

Use of Tides.

Deep draft wood pulp vessels presently have had to wait for favorable tides before entering the Harbor. This situation occurs when scheduling does not permit them to stop at Long Beach first to off-load cargo. Approximately 2-3 wood pulp vessels per year have incurred tidal delays. Tidal delays can be expected to rise sharply in the future when HAI begins utilizing 50,000 DWT tanker vessels. Use of tides results in slower cargo movements and queuing which increases the cost of transportation per unit of cargo. Strict use of tides is considered economically inefficient and was thus, eliminated from further consideration; however, using tides in concert with other improvement measures such as channel deepening was carried forward (see Section 3.1.2).

3.1.2 Alternatives Recommended for Further Evaluation

Channel Improvement.

Improvements to the approach channel, entrance channel, turning basin, and Channel "A" are viable options that warrant consideration, since this would allow vessels to come in more fully loaded and allow larger vessels to call on the Port. Use of tides was considered when developing the final array of alternatives.

3.1.2.1 Depth Configurations

The existing channel dimensions, other than the depth, are all adequate to allow the design vessels to maneuver in the harbor. Originally, a broad array of depths were assessed generally to determine depths that meet project needs. Optimal depths for achieving most efficient and economical vessel transit through the channel fully loaded vary between -14 m and -11.5 m MLLW. Thus, the following five alternatives were developed (see Section 4.12 of the Main Feasibility Report).

Alternative 1. The Main Approach Channel would be dredged to -12.5 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -11.5 m MLLW. Approximately 300,000 m^3 of material would be dredged over 2.5 months.

Alternative 2. The Main Approach Channel would be dredged to -13 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -12 m MLLW. Approximately 450,000 m^3 of material would be dredged over 3 months.

Alternative 2a. (Recommended Plan). The Main Approach Channel would be dredged to -13.2 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -12.2 m MLLW. Approximately 485,000 m^3 of material would be dredged over 3.5 months.

Alternative 3. The Main Approach Channel would be dredged to -13.5 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -12.5 m MLLW. Approximately 600,000 m^3 of material would be dredged over 4 months.

Alternative 4. The Main Approach Channel would be dredged to -14 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -13 m MLLW. Approximately 750,000 cubic meters (m^3) of material would be dredged over 4.5 months.

3.1.2.2 Material Placement Sites

Potential material placement sites include offshore, onshore, nearshore, and inland alternatives. Criteria for selecting suitable sites include engineering feasibility and economic considerations; federal and local support and acceptability; environmental considerations; and sediment suitability.

Sediment Suitability Criteria

Beach nourishment is the most acceptable use for beach compatible materials, and is supported by the different resource agencies, including, but not limited to, the Corps, the Environmental Protection Agency (EPA), the California Regional Water Quality Control Board (CRWQCB), the California Department of Fish and Game, (CDFG), the California Coastal Commission (CCC), the U.S. Fish and Wildlife Service (USFWS), etc. Beach nourishment is also considered feasible from an engineering practice and is economical. Therefore, if geotechnical and chemical evaluations determine the proposed dredge materials compatible with those on the proposed beach site, then beach nourishment will be the recommended alternative.

Federal authority (HD 362, 90th Congress, Second Session (1968)) mandates the Corps to maintain the downstream beaches of Channel Islands and Port Hueneme harbors as long as periodic maintenance dredging occurs within these basins and the harbors remain under Federal ownership. (The downstream beaches include Silver Strand and Hueneme beaches.) Due to the overall closeness in relation to the PoHH, Hueneme Beach is the recommended site for nourishment activities.

Grain Size Compatibility. The Corps's guidelines for sediment suitability for beach nourishment state that the percent of "fines" in a composite sediment sample from the dredge site must be within 10 percent of the percent of fines at the receiving beach to be suitable for beach nourishment. ("Fines" are the finer-grained sediments commonly referred to as silts or clays.) Sediments would be considered suitable for offshore placement if the proposed dredge sediments are, on average, as coarse or coarser than existing receiver-site sediments.

Sediment Chemistry Compatibility. Chemistry compatibility is assessed by analyzing the quality of sediments at the proposed dredge area and the potential receiver beach. If material is found to be relatively free of contaminants as compared to each other, and the LA-2 and Long and Morgan (1980) reference sites, then dredge material can be placed at the receiver beach.

Material Testing Results. The project area sediments were sampled and evaluated prior to the initiation of this Environmental Assessment. Testing results indicate proposed project sediments are physically and chemically compatible with beach sediments at Hueneme Beach.

Material Placement Options

Material testing results indicate that proposed dredge materials are suitable for beach nourishment at Hueneme Beach, therefore, other disposal options are dismissed.

Hueneme Beach is located southwest of PoHH (Figure 1.2-1). Hueneme Beach is 64 m in length and 37 m in width. Due to the construction of the Port of Hueneme and the Channel Islands harbors, Hueneme Beach's natural transport of littoral material has been altered and resulted in periodic erosion. As this beach is heavily used, beach nourishment has been deemed necessary to maintain the beaches for shoreline protection and recreation uses. Over the past twelve years, 1.46 million m^3 of material has been placed on this beach from the Channel Islands Harbor/Port Hueneme O&M dredging projects biennially to aid in shore stabilization. The benefits of placing material here are of great value. Material placement could occur as follows:

Onshore Placement. A hydraulic cutter pipeline dredge with pumpout capability would be used to place material between 0 and +4.9 m MLLW, then material would be graded to match the existing beach profile (Figure 3.2-1).

Nearshore Placement. A bottom dump hopper or clamshell dredge would be used to place sediment in a mound parallel to the shore in the littoral zone, at depths ranging from -6.1 to -10.6 m MLLW (Figure 3.2-1). Wave energy would naturally rebuild the beach by carrying sediments onto the beach profile.

3.1.3 No-Action Alternative

For comparison purposes, and consistent with the NEPA and the CEQA, the no-action alternative is considered for further study. The proposed deepening project would not occur, and the controlling depth would remain at -10.7 m MLLW, which would require large, deep-draft tankers, with approximately 50,000 Dead Weight Tonnage and above, to enter the PoHH light-loaded on tides. This alternative would be both an inefficient and costly operation.

3.2 CONSTRUCTION, TIMING AND MAINTENANCE REQUIREMENTS

3.2.1 Construction Methods

Material Placement

It is anticipated that a hydraulic cutter pipeline dredge with pump-out capability would be used for material dredging and placement activities associated with an onshore effort and a bottom dump hopper or clamshell dredge for a nearshore effort.

Pier Pile Removal Operations. During the vibracore sampling process an unknown quantity of wooden pier piles were discovered. Background findings indicate these piles were placed to support a wooden wharf in the late 1930's and early 1940's (Figure 1.1-1). Engineering diagrams indicate that approximately 1700 piles were placed to support the structure. Records also reveal the wooden wharf was removed in the early 1970's, and pilings were either removed or cut off at the mudline. A recent dive survey, conducted on August 12, 1997, indicated that approximately 350 piles remain today. Piles extend approximately 0.5 m above the mudline. The average pile diameter is estimated at approximately 25.4 cm, and the overall length varies between 4.5 and 6 m.

Two construction methods were compared in terms of economic efficiency and environmental acceptability. Method 1 is the use of a hydraulic pipeline dredge for the entire project. Method 2 is the use of a hydraulic pipeline dredge for the harbor excluding the "pile zone" area. In the pile zone, a mechanical clamshell dredge would be used to dredge to the project depth.

Method 1- A pipeline would be used to convey dredged material from the hydraulic cutterhead dredge to the beach disposal site located downcoast of the East Jetty of Port Hueneme Harbor. When dredging in the pile zone, the cutter-head would chop the piles into small chunks which will travel through the dredge and onto the beach. The pile zone material would be separated from other dredged material in a bermed area. All wood debris would be screened and separated prior to removing the berm and grading the beach. This operation may cause considerable down time for the dredge, since the equipment used to clean the beach can only clean a 6" layer of material. If all the pile zone material was placed in the bermed area at one time, the screening equipment could only clean the top 6" layer which would leave wood debris buried. Due to tidal and seasonal fluctuations of the beach, these materials would eventually be exposed causing a potential safety risk to recreational users of Hueneme Beach and the beaches immediately upcoast and downcoast. Therefore, only a limited amount of material could be pumped into the bermed area before the dredge would be shut down to allow the water to drain so the screening equipment could remove the wood debris. To decrease the amount of down time for the dredge, more than one bermed area could be constructed on the beach so that the dredge would only need to shut down long enough to move the pipeline to another bermed area. Material could be pumped into one area while waiting for water to drain from another and the screening equipment to remove the debris. Even with more than one bermed area, however, this construction method is considered economically inefficient due to the time and cost of constructing the bermed area and amount of dredge down time. Further, it would be difficult to ensure that all the wood debris would be removed from the pile zone material prior to grading of the beach. Any debris not removed may pose a safety risk for beach users. For these reasons, this construction method was not considered further.

Method 2- A clamshell dredge would be used to dredge the pile zone. If the dredge encounters a submerged pile, it will either clamp onto it and pull it out whole, in which case the clamshell head would not fully close, allowing any sediment to fall out while pulling the pile. The pile would be placed in an on-dock staging area while awaiting transport by tractor trailer to an upland disposal site. Or the clamshell will sheer the pile, in which case the clamshell head would close trapping the sediment and the sheered off pile. The dredge would place the load on a hopper barge where the pile piece could be removed and placed with the whole piles in the on-dock staging area. Once the barge is full, it would be maneuvered nearshore of Hueneme Beach for placement of the material in the nearshore zone. This method was found to be cost efficient and environmentally acceptable, therefore, the cost estimates shown in the following section were developed based on this construction method.

Onshore Placement. Typically, a floating dredge is used to excavate the sand. A hydraulic pipeline dredge is essentially a floating barge with onboard pumping equipment capable of excavating wide bottom cuts. A suction pipe is often fitted with a rotating cutterhead which loosens the material to be excavated for easier entrainment. Then, the sand slurry is pumped through a pipeline onto the receiver beach. [The pipeline route is identified on Figure 3.2-1; the pipeline is expected to be placed above the reach of wave action. Dredge discharge pipes generally range in size from 41 to 66 centimeters (cm).] Inwater work usually requires three support boats, an anchor tender, a pipe tender, and a crew boat in addition to the dredge, while onshore work requires earth moving equipment, i.e. two bulldozers.

Nearshore Placement. Either a bottom dump hopper or clamshell dredge may be used. One 2,750-^{Mc} capacity hopper dredge may be used for material dredging and placement operations. A hopper dredge picks up material by pulling a suction drag head along the bottom. The excavated material is stored on-board in a compartment called the vessel hopper. Normally, a load is filled in about one hour. The vessel produces an average excavation width of 24.4 m and an average depth of about 0.03 m. When full, it travels with an average speed of 45.7 m per minute and discharges its load at the placement site, either by bottom dumping or pumping out the material. The support equipment for a trailing suction hopper dredge includes a 15 m crew boat, an 8 m survey boat, and buoys for marking off work areas. The other method consists of using a derrick mounted on a barge outfitted with a "clamshell" bucket. This method is used normally when removing soft bottom sediment. The material is clammed, then placed into a barge for transport to the disposal site by barge. Support equipment include a 15 m crew boat, an 8 m survey boat, and buoys for marking off work areas.

<u>Other Construction Associated Actions</u>

Wharf Modifications/Toe Wall Installation.

Modifications for berths 1-5 may be needed to stabilize the structures as the berthing areas are deepened. Preliminary designs of proposed improvements are shown in Figures _ and _. Total construction time may range from 5-6 months. Removal of the existing fender system, which consists of piles, wales, chain, fenders and miscellaneous hardware, would take about 7 weeks to complete. Driving sheet pile toe wall, would take approximately 6 to 7 weeks at a driving rate of 80 feet per day. Installing the new timber fender system, which, at an installation rate of 60 feet per day, would take approximately 11 weeks. Installation of the new fender system may be performed concurrently with sheet pile toe wall work which may reduce the total construction time.

The equipment anticipated to be used for construction consists of two 65-ton trucks or crawler mounted cranes; one for sheet piles and one for fender work. These trucks are equipped with 6-cylinder diesel engines and burn fuel at a rate of 8-10 gals/hr. A vibratory hammer equipped with an 8-cylinder diesel engine would be used to install the sheet piles. The vibratory hammer consumes fuel at a rate of 10 gals/hr. A diesel hammer with a fuel consumption of 2-3 gals/hr would also be used for the sheet piles. Other miscellaneous small tools and equipment include chain saws, compressors and welding machines. It is estimated that about 730 tons of material from the fender demolition will be hauled to a local landfill. At 10 tons per truck, it would take 73 truck loads.

Staging Requirements

The proposed dredging and wharf modification will require use of a portion of the U.S. Navy's Battalion Center property. (The property is zoned for industrial uses and permits staging activities.) The proposed staging site is located in the southwestern corner of the lot and includes approximately 5,600 square meters (m^2). The staging/storage area is shown on Figure 3.2-1. This portion of the lot is paved and is routinely used for similar uses by both the Navy and the Corps. The Corps previously cleared this site through the NEPA process (Corps 1994) for similar uses and used this site in the past for maintenance dredging projects. Because this site was recently cleared for staging activities associated with dredge projects, and associated impacts were not considered significant (Corps 1994), this site (and associated impacts) will not be further addressed in this document.

3.2.2 Construction Timing

By using a hydraulic dredge, approximately 10,000 m^3 per day on average can be piped to the beach. The equipment typically operates on a 24-hour continuous basis. Approximately 2.5 to 4.5 months will be required to dredge and place between 300,000 and 750,000 m^3 of sand, depending on which alternative is implemented. Time also includes one month for mobilization and demobilization activities.

If a joint operation occurs where sand is placed both on the beach and in the nearshore zone, approximately 3 to 5 months will be required to dredge and place between 300,000 and 750,000 m^3 of sand, respectively. (It is assumed the clamshell will remove material from the pier pile zone, and the cutterhead will remove any additional material.) Time includes one month for mobilization and demobilization.

The wharf modifications and toe wall installation is estimated at 5-6 months. This work is expected to occur simultaneously with other dredge operations.

The proposed project is planned for a construction start in FY00. Due to potential biological concerns related with the presence of endangered species being onsite for a portion of the year (Section 4.2.1.7), construction activities have been planned to occur during the time of year when these species are not present, between October 1 and March 1.

3.2.3 Maintenance Requirements

It is estimated that deepened channel reaches will require periodic maintenance dredging, every 6 to 10 years, with removal of 200,000 m^3 of material per event. This maintenance requirement is equal to the existing project maintenance requirement; therefore, no additional maintenance is expected for any of the proposed alternatives. Although maintenance dredging impacts will be similar to the overall project impacts discussed in Section 5, additional environmental documentation will be prepared to address specific maintenance dredging episodes and any project modifications prior to each event.

3.2.4 Mariner Notifications/Markers

Prior to construction, the local sponsor and/or the Corps will coordinate with the Coast Guard and other appropriate agencies related to water transit to identify dredge activities, sequencing events, and timing requirements.

The dredging contractor will conduct/participate in an orientation session prior to construction, ensuring coordination protocols with port and navy pilots so existing vessel traffic in the project area can be safely monitored; properly mark equipment, pipe, and project area (with buoys and/or caution flags); and post the area with proper notifications. In addition, flagmen shall be used to direct pedestrians and other vehicles in the area, if needed.

3.3 ECONOMIC ANALYSIS OF ALTERNATIVES

Benefits are derived by calculating the transportation costs under without project conditions and comparing them to transportation costs with project improvements. Benefits from the different deepening alternatives derive from the ability to either load vessels more fully or utilize larger vessels, thus reducing the number of vessel trips required to supply the market area.

An economic analysis of the total plan costs and benefits for each of the final alternative plans was conducted by comparing the cost for implementation with expected benefits of the plan on an annual basis. This determines the optimized NED depth based on maximizing annual net NED benefits. See Economic Appendix for detailed economic analysis of the final alternate deepening plans. Table 3.3-1 summarizes the annualized construction costs and transportation savings in thousands of dollars for each alternative plan and computes the net NED benefits.

Table 3.3-1 Benefit/Cost Analysis

	Alt 1	Alt 2	Alt 3	Alt 4
Annual Benefits	$1,115	$1,496	$1,555	$1,569
Expected Annual Costs	$502	$553	$609	$666
Net Benefits	$613	$943	$946	$903
Benefit/Cost Ratio	2.22	2.71	2.55	2.36

As shown in Table 3.3-1, all of the alternatives analyzed have benefit-to-cost ratios greater than 1; and, Alternatives 2 and 3 produce the greatest annual net benefits. Since the costs for Alternative 2 are less than the costs for Alternative 3, Alternative 2 would be selected as the Recommended Plan.

In an attempt to capture the economies of scale of Alternative 3 without significantly increasing the cost of the Recommended Plan, the depths of the Recommended Plan have been modified from 13 Meters (42.2 feet) to 13.2 meters (43.3 feet) in the Approach Channel and from 12 meters (39.4 feet) to 12.2 meters (40 feet) in the Entrance Channel, Turning Basin and Channel "A". This modification will allow the gypsum vessels to enter the harbor fully loaded utilizing 1 meter (approximately 3 feet) of tide; and, also allow the liquid fertilizer tankers to load to the maximum draft allowable for safe transit through the Panama Canal.

.3.1 Benefit/Cost Analysis

Expected annual benefits and costs for the Recommended Plan total $1,541,000 and $593,000, respectively. Net benefits equal $947,000, and the benefit/cost ratio is 2.60. This alternative is the NED plan, since it maximizes net benefits.

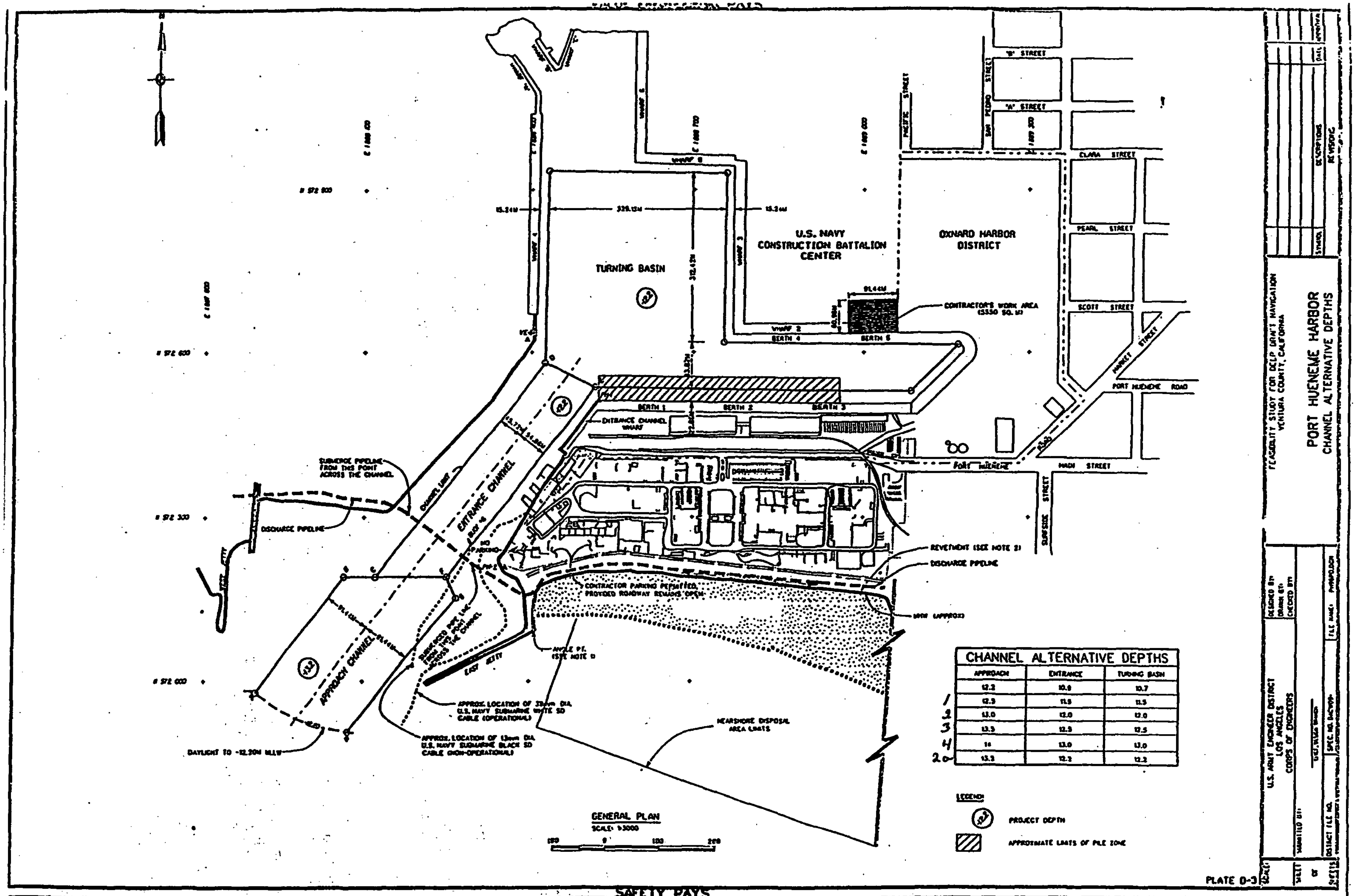
Initially, the Recommended Plan will reduce the number of deep draft vessel calls by 3 shipments per year. Projecting the growth of liquid fertilizer and gypsum imports to 2020, the number of annual shipments will be reduced from 28 shipments annually without project to 20 shipments annually with project. This amounts to an approximate 30% annual reduction in the number of deep draft vessel calls to the Port.

3.4 RECOMMENDED PLAN DESCRIPTION

The Recommended Plan is shown in Figure 3.4-1. The Plan provides for increasing the depth of the entrance channel and inner harbor from -10.7 meters (35 feet) MLLW to 12.2 meters (40 feet) MLLW. The Plan includes stabilizing the entrance channel wharf as well as wharves 1 and 2 and dredging berthing areas 1 and 5 which are located along Wharves 1 and 2. Dredged material will be placed on or nearshore of Hueneme Beach, located south of Channel "A".

3.4.1 General Navigation Features

The Plan consists of deepening the existing Federal approach channel to a depth of -13.2 meters (43.3 feet) MLLW and deepening the entrance channel, turning basin and Channel "A" to 12.2 meters (40 feet). MLLW.



CHANNEL ALTERNATIVE DEPTHS

	APPROACH	ENTRANCE	TURNING BASIN
	12.2	10.9	10.7
1	12.3	11.5	11.5
2	13.0	12.0	12.0
3	13.5	12.5	12.5
4	14	13.0	13.0
20	13.3	12.2	12.2

Recommended Plan

Figure 3.4-1

All dredged material will be disposed of on or nearshore of Hueneme Beach located just south of Channel "A". Dredged material quantities for the entire Recommended Plan are itemized as follows:

Approach Channel	62,000 m^3
Entrance Channel	77,000 m^3
Turning Basin	200,000 m^3
Berth 1	7,653 m^3
Berth 5	4,935 m^3

Dredge material quantities including the berthing areas totals approximately 485,000 cubic meters (630,000 cubic yards).

3.4.2 Associated Features

The associated features of the Recommended Plan consist of deepening Berths 1 and 5 along Wharves 1 and 2 respectively to a depth of 12.2 meters (40 feet) MLLW. In addition, modifications are needed to stabilize Wharves 1 and 2 and the entrance channel wharf to allow for dredging of the entrance channel and berthing areas. Berths 2 and 3 along Wharf 1 and Berth 4 along Wharf 2 will not be dredged to the new project depth.

The project benefits will be fully supported by only deepening Berths 1 and 5. The Oxnard Harbor District has expressed interest in dredging these commercial berths in the future. Although the costs associated with dredging and stabilizing Berths 2, 3 and 4 were not included in the total costs of the project, the construction of these non-essential features has been included in the impact analysis contained in Section 7.

SECTION 4 - AFFECTED ENVIRONMENT

The Ventura coastline includes predominantly wide, sandy beaches, backed by the low-lying Oxnard Plain. The Port of Hueneme is located on the southwest edge of the Oxnard Plain. The terrain which borders the Pacific Ocean, has an average width of 16 km and is relatively flat lowland. The plain slopes southwest from the Camarillo Hills, with a gradient of 2 to 3 m/ km. Average elevations over the PoHH facilities range between +4 and +5.5 m MLLW.

4.1 OCEANOGRAPHY AND WATER QUALITY

4.1.1 Oceanic Resources

Port Hueneme is located within the Santa Barbara littoral cell that is bounded by Point Conception and Point Mugu. The 154.5 km cell is the longest shoreline unit in Southern California. The harbor area is bounded by the Silver Strand Beach and Hueneme Submarine Canyon. Littoral transport of sand along the Santa Barbara cell is most influenced by the material source and the physical processes acting on the material source. Materials in the local area have been classified as fine-grained sands. The dominant direction of movement is from north to south in response to an alongshore component of wave energy that is oriented downcoast. The net total transport volume is about 917,500 m^3 per year on average (Noble Consultants 1989). Silver Strand Beach, located between Channel Islands Harbor and Port Hueneme, has been relatively stable over the past 50 years. The shoreline has formed a state of equilibrium, with a zero net longshore transport rate. From Port Hueneme to Point Mugu, it was estimated that about 688,100 m^3 per year is transported downcoast (Bailard 1985).

4.1.1.1 Sediment Data. The sediments in the project area have been characterized as alluvium. The deeper layers, below 600 M, have been characterized as deposits of non-marine clay, silt, sand, and gravel possibly from the late Pleistocene. The top layers consist of lenticular beds of gravel, sand, silt and clay. In March 1996, twelve sediment samples were collected from the proposed dredge area to determine sediment profiles. The average (d_{50}) grain size was 0.20 millimeter (mm). Historical data indicate that Hueneme Beach sediments average a (d_{50}) grain size of 0.123 mm. Sediment profiles indicate that both areas, on average, consist of fine-grained sands.

4.1.1.2 Physical Processes. The PoHH experiences tides of diurnal inequality. The mean sea level is 1.5 M; mean high water is 1.4 M; and the mean low water is 0.3 M.

Waves. The PoHH is partially sheltered from waves by the adjacent coast of offshore islands. Deep water swell can approach the harbor from the southwest through the Anacapa passage and from the south through the south opening of the Santa Barbara Channel. The largest waves propagate to the site from the west through the Santa Barbara Channel. Due to the geometry of the channel, these waves are restricted to a narrow bank of directional approach. During the summer months, deep water swells can approach from the southern sections. Southerly waves generated locally can occur during prefrontal winds associated with winter extra-tropical weather fronts.

<u>Deepwater Wave Climate.</u> Wind waves and swell which comprise the prevailing and storm wave climate at the harbor are produced by four basic meteorological patterns: Eastern Pacific High, Eastern Pacific Low, Tropical Cyclones and Southern Hemisphere Low.

Eastern Pacific Anticyclone. During the vast majority of the time, the region is under the influence of high pressure. Spring is the windiest time of the year. Windy conditions in the outer coastal waters occur periodically throughout the summer. Light winds are, therefore, much more common than during spring and summer months. With an intense buildup of high pressure inland, strong northeasterly winds (Santa Ana) occur in exposed areas of Southern California.

Extratropical Cyclones of the Northern Hemisphere. During the winter season, migratory low pressure centers of the North Pacific are the most important source of wave energy to reach Southern California.

Tropical Cyclones. The west coast of Mexico tropical cyclone is a regular, frequently occurring, meteorological phenomenon during the summer and early fall. Satellite coverage in recent years has revealed an average of about 14 of these storms per year. Moderate to high swells from these storms occur on average of two to three times a year, but the project area is well protected by headlands and offshore islands from the predominant approach direction of 155 to 170 degrees.

Extratropical Cyclones of the Southern Hemisphere. Southern Hemisphere swell occurs for the most part between the months of March and October, with extreme events tending to be bimodal, peaking during early and late summer. The period is long, with maximum energy most often in the 15 to 17 second range but on occasion as high as 18 to 20 seconds. Because they are nearly monochromatic, swells tend to occur in sets usually about 5 minutes apart, but sometimes as infrequently as 20 minutes. Deepwater wave heights are rarely greater than 1.5 m, but these waves will sometimes break at 4.5 to 6.1 M or more in well exposed areas.

<u>Shallow Water Wave Transformation</u>. Deepwater waves are altered by the proximity of the offshore islands, refraction and shoaling as they propagate toward PoHH. The complex bathymetry of the submarine canyon just offshore of the harbor entrance has a dissipating effect on the approaching waves.

<u>Storm Waves</u>. Extreme wave occurrence was estimated by the Corps to a first approximation using data developed for the nearby Channel Islands Harbor (Corps 1985). The recurrence probabilities for extreme wave heights are as follows: 5 year event and 1.83 M wave height, 10 year event and 2.68 M wave height, 50 year event and 4.02 M wave height, and 100 year event and 5.58 M wave height. Storm surge is relatively small (less than 0.3 m) along the Southern California coast when compared to tidal data.

Entrance Channel Shoaling. The PoHH's bathymetry was last surveyed in April 1996 by the Corps as part of a regular conditions survey. Measured soundings from previous years show the presence of sand shoals forming across the approach channel, between the jetty ends and at both sides of the channel near the entrance. The approach and entrance channels were last dredged in 1991. Maintenance dredging within the channel area is infrequent. Comparisons of the post-dredging survey in January 1991 and condition surveys in July 1992 and February 1993 indicated that very minor shoaling occurred immediately adjacent to the west jetty and in the approach channel. This shoaling may be attributed to overspill of the longshore sediment at the west jetty and the reverse longshore transport from the south, where dredged sediment from the maintenance efforts at Channel Island Harbor are disposed.

4.1.1.3 Chemical Properties

Water quality is typically characterized by dissolved oxygen, temperature, pH, salinity, transparency, nutrients, and trace metals. Based on these parameters and as supported below, the quality of the nearshore and harbor environments are characteristic of a good quality system.

Dissolved Oxygen (DO). DO is a good indicator of water quality. Past studies have shown that concentrations vary considerably throughout the harbor by area, depth, and season. A large number of factors influence DO concentrations, including: abundance of living plants (photosynthesis) and animals (respiration); waste discharges rich in biochemical oxygen demand (BOD); bottom disturbances that expose anoxic sediments; surface water mixing; water flushing rates (circulation patterns); and salinity and temperature. Surface waters in the ocean are usually saturated with oxygen, and concentrations decrease with depth. Average offshore concentrations in the Santa Barbara Channel near our project area (Ormand Beach) ranged between 7.3 and 11.0 milligrams per liter (mg/l) in the surface waters, and between 6.0 and 8.7 mg/l near the bottom (Chambers Group 1992). PoHH waters are likely to be somewhat lower than coastal regions. Localized reductions in DO, however, still occur occasionally. These localized, short-term reductions of DO are usually due to decomposition of phytoplankton following algal blooms or "red tides". "Red tides" (high density of phytoplankton) may be observed in the harbor during summer months and are attributed to conditions of intense solar radiation and nutrient-rich waters (Corps 1995). Although localized reductions may occur for DO, DO concentrations generally remain above 5 mg/l (the 5 mg/l is a threshold level set by the Regional Water Quality Control Board (RWQCB) and is considered the minimum level necessary to sustain biological life).

Temperature. Surface water temperatures in the project area are highest from August through September and lowest between December and February. Temperatures in the Santa Barbara Channel vary between 12 and 17°C (Chambers Group 1992). Temperature, like DO, also typically decreases with depth. In the PoHH, temperatures are expected to be slightly warmer than those recorded in the Santa Barbara Channel.

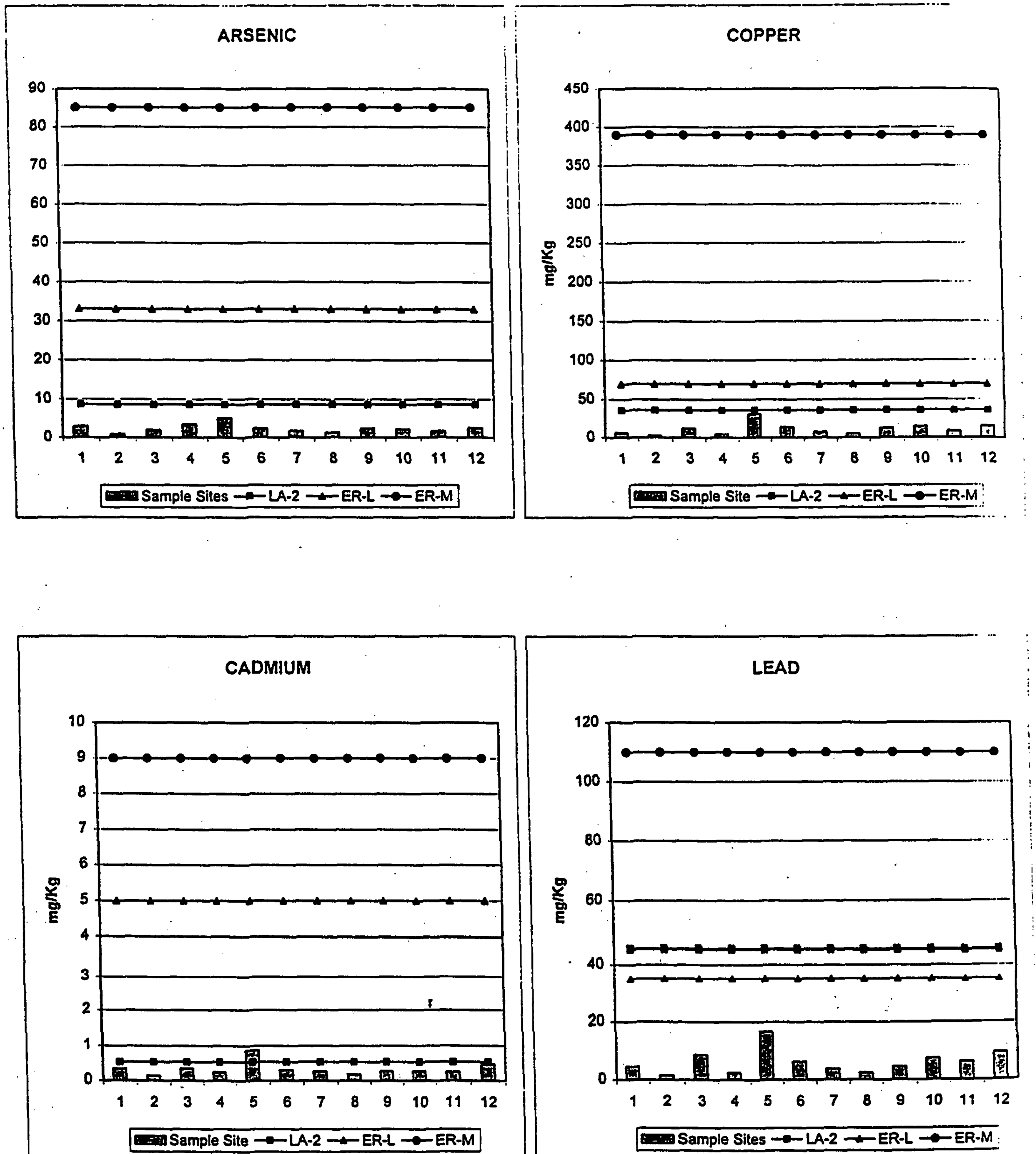
pH. The pH for local coastal waters have been found to range from 7.5 to 8.6 (Chambers Group 1992). The pH generally decreases with depth. Harbor waters are likely to be similar to the values recorded offshore, with higher values at the surface during warmer periods than in cooler, deeper waters.

Salinity. The salinity of the ocean water regime remains relatively constant. In surface waters, salinity is influenced primarily by evaporation and precipitation. In general, surface salinity ranges between 33.0 and 34.5 parts per thousand (ppt). In harbor waters, freshwater inputs will decrease salinity ranges (Corps 1995). Harbor waters are expected to be less saline and more variable than coastal waters.

Transparency. Water transparency is influenced by the presence of suspended organic and inorganic material. Organic material includes plankton and materials from land-based discharges while inorganic material includes the sediments. Waves and currents may suspend sediments in shallow waters and can transport suspended materials away from their place of origin. Suspended sediment measured in the Santa Barbara Channel is typically on the order of 0.5 to 1 mg/l, when storms are not taking place, and transmissivity averaged between 10 and 20 m (Chambers Group 1992). Due to the mixing of freshwater and saltwater in the harbor, tansmissivity is expected to be lower than the open coastal environment.

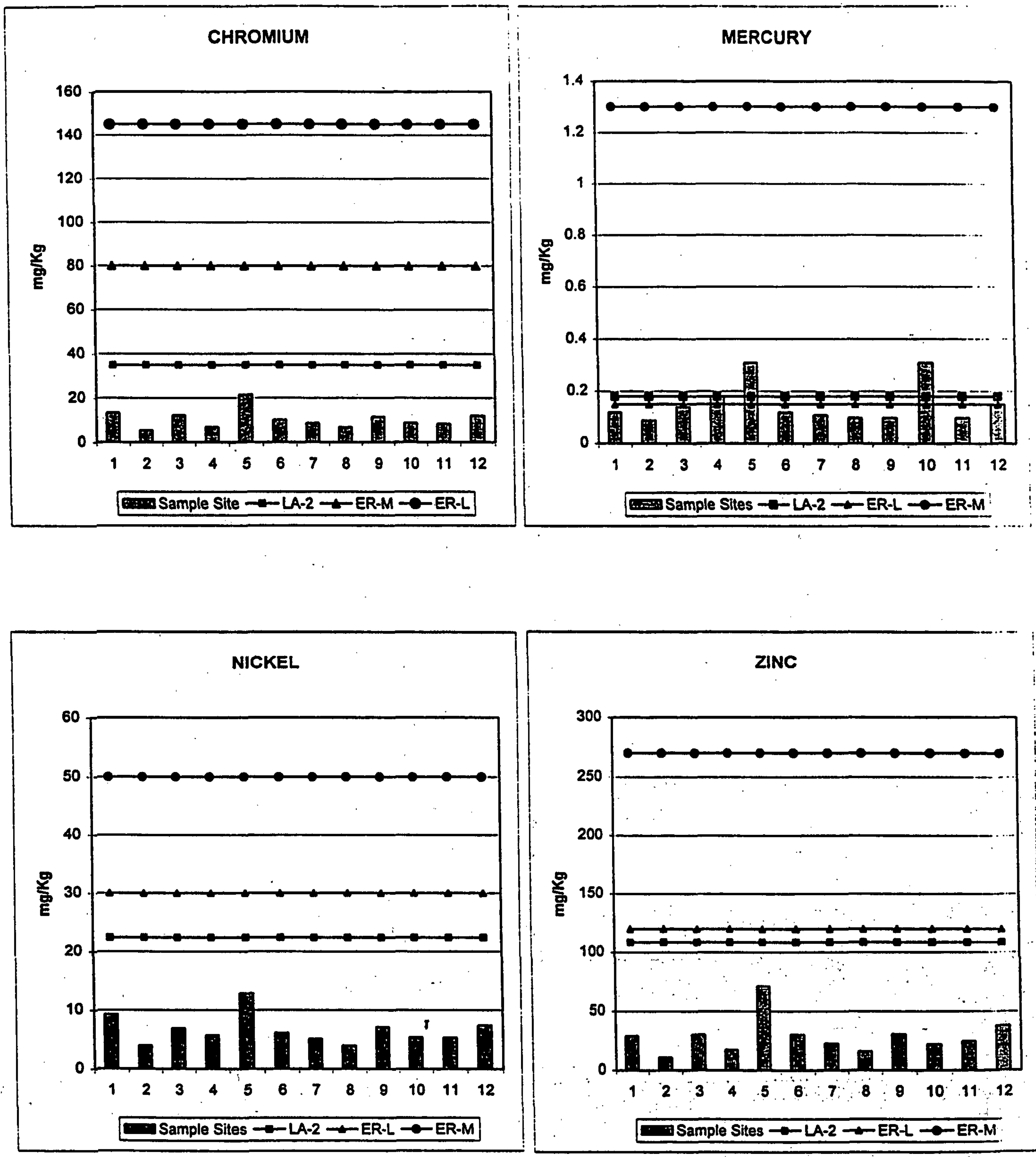
Nutrients. Phytoplankton must obtain a range of substances from their environment in order to sustain growth and division, including, most importantly nitrates, phosphates, and silicates. Maximum concentrations of nitrate in the Santa Barbara Channel were recorded at 0.74 mg/l; maximum phosphate concentrations at 0.12 mg/l; and maximum silicate levels, 0.42 mg/l (Chambers Group 1992). Generally, concentrations tend to be lower in summer when photosynthetic activity is greatest and higher in winter when day length is shortest and runoff from precipitation is increased. Nutrient concentrations in harbor waters can be fairly high at times. High nutrient levels are not good if they cause eutrophic conditions and large algal blooms. These conditions can result in a crash of the plankton population. Nutrients can be added by diffusion and/or mixing by winds and waves of sedimentary organic material, storm runoff from residential and industrial areas that enter via the Santa Clara and Ventura Rivers, municipal wastewater outfalls, storm drain discharges, vessel maintenance, and accidental spills.

Trace Metals. Although many trace metals are essential to biological productivity, they can be toxic in certain concentrations to marine organisms. These levels vary widely, with variability being a function of the proximity of sewage outfalls, river mouths, urban centers, and upwelling of subsurface waters (Chambers Group 1992). In March and June, 1996, sediment samples were collected from the proposed dredge site to determine the level of trace metals in the PoHH. Test results are presented in graph form in Figure 4.1-1. Because State and Federal sediment quality criteria are not available for interpreting sediment chemical analyses, the NOAA sediment criteria developed by Long and Morgan (1990) are often used to interpret sediment data. Based on their research and findings, the ER-L (or lower) concentration levels are generally interpreted



SEDIMENT CHEMISTRY

Figure 4.1-1



SEDIMENT CHEMISTRY

Figure 4.1-1 (continued)

as unlikely to have biological effects, whereas the ER-M (or higher) levels are considered to have probable effects. Levels between the ER-L and ER-M are considered to have possible effects, especially on sensitive species. Sample findings were also compared to data collected at LA-2. At most of the test sites, metals were found to be lower than the ER-L level. However, at one station (Station 5), located in the lower part of the Turn Basin, cadmium was determined to be slightly higher than the ER-L level, and at this same station (Station 5) and one other station (Station 10), located in Channel A near Berth 4, mercury was determined to be between the ER-L and the ER-M. Organic results indicated low levels or no detections of contaminants. Sediment chemistry has been coordinated and interpreted jointly with the EPA. The findings indicate that sediments are similar in nature to those existing at Hueneme Beach.

4.2 MARINE RESOURCES

4.2.1 Biotic Communities

Marine resources are presented for the following categories: plankton, vegetation, invertebrates, fishes, birds, and marine mammals. These categories are further subdivided by habitat (i.e., subtidal, inter-tidal, sandy beach and water column). The proposed dredge area is characterized predominantly by deep water, subtidal soft bottom habitat, and the disposal site by nearshore shallow water, soft bottom habitat and sandy beach. Following is a discussion on the occurrence of general species and potential threatened and endangered species in the project area.

4.2.1.1 Plankton

Planktonic organisms drift with the currents and include phytoplankton and zooplankton. Phytoplankton (i.e., the plants) are the primary producers in the pelagic food web. Zooplankton are the animal component of the plankton. Many species, including invertebrates and fishes important to commercial and recreational fisheries, spend the early stages of their life histories in the plankton. Planktonic communities are characterized by patchiness in distribution, composition, and abundance.

4.2.1.2 Vegetation

Subtidal habitats consist of unconsolidated, fine-grained sands, which typically support limited vegetation opportunities. In addition, the harbor, on average, is dredged biennially for maintenance purposes. The overall conditions in the PoHH support limited opportunities for marine vegetative growth. If vegetation is present, species diversity and density is expected to be low and would consist of species of green ,red, and brown algae.

The neighboring breakwaters, jetties, and pier pilings are expected to support algal growth typical of rip-rap communities. Studies at the Port of Hueneme and Mandalay Beach Generating

Station jetties found several species of green and red algae (Dames and Moore 1980). A small bed of feather boa kelp was found also on the Port of Hueneme breakwater (Dames and Moore 1980).

Hueneme Beach has little or no plant growth due to seasonal erosion processes, beach nourishment projects, and high recreation use.

4.2.1.3 Invertebrates

As the sediments at the dredge site consist of fine-grained sands, and they are subject to wave surge and disturbance by biennial dredge episodes, invertebrate populations are expected to be similar to those in the adjacent open coast, shallow, soft bottom, subtidal habitats. The nearshore coastal areas and the sandy beaches are expected to support typical soft-bottom communities. In the nearshore, coastal environment, species diversity and density increases with depth. Between 9 M and 6 M, the sea pen and sea pansy (Renilla spp.).coexist. At depths greater than 9 M, the sea pen generally becomes conspicuous. In the shallower, shoreward zone, the physical environment is rigorous and species diversity is low. Species may include the sea pansy.

Subtidal invertebrates are likely to include bivalves, tube worms, and clams (Dames and Moore 1980). Seastars, sand dollars, and different species of crabs may be present also. Common pier piling (artificial reef) organisms are likely to include different species of mussels, barnacles, worms, and anemones.

Common sandy intertidal organisms occurring in this zone must cope with a rigorous environment of constantly shifting sands. Common species are likely to include bean and pismo clams between +1 and -3.0 m MLLW (Marine Biological Consultants (MBC) 1975, Blunt 1980, Ricketts, Calvin, and Hedgpeth 1985). Pismo clams are a state-listed sensitive species. The California Department of Fish & Game (CDFG) regulates recreational catch and prohibits commercial harvest. Characteristic sandy beach organisms are likely to include sand crabs, bloodworms, and beach hoppers (Dames and Moore 1980, MBC 1975).

4.2.1.4 Fishes

The predominant fish assemblage is expected to be characterized by the dominance of the soft bottom habitat. Common fishes recorded in shallow offshore environments near Channel Islands Harbor and ikely to exist in the PoHH and adjacent coastal waters include thornback rays, lizard fish (Dames and Moore 1980), speckled sanddab, northern anchovy, white croaker and walleye surfperch (MBC 1975). The breakwater and jetties support additional foraging opportunities for the following fishes: Garibaldi, sargo, opaleye, black perch, rock wrasse, seniorita, half moons and kelp bass.

Between March and September, grunion may spawn on Hueneme Beach. These schooling fishes, which are members of the silversides family, lay their eggs on sandy beaches at the mean higher high water (MHHW) line during nighttime spring tides. (They prefer gradual sloping beaches with fine- to medium-grained sands.) Their eggs are buried in the sand and hatch when the next spring tide occurs, approximately 2 weeks later. Peak grunion spawning activity occurs between April and June. Grunion, like Pismo clams, are a sensitive species, and catch is regulated by CDFG.

4.2.1.5 Birds

The harbor and coastal waters and neighboring rocky structures provide loafing, foraging, and roosting areas for a variety of shorebirds and waterfowl, including loons, Bonaparte's gull, Western gull, Brandt's, Pelagic and Double-crested cormorants, grebes, surf scoters, ruddy ducks, black turnstones, black oystercatchers, wandering tattlers, and California brown pelicans.

The beach environment provides foraging and roosting opportunities for a variety of shorebirds, including black-bellied plover, willet, whimbrel, long-billed curlew, marbled godwit, sanderling, western sandpiper and gulls.

4.2.1.6 Marine Mammals

While several species of whales, dolphins, porpoises, harbor seals and sea lions are frequently seen offshore, only the California sea lion and the harbor seal are likely to forage in the harbor waters and haul-out on the breakwater and jetties.

The California gray whale was recently removed from the Endangered Species List. The gray whale spends its summers in the Bering and Chukchi Seas and calves in the lagoons of Baja, California. The gray whale is occasionally observed offshore during its seasonal migrations. The whales travel south between the last week in November and the first week in January, and they travel north between the second week of January and the first week of May. There is also evidence suggesting that resident populations may exist in southern California.

4.2.1.7 Threatened and Endangered Species

The following table (Table 4.2-1) lists the species of special concern known or expected to occur in the project area, federal status, and information on occurrence. Additional information can be found in the USFWS Coordination Act Report (Appendix A).

TABLE 4.2-1. SPECIAL STATUS SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

SPECIES	STATUS[1]	REMARKS (Nearest Occurrences)	PoO[2]
California brown pelican Pelecanus occidentalis californicus	E	Forages in offshore waters/roosts on breakwaters & jetties. Observed in PA[3].	C
California least tern Sterna antillarum browni	E	Nesting in sandy, unvegetated flats/forages in nearshore waters. Observed in PA[3].	C
Belding's savannah sparrow Passerculus sandwichensis beldingi	E (state)	Wetlands at Ormond Beach/ McGrath Beach State Park. Not observed in PA[3].	R
Saltmarsh bird's beak Cordylanthus maritimus spp. maritmus	E	Salt marsh at McGrath Beach State Park. Not observed in PA[3].	R
Tidewater goby Eucyclogobius newberryi	E	Mugu Lagoon/Santa Clara River (near mouth). Not observed in PA[3].	R
Western snowy plover Charadrius alexandrinus nivosus	T	Ormond Beach/McGrath Beach State Park. Not observed in PA[3].	U
Long-billed curlew Numenius americanus	C	Ormond Beach/McGrath Beach State Park. Not observed in PA[3].	R
Coastal black-tailed gnatcatcher Polioptila melanura californica	T	McGrath Beach State Park. Not observed in PA[3].	R
Tricolored blackbird Agelaius tricolor	C	McGrath Beach State Park. Not observed in PA[3].	R
Globose Dune Beetle Coelus glogusus	C	Morro Bay. Not observed in PA[3].	R
Ventura marsh locoweed Astragulus pychnostachyus ssp. lanosiessimus	C	Mugu Lagoon marsh habitat. Not observed in PA[3].	R
Beach spectacle pod Dithyrea maritima	C	Ormand Beach dune habitat. Not observed in PA[3].	R
Coast wallflower Erysimum ammophilium	C	Ormand Beach dune habitat. Not observed in PA[3].	R

Notes: 1. E = Endangered; T = Threatened; C = Candidate
2. PoO = Estimated Probability of Occurrence in PA; C = Common; U = Uncommon; R = Rare
3. PA = Project Area

Source: Corps 1994.

The two listed species of primary concern are the California brown pelican (Pelicanus occidentalis occidentalis) and the California least tern (Sterna antillarum browni) because both species are known to use the local area regularly. The least tern is the only special status species which breeds in the project area. The Western snowy plover (Charadrius alexandrinus nivosus) has also been observed in the region. Additional information for these three species is provided below.

California Brown Pelican. The California brown pelican (Pelecanus occidentalis californicus), a Federally endangered species, was originally listed because of its low reproductive success, attributed to the production of thin-shelled eggs as a consequence of pesticide contamination (e.g., DDT). The discharge of DDT was prohibited in 1970, and it appears that the brown pelican population has largely recovered (Anderson et al. 1975; Gress and Anderson 1983; Schreiber 1980). California brown pelicans forage along the coast of California all year, but in smaller numbers during the breeding season (approximately January through June). Breeding occurs in Mexico, in the Gulf of California, and on several of the Channel Islands (Gress and Anderson 1983; URS 1986). It is most abundant on the mainland coast from August to November. Brown pelicans are diving birds that feed exclusively on fish, primarily northern anchovies but any small schooling fish near the surface of the water. Brown pelicans are often very tolerant of human activity, and utilize various shoreline structures such as piers, breakwaters, groins, and buoys for roosting. Activities of the brown pelican in these waters are restricted primarily to foraging and roosting.

California Least Tern. The Federally endangered California least tern (Sterna antillarum browni) is a Federally endangered species. The California least tern migrates to southern and central California in the spring to breed, arriving in small numbers in early to mid-April. The terns generally depart for their wintering grounds in August. Of the two tern colonies in the region, the closest one is located at Ormond Beach, approximately 1.6 km downcoast from Hueneme Beach. The next closest colony is located at McGrath State Beach, approximately 9.7 km upcoast of the project area. The terns nest in coastal areas adjacent to shallow marine and estuarine habitats, where they can forage on fish at the water's surface by diving into the water. Most foraging (80 percent) occurs within 4.8 km of the nesting site in waters less than 6 m deep (USFWS 1995 in Corps 1996). Primary prey items of the California least tern are the northern anchovy, topsmelt, and jacksmelt (Massey and Atwood 1984).

Western Snowy Plover. The western snowy plover (Charadrius alexandrinus nivosus), a Federally threatened species, has been observed at the McGrath and Ormand beaches. They nest in the dunes, in flat, open areas with sandy or saline substrates, where vegetation and driftwood are usually sparse or absent. Nesting occurs between March and July. Nest site selection and pair bond formation occur from early to mid-March, and eggs of the first clutch are usually laid by early April. Snowy plovers forage on invertebrates in wet, sandy areas among surf-cast kelp; in dry, sandy areas above the high tide; on salt pans; and along the edges of salt marshes and salt ponds. Studies in California, Oregon, and Washington indicate that coastal breeding populations have declined significantly in recent years (Page and Stenzel 1978). Fewer than 1,500 birds, and

28 nesting sites, remain in the three states. The western snowy plover has disappeared as a breeding bird from most of California beaches south of Los Angeles. Evidence suggests that human activity (i.e., development, recreation, dune stabilization, beach cleaning) and domestic predation are responsible for the sharp decline of this species.

4.3 LAND AND WATER USES

The overall character of the area is composed of a mix of public and commercial water-oriented facilities, dominated by the harbor, restaurants, and shops. The park and beaches further add to the overall impression of a recreation-oriented visual setting. The area is well maintained and projects an image to attract the recreation user.

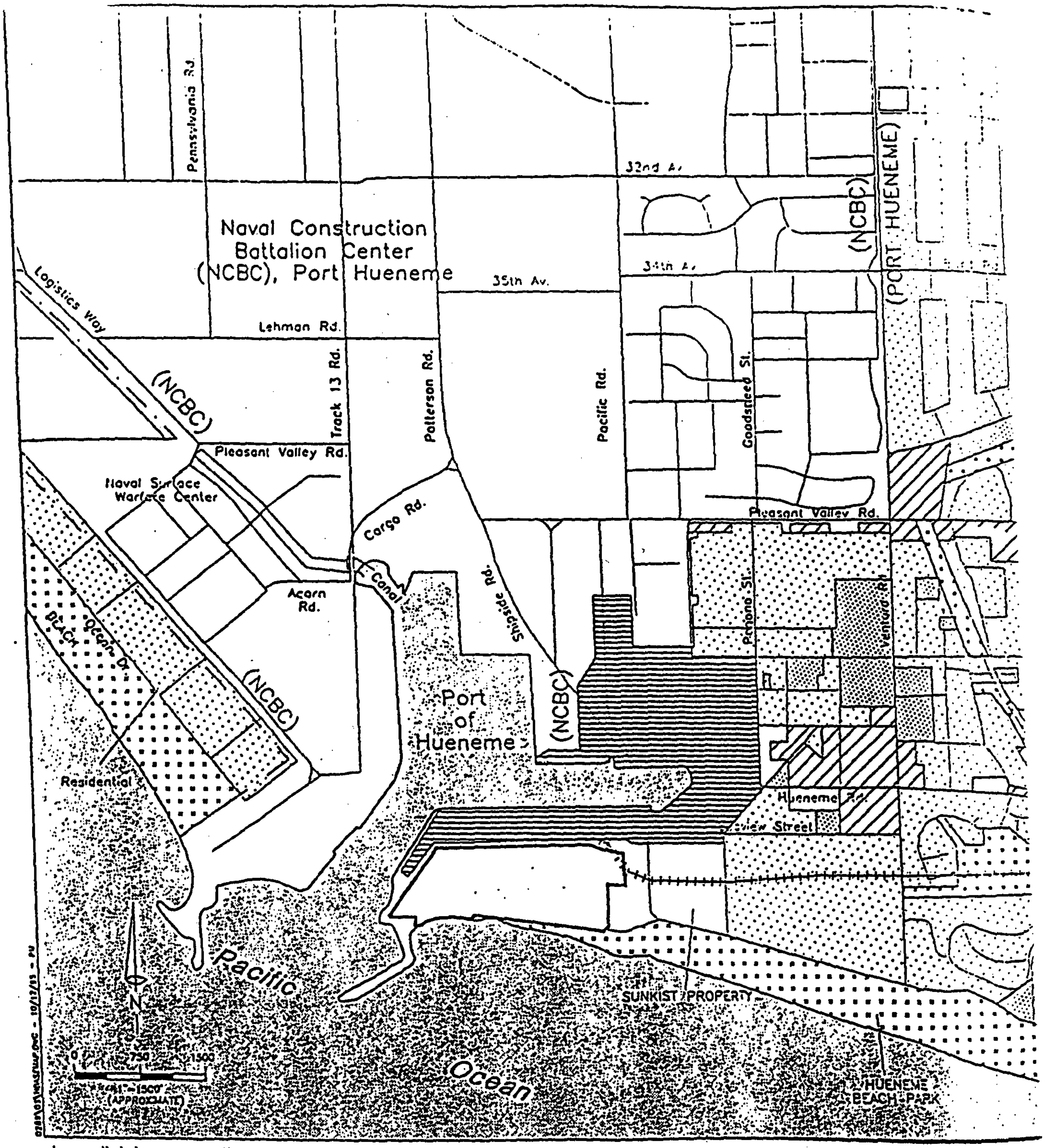
4.3.1 Uses

Local land use patterns are shown on Figure 4.3-1. Dominant land uses include single- and multifamily residential, industrial (i.e., port uses), commercial (i.e., restaurants, hotels, shopping establishments, and facilities affiliated with sports fishing enterprises), and recreation. The OHD land use includes light industrial. The PoHH supports a variety of deep-draft shipping uses for commercial and military purposes. The most important commodity movements at the PoHH include petroleum and petroleum products, motor vehicles from Japan and Europe, bananas and other tropical fruit from Ecuador, Mexico and Columbia, and wood pulp from Brazil. Other commodity commerce includes imports and exports of general cargo, exports of fruit to Japan, and imports of beef from Australia. The project area includes a mix of public and private uses.

4.3.2 Recreation

The overall area attracts both local and county residents, and visitors/vacationers from outside the region. Recreation includes use of the local beaches, coastal waters, and local harbors. Traditionally, local beaches, Hueneme Beach and Silver Strand, have functioned at a high capacity for many years over the spring and summer months (April to September), as well as on weekends year-round. The beach areas provide picnicking, sunbathing, volleyball, and other activities. Hueneme Beach is also inhabited by Pismo clams. Clamming is a popular recreational activity for residents and visitors in the area. Grunion runs may occur also on this beach; grunion spawn between March and mid-September.

The coastal waters offer swimming, surfing, sport diving, boating, and fishing opportunities. Fishing opportunities occur from the beach, with fishermen using long poles to cast their bait beyond the breakers, and at the city's 375 m fishing pier. Common surf fish caught include corbina, barred calico, walleye surfperch, and sometimes halibut. Sportfish caught from the pier include mackeral, bonito, croakers, sandbass, and some halibut (Chambers Group 1992). Water access is provided by the public launch ramp. Additional sportfish may include California barracuda, rockfish, and sole.



Immediately surrounding uses are military and port-related, with the nearest existing residential area beginning about 700 feet to the east.

LEGEND:

- Residential
- Commercial
- Public
- Port-related Uses & Light Industrial
- Recreation (Public)

Land Uses

Port Hueneme, CA

FIGURE 43-

SOURCE: U.S. Navy 1996.

4.4 CULTURAL RESOURCES

The PoHH is man-made. According to Mr. Robert Harmith, PoHH, Director of Marine Operations, there is no written policy toward managing shipwrecks (pers. com., April 29, 1997). He said that they strive to prevent ships from sinking and if one were to sink it would be immediately removed.

In 1994, the entrance channel and disposal beaches were cleared for cultural resources (Corps 1994). Deep draft dredging of the turning basin and channel A are new areas not previously surveyed. A review of the existing conditions shows that a historic wharf was located on the south side of Channel A. The wharf, which was built in the 1930s, was turned over to the PoHH by the Navy in the 1960's and removed in the early 1970's. Some of the pilings were left in place and cut off at the mud line. The remaining pilings have no historical value since there is no integrity of association with the original wharf.

4.5 TRANSPORTATION

4.5.1 Ground Transportation System

Figure 4.5-1 presents the regional highway system and the local network. As described in the NCEL Port Hueneme Disposal and Reuse DEIS (U.S. Navy 1996), Port Hueneme identifies a roadway as a major highway, which distributes and collects freeway bound traffic, accommodates intracity trips and services other medium distance movements, secondary highway, which distributes and collects traffic generated in the area by major highways, and local streets, which provides most localized access.

Traffic is typically measured and averaged over a 24-hour period of time. The average daily traffic (ADT) is often based on an actual 24-hour traffic count taken during mid-week. In some cases, traffic is measured at various times during the day and extrapolated to the ADT. Seasonal variations may also be taken into account by collecting data during different months of the year.

The capacity of a roadway segment or intersection is the maximum rate of vehicular traffic flow under prevailing traffic, design, and operational conditions. Factors affecting capacity include traffic controls, lane widths, grades, the amount of truck and bus traffic, availability of on-street parking, parking turnover and turn movements. The capacity is commonly defined for hourly periods of time. The level of service (LOS), denoted alphabetically from A to F, best to worst, is a summary evaluation of the degree of congestion, roadway design constraints, delay, accident potential, and driver discomfort experienced during a given period of time, typically peak hour for intersections and 24 hours for roadway segments. While LOS A is the most desirable operational condition for a roadway or intersection, LOS C is considered a benchmark for planning purposes. In heavily urbanized areas, LOS D is an accepted, though undesirable, condition for peak hour travel, particularly on freeways. Hourly capacities as defined in the

Figure 4.5-1

Local Roadways

Port Hueneme, CA

LEGEND:

- Major Highway
- Secondary Highway
- Local Street

... regional highway system is located north ... the site and feeds onto the local systems at H Street and Oxnard Boulevard.

LEGEND:

- Regional Highway
- Railroad

Regional Transportation Network

... Property
Port Hueneme, CA

SOURCE: U.S. Navy 1996.

"Highway Capacity Manual" for various facilities under ideal conditions are listed in Table 4.5-1. The LOS may be quantitatively calculated by a number of methods that generally compare traffic volumes with the physical and operational capacity of the roadway under study. For roadway segments and controlled intersections, the volume/capacity (V/C) ratio is indicative of the LOS. The LOS interpretation is presented in Table 4.5-2. Project area roads currently operate at a LOS of D or better.

Table 4.5-1. Daily Capacities for Major and Minor Arterials

Facility Geometrics	Capacity in Vehicles per Day (LOS E)
8-Lane Divided Regional Arterial	80,000
8-Lane Divided Major Arterial	72,000
6-Lane Divided Major Arterial	54,000
4-Lane Divided Major Arterial	36,000
4-Lane Undivided Major Arterial	30,000
2-Lane Undivided Major Arterial	15,000
4-Lane Minor Arterial	24,000
2-Lane Minor Arterial	12,000

Table 4.5-2. Level of Service Interpretation

Level of Service	Volume-to-Capacity Ratio
A	0 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	> 1.00

4.5.2 Vessel Transportation and Safety

Currently, boat traffic, including commercial boats, fishing vessels, and recreational vessels, often traverse the nearshore waters. These vessels operate primarily out of the Santa Barbara Harbor, Ventura Harbor, Channel Islands Harbor, and the Port of Hueneme (which is strictly for commercial and military uses). Large commercial vessels that traverse the channel generally follow the Vessel Traffic Separation Scheme (VTSS); these routes are marked for vessel transit and safety. There are no marine terminals, pipelines, or platforms located in the project area.

A few commercial fishing boats leave out of PoHH. Boats typically operate on a half, three-quarter, and full-day fish spots along the coast and the Channel Islands. The most common species include rockfish, kelp, sandbass, Pacific mackerel and ocean whitefish (Chambers Group 1992). Commercial fishing operations occur in the Santa Barbara Channel, offshore of the project area, with operations including round haul nets, set or stationary gill nets, drift gill nets, drag nets or trawls, stationary and trolling hook and line fishing, traps, and diving (Chambers Group 1992).

4.6 AIR QUALITY

4.6.1 Meteorology and Climate

The climate in the project area, as with all of Southern California, is largely governed by the semi-permanent high pressure center near Hawaii and the moderating effects of the Pacific Ocean. The climate is characterized by moderate summer temperatures, mild winters, frequent morning coastal stratus clouds, infrequent rainfall confined mainly from late fall to early spring, and moderate onshore breezes. The same conditions that create a desirable living climate also combine to severely restrict the ability of the local airshed to disperse the air pollutants generated by the large population. The project area, being coastal, is protected from the worst of the air pollution problems by the daily sea breeze that brings in clean air and blows pollutants inland, but recirculation of polluted air and incomplete ventilation of the basin can cause smog alerts even in coastal communities.

Table 4.6-1 provides a climatological summary (1946-1993) of the Port Hueneme area from data obtained at the Point Mugu Pacific Missile Testing Command located approximately 3.1 km south of the harbor. The hottest month, August, has an average maximum temperature of 73°F, an average minimum temperature of 59°F, and a mean daily temperature of 66°F. The coldest month, January, has an average maximum temperature of 64°F, an average minimum temperature of 45°F, and a mean daily temperature of 54°F. The highest recorded temperature at the Point Mugu monitoring station was 105°F which occurred during an October heat wave. The high temperature exceeds 70°F an average of 140 days per year. However, temperatures exceeding 90°F only occur an average of 3 days per year. Temperatures rarely drop below freezing (32°F), occurring on average once per year. Rainfall in the area is moderate, averaging just under 31 cm per year. However, annual rainfall totals of nearly 77 cm have been recorded. Periodically, heavy storms pass over the harbor area, producing single day rainfall totals of nearly 13 cm.

Two meteorological parameters are important in assessing air emission impacts in the project area. These are the winds which control the rate and trajectory of horizontal transport and the vertical stability structure which control vertical depth through which the pollutants are mixed.

Winds across the site travel in two distinct directions: 1) a strong onshore wind by day which is strongest in summer, and 2) a weak offshore wind which is strongest in winter when nights are long and the land becomes cooler than the ocean.

The wind direction frequency distribution near the beaches has a strong onshore component from SW-WSW, and a weaker nocturnal flow. The net effect of this wind pattern is that daytime air pollution emissions from near the project area are carried inland. The nocturnal winds reverse the process as they recycle the previous day's pollution and carry diluted pollutants seaward. In contrast to the strong daytime flow, the weak nocturnal winds allow for localized stagnation of pollutants near their source such as freeways or other concentrations of emissions.

Table 4.6-1: Climate Summary From Data Obtained From The Meteorological Monitoring Station Located At The Point Mugu Pacific Missile Testing Center South Of Oxnard, California.

Point Mugu PMTC, CA (LAT 34 07N; LONG 119 07W; Elevation 0013 ft; 1946-1993 Climatic Summary)																					
	TEMPERATURE					PRECIPITATION (in)				RELATIVE HUMIDITY		WIND			MEAN NUMBER OF DAYS WITH... ‡						
	MEANS (°F)			EXTREMES (°F)								PREVAILING		Max. Gusts (Knots)	TEMPERATURE (°F)				PRECIP. (in)		FOG
MONTH	Max.	Min.	Ave.	Max.	Min.	Mean	Max.	Min.	24 Hr Max.§	AM (0700)	PM (1600)	Dir.	Speed (Knots)		Max. ≥90	Max. ≥70	Min. ≤32	Min. ≤10	≥0.01	≥0.50	
JAN	64	45	54	90	29	2.7	11.6	0	3.9	68%	61%	NE	10	61	#	6	#	0	6	2	11
FEB	64	45	55	89	27	2.4	13.8	0	4.8	75%	64%	NE	8	51	0	5	#	0	5	2	12
MAR	64	46	55	99	33	1.9	7.3	0	2.9	80%	67%	W	10	52	#	4	0	0	6	1	12
APR	65	48	57	100	34	0.8	4.2	0	1.6	81%	68%	W	10	57	#	5	0	0	3	#	12
MAY	66	51	59	96	35	0.1	1.0	T	0.6	82%	70%	W	9	49	#	5	0	0	1	#	15
JUN	69	54	62	100	39	T	0.3	0	0.3	85%	71%	W	8	42	#	11	0	0	1	0	17
JUL	71	57	65	93	41	T	0.2	0	0.2	87%	71%	W	8	33	#	21	0	0	#	0	22
AUG	73	59	66	97	46	0.1	1.2	0	1.0	88%	71%	W	8	52	#	26	0	0	#	#	23
SEP	73	57	65	100	41	0.3	5.0	0	2.4	86%	70%	W	8	43	1	22	0	0	1	#	20
OCT	71	53	62	105	33	0.2	2.2	T	1.0	80%	69%	W	8	53	1	17	0	0	2	#	19
NOV	69	48	59	98	31	1.5	6.4	0	2.7	69%	63%	NE	9	78	#	11	#	0	4	1	13
DEC	65	45	55	89	27	1.7	5.3	0	2.2	66%	61%	NE	10	65	0	6	#	0	5	1	11
ANNUAL	68	51	60	105	27	11.7	29.9	3.1	4.8	79%	67%	W	9	78	3	140	1	0	34	7	187

T = Trace amounts.
§ = 24 Hr Max. is from midnight to midnight.
# = Mean number of days < 0.5 days.
‡ = Annual totals may not equal sum of monthly values due to rounding.

Source: National Oceanic and Atmospheric Administration Web Page (http:\\www.wrc.noaa.gov/oxnard/climate/ntd/ntdtex)

In addition to the two characteristic wind patterns, there are two corresponding temperature inversions that trap pollution within shallow layers near the ground. The first is created when daytime onshore cool ocean air undercuts a massive dome of warm air within the Pacific high pressure system. This process creates marine/subsidence inversions that form a lid at about 305 m or so above the surface over the entire Basin. These inversions allow for the mixing of pollutants near their source, but they trap the entire basin's emissions within the shallow marine layer. As the relatively clean marine air moves inland, pollution sources continually add contaminants from below without any dilution from above. Reactive organic gases and nitrogen oxides combine under abundant sunlight to form photochemical smog. Smog levels increase steadily from the coast inland until the inversion is broken by strong surface heating and by thermal chimneys created along the heated slopes of the mountains surrounding the basin.

The second major inversion type forms during long, cloudless nights as cold air pools near the surface while the air aloft remains warm. The radiation inversions from this second type are very shallow and contribute to the "hot spot" potential near ground level sources, especially vehicular source concentrations. (A "hot spot" is a high concentration of pollutants trapped in a cooler air pocket with limited dispersion characteristics).

Regional trapping inversions (the first type) occur on about 85% of all summer afternoons and ground-level radiation inversions (the second type) on about 70% of all winter nights and early mornings. These inversions occur during all seasons and at all times, but they are not as strong, persistent, or frequent as during their summer afternoon and winter morning dominant periods.

4.6.2 Existing Air Quality

Existing levels of ambient air quality and historical trends and projections in the Port Hueneme area can be characterized from air quality data obtained from two monitoring sites operated by the Ventura County Air Pollution Control District (VCAPCD). The El Rio monitoring station (located nearly 10 miles northeast of the harbor at Rio Mesa High School) is representative of the air quality inland of the project location, and the Ventura-Emma Wood State Beach monitoring station (located approximately 15 miles north of the harbor along the coast) is representative of the air quality in the coastal areas. The last available 4 years of monitoring data from these monitoring stations are summarized in Table 4.6-2. Due to the lack of PM-10 monitoring at the Ventura-Emma Wood State Beach monitoring station, data from the East Main Street monitoring station was substituted as providing best available representative PM-10 data. This monitoring station is located on East Main Street near Emma Wood State Beach.

Based on the California Ambient Air Quality Standards, which are more stringent than the National Standards, the data show recurring violations of the hourly standard for ozone and occasional violations of the total suspended particulate standard at both the inland and coastal monitoring sites. No violations of the standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), or carbon monoxide (CO) have been reported at these sites. While the coastal area summer ozone levels are occasionally unhealthful, they are certainly lower than in inland valleys of the

Table 4.6-2.Maximum Pollutant Concentrations and Number of Days Exceeding Federal (NAAQS) and State (CAAQS) criteria Pollutant Standards in the Port Hueneme Area.

Pollutant/ Monitoring Station	*Averaging Time (units)*	MAXIMUM CONCENTRATION BY YEAR				NUMBER OF DAYS FEDERAL STANDARD EXCEEDED**				NUMBER OF DAYS STATE STANDARD EXCEEDED**			
		1992	*1993*	*1994*	*1995*	*1992*	*1993*	*1994*	*1995*	*1992*	*1993*	*1994*	*1995*
OZONE													
Ventura-Emma Wood State Beach	**1-hour (ppm)**	**0.11***	**0.14**	**0.10**	**0.12**	**3**	**2**	**0**	**0**	**17**	**5**	**3**	**4**
El Rio-Rio Mesa High School	**1-hour (ppm)**	**0.14***	**0.14**	**0.12**	**0.12**	**0**	**1**	**0**	**0**	**4**	**8**	**7**	**7**
NITROGEN DIOXIDE													
Ventura-Emma Wood State Beach	**1-hour (ppm)**	**0.06***	**0.11**	**0.08**	**0.07**	**NR**	**NR**	**NR**	**NR**	**0**	**0**	**0**	**0**
El Rio-Rio Mesa High School	**1-hour (ppm)**	**0.08***	**0.08**	**0.10**	**0.13**	**NR**	**NR**	**NR**	**NR**	**0**	**0**	**0**	**0**
SULFUR DIOXIDE													
Ventura-Emma Wood State Beach	**24-hour (ppm)**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**
Ventura-Emma Wood State Beach	**1-hour (ppm)**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**
El Rio-Rio Mesa High School	**24-hour (ppm)**	**NM**	**NM**	**0.005**	**0.003**	**NM**	**NM**	**NR**	**NR**	**NM**	**NM**	**0**	**0**
El Rio-Rio Mesa High School	**1-hour (ppm)**	**NM**	**NM**	**0.01**	**0.01**	**NM**	**NM**	**NR**	**NR**	**NM**	**NM**	**0**	**0**
CARBON MONOXIDE													
Ventura-Emma Wood State Beach	**8-hour (ppm)**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**
Ventura-Emma Wood State Beach	**1-hour (ppm)**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**
El Rio-Rio Mesa High School	**8-hour (ppm)**	**1.3***	**2.7***	**2.2**	**2.4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
El Rio-Rio Mesa High School	**1-hour (ppm)**	**2.0***	**5.0***	**2.9**	**2.9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 4.6-2.Maximum Pollutant Concentrations and Number of Days Exceeding Federal (NAAQS) and State (CAAQS) criteria Pollutant Standards in the Port Hueneme Area.

Pollutant/ Monitoring Station	*Averaging Time (units)*	MAXIMUM CONCENTRATION BY YEAR				NUMBER OF DAYS FEDERAL STANDARD EXCEEDED**				NUMBER OF DAYS STATE STANDARD EXCEEDED**			
		1992	*1993*	*1994*	*1995*	*1992*	*1993*	*1994*	*1995*	*1992*	*1993*	*1994*	*1995*
PM_{10}													
Ventura-East Main Street	Annual (geometric)	23.5*	22.6	24.0	23.3	NA	NA	NA	NA	NA	NA	NA	NA
Ventura-East Main Street	Annual (arithmetic)	25.9*	25.2	26.1	26.2	NA	NA	NA	NA	NA	NA	NA	NA
Ventura-East Main Street	24-hour ($\mu g/m^3$)	73	88	57	69	0	0	0	0	2	1	1	2
El Rio-Rio Mesa High School	Annual (geometric)	27.8*	25.4	26.3	22.3	NA	NA	NA	NA	NA	NA	NA	NA
El Rio-Rio Mesa High School	Annual (arithmetic)	30.1*	29.0	29.2	26.2	NA	NA	NA	NA	NA	NA	NA	NA
El Rio-Rio Mesa High School	24-hour ($\mu g/m^3$)	55	63	61	62	0	0	0	0	2	4	2	3

Notes:
NA = Not Applicable (number of days exceeding an annual mean cannot be calculated).
NM = Not Measured at this monitoring station.
NR = Data not Reported.
* = Data presented are valid, but incomplete in that an insufficient number of valid data points were collected to meet the EPA and/or the ARB criteria for representativeness.
** = PM_{10} 24-hour standard exceedance, measured as percentage of time samples exceeded standard. Percentage is used because PM_{10} sampling is not performed on a daily basis.

Sources: Ventura County Air Pollution Control District. 19

County where the combination of locally generated emissions and recirculated pollutants from western Los Angeles County results in elevated pollutant levels.

Air quality planning, enforcement, permitting, and other control functions in Ventura County are the responsibility of the VCAPCD. The VCAPCD uses an emissions "budget" to insure that cumulative minor sources of air emissions remain within an allowable range of total emissions, and has a program of New Source Review (NSR) to insure that any significant new sources cause an equal or greater amount of emissions to be retired somewhere within the county (off-sets).

4.7 NOISE

The dominant land uses in the area include recreation, residential, and industrial/commercial (Section 4.3). Dominant noise sources at the site include port operations, beach recreation, transportation (i.e., automobiles and light planes), and waves crashing against the beach. (The sound of wave action will vary with many factors including the wave's profile, the ocean's bottom profile, and the climatic conditions. Chambers Group Inc. (1992) revealed average noise levels (Leq) from wave action ranging from approximately 56 to 70 decibels on an A-weighted scale (dBA) for 10 minute periods at a distance of about 50 m from the water's edge at low tide. The noise included both wave and wind activity. Another common measure of noise is the Community Noise Equivalent Level (CNEL) or otherwise known as the day-night average sound level (L_{dn}), which is the average noise exposure over a 24 hour period, and the average sound level.)

Recent noise surveys indicated that when ships are being loaded and unloaded in the PoHH, noise levels along the northern portion of the former U.S. Naval Civil Engineering Laboratory (NCEL) property (Figure 4.6-1) average 68 dBA, and along other portions of the property, 60 dBA (City of Port Hueneme 1995 in U.S. Navy 1996). The CNEL for properties along Ventura Road are generally above 65 dBA and along Hueneme Road, 60 to 65 dBA (U.S. Navy 1996).

Noise field monitoring was conducted on October 16, 1991, by Chambers Group Inc., at Oxnard Shores Beach, which is a couple of miles north of the project area. Field data were recorded between 3:15 and 3:25 P.M. on Oxnard Shores Beach approximately 12 m from the "mobile home park". During the testing period, the wind was estimated at 11 to 13 kmph. Ambient noise consisted of people talking in the background, vehicle noise (one car per 30 seconds averaging 32 to 40 kmph), and minor noise from construction located approximately 0.4 km away. This measurement was obtained on a weekday when low use was observed. An Leq reading of 60.3 dBA was obtained.

A noise survey was also conducted on October 20, 1988 at Silver Strand Beach. At the time of the survey, there was a heavy overcast and a bridge outage on Harbor Drive, both recreation use and nearby traffic was somewhat lighter than might be found at other times. Noise levels varied between 48 and 56 dBA.

4.8 AESTHETICS

The PoHH harbor and wharf areas consists primarily of industrial and military uses. These are areas with generally low esthetic values. No sensitive receptors are located near the immediate dredge or wharf improvement sites. The Hueneme Beach area is used for recreational purposes year-round and has a high level of visual sensitivity, especially in the peak summer season. The nearest visually sensitive (single-family residential) area is located approximately 300 m east of Hueneme Beach. The disposal site offers views of open water and sandy beaches to visitors, as well as residents. The visual quality has been degraded to some extent due to erosion of the beach.

SECTION 5 - ENVIRONMENTAL IMPACT CRITERIA AND RATING FACTORS

5.1 RESOURCE CRITERIA

To classify the degree of environmental impact associated with the recommended alternatives, the following impact significance criteria are used:

Class I: Non-mitigable, significant adverse impact;
Class II: Mitigable significant adverse impact to not significant
Class III: Adverse impact, but insignificant;
Class IV: No impact; and
Class V: Beneficial impact.

The resource (significance) criteria for rating potential project impacts are presented below in Table 5-1. If a potential impact is predicted to occur or result in a violation of one of the resource category significance criteria, the impact will be considered significant. If significant impacts are predicted, mitigation measures will be developed to minimize the impact, and the impact will be re-evaluated. For an alternative with unmitigable significant impacts, the alternative will be dismissed or the alternative will be recommended for re-assessment with an Environmental Impact Statement, pursuant with the NEPA.

Predicted impacts for the Future 50-Year No Action are presented in Section 6. Section 7 presents the impacts for the recommended alternatives, Alternatives 2, 2a and 3. Because Alternative 3 involves deeper dredge depths, greater dredge volumes, and more time to complete the proposed project action, this alternative is assumed to present a worst case analysis. Therefore, impacts are presented for Alternative 3 only, except where potential impacts may have significant differences in the findings. Otherwise, potential impact findings will be assumed to be similar in nature and less severe for Alternatives 2 and 2a as compared to Alternative 3.

TABLE 5-1: SIGNIFICANCE CRITERIA.	
RESOURCE	SIGNIFICANCE CRITERIA FOR ALTERNATIVE ANALYSIS COMPARISON
OCEANOGRAPHY AND WATER QUALITY	(1) Adversely affect unique geologic features. (2) Disturb a geologic feature of unusual scientific value. (3) Render known mineral resources inaccessible. (4) Trigger or accelerate geologic processes such as landslides or erosion; (5) Cause substantial changes in topography or physical processes acting on the system. (6) Cause water quality conditions that have potential deleterious effects on human, animal, or plant life. (7) Exceed water quality objectives presented in the California Enclosed Bays and Estuaries Plan (California WRCB 1991) in the PoHH, the Ocean Plan (Marshack 1991) outside the harbor, or RWQCB certification/waiver conditions. (8) Create pollution, contamination, or a nuisance as defined in Section 13050 of the California Water Code. Note: Water/sediment quality impacts will be significant for regional violations, not temporary (a few days) and localized changes.
BIOLOGY	(1) Degrade habitat for, or reduce, the population size of a federal listed species. (2) Degrade biologically important habitats and/or areas of high biological activity. (3) Create a long term (over 10 years) measurable change in species composition and/or abundance beyond that of normal variability. (4) Create a long term (over 10 years) measurable change in ecological function within a localized area. (5) Create a measurable change in commercial fishing opportunities, such that: (a) Ten percent or greater loss of, or preclusion from, current productive fishing grounds in the project area for more than 10 percent of the open or peak season, (b) Ten percent or more of the fishermen regularly using fishing grounds in the project area are precluded from fishing for 10 percent or more of the open or peak season.
LAND/WATER USES	(1) Cause substantial conflict with existing/planned regional land uses/approved zoning classifications; impacts will be based on permanent physical impacts related to compatibility and transition of uses. (2) Cause a permanent closure or loss of an existing recreation area by ten percent or more of the total available recreation area. (3) Cause substantial and adverse changes that conflict with visual qualities of designated scenic areas or corridors, other designated visual resources, or views from visually sensitive viewing areas.
CULTURAL	(1) Disturbs, removes from original context, or introduces incompatible elements out of character with any property considered eligible under the National Historic Preservation Act or CEQA criteria.
TRANSPORTATION	(1) Increase ground traffic such that peak-hour exceeds a LOS D, with a four percent or greater increase in the ratio of traffic volume to capacity. (2) Increase maritime traffic such that congestion in transit occurs in or near the PoHH and overall navigation safety is jeopardized by vessel congestion/conflict. (3) Create a potential public health hazard or involves use, production, and/or disposal of potentially hazardous materials posing a threat to the general public through risk of explosion or release in the event of an accident or upset condition.
AIR	(1) Exceed Federal and state regulation for criteria pollutant emissions (i.e., oxides of nitrogen (NO_x), reactive organic compounds (ROC), oxides of sulfur (SO_x), PM-10, and lead). Criteria for compliance with above provisions is specified in 40 CFR 93.153(b). This section lists de minimus levels for which exceedance will necessitate a formal conformity determination. Since the Ventura County Air Basins' (VCAB) non-attainment status is classified as severe for ozone and serious with respect to PM-10, the following de minimus levels are applicable: VOC - 25 tons/year; NO_x - 25 tons/year; CO - 100 tons/year; SO_x - 100 tons/year; and PM-10 70 tons/year. (2) Show conformity with Section 176 of the CAA and conformity to the State Implementation Plan's for purpose of eliminating or reducing the severity and number of violations of the National Ambien Air Quality Standards and achieving expeditious attainment of standards, such that activities will not: (a) Cause or contribute to any new violation of any standard in any area. (b) Increase the frequency or severity of any existing violation of any standard in any area. © Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. Note: Contractor will be required to obtain construction permits from the VCAPCD in order to perform the dredging activities at PoHH.
NOISE	(1) Increase traffic-generated noise level by 3 dBA (or more). (2) Introduce new source noise incompatible with zoning districts; limits for various land uses are: 60 dBA for residential; 75 dBA for outdoor recreation facilities; and 80 dBA for commercial/industrial.

SECTION 6 - IMPACTS OF THE NO ACTION ALTERNATIVE

The PoHH consists of a west and east jetty, an approach channel, an entrance channel, and a central basin. The approach channel is approximately 240 M in length and 180 M in width. The entrance channel is approximately 470 M in length and 100 M in width, with an authorized depth of -11 m MLLW. The central basin is approximately 366 M in length, 427 M in width, and 11 M in depth. (The PoHH complex is shown on Figure 1.2-2.) Roughly 200,000 cubic M of materials are dredged in the harbor and placed at Hueneme Beach on a biennial maintenance schedule. At the authorized depth, large, deep-draft tankers are required to enter the PoHH light-loaded and on tides. The Future No Action assumes the harbor will be maintained at the depths authorized by Congress.

Oceanography. Because routine maintenance will occur, geological and physical impacts will remain the same (Class IV Rating Factor). However, over the long term, the quality of the sediments near the pier pile zone will deteriorate as creosote (and its associated constituents, like the aromatic polynuclear compounds) leaches from the piles to the sediments. It is likely that the contaminants will bind to the sediments and be biologically available to the in and epi-fauna (and the associated food chain). As some metals and organics have been detected in the central basin sediments, it is expected that higher levels will be detected over time as more and more metals and organics continue to settle in the basin. It is expected that over time, the water/sediment quality will significantly degrade from current conditions (Class II Rating Factor). Therefore, it is recommended that input sources be identified, characterized and remediated under the No Action.

Marine Resources. As routine maintenance occurs, the benthic fauna (and food chain) will experience losses with each event. Impacts will be adverse, but not significant (Corps 1995). As the water/sediment quality continues to deteriorate in the harbor, the benthic fauna will react accordingly. It is expected that overall biodiversity and species abundance will decline as contaminant concentrations increase in the water column and sediments (Class II Rating Factor). Recommended mitigation includes identification and reduction of input contaminants and removal of creosote lined pier piles.

Land and Water Uses. Although the project area is currently zoned for port development and other port uses and only routine maintenance is predicted to occur over the project life, land/water use impacts may occur due to the existing inefficiencies in operations. For example, large, deep-draft tankers are required now to light-load and enter on tides. In the future, operations are predicted to continue in this manner. Additional traffic congestion may occur in the harbor. Over time, additional vessel impacts may create user conflicts with other commerce, navy and recreation users. In addition, if the necessary landside facilities are not available to support future product handling and storage requirements, other facilities may be forced to convert uses for the needs of the new tenant, which may result in a loss of other uses, such as, recreation (Class II Rating Factor). Recommended mitigation includes harbor deepening project with wharf/toe wall modifications.

Cultural Resources. The harbor has been previously surveyed and findings indicate that no cultural resources exist in the project area (Corps 1995). If a vessel sinks in the harbor, harbor policy is to remove the vessel immediately for navigation safety purposes. As there are no cultural resources existing in the harbor now and only routine maintenance dredging operations are predicted for the future, no cultural resource impacts are expected (Class IV Rating Factor).

Transportation.

Vessel. With the new tenant, an additional 9 trips per year will be generated by Year 2000 and 22 trips by Year 2020. Because vessel traffic to the port will increase over time, large, deep-draft tankers will continue to be forced to enter the port light-loaded and on tides, the additional vessel traffic may cause additional delays and congestion both outside and inside of the port as vessels are required to wait for the appropriate tides for entry. The additional potential for vessel congestion may introduce or create some safety concerns. As more product delivery occurs and vessel trips increases over time, safety will become more of an issue for navigation movements (Class II Rating Factor). Recommended mitigation includes harbor deepening project with wharf/toe wall modifications.

Ground. As more product delivery occurs, additional traffic impacts will occur. Because vessel traffic is dependent on tides, ground traffic may experience some additional congestion as well. Additional ground traffic impacts are anticipated to result in adverse impacts on the overall traffic networking system, but not significantly alter existing conditions. Although regional, cumulative actions are likely to result in significant, adverse actions, the community is already in the process of addressing this situation (Class II Rating Factor).

Air Quality. The regional area is not currently in attainment for all air quality criteria constituents. As the new tenant comes on-line, new development will induce additional air impacts. As the regional area can support the new employment base, air impacts are likely to be associated with long term delivery of product into and out of the port. As the port is currently operating at a substandard level, forcing large, deep-draft vessels to enter the port light-loaded and on tides, the additional product to be delivered to the port will cause the regional air quality to further degrade. The existing, shallow approach channel will remain and larger, light-loaded vessels will continue to wait for favorable tides before entering the PoHH. This additional queuing and partial loading of cargo will further reduce efficiencies in cargo movement. These inefficiencies will result in higher emissions per unit of cargo throughput now and in the future as even more vessels call the port. Current and future operations will hinder the regional area from obtaining attainment of Federal and State ambient air quality standards (Class II Rating Factor). Recommended mitigation includes harbor deepening project with wharf/toe wall modifications.

Noise. Over time, product delivery into the port will increase as the new tenant comes on-line. Additional noise will be generated both by water and landside activities. Overall vessel traffic in the harbor will increase with the increase of product delivery. Because large, deep-draft vessels will be forced to continue to light load and enter the Port on tides, additional water associated noise impacts will be directly correlated with increased product delivery. Additional noise also will be generated by landside activity, but, hereto, the additional noise is not predicted to exceed permitted use levels. Because the harbor area is zoned for port uses, it is not likely that additional cumulative noise will exceed permitted levels (Class III Rating Factor).

Socioeconomics. The project benefit of fewer ships carrying the same amount of cargo would not occur, because more vessels would be necessary to carry the same amount of cargo if dredging did not occur Approximately 20 short-term (up to 5 months) construction jobs and related purchases of construction materials and services would also be lost. The annual net benefit of $918,000.00 in transportation cost savings, a long-term beneficial impact, would not be realized (Class IV Rating Factor).

SECTION 7: ENVIRONMENTAL EFFECTS

The following analysis evaluates impacts associated with, Alternative 2a (the Recommended Plan), and Alternatives 1, 2, 3, and 4. The No Action Alternative is analyzed separately, in Section 6 of this EA. The Recommended Plan includes deepening the Main Approach Channel to -13.2 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Channel A Berthing Area to -12.2 m MLLW, and placing approximately 485,000 M^3 of dredged material at Hueneme Beach. Channel depths and volumes of dredged material for the other alternatives are found in Section 3.1.2.1 of this EA. Deepening activities can occur with use of a cutterhead, hopper, or clamshell dredge or a combination. Material placement can be completed with on-shore or near-shore disposal methods. Modifications for berths 1-5 are proposed for all alternatives to stabilize the structures as the berthing areas are deepened.

If material is placed in the nearshore, either a hopper or clamshell dredge can be employed. If a hopper dredge is used, it picks up material by pulling a suction drag head along the bottom, where excavated material is stored on-board in a compartment called the vessel hopper. Once filled, the hopper dredge travels to the placement site where sediment is offloaded. If a clamshell dredge is used, a barge-mounted crane retrieves excavated material and places it on a barge for transport by tug to the placement site. Pier pilings will be pulled by the clamshell. Pier piling materials will be removed prior to sediment dumping. Following the sediment disposal, the barge is transported back to the dredge site for re-loading.

A second option is to use a combined operation where a hydraulic cutterhead is used to remove sand from all areas excluding the pier pile zone, and a clamshell is used to remove sand in the pier piling zone (Figure 3.2-1). Under this scenario, sediment associated with the cutterhead operation will be pumped through a pipeline onto the beach, and sediment dredged with the clamshell will be disposed nearshore. As with the first option, pier pilings will be pulled by the clamshell and removed prior to sediment disposal.

Section 3.2.1 identifies equipment requirements for each of the above methods. Project implementation is estimated at 3.5 months, with 1 month set aside for mobilization and demobilization activities.

Wharf modifications and toe wall stabilization will include removal of the existing fender system, which consists of piles, wales, chain, fenders and miscellaneous hardware; driving sheet pile toe wall; and, installing the new timber fender system. The construction period is estimated at 5-6 months. Installation of the new fender system may be performed concurrently with sheet pile toe wall work which may reduce the total construction time. Equipment anticipated to be used for construction includes two 65-ton trucks or crawler-mounted cranes, a vibratory hammer and diesel hammer to drive sheet piles, and miscellaneous smaller equipment and tools. Approximately 730 tons of material from fender demolition will be hauled to a local landfill by truck.

Since Alternatives 1 and 2 will involve less dredging and disposal and a shorter construction period than the Recommended Plan, adverse impacts will be similar to but less than impacts for the Recommended Plan, and separate analyses have not been prepared. These alternatives would also provide fewer economic benefits than the Recommended Plan. Impacts of Alternatives 3 and 4 will have impacts similar to, but sometimes greater than the Recommended Plan. The main analysis of this section applies to the Recommended Plan, followed by Impacts of Alternatives, where they differ from the Recommended Plan. Impacts of wharf modifications will be the same for all alternatives and will not be discussed separately.

7.1 OCEANOGRAPHY AND WATER QUALITY

7.1.1 Dredging Impacts

7.1.1.1 Pile-free Zone

Cutterhead Dredge Option

The harbor deepening will alter local bathymetry. The proposed channel side slope inclinations for the project have been designed to maintain stability and have been determined in accordance with recommendations based on geotechnical investigations of the project area and accepted engineering practice. The potential for side-slope failure along the margins of the channels are limited, although this potential will increase in the event of a moderate or stronger seismic event in the vicinity of the project. Such potential side-slope failures will not be considered a significant impact. Due to the local oceanic conditions (Section 4.2.1), periodic maintenance dredging may be required (Section 3.4.3).

Dredging to the designed depths will have minimal effects on water circulation. Bottom current patterns can be modified slightly in the immediate vicinity of the dredge area, but overall current patterns will not be changed. The deepened area will not alter waves caused by winds and will have minimal effects on deep-water waves approaching PoHH.

Water quality will be temporarily affected during the dredging process, primarily through turbidity. Decreases in dissolved oxygen (DO), increases in nutrients, and increases in suspended and dissolved metals and organic chemicals can also occur. The project is expected to have no impacts on pH, salinity or water temperature.

Excavation with a cutterhead dredge will resuspend silt, clays, and organic material in the bottom sediments. A relatively small turbidity plume will be expected near the bottom where sediments are being suctioned up into the pipe. The turbidity plume, consisting of suspended solids, may exceed background levels and can extend between 70 and 170 m from the operation (Corps 1994). The duration of the turbidity plume will likely exist over a short duration, with concentrations of suspended solids returning to background levels within one to 24 hours after dredging ceases (Parish and Weiner 1987 in Corps 1995). Impacts on water quality are expected to be intermittent over construction, localized to the vicinity of the dredge, and not significant. Turbidity levels will be in compliance with Section 404(b)(1) of the Clean water Act (Appendix B of this EA) and all project RWQCB Section 401 Certification/Waiver stipulations.

Turbidity from dredging has the potential to decrease DO in the immediate vicinity (within about 100 m) of the dredge. Although dredging will be conducted in the PoHH, DO levels are normally above 5 mg/l, and the potential for decreasing DO to below that level is slight. In the unlikely event that DO is reduced to below 5 mg/l, the exceedance of water quality criteria will be of short duration and over a localized area near the dredge site. Because no long-term exceedances of DO are expected, water quality impacts on marine life are not expected.

Although resuspension of nutrients may occur also, local tides and currents are expected to adequately dilute and disperse available concentrations. Although additional nutrients will be available to plankton for uptake and growth, this increase is not expected to result in plankton blooms.

Metals and organic chemicals existing in the sediments can be released in the water column during sediment resuspension. Most of these elements, however, have a very low solubility in water, are adsorbed to sediments, and will not be released in the water column. More soluble metals, such as zinc and nickel, can be released, but the Ocean Plan water quality goals for these metals are relatively high, and existing levels are low (Appendix C). Sediment sampling and analyses indicate local sediments do not contain high concentrations of organic chemicals or metals (Appendix C), and release of these chemicals from resuspended sediments are not expected to have significant impacts on water quality or marine life.

Alternative 3. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments, and other water quality effects would occur over a period of approximately an additional two weeks. The final difference in the harbor depth of 0.3 m would not be significant.

Alternative 4. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional month. The final difference in the harbor depth of 0.8 m would not be significant.

Hopper or Clamshell Dredge Option

Although impacts will be similar to those discussed for the Cutterhead Operation, turbidity impacts will occur throughout the entire water column. The turbidity plume may exceed background levels and can extend between 340 and 1,360 m from the dredge (Herbich and Brahme 1983 in Corps 1994). The duration of the turbidity plume is expected to be short, with concentrations of suspended solids returning to background levels within one to 24 hours after dredging stops (Parish and Weiner 1987 in Corps 1995).

Impacts on water quality are expected to be intermittent over project construction, localized to the vicinity of the dredge, and not significant because dredging activities will be conducted in compliance with Section 404(b)(1) of the Clean water Act (Appendix B of this EA) and Section 401 stipulations to be provided by the RWQCB.

Alternative 3. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments, and other water quality effects would occur over a period of approximately an additional two weeks. The final difference in the harbor depth of 0.3 m would not be significant.

Alternative 4. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional month. The final difference in the harbor depth of 0.8 m would not be significant.

7.1.1.2 Pier Pile Zone. A clam shell dredge would be used to dredge the pier pile zone and to remove the remaining pier piles under either option. Impacts would be similar to the impacts of dredging the pile-free zone with a hopper or clamshell dredge, as discussed above. Additional turbidity impacts will be associated with the pulling of the pier piles. An estimated 350 piles remain to be removed. Turbidity impacts will be likely to be localized near the bottom of the channel. Turbidity is expected to be short-lived. Because the piles will be removed intact, for the most part, significant creosote resuspension is not expected. Recent tests indicate little or no leaching of creosote into the surrounding sediments.

Alternative 3. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments, and other water quality effects would occur over a slightly longer period, possibly one additional day. The final difference in the harbor depth of 0.3 m would not be significant.

Alternative 4. Impacts would be similar to the Recommended Plan, except that conditions of turbidity and resuspended sediments would occur over a period of approximately two additional days. The final difference in the harbor depth of 0.8 m would not be significant.

7.1.2 Disposal Impacts, Hueneme Beach

7.1.2.1 On-Shore Disposal: Supratidal Zone. Sediments will be placed on the beach, between 0 and +4.9 m MLLW, to provide additional shoreline stability. This disposal option is viable only for the cutterhead dredge operation, and only for sediments dredged from the pile-free zone, approximately 465,000 M^3. Sand will be pumped through a pipeline from the dredge to the beach. The beach profile will be sloped as designed by acceptable geotechnical and engineering practices. Proposed dredge sediments are compatible with existing sediments on Hueneme Beach (Section 3.2.2.2).

As sediment is spread over the beach, return waters will flow back into the ocean. Return waters are not expected to affect water circulation, local current, wave, and/or littoral transport patterns.

Material placement and return waters will cause localized turbidity impacts. These impacts may be more extensive than turbidity generated at the dredge site, as turbidity plumes from beach disposal operations generally extend about 0.8 km downcoast. However, it is expected the plume will remain predominantly in the littoral zone. (The littoral/surf zone is a high energy and vigorous zone of constantly shifting sands.) The plume is not anticipated to be significantly greater than ambient suspended concentrations caused by natural surf zone levels. Turbidity plumes are expected to be fairly short-lived and not significant.

Decreases in DO, increases in nutrients, and increases in suspended and dissolved metals and organic chemicals can also occur. The project is expected to have no impacts on pH, salinity, or water temperature. Impacts on water quality are expected to be intermittent over the 3.5 months, localized to the immediate nearshore zone adjacent to the material placement site, and not significant because activities will be conducted in compliance with compliance with Section 404(b)(1) of the Clean Water Act (Appendix B of this EA) and Section 401 stipulations to be provided by the RWQCB.

Nutrients, metals, and organic chemicals released from sediments can add to the concentrations present in local waters. However, the small amount that may be released is not expected to cause any plankton blooms due to local dispersion factors. Resuspended sediments are not expected to have significant impacts on water quality.

Alternative 3. Impacts would be similar to the Recommended Plan, except that conditions of turbidity, resuspended sediments, and other water quality effects at the disposal site would occur over a period of approximately an additional two weeks. The deposition of an additional 115,000 M^3 of sand on the beach would be beneficial.

Alternative 4. Impacts would be similar to the Recommended Plan, except that conditions of turbidity, resuspended sediments, and other water quality effects would occur over a period of approximately an additional month. The increased deposition of an additional 265,000 M^3 of sand on the beach would be beneficial.

7.1.2.2 <u>Near-Shore Disposal: Subtidal Zone</u>. This disposal method will be used to dispose of sediments from the entire project area (approximately 485,000 M^3) if the clamshell or hopper dredge option is selected. If a cutterhead dredge is used to dredge the pile-free areas, only those sediments dredged from the pier pile zone (approximately 20,000 M^3) will be disposed near-shore. A hopper dredge picks up material by pulling a suction drag head along the bottom, where excavated material is stored on-board in a compartment called the vessel hopper. When filled, the hopper dredge travels to the near-shore disposal site where sediment is offloaded. If a clamshell dredge is used, a barge-mounted crane retrieves excavated material and places it on a barge for transport by tug to the near-shore disposal. Following the sediment disposal, the barge is transported back to the dredge site for re-loading. Although impacts will be similar to those discussed for the On-Shore Method, turbidity impacts may be somewhat more extensive. Turbidity may migrate further down the coast (beyond 1,360 m) and up to about 200 meters offshore from the point of disposal, depending on the wave environment. Consequently, suspended sediments will be relatively short-lived and not significant.

Alternative 3. Impacts would be similar to the Recommended Plan, except that conditions of turbidity, resuspended sediments, and other water quality effects at the disposal site would occur over a period of approximately an additional two weeks. The deposition of an additional 115,000 M^3 of sand on the beach would be beneficial.

Alternative 4. Impacts would be similar to the Recommended Plan, except that conditions of turbidity, resuspended sediments, and other water quality effects would occur over a period of approximately an additional month. The increased deposition of an additional 265,000 M^3 of sand on the beach would be beneficial.

7.1.3 Wharf Modifications

Modifications for berths 1-3 along wharf 1 and berths 4 and 5 along wharf 2 will be needed to stabilize the structures as the berthing areas are deepened. Preliminary designs of proposed improvements are shown in Figures 1.1-2 and 1.1-3. Construction activities would consist of the removal of the existing fender system, installing the new timber fender system, and driving sheet pile toe wall. Total construction time may range from 5-6 months. Construction impacts would consist primarily of turbidity associated with removal and replacement of timber piles and installation of sheet pile. Turbidity impacts will be likely to be localized near the bottom of the channel short-lived. The wharf modifications will not change the existing "footprint" of the structure; consequently, no long-term impacts to oceanography or water quality will occur.

7.1.4 Long-Term Impacts

There will be no significant long-term project impacts on the oceanographic environment with any alternative.

7.2 MARINE RESOURCES

7.2.1 Dredging Impacts

7.2.1.1 Pile-free Zone

Cutterhead Dredge Option. Dredge activities will create turbidity and noise impacts, which may affect biotic (i.e., plankton, benthic, fish, marine mammal, and bird) resources. Potential turbidity and noise impacts are discussed below, followed by species impacts.

Turbidity (water column) effects will be largely limited to the immediate vicinity of the dredge site. Most turbidity generated by a cutterhead dredge operation (exclusive of disposal) is found near the cutter (Herbich and Brahme 1983 in Corps 1994). Field studies indicated that turbidity increases above background levels are usually confined to within 70 to 170 m of the operation (Corps 1994). While potential water column impacts at the site will include increased turbidity, resuspension of contaminants is not expected. Sediment testing results indicated that concentrations of metals and organic chemicals in the dredge sediments are low (Section 4.1), and the potential for release from sediments resuspended during dredging will be negligible (Section 7.1.2.1.1). Direct toxic effects to marine organisms or bioaccumulation through the food web will be minimal.

Noise may disturb marine life. Data on noise effects on fishes are limited. Suzuki et al. (1980) reported ship noise can affect fish behavior. These investigators believed sounds produced by large or high speed vessels can frighten fish schools or cause them to change their migration routes. University of California, Santa Barbara divers at Naples Reef noticed that fish scatter briefly as boats go over the reef (Ebeling personal communication in Corps 1994). The data suggest that fish will be more likely to be startled by sudden staccato noises than by the steady noise the dredge will generate. In addition, project generated noise will occur against a background mixed with other vessel noises.

Plankton populations can be impacted by turbidity as it lowers the total light available for phytoplankton photosynthesis and clogs the filter feeding mechanisms of zooplankton. Turbidity can have short-term effects on plankton in the immediate vicinity of the dredge operation. No significant impacts will occur due to the relatively small area affected by the turbidity plume and the rapid recovery of these populations.

Benthic organisms living in the immediate dredge area will be directly disturbed and/or eliminated. Significant decreases of benthic infauna abundance after dredging have been found to extend at least 100 m from the site of actual dredging (McCauley, Parr, and Hancock 1977). Approximately 250,000 m^2 will be disturbed with the removal of 485,000 m^3 of sediment. Benthic organisms will be susceptible to turbidity. Mechanical or abrasive action of suspended silt and detritus can negatively impact filter feeding organisms by clogging their gills and impairing proper respiratory and excretory functioning and feeding activity (Snyder 1976).

Another impact will be the redisposition of suspended sediments on adjacent areas, however, if the rain of fines is minimal, as it will be with hydraulic dredging, adjacent organisms may work their way up through the sediment (Soule and Oguri 1976). The loss of invertebrates will be short term with recolonization beginning in a few weeks and a dynamic community in 2 to 3 years (McCauley, Parr, and Hancock 1977; Oliver et al 1977; Rosenberg 1977, and MEC 1988). Most benthic populations in the shallow water, soft bottom habitat, consist of broadly distributed species. Species composition following recolonization is expected to be similar to the existing community. The potential differences in benthic infaunal community structure are expected to be minor, and dredge impacts associated with species burial, turbidity, and sedimentation on the benthic communities is expected to be short term and not significant.

Fish populations in the local area will be affected in several ways. Most species will avoid the dredge area due to turbidity and noise, resulting in a temporary loss of habitat. Turbidity will likely limit visibility for sight-feeding fish, and these species will likely avoid the turbidity plume. Other species will be attracted to the site to forage on benthic organisms suspended by the dredging. Noise will have negligible effects on avoidance because the proposed project is not expected to generate short, high-intensity noises that can cause startle responses in fish. Because impacts will be restricted to a small area around the dredge, recovery will occur within a few days after dredging stops, and turbidity dissipates quickly, impacts will not be significant.

Marine mammals (i.e., harbor seal and sea lion) that may be present in the project area will likely avoid the disturbed area due to turbidity and noise impacts. No important feeding, resting, or mating areas will be affected. Consequently, impacts are predicted to be insignificant.

Dredging activities during the daytime will cause most seabirds to avoid the immediate disturbance area due to increased turbidity and noise, while scavenger species such as gulls may be attracted to the site. It is expected that most forage (fish) species will avoid turbid areas and be available for capture elsewhere. As there are many roosting sites available in the local area, species avoidance of a few sites near dredge activities will not cause significant crowding effects at other sites. Dredge activities will not occur in the immediate vicinity of any important seabird breeding areas. Following the completion of construction activities, birds will be expected to return and use the area for foraging and roosting; therefore, turbidity and noise impacts are judged to be adverse, but insignificant.

Of particular concern will be the potential for effects on California brown pelicans that rest on neighboring breakwater/jetties and forage throughout the general area. Dredging activities and associated turbidity plumes will likely preclude pelican foraging in a small area. The fish that brown pelicans forage upon, however, are expected to move away from the dredge site and thus will be available for capture elsewhere. The number of individuals potentially affected will be lowest from December through June when few are present. Nesting activities will not be affected because no nesting sites are located in the project vicinity, and only a very small fraction of the available foraging area will be temporarily affected. Although dredging may have negligible impacts on resting or roosting opportunities, impacts will be short term and not significant. Overall, dredging activities will not affect brown pelican populations. The project will have "no effect" on brown pelican populations.

The California least tern is present in the area from April through August. Those individuals occasionally foraging in the area to be dredged may be impacted, especially early in the spring before the young hatch. As discussed for the brown pelican, fish that terns feed upon are expected to move away from the turbidity plume. Any individuals attempting to forage in the vicinity of the dredge site can forage in adjacent undisturbed areas with minimal effects on their ability to find food. Consequently, if dredging occurs between April 1 and September 1, project actions may potentially affect least tern foraging/breeding opportunities, behaviors, and overall success. To avoid impacts, construction will occur between September 1 and March 31. The project will have "no effect" on least terns.

During night operations, high intensity flood lighting may be used. The light will be directed onto the dredge deck and will likely illuminate the immediate vicinity of the dredge. The light will have no effect on benthic invertebrates and negligible effects on plankton, fish, and marine mammal populations due to the small area to be affected. Birds that roost on the breakwaters/jetties at night may avoid the area influenced by the light while the dredge is immediately adjacent to the breakwater/jetties. The amount of roosting habitat affected will be small and will decrease as the dredge moves in the harbor. A temporary small reduction in the amount of roosting habitat available on the breakwater/jetties will not affect the populations of any species, including the brown pelican. The light will have no effect on the least tern due to the distance from the nesting site and because this species is not active at night.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two additional weeks. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one additional month. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

Hopper or Clamshell Dredge Option

As with the Cutterhead Operation, construction impacts to marine resources will be related to water quality impacts, predominantly turbidity, and to noise. As described in Section **7.1.1**, turbidity from the dredge operation may range between 340 and 1,360 m depending on localized conditions. Deposition from the suspended sediment plume may occur over that area, but most of the deposition will occur within about 15 to 30 m of the dredge with negligible amounts beyond 150 m (Corps 1995). Impacts on planktonic species, benthic communities, fishes, marine mammals, and birds will be short term and not significant.

Of particular concern will be the potential for effects on the California brown pelicans and California least terns that roost and forage in the harbor. Potential impacts will be similar to those presented for the cutterhead operation. The proposed project will not affect the California brown pelican and California least tern populations.

Like the Cutterhead Operation, night operations may require use of high intensity flood lights.

Light impacts are not expected to have significant impacts on general aquatic species or species of special concern.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two addiitional weeks. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one addiitional month. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

7.2.1.2 Pier Pile Zone. Dredging impacts to marine resources in the pier pile zone would be as discussed for the Hopper or Clamshell Dredge option for the pile-free zone. Additional turbidity associated with pile removal would also cause temporary impacts to plankton, fish, and benthic communities. Any attached invertebrates or algae would be permanently lost when the old pier 7-10piles are removed. This impact is not considered significant, because the pier piles do not support extensive algal or invertebrate populations, possibly due to the treatment of the timbers with creosote. The impacts will be partially mitigated because the pilings of the new fender system will be exposed to a greater depth in the water column than under existing conditions and will be free of creosote.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one addiitional day in this zone. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two additional days in this zone. The deeper depth of dredging is expected to have little additional impact to benthic organisms because most benthic organisms are found on the surface or buried near the surface and would be removed with any alternative.

7.2.2 Disposal Impacts, Hueneme Beach

7.2.2.1 On-Shore Disposal: Supratidal Zone. The slurry of sand will be pumped directly onto the higher portion of the beach, between 0 and +4.9 m MLLW. It is expected that some sand will flow into the intertidal zone, which is a rigorous environment of constantly shifting sand.

Disposal activities will have impacts on organisms that use the beach. Sandy beach invertebrates such as beach hoppers and sand crabs will be crushed and/or buried. These species are well adapted to periodic disturbance. Recovery of the community will be expected to occur rapidly and within a year. Parr et al., 1978, studied effects of disposal of 765,000 M^3 of dredged material on an eroded beach and found that measured effects on intertidal fauna were short-term; 5 weeks or less. Impacts on beach organisms will be adverse, but insignificant.

Most of the dredged sediments will consist of fine-grained, sand particles, which will sink rapidly. Sediments may be expected to remain in suspension approximately 15 minutes or less (Corps-LAHD 1992). Silt fractions may remain in suspension for up to 30 minutes and some of the fine grained material may drift as far as 1,000 m from the discharge site. There may be some minor turbidity impacts from the discharge on planktonic and benthic organisms, fishes and visually feeding seabirds. These impacts are expected to be adverse but insignificant because impacts will be localized within 1,000 m or less from the receiver beach. Impacts on intertidal marine life will be adverse but not significant.

Onsite equipment, human presence, and disposal return waters/slurry may cause temporary disturbances to shorebirds attempting to forage in the intertidal zone. Birds will either acclimate to the noise created by equipment and the presence of humans onsite, or forage in an undisturbed neighboring area. While most species are expected to forage in neighboring areas, some scavengers (i.e., gulls, sandpipers, dowitchers) may forage in the return flow and would temporarily benefit from the readily available source of food. Foraging impacts will be temporary during construction, species that relocated during construction are expected to return upon completion.

Of particular concern is the potential for project actions to impact the California brown pelican and/or California least tern. Both species are visual foragers and feed in shallow waters, however, they do not forage in the immediate nearshore (surf zone) waters due to existing high ambient turbidity conditions. Although pelicans and least terns may be in the area during project construction, construction will not affect nesting or roosting opportunities. Turbidity may preclude foraging in a small area; however, forage fish will be available for capture elsewhere. Because turbidity will likely remain in the surf zone, this method may not impact foraging opportunities. Consequently, potential impacts will be completely avoided by constructing the project between September and March. Under these conditions, the proposed project will not affect these species.

Although the Western snowy plover uses Ormond Beach for foraging opportunities, it is unknown if the species uses Hueneme Beach for foraging or nesting (FWS 1997). To avoid potential impacts on this species, construction will occur during the plovers' non-nesting season, between September and March. Therefore, the proposed project will not "affect" the Western snowy plover population.

Although Pismo clams are not a federally listed species, they are unique to the local and regional area. The Pismo clam has historically been found on Hueneme Beach. If the sediment material is dumped directly on them, the population may die by suffocation. Pismo clams are typically found between +3 feet (+0.9 m) MLLW and -10 feet (-3m) MLLW. Therefore, beach material will be placed in a slurry form on the upper portion of the beach and allowed to migrate seaward minimizing possible suffocation effects on the Pismo clam population. In the past, Pismo clam populations have recovered from local nourishment events, and it is expected that natural populations, which routinely fluctuate on a yearly basis, will recover from this event. If material is placed on-shore lower than 0 m MLLW (but higher than -3m MLLW), there will be a potential to bury a significant portion of the Pismo clam population, resulting in a locally significant impact. Between +0.9 m and 0 m MLLW there would be an adverse, but not significant ,impact to the Pismo clam population. If it is necessary to place the disposal material on-shore below 0 m MLLW, mitigation shall be developed, and approved by the resource agencies prior to construction activities occurring below 0 m MLLW.

Grunion, like Pismo clams, are a unique species to the regional area and may use Hueneme Beach during their spawning season. Thus, there is a potential to disturb grunion eggs, if grunion spawned on the beach prior to the beachfill, eggs may be buried. The use of earthmoving equipment on the beach may crush or uncover grunion eggs. Because grunion are a declining species which only spawns on a limited number of beaches, impacts to grunion may be significant. These impacts will be avoided by conducting the beachfill between September and mid-March, when grunion spawning does not occur. If it is necessary to conduct the disposal activities during the summer spawning season, mitigation shall be developed and approved by the resource agencies prior to any activities occurring past March 15.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two additional weeks. The additional sand will potentially improve conditions for grunion spawning.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one additional month. The additional sand will potentially improve conditions for grunion spawning.

7.2.2.2 Near-Shore Disposal: Subtidal Zone. Dredged material will be placed at Hueneme Beach at an elevation of approximately -3 to -9 m MLLW. Sediments will be placed in the littoral zone to nourish eroding downcoast beaches. All sediments dredged from the project area will be disposed using this method if the hopper or clam-shell dredge option is used. If the cutterhead dredge is used in the pile-free zone, only the sediments dredged from the pier pile zone will be disposed using this method. Construction activities will result in temporary impacts to intertidal communities, primarily associated with noise and turbidity. Noise impacts will be minor and temporary and will be associated with the offloading the dredged materials from the dredge or barge.

Because the disposal site is along the open coast, material discharge will be expected to generate more turbidity and remain in suspension longer than that created with the on-shore disposal method. The material will be expected to drift between 75 and 365 m from the discharge site. Because most of the sediment will consist of fine-grained, sand particles they will sink rapidly and remain in suspension less than 15 minutes (Corps-LAHD 1992). Silt fractions may remain in suspension for up to 30 minutes and can drift as far as 1,200 m from the discharge site.

Placed material will bury existing communities living in the nearshore zone. Species diversity and density in this zone is typically low, because this environment is a rigorous one of constantly shifting sand. Existing species have adapted to this type of lifestyle. Thus, recolonization is also expected to be relatively quick (Davis, personal communication in Corps 1994). Therefore, impacts on intertidal marine life will be adverse, but not significant.

Impacts to fish, marine mammals, and birds impacts will be similar to but slightly more extensive than those associated with the on-shore disposal method.

As material is placed in the nearshore zone, brown pelican and least tern impacts may occur similarly to those discussed for on-shore disposal. As turbidity impacts are likely to be somewhat greater than those presented for the On-Shore Placement), with potential plumes extending out of the surf zone and taking longer time to settle, this disposal method could potentially cause significant impacts on the California brown pelican and California least tern. Consequently, potential impacts will be avoided by constructing the project between September and March. Under these conditions, the proposed project will not affect these species.

As no work will occur on the beach, Snowy plover and grunion impacts will not occur. Because material will be disposed at -3 m MLLW and deeper, the Pismo clam populations will not be impacted.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two additional weeks. The additional sand will potentially improve conditions for grunion spawning.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one additional month. The additional sand will potentially improve conditions for grunion spawning.

7.2.3 Wharf Modifications. Wharf modification impacts to marine species and communities would be related primarily to noise and turbidity associated with removing and replacing the new timber fender system, and driving sheet pile toe wall. Some invertebrates and algae attached to the existing fender system would be removed. Turbidity impacts will be primarily localized near the bottom of the channel and would primarily affect benthic invertebrates and bottom-feeding fish. The highest level noise impact is expected to be associated with driving the sheet pile toe wall. This impact would be temporary, but could occur over a period of up to 10 weeks. Aquatic birds, marine mammals, and fish, are likely to avoid the immediate project vicinity during this phase of construction. When completed, the new fender system would provide new habitat for invertebrates, which would also attract fish. The new fender system would be exposed to a greater depth of water column, and would provide more habitat area than the existing system.

7.2.4 Long-Term Impacts

Species and community recovery and recolonization in the harbor is expected to begin almost immediately and to be complete within two to three years. Recovery at the on-shore or near-shore disposal site is expected to be more rapid. No long term impacts to marine biological resources due to project implementation are anticipated.

Because grunion prefer wide, sandy beaches with gradual slopes, grunion will receive long-term benefits due to the placement of dredged sand on Hueneme Beach.

7.3 LAND AND WATER USES

7.3.1 Dredging Impacts

Impacts to land and water uses will be similar whether a cutterhead, clam-shell, and/or hopper dredge is used. Since the primary use of the proposed dredge area consists of naval and commercial shipping, the deeper channels will facilitate this approved use, with a long-term beneficial effect. During construction, no channel closures are anticipated due to dredging. Although potential impacts may occur during times of high vessel traffic, there will be only one dredge working in the local area. For the most part of construction, the dredge will be stationary, and when it moves, it will move slowly. It is anticipated that other vessels will be able to easily maneuver around the dredge. Channel closures are not anticipated due to dredging. Also, all appropriate coordination with other agencies related to timing will be completed; public notices will be posted/published prior to construction; and the project area will be appropriately marked. As the PoHH facilitates only commercial and military uses, no recreation impacts are expected during dredging.

Alternative 3. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately two additional weeks.

Alternative 4. Impacts would be similar to the Recommended Plan, except that duration of impacts would occur over a period of approximately one additional month.

7.3.2 Disposal Impacts

7.3.2.1 On-Shore: Supratidal Zone
Sediment disposal activities will not restrict public access to other land and/or water uses.

Recreation impacts will occur at Hueneme Beach. The mobilization and demobilization of the discharge pipe on the beach along with associated earth moving equipment will cause temporary land use impacts by disrupting potential recreation opportunities. Construction impacts will occur in an area that is used typically for recreation purposes year-round, especially in the summer months (between Memorial Day and Labor Day). Because portions of the beach will be excluded from use during pipeline placement and construction (4.5 months), this impact may extend beyond recreation concerns and can include a loss of revenues to both the state from the collection of fees and the local neighboring retail businesses. These impacts will be minimized by constructing when beach use is typically low (between Labor Day and Memorial Day). As temporary beach access may be limited due to the pipe, sand access ramps will be placed over the pipe every 170 m on the beach. Impacts will be temporary and not significant. The long-term effect of a wider, sandier beach will be beneficial.

Additional recreation losses may occur if the scheduled work occurs during the grunion season, work may prevent or limit grunion spawning opportunities on Hueneme Beach. Activities will be scheduled to avoid impacts by constructing between October 1 and March 1. Impacts on local Pismo clam populations will be minimized by placing material above +0 m MLLW. Thus, grunion and Pismo clam impacts will be minimized and/or avoided.

Alternative 3. Impacts would be similar to the Recommended Plan, except that impacts would occur over a period of approximately two additional weeks. The deposition of an additional 115,000 M^3 of sand on the beach would be beneficial to recreational use.

Alternative 4. Impacts would be similar to the Recommended Plan, except that impacts would. occur over a period of approximately an additional month. The increased deposition of an additional 265,000 M^3 of sand on the beach would be beneficial.

7.3.2.2 Near-Shore: Subtidal Zone.
Sediment disposal activities in the near-shore area will not restrict public access to other land and/or water uses. Prior to construction, appropriate notices and markings will be completed. As no channel closures are anticipated in the PoHH, the dredge is expected to make between 4 and 7 trips per day over approximately 3.5 months. These additional few daily trips will represent a very small increment to the number of vessel movements in the PoHH. The overall impact of these additional vessel movements will be adverse, but not significant.

Although most of the construction work will be confined to the nearshore zone, recreation impacts will still occur at Hueneme Beach. Beach access in the immediate disposal area may be temporarily limited during the disposal period. Unlike the on-shore disposal method, no pipeline on the beach would be required. As with the On-Shore disposal method, construction impacts will be minimized by constructing the effort during the non-peak season. As with the on-shore disposal option, the long-term effect of a wider, sandier beach will be beneficial.

As with the On-Shore disposal option, grunion impacts will be avoided by timing restrictions. Pismo clam impacts will be avoided by placing material deeper than -3.0 m MLLW.

Alternative 3. Impacts would be similar to the Recommended Plan, except that impacts would occur over a period of approximately two additional weeks. The deposition of an additional 115,000 M^3 of sand on the beach would be beneficial to recreational use.

Alternative 4. Impacts would be similar to the Recommended Plan, except that impacts would occur over a period of approximately an additional month. The increased deposition of an additional 265,000 M^3 of sand on the beach would be beneficial.

7.3.3 Wharf Modifications. Construction activities associated with modifications for berths 1-5 to stabilize the structures as the berthing areas are deepened, would temporarily limit access to the construction areas. Only a small area, both on the wharf and in the channel would be affected at any time during. Adverse impacts would be minor and temporary, but the long-term effect of the improved wharves would be beneficial, although construction activities are expected to occur over a period of 5 to 6 months. Since no recreational activities occur in the vicinity of these wharves, no impacts to recreation will occur.

7.3.4 Socioeconomic Effects. In addition to beneficial land use impacts, socioeconomic impacts will also be positive. For example, employment resulting from the projected 3.5-month dredging schedule is projected to be 20 persons. This increase will be short-term and can utilize labor available in the region, with no changes to population and housing conditions in the region. Additional economic benefits will result from purchases of construction materials and other services.

Alternative 3. Impacts and benefits would be similar to the Recommended Plan. The project is expected to employ the same number of workers as the Recommended Plan, but the period of employment would increase by approximately two weeks.

Alternative 4. Impacts and benefits would be similar to the Recommended Plan. The project is expected to employ the same number of workers as the recommended plan, but the period of employment would increase by approximately one month.

7.3.5 Long-Term Impacts. As the proposed project has been determined to be compatible and consistent with existing and future land and water uses, it will not create or have long-term adverse impacts, and it will have long term benefits to navigation and the economy. Long-term beneficial socioeconomic impacts are projected.. The economies of scale possible with use of larger ships will result in lower transportation costs. After the proposed deepening, there will be an annual net benefit of $$947,000.00 in cost savings associated with product movement. (This net benefit accrues after assigning the cost of the deepening project.) The net benefit will recirculate in the national economy through respending and investment effects. The net annual benefits for the other alternatives are as follows:

Alternative 1. $613,000.00
Alternative 2. $943,000.00
Alternative 3. $946,000.00
Alternative 4. $903,000.00

Regional socioeconomic benefits will also occur with additional shore protection and increased recreation. At Hueneme Beach, sediment disposal will establish wider beaches, resulting in more beach opportunities and use, as well as greater shore protection. In addition, the widened beach will provide better opportunities for grunion spawning. Long-term, impacts will be beneficial, as the beach will support more recreational opportunities than without the project.

7.4 CULTURAL RESOURCES

Currently there are no shipwrecks within the area of potential effects for the proposed project for any proposed alternative. There will be no impacts associated with wharf replacement as the original wharf is long gone. No impacts to cultural resources are expected with any alternative.

7.5 TRANSPORTATION

7.5.1 Ground Transportation

7.5.1.1 Construction Impacts. Project construction will require approximately 10 to 20 employees during the 3.5 month construction period. At the extreme, commuting employees will generate 20 daily peak A.M. and P.M. trips (PHT) to the staging area. The addition of a maximum 20 PHT distributed over the transportation network in the PoHH vicinity will be minute relative to the number of vehicles currently accessing the system. Degradation of existing intersection LOS are not predicted during project construction.

Alternative 3. Impacts would be similar to the Recommended Plan. The project is expected to generate the same number of PHT over the construction period as the Recommended Plan, but the period of construction would increase by approximately two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. The project is expected to generate the same number of PHT over the construction period as the Recommended Plan, but the period of construction would increase by approximately one month.

7.5.1.2 Dredging and Disposal Impacts

Cutterhead Dredge Option

It is likely that dredge and support equipment will be transported to the site by water, resulting in no impact on ground transportation.

A small construction crew will be used to lay the pipe. Approximately 1 to 5 km of pipe will be required for the sand bypass. If it is assumed that a haul truck can transport 20 pieces of pipe and each piece is 6 m in length, then about 40 round trips will be necessary for pipe delivery. Assuming that the delivery of pumping equipment accessories requires an additional seven loads, trucking is projected to generate 94 ADT over the construction phase. If this construction is phased over a 2 week period, 8 ADT will be generated. The total volume of construction traffic over this period will be negligible.

Heavy earthmoving equipment will be moved onsite to spread sand. The equipment will remain onsite for the duration of the project, and it will not add to the average daily traffic volume. This equipment will be used to spread sand on the beach, and a flagman shall be used to direct pedestrians and other vehicles in the area, if needed.

Alternative 3. Impacts would be similar to the Recommended Plan. Impacts associated with installing and removing the pipeline are expected to be the same as for the Recommended Plan. The only additional impact will be associated with the additional use of equipment on the beach to spread sand for approximately two additional weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Impacts associated with installing and removing the pipeline are expected to be the same as for the Recommended Plan. The only additional impact will be associated with the additional use of equipment on the beach to spread sand for approximately one additional month.

Hopper/Clamshell Dredge Option

As with the Cutterhead Operation With On-shore Placement, Section, the dredge and support equipment will occur also by water. With this option, no pipe or earthmoving equipment or associated vehicle trips will be required; therefore, no impacts to ground transportation are anticipated.

Alternative 3. Impacts would be similar to the Recommended Plan.

Alternative 4. Impacts would be similar to the Recommended Plan.

7.5.1.3 Wharf Modifications. Wharf modification construction will require approximately 5 to

6 employees during the 5 to 6-month construction period. At the extreme, commuting employees will generate 6 daily peak A.M. and P.M. trips (PHT) to the wharf area. The addition of a maximum 6 PHT distributed over the transportation network in the PoHH vicinity will be insignificant relative to the number of vehicles currently accessing the system. Two 65-ton truck or crawler mounted cranes; one for sheet piles and one for fender work, will need to be driven or transported to the site over existing roads. This equipment will remain at the site for most of the construction period, but may occasionally need to be driven off-site for refueling. Alternatively, a fuel truck could be brought on-site for refueling. Other equipment and construction materials would also be transported to the site by truck. Equipment would include pile drivers, chain saws, compressors, welding machines, and miscellaneous tools will be transported to the site by truck. It is estimated that an average of one round trip per week or less would be required for equipment transport. Construction materials would include approximately 3,500 linear feet of sheet piling and 350 timber piles. An estimated 150 truck round trips would be required to transport construction materials to the site. Assuming a 15-week construction period, this would amount ro 10 truck trips per week. It is estimated that about 730 tons of material from the fender demolition will be hauled to a local landfill. At 10 tons per truck, it would take 73 truck loads over the 7-week demolition period, or just over 10 trips per week. Assuming a total demolition/construction period of 22 weeks, an estimated 7.6 ADT will be generated. If the construction/demolition period extends for a period of 26 weeks, the ADT will be slightly lower.. The total volume of project-related traffic over this period will be negligible. No degradation of existing intersection LOS is predicted during project construction.

7.5.1.4 Long-Term Impacts

Although product delivery into the PoHH will be more efficient (i.e., less vessel transit), overall long-term ground transportation is not expected to increase as a result; therefore, there will be no long-term impacts.

7.5.2 VESSEL TRANSPORTATION AND SAFETY

7.5.2.1 Dredging and Disposal Impacts

7.5.2.1.1 Cutterhead Dredge Operation With On-Shore Placement

Vessel traffic and safety impacts can occur, since dredging and disposal activities will require use of some heavy equipment, primarily dredges and support vehicles. The dredge will be anchored during use. To minimize potential safety concerns (i.e., collisions), the dredging contractor will participate in an orientation session prior to construction, ensuring coordination protocols with port and navy pilots so existing vessel traffic in the project area can be safely monitored. The contractor will properly mark equipment, pipe, and project area (with buoys and/or caution flags) and post the area with proper notifications. Since the appropriate notices will be given, equipment and work areas properly marked, vessel traffic associated with construction will cause minimal interference with public/commercial/military uses. Activities will not restrict public access to other water uses abutting the proposed dredge and/or disposal area. In addition, craft shall be able to navigate around obstacles created by construction equipment. Significant commercial and/or military vessel impacts are not anticipated.

Alternative 3. Impacts would be similar to the Recommended Plan except that impacts would occur over a period of two additional weeks.

Alternative 4. Impacts would be similar to the Recommended Plan except that impacts would occur over a period of one additional month.

7.5.2.1.2 Hopper/Clamshell Dredge Operation With Near-Shore Placement

As discussed for the cutterhead dredge operation vessel traffic and safety impacts can occur, since dredging and disposal activities will require use of some heavy equipment, primarily dredges and support vessels. If a clamshell dredge is used, approximately 4 to 7 barge trips will be completed each day, between the dredge site at PoHH and the disposal site at Hueneme Beach. This option could be used for the entire project area or for the pier piling zone only. If a hopper dredge is used, the dredge, itself, would be used to transport the sediment material to the disposal site. Approximately 3 to 4 daily round-trips between the harbor and the disposal site would be required. The numbers of vessel trips do not represent a substantial increase in volume, given the number of vessels typically active in the harbor. Dredging is not expected to require the closure of any navigation channels/wharves nor entrance channels. In addition, the appropriate signage, notices and orientations will be required, as described for the cutterhead dredge operation. No significant commercial and/or military vessel impacts are anticipated.

Alternative 3. Impacts would be similar to the Recommended Plan except that impacts would occur over a period of two additional weeks.

Alternative 4. Impacts would be similar to the Recommended Plan except that impacts would occur over a period of one additional month.

7.5.2.2 Wharf Modifications. Temporary adverse impacts to vessel traffic will occur during the 5-6 month wharf modification demolition and construction period. As berths 1-5 are improved, one or more berths will be unavailable for docking at any given time. It is not anticipated that all berths will be unavailable at any time. Impacts to navigation would be minor because construction would primarily take place from the dock.

7.5.2.3 Long-Term Impacts. Initially, the Recommended Plan will reduce the number of deep draft vessel calls by 3 shipments per year. Projecting the growth of liquid fertilizer and gypsum imports to 2020, the number of annual shipments will be reduced from 28 shipments annually without project to 20 shipments annually with project. This amounts to an approximate 30% annual reduction in the number of deep draft vessel calls to the Port. The size of vessels will increase, but this will not increase the potential for transportation incidents. In actuality, the reduced traffic will increase overall vessel safety. No navigational problems are anticipated as a result of the decreased vessel activity. The long-term effects of wharf modification will be beneficial, providing greater stability to berths 1-5.

7.6 AIR QUALITY IMPACTS

Project execution will consist of dredging approximately 485,000 M^3 of sediment over 3.5 months, which includes a mobilization/demobilization time of one month. Worker commutes, dredging operations, dredge material placement operations, and wharf modifications will produce exhaust emissions. Because of the high moisture content of the dredged material, and the methodologies which will be used to place the dredged material and wharf construction materials, fugitive dust emissions are expected to be minimal and therefore will not be addressed further. As for emissions of lead, the only source of lead due to this project is from vehicular/heavy equipment fuels. Since the levels of lead emissions from the burning of gasoline and diesel fuels is believed to be negligible, these emissions will not be addressed further. All emission estimates are based on emission factors furnished in the CEQA Air Quality Handbook (South Coast Air Quality Management District 1993).

The Contractor will be required to obtain construction permits from the VCAPCD in order to perform dredging activities at PoHH. Permit stipulations may require use of Best Available Control Technologies to further reduce emissions over those currently projected by construction activities.

7.6.1 Dredging and Disposal Impacts

7.6.1.1 Cutterhead Dredge Operation With On-Shore Placement

To estimate worker commutes, it is assumed that 20 workers travel an average distance of 35 miles to PoHH (70-mile round trip distance) at an average speed of 45 miles per hour. Emissions from the dredging operation are based on a 2,500 horsepower diesel engine working at 80 percent capacity for 10 hours per day. It is assumed that 4 hours per day will be needed for dredge maintenance and other activities where the dredge is not in operation. Bulldozer emissions are based on two 356 horsepower diesel engines (two bulldozers) working at 59% capacity for 6 hours per day. It is assumed two miscellaneous commercial vehicles will be driven on the construction site an average of 40 miles per day at a speed of 15 miles per hour. Based on emission estimates shown in Table 7.6-1, all criteria pollutants will be below threshold levels.

Table 7.6-1.
Unmitigated Daily Emissions for Vessels and Equipment Associated with Direct Pumping of Dredge Material from the Borrow Area to the On-Shore Placement Site.[§]

Emission Source	Emissions (lbs/day)				
	CO	NOx	ROG	SOx	PM-10
Worker Commutes	15.94	8.88	1.20	0.19	0.32
Dredge	800	480	120	80	60
Booster Pump	3.93	6.4	0.71	0.71	0.36
Bulldozers (2)	25.20	52.93	5.04	5.04	1.26
Miscellaneous Commercial Vehicles (2)	0.79	0.13	0.08	0.00	0.00
Total Daily Emissions	845.86	548.34	127.03	85.94	61.94
Total Annual Emissions (Tons/yr)	31.72	20.56	4.76	3.22	2.32
Federal de minimus Thresholds (Tons/yr)	100	25	25	100	70
Exceeds de minimus Thresholds?	NO	NO	NO	NO	NO

[§]All emission estimates are based on factors supplied by the South Coast Air Quality Management District in the CEQA Air Quality Handbook, 1993.

Alternative 3. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 90 days of construction under this alternative, Total Annual Emissions for NOx are estimated at 24.66 Tons/yr, or near the de minimus threshold. Emissions for other criteria pollutants will be well below de minimus thresholds.

Alternative 4. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 105 days of construction under this alternative, Total Annual Emissions for NOx are estimated at 28.77 tons/year, or slightly above the de minimus threshold. This impact would be considered significant, and mitigation would be required. Mitigation could include purchase of offsets elsewhere in the county under the New Source Review (NSR). If offsets are not available, this Alternative would require modifications to the operation to reduce emissions of NOx (See Section 7.6.4 Impact Summary and Mitigation). Emissions for other criteria pollutants will be well below de minimus thresholds.

7.6.1.2 Hopper/Clamshell Dredge Operation With Near-Shore Placement

If nearshore sediment placement of dredged sediments is conducted, then either a hopper dredge or a clamshell dredge can be used to complete the operation. Both options are analyzed below.

<u>Hopper Dredge</u>

Parameters, emission factors, and emission estimates for this methodology are shown in Tables 7.6-2 through 7.6-4. Worker commute emissions are estimated assuming 20 workers traveling an average distance of 35 miles at an average speed of 45 miles per hour. Emissions from dredging activities using a hopper dredge are based on parameters listed in Table 7.6-2 (Corps 1995). The parameters are based on times required to perform both the dredging activities (60 minutes per cycle) and transport and disposal of the dredged sediments at the disposal site (40 minutes per cycle). An average of 3.6 cycles per day are estimated to be necessary to dredge the entire 485,000 M^3 of material over the 75 days of construction. (Emission factors for diesel engines (Table 7.6-3) were obtained from the CEQA Air Quality Handbook (SCAQMD 1993), the Air Resources Board (1984) and Scott Environmental Technology (1981).) Based on emission estimates shown in Table 7.6-4, all criteria pollutant emissions are expected to be below Federal de minimus levels.

Table 7.6-2
Operational Parameters for Hopper Dredge Activities for a Single Dredging Cycle

Mode/Activity Parameter	Activity Time (min)	Horsepower Rating (H.P.)	Load Factor (%)	Fuel Consumption (gal/hr)
<u>Dredging Operations</u>				
Propulsion	60	3,000	10	15.0
Dredge Pumps	60	1,700	80	68.0
Auxiliary & Miscellaneous	60	2,265	50	56.6
<u>Transportation Operations</u>				
Propulsion	40	3,000	85	127.5
Dredge Pumps	0	1,700	0	0.0
Auxiliary & Miscellaneous	40	2,265	25	28.3
Support Launches (2)	40	50	50	11.0

Table 7.6-3 Emission Factors for Hopper Dredge Operational Activities							
		Emission Factors (lbs/1000 gallons)					
Equipment Type	Fuel Type	CO	ROC	NOx	SOx	PM-10	Source
Propulsion Engines	D	70.2	43.87	407.50	28.50	31.68	(a)
Dredge Pump Engines	D	102.00	32.10	469.00	31.20	16.75	(b)
Auxiliary & Miscell. Engines	D	102.00	32.10	469.00	31.20	16.75	(b)
Launch Boats	D	70.20	43.87	407.50	28.50	31.68	(a)

Note: (a) Air Resources Board (1984), except SO2 and PM-10 from Scott Environmental Technology (1981).
(b) Air Quality Handbook, SCAQMD, 1993, Table A9-3-B.

Table 7.6-4 **Unmitigated Daily Emissions for Vessels and Equipment Associated with Hopper Dredging Activities at Port Hueneme Harbor.[§]**					
	Emissions (lbs/day)				
Emission Source	CO	NOx	ROG	SOx	PM-10
Worker Commutes	15.94	8.88	1.20	0.19	0.32
Dredging Operations					
Propulsion	3.79	22.01	2.37	1.54	1.71
Dredge Pumps	22.03	101.3	6.93	6.93	3.62
Auxiliary & Miscellaneous	20.78	95.56	6.54	6.54	3.41
Transportation Operations					
Propulsion	21.48	124.69	13.42	8.72	9.69
Dredge Pumps	0.00	0.00	0.00	0.00	0.00
Auxiliary & Miscellaneous	6.93	31.85	2.18	2.18	1.34
Support Launches (2)	1.85	1.16	10.76	0.75	0.83
Total Daily Emissions	92.8	385.45	43.4	26.85	20.92
Total Annual Emissions (Tons/yr)	3.48	14.45	1.63	1.00	0.78
Federal de minimus Thresholds (Tons/yr)	100	25	25	100	70
Exceeds de minimus Thresholds?	NO	NO	NO	NO	NO
[§]All emission estimates are based on factors supplied by the South Coast Air Quality Management District in the CEQA Air Quality Handbook, 1993.					

Alternative 3. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 90 days of construction under this alternative, Total Annual Emissions for all criteria pollutants will remain well below de minimus thresholds.

Alternative 4. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 105 days of construction under this alternative, Emissions for all criteria pollutants will remain below de minimus thresholds.

Clamshell Dredge

To estimate the emissions using a clamshell dredge, it is assumed that dredge emissions will be similar to the emissions from a 250 horsepower crane mounted on a barge operating for 13 hours per day. (Emission factors for the crane were obtained from the CEQA Air Quality Handbook (SCAQMD, 1993).) It is assumed that three tug boats will be needed for the operation. One for maneuvering the barge-mounted crane, and the other two to transport dredged sediments to Hueneme Beach. The operational parameters and emission factors for these tug boats are shown in Table 7.6.-5. Based on an estimated 75 working days necessary to complete the project, it is assumed that it will require loading and disposal of 6.5 barge loads of dredged sediment per day. It is also assumed that the crane operating the clamshell dredge will be working approximately 9 hours per day. Finally, emissions from worker commutes are estimated assuming 20 workers traveling an average distance of 35 miles at an average speed of 45 miles per hour. Based on the estimates shown, all criteria pollutant emissions are expected to be below Federal de minimus levels (Table 7.6-6).

Table 7.6-5
Tug Boat Operational Parameters Used in the Calculation of Total Emissions Due to Dredging at Port Hueneme Harbor

	Operational Parameter †				
Parameter	**Maintenance and Down Time**	**Idle Speed**	**Unloaded Cruising Speed**	**Maneuvering Speed**	**Loaded Cruising Speed**
Fuel Consumption Rate (gal/1000 hrs)†	0	10	50	30	70
Activity	**Time of Operation (hrs)**				
Barge Maneuvering at Dredging Site	15.0	6.0	0.0	3.0	0.0
Barge Transport of Sediment to Disposal Site	15.0	1.0	3.25	1.5	3.25

† Fuel consumption under various loads as specified in AP-42 (EPA, 1985).
Tug boat emission factors:
CO = 55 lbs/1000 gal-hrs; SOx = 81 lbs/gal-hr;
NOx = 342 lbs/1000 gal-hr; PM-10 = 34 lbs/gal-hr.
ROG = 19.2 lbs/gal-hr;

7.6.4 Mitigation

The only alternative in which Federal "de minimus" thresholds are exceeded is Alternative 4, with the use of the cutterhead dredge as the primary means of removing sediment. Use of this dredging technique is expected to produce 28.77 tons of NOx emissions per year, which is 3.77 tons per year above the threshold of 25 tons per year. Alternative 3, when combined with the Wharf Modifications, may also slightly exceed the NOx emissions threshold. Since neither of these plans is the Recommended Plan, mitigation is not required for the Recommended Plan. If an Alternative which exceeds the NOx emissions threshold is selected over the Recommended Plan, significant adverse impacts would need to be mitigated, either with offsets elsewhere in the county, or with one of the following techniques:

Injection Timing The most feasible method to reduce NOx emissions is to retard the injection timing of the diesel-powered equipment by 2 degrees, which will result in a 40 percent reduction in NOx emissions which will reduce total estimated NOx emissions to well below de minimus levels. This technique will cause significant increases in the amount of fuel necessary to perform the work. In addition, the injection system retardation may also increase ROG emissions, but since the unmitigated emissions are over an order of magnitude below de minimus, this increase is not expected to cause exceedance of the threshold.

Selective Catalytic Reduction (SCR). The use of SCR technology can reduce NOx emissions up to 90% (ARB, 1991), which will bring total NOx emissions well below de minimus. However, installation of SCR equipment is expensive and may be cost prohibitive.

7.7 NOISE

7.7.1 Commute-Related Impacts

Noise impacts will occur as workers commute back and forth to the project site. It is assumed that approximately 10 to 20 workers will work on a daily basis at the staging area. A rise of 3 dBA, the threshold of significant impact, would essentially involve a doubling of the existing traffic noise, and this is not projected with traffic generated by worker commutes. No significant traffic-generated noise impacts will be produced by worker commutes.

Alternative 3. Impacts would be similar to the Recommended Plan. The project is expected to generate same number of daily trips over the construction period as the Recommended Plan, with the same increase in the noise level, but the period of construction would increase by approximately two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. The project is expected to generate same number of daily trips over the construction period as the Recommended Plan, with the same increase in the noise level, but the period of construction would increase by approximately one month.

7.7.2 Dredging and Disposal Impacts

7.7.2.1 Cutterhead Dredge Operation With On-Shore Placement

Dredging Impacts

The noise produced by the dredge (and support equipment) is projected between 80 and 85 dBA as measured at a distance of 17 m from the center of the activity (Corps 1994).

The closest land use to the dredge site is zoned for industrial-port uses (Section 4.6.1). The closest building, located approximately 200 m from the dredge site, is zoned for industrial uses, the former NCEL property. Acceptable noise levels for industrial land use zones are 75 dBA or below. Noise levels at 200 m are projected at 65 dBA. The closest residential area is located approximately 340 m from the dredge site. Acceptable noise levels for residential zones are 60 dBA and below. Noise levels at 340 m are projected at 59 dBA. Significant adverse noise impacts are not anticipated due to the distance to sensitive receptors.

Alternative 3. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended Plan, but the period of dredging would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended plan, but dredging would be extended by an additional month.

Disposal Impacts, Hueneme Beach

The combined noise of equipment and material pumping are projected at 82 dBA as measured at a distance of 17 m (Corps 1994). The closest residential properties are estimated at a distance of 340 m from the beach. Noise levels are projected at 55 dBA and are not significant due to the distance to sensitive receptors.

Alternative 3. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended Plan, but the period of disposal would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended plan, but disposal would be extended by an additional month.

Table 7.6-6 Unmitigated Daily Emissions for Vessels and Equipment Associated with Clamshell Dredging Activities at Port Hueneme Harbor.§					
	Emission Rate (lbs/day)				
Emission Source	**CO**	**NO_x**	**ROG**	**SO_x**	**PM-10**
Worker Commutes	15.94	8.88	1.20	0.19	0.32
Clamshell Dredging Crane‡	12.58	32.14	4.19	2.8	2.10
Crane Maneuvering by Tug Boat§	8.25	51.30	2.88	12.15	5.10
Barge Disposal of Sediment§	24.48	152.19	8.54	36.05	15.13
Support Launches (2)	1.85	1.16	10.76	0.75	0.83
Estimated Total Daily Emissions	63.1	245.67	27.57	51.94	23.48
Total Annual Emissions (Tons/yr)	2.37	9.21	1.03	1.95	0.88
Federal de minimus Thresholds	100	25	25	100	70
Exceeds Significance Threshold?	No	No	No	No	No

§ Tug boat emission factors from AP-42 (EPA, 1985).
‡ Emission factors derived from CEQA Air Quality Handbook (SCAQMD, 1993).

Alternative 3. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 90 days of construction under this alternative, Total Annual Emissions for all criteria pollutants will remain well below de minimus thresholds.

Alternative 4. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 105 days of construction under this alternative, Emissions for all criteria pollutants will remain below de minimus thresholds.

7.6.1.3 **Combined Operation.** To estimate the emissions using a hydraulic cutterhead dredge and a clamshell dredge, worker commutes and dredge assumptions will be similar to those described above for the cutterhead dredge because the "pier-pile zone" comprises only about 4% of the total sediment to be removed. It is assumed that hydraulic dredge operations will occur over 72 days, and clamshell operations over 3 days. Based on the estimates shown, all criteria pollutant emissions are expected to be below Federal de minimus levels using operation.

Alternative 3. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 90 days of construction under this alternative, Total Annual Emissions for all criteria pollutants will remain below de minimus thresholds.

Alternative 4. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 105 days of construction under this alternative, NOx emissions are expected to exceed de minimus thresholds because only about 4% of the dredging would be conducted with a clamshell dredge. Impacts would be adverse and significant, and mitigation would be required, as for the Cutterhead operation, alone. Emissions for all other criteria pollutants will remain below de minimus thresholds.

7.6.2 Wharf Modifications. Emissions associated with worker commutes, transportation of equipment and construction materials to the site, and hauling demolition materials off-site will be minor due to the small number of vehicle trips involved. Pile drivers and other construction equipment would be used intermittently during the construction period and are expected to be below Federal de minimus thresholds.

Alternative 3. Daily emissions would remain the same as with the recommended plan, but because NOx emissions for dredging with a cutterhead dredge are near de minimus thresholds, cumulative impacts could be significant, and if so, mitigation will be required. Emissions for all other criteria pollutants will remain below de minimus thresholds.

Alternative 4. Daily emissions would remain the same as with the recommended plan, but total emissions would increase over the extended construction period. Assuming 105 days of construction under this alternative, significant Cumulative impacts would occur when combined with the cutterhead dredging option, and mitigation would be required.

7.6.3 Long-Term Impacts

Although short-term air quality impacts may occur during construction, long-term impacts will be beneficial, and they will outweigh the short-term adverse impacts. Once dredging of the harbor is completed, no significant increases in criteria pollutant emissions are expected to occur. Instead, it is likely that the harbor deepening will result in an overall net decrease in emissions of criteria pollutants. Benefits will include fewer vessels to transport existing volumes of product. The increased efficiencies and economies of scale will result in lower emissions per unit of cargo throughput in the future. This will assist the Ventura County air basin in meeting its long-term compliance commitments with state and Federal air pollution standards. If the harbor is not dredged, then large, deep draft vessels will be forced to continue to enter the harbor light-loaded. Elimination of lightering and queuing of ships will reduce existing inefficiencies in product movement. The increased efficiencies and economies of scale due to dredging the harbor to greater depths will result in lower emissions per unit of cargo throughput in the future.

7.7.2.2 Hopper/Clamshell Dredge Operation With Near-Shore Placement

Dredging Impacts. Assuming the hopper or clamshell dredge utilizes a diesel engine to power the dredging equipment, the noise from this source is estimated at 82 dBA at a distance of 17 m (Corps 1994). A combined total noise level from the dredge and support boats are projected at 85 dBA at a distance of 17 m from the center of the activity.

The closest (industrial) buildings are located on the former NCEL property, approximately 340 m from the dredge site. Noise levels are projected at 64 dB and not significant. The closest residential area is located approximately 340 m from the dredge site. Noise levels at 340 m are projected at 59 dBA, and not significant.

Alternative 3. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended Plan, but the period of dredging would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended plan, but dredging would be extended by an additional month.

Disposal Impacts, Hueneme Beach

As work occurs in the nearshore zone, noise levels at the nearest residential receptor are projected to be less than those for the on-shore placement due to greater distance and attenuation by wave action. Impacts would, therefore, be insignificant.

Alternative 3. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended Plan, but the period of disposal would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended plan, but the disposal period would be extended by an additional month.

7.7.3 Wharf Modifications

Wharf modifications would involve the use of equipment producing high levels of noise. A pile driver produces noise levels averaging about 100 dBA at 50 feet (15 m) from the source. Noise from localized sources, such as construction sites, typically decreases by about 6 dBA for each doubling of the distance from the source. At the nearest residential area, about 1000 feet (340 m) east of the construction site, noise levels are projected to reach about 73 dBA. This impact would be temporary, but significant if unmitigated. This noise level would exceed the City of

Port Hueneme's exterior noise standards of 55 dBA between the hours of 7:00 A.M. and 10:00 P.M. It is assumed that all wharf modification construction activities would occur during these hours. The noise level can be successfully and relatively easily mitigated to comply with local standards with the addition of sound barriers around the construction site (Class II). The contractor will be responsible for providing the appropriate sound-attenuation barrier.

7.7.4 Long-Term Impacts

On a long-term basis, the project is projected to result in a decrease in vessel traffic and related noise because product will be brought in by larger, but fewer vessels. No long-term adverse noise impacts will be generated by the project.

7.7.5 Impact Summary and Mitigation

Although additional noise will be produced by the operation of heavy equipment, tugs, dredges, support vessels, and additional traffic along the access route, noise impacts will not be significant (Class III). Noise produced by pile driving for wharf improvements requires mitigation with a sound barrier or other sound reduction techniques to reduce the impact to a level that is not significant (Class II). Over the long-term, vessel traffic is predicted to be more efficient and will require less cargo hauls, thus, associated noise will also decrease (Class V).

7.8 AESTHETICS

7.8.1 Dredging and Disposal Impacts

7.8.1.1 Cutterhead Dredge Operation With On-Shore Placement

7.8.1.1.1 Dredge Area

The PoHH dredge area consists primarily of industrial and military uses. Because no sensitive receptors are located near the immediate dredge site, no aesthetic impacts are anticipated with any alternative.

7.8.1.1.2 Hueneme Beach Disposal Area

Aesthetic impacts will occur in an area that is used typically for recreational purposes year-round and has a high level of visual sensitivity, especially in the peak summer season. (The nearest visually sensitive (single-family residential) area is located approximately 300 m east of Hueneme Beach.) Beach aesthetic impacts will occur over the duration of the project, approximately 3.5 months. Impacts will be associated with pipe placement, sediment disposal, and sediment grading activities.

Temporary impacts will be associated with the setting and removing of the discharge pipe. There will be a disruption to the visual character of the area while the pipe is strung to Hueneme Beach.

The discharge of dredged material will cause temporary impacts to the aesthetic quality of the beaches. Dredged material is black in color and often possesses an unpleasant odor when first dredged. Both of these conditions will dissipate with exposure to sunlight and fresh air.

Aesthetic impacts also will occur when sediments are spread over the beach. Because equipment will use portions of the beach, the equipment will be dominant elements in the viewshed to an observer on the beach adjacent to this work. Although the character of the viewshed will be altered by the introduction of these anomalous elements over the project duration, no residual aesthetic impacts will result.

Alternative 3. Impacts would be similar to the Recommended Plan. Aesthetic impacts associated with disposal will be the same as with the Recommended Plan, but the period of dredging would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Aesthetic impacts associated with disposal will be the same as with the Recommended plan, but the disposal period would be extended by an additional month.

7.8.1.2 Hopper/Clamshell Dredge Operation With Near-Shore Placement

7.8.1.2.1 Dredge Area

As with the Cutterhead Operation aesthetic impacts are not expected at the dredge site.

7.8.1.2.2 Hueneme Beach Disposal Area

Although the land side earthwork will not occur, nearshore disposal impacts will be similar to, but less than those impacts associated with the On Shore Placement. Impacts will consist, primarily of turbidity and discoloration of the nearshore waters.

Alternative 3. Impacts would be similar to the Recommended Plan. Aesthetic impacts associated with disposal will be the same as with the Recommended Plan, but the period of disposal would be extended by an additional two weeks.

Alternative 4. Impacts would be similar to the Recommended Plan. Noise levels associated with dredging will be the same as with the Recommended plan, but the disposal period would be extended by an additional month.

7.8.2 Wharf Modifications

The PoHH wharf area consists primarily of industrial and military uses. Because no sensitive receptors are located near the immediate wharf site, and construction activities are generally compatible with existing uses.

7.8.3 Long-Term Impacts

As dredge work will occur under water, no long-term aesthetic impacts will occur as a result of project implementation. Disposal operations will result in the restoration of Hueneme Beach. Beach elevations will be consistent with historic profiles and long term adverse aesthetic impacts are not expected. The wharf modifications will result in little or no change from the current appearance of the wharf.

SECTION 8 - CONCLUSIONS

The proposed project alternatives as outlined above have been designed and scheduled to avoid, and/or minimize probable effects on the environment. Where avoidance cannot be used and significant impacts may result, mitigation measures have been designed to minimize the impact upon the resources. It is determined that the proposed project alternatives will not have a significant impact upon the existing environment or the quality of the human environment, as documented in this EA. As a result, preparation of an Environmental Impact Statement is not required.

SECTION 10 - LIST OF PREPARERS

U.S. Army Corps of Engineers, Los Angeles District - Preparers/Reviewers		
Name	**Degree**	**Study Role**
Jim Adams	M.S. - Environmental Toxicology	Air Quality
Pamela Castens	M.A. - Geography	Chief, Environmental Planning Sec
Stephen Dibble	M.A. - Anthropology	Senior Archaeologist
Lois Goodman	M.A.- Biological Sciences	Environmental Manager/ Environmental Resources
Russell Lee Kaiser	M.S. - Coastal Zone Management/Oceanography	Environmental Manager/ Environmental Resources
Richard Perry	B.A. - Anthropology	Cultural Resources
Ruth Villalobos	M.A. - Geography	Chief, Environmental Resources Br.

SECTION 9 - PUBLIC REVIEW

This Draft EA will be sent for 30 day public review. Following the public Review period, all comments will be carefully considered and incorporated into a final EA.

SECTION 11 - REFERENCES

Anderson, D.W., J.R. Jehl, Jr., R.W. Risebrough, L.A. Woods, Jr., L.R. Deweese, and W.G. Edgecomb, 1975. Brown Pelicans: Improved Reproduction off the Southern California Coast. *Science* 190: 806-808.

Bailard, J.A. Naval Civil Enginnering Laboratory, 1985. Beach Erosion and Seawall Assessment at Mugu Beach, California. Technical Memorandum No. M-42-86-02. Port Hueneme, CA.

Blunt, C.E., 1980. California Coastal Marine Atlas. State of California, Resources Agency, Department of Fish and Game.

Chambers Group, 1992. Final EIR/EA for the BEACON Beach Nourishment Demonstration Project prepared for Beach Erosion Authority for Control Operations and Nourishment.

Corps (U.S. Army Corps of Engineers, Los Angeles District), 1986. Draft Finding of No Significant Impact and Environmental Assessment. Channel Islands Harbor Maintenance Dredging, Ventura County, California.

Corps, 1994. Channel Islands/Port Hueneme Harbors Maintenance Dredging Project, Ventura County, California.

Corps, 1995. Final Feasibility Study, FEIS/EIR, for Port of Long Beach, Main Channel Deepening Project.

Dames and Moore, 1986. EIR/EA Union Oil Company Platform Gina and Platform Gilda. Project prepared for City of Oxnard and U.S. Geological Survey.

Dames and Moore, 1980, in Corps, 1994. Channel Islands/Port Hueneme Harbors Maintenance Dredging Project, Ventura County, California.

Fancher, Jack 1974. Grunion Spawning on the Beaches South of Ventura Marina, March through May, 1978. U.S. Fish and wildlife Service Special Report to the Corps - Los Angeles District.

Gress, F., and D.W. Anderson, 1983. A Recovery Plan for the California Brown Pelican. U.S. Fish and Wildlife Service. Portland, Oregon.

Harmith, Robert, PoHH, Director of Marine Operations, 1987. Pers. com. on vessel operations.

Herbich, J.B. and S.B. Brahme 1983. Literature Review and Technical Evaluation of Sediment Resuspension During Dredging. U.S. Army Engineers Waterways Experiment Station CDS Report No. 266.

Long, E.R., and L.G. Morgan, 1990. Potential for Biological Effects of Sediment-Sorbe Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum, NOS OMA 52.

Marine Biological Consultants 1975. Oxnard Beach Generating Station Analysis on the Near shore Environment 1968-1975 for Southern California Edison Company.

Massey, B.W., and J.L. Atwood. 1984. Application of Ecological Information to Habitat Management for the California Least Tern. Progress Report No. 6. U.S. Fish and Wildlife Service.

McCauley, J.E., R.A. Parr and D.R. Hancock 1977. Benthic Infauna and Maintenance Dredging: A Case Study Water Resources II:233-242.

McClelland Engineers, Inc. 1986. Water Quality Monitoring Report Baseline Survey Maintenance Dredging Channel Islands Harbor, California for California Regional Water Quality Control Board.

Noble Consultants 1989. Coastal Sand Management Plan, Santa Barbara/Ventura County, Main Report. Prepared for BEACON. Irvine, CA. 14 July 1989.

O'Connor, J.M., D.A. Neumann, and J.A. Sheik, Jr. 1977. Sublethal Effects of Suspended Sediment on Estuarine Fish Technical Paper U.S. Army Corps of Engineers Coastal Engineering Research Center (No. 77-3):9Opp.

Oliver, J.S., P.N. Slattery, L.W. Hulberg and J.W. Nybakken 1977. Patterns of Succession in Benthic Infaunal Communities Following Dredging and Dredged Material Disposal in Monterey Bay. U.S. Army Waterways Experiment Station Technical Report D-77-27:186pp.

Page, G.W., and L.E. Stenzel, 1981. The Breeding Status of the Snowy Plover in California. Western Birds, 1:1-40.

Parr, T., D. Diener and S. Lucy 1978. Effects of Beach Replenishment on the Near shore Sand Fauna at Imperial Beach, California" U.S. Army Corps of Engineers Coastal Engineering Research Center Miscellaneous Report No. 78-4:125pp.

Ricketts, E.F., J. Calvin, and J.W. Hedgpeth, 1985. Between Pacific Tides Fifth Edition. Stanford University Press.

Rosenberg, R. 1977. Effects of Dredging Operations on Estuarine Benthic Macrofauna. Marine Pollution Bulletin 8:102-104.

Ross, Brian 1996. Pers. Com., Team Leader, Dredging & Sediment Management Team, U.S. EPA, Region 9.

Schreiber, R.W. 1980. The Brown Pelican: An Endangered Species? *Bioscience* 30: 742-747.

Soule, D.F. and M. Oguni 1976. Marine Studies off San Pedro, California. Part II. Potential Effects of Dredging on the Biota of Outer Los Angeles Harbor. Toxicity, Bioassay, and Recolonization Studies. Rep. So. California Sea Grant Program (No. 2-87):325pp.

URS Consultants. 1986. Cities Service Oil and Gas Corporation and Celeron Pipeline Company of California, San Miguel Project and Northern Santa Maria Basin Area Study Final Environmental Impact Statement/Environmental Impact Report. Volume I. Prepared for County of San Luis Obispo, Minerals Management Service, State Lands Commission, County of Santa Barbara, California Coastal Commission, and California Office of Offshore Development.

U.S. Fish and Wildlife Service in Corps, 1995. U.S. Fish and Wildlife Coordination Act Report in the Final Feasibility Study, FEIS/EIR, for Port of Long Beach, Main Channel Deepening Project.

U.S. National Oceanic and Atmospheric Association, 1979. Tidal Benchmark Sheet, Port Hueneme, California.

U.S. Navy, 1996. NCEL Port Hueneme Disposal and Reuse DEIS. NFESC Port Hueneme, California.

APPENDIX A

FISH AND WILDLIFE COORDINATION ACT REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

September 19, 1997

Robert S. Joe
Chief, Planning Division
ATTN: Mr. Russell L. Kaiser (CESPL-PD-RN)
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Subject: Final Fish and Wildlife Coordination Act Report, Port of Hueneme Harbor Feasibility Study, Port Hueneme, Ventura County, California

Dear Mr. Joe:

Enclosed is the Final Coordination Act Report prepared by U.S. Fish and Wildlife Service (Service) for the Port of Hueneme Harbor Feasibility Study. This work product is provided under Order for Reimbursable Services number E86-97-0044 and the Scope of Work dated 4 April 1997.

The Service has coordinated with Mr. Russell L. Kaiser of your staff to review the draft report. It was provided to Mr. Kaiser with a transmittal letter dated August 4, 1997. The Service also has coordinated with California Department of Fish and Game, and National Marine Fisheries Service. We believe the final report is complete in accordance with the Scope of Work, and we incorporated additional information from a field investigation on August 5, 1997. The Service may be able to assist the U.S. Army Corps of Engineers with implementation of the recommendations noted in the final report, or with other environmental investigations and documentation associated with the Feasibility Study.

If you have any questions regarding this correspondence or the enclosure, please contact Greg Sanders or David Pritchett of my staff at (805) 644-1766.

Sincerely,

Judy Hohman

Diane K. Noda
acting Field Supervisor

Enclosure

FINAL

COORDINATION ACT REPORT

Port of Hueneme Feasibility Study

Port Hueneme, Ventura County, California

prepared by

US Fish and Wildlife Service
Ventura Fish and Wildlife Office

prepared for

US Army Corps of Engineers
Los Angeles District, Planning Division
(CESPL-PD-RN)

September 1997

are given as nearshore or onshore options.

For this Coordination Act Report, the assessment and recommendations will consider the dredging option for the maximum depth of minus 14.0 meters MLLW and the maximum volume of 750,000 cubic meters over the longest duration of 4.5 months. The Service considers the practical differences in environmental effects to be insignificant among the four options for dredging depth, volume, and duration of operations. However, as described in this report, the differences in environmental effects likely are significant for the dredge material disposal sites, either as nearshore or onshore placement.

The Draft EIS/EIR anticipates that selection of a disposal site will depend upon the method used for the dredging operation. Use of a floating dredge with suction pipe and rotating cutterhead would yield the onshore (beach) disposal option by deposition of a sand slurry through an overland pipe discharging at an elevation approximately at MLLW. Use of a bottom dump hopper or clamshell dredge would render the nearshore disposal option by deposition of material at an elevation ranging from minus 6 to minus 10 meters MLLW, or a similar elevational range consistent with California Department of Fish and Game guidelines for clam beds.

Furthermore, the Draft Administrative Environmental Assessment (Corps of Engineers 1997b) for pile removal indicates that approximately 1700 wooden piles from a "historic wharf" may be present at the location of wharf 1. The piles may be removed (shredded) by use of a rotating cutterhead for onshore disposal with the sand slurry, and the wooden particles subsequently would be removed from the beach. Alternatively, depending on efficiency of removal, the wooden piles may be pulled intact for disposal in an appropriate landfill. The piles also may be removed intact by use of a clam-shell type of dredge if it is available.

The description of the preferred project alternative designates placement of the dredge material (essentially sand) at a nearshore or onshore location below the former Naval Construction Engineering Laboratory (Figure 3.2.1 in the Draft EIS/EIR). This location fulfills a complimentary project purpose for beach nourishment at Hueneme Beach. As littoral transport occurs, sand placed at Hueneme Beach also is expected to provide beach nourishment at downcoast areas, such as Ormond Beach (two to five kilometers away) and West Spit of Mugu Lagoon.

ASSESSMENT OF EXISTING BIOLOGICAL ENVIRONMENT

Section 4.4.1 of both the preliminary Draft EIS/EIR (Corps of Engineers 1997a) and the Environmental Assessment prepared by the Corps for maintenance dredging at the Port (Corps of Engineers 1994) provide a good overview of the existing biological environment in the study area. Therefore, this Coordination Act Report does not repeat the details of the particular biological information that already is readily available. However, this report does include additional pertinent information about certain species, communities, and habitats.

Birds

During the field investigation by the Service on 15 May 1997, casual observation revealed brown pelican (*Pelicanus occidentalis*) and double-crested cormorant (*Phalacrocorax auritis*) roosting at wharf 1, California least tern (*Sterna antillarum browni*) foraging at channel A, and western snowy plover (*Charadrius alexandrinus nivosus*) foraging at Ormond Beach. In the 1930s, over 200 nesting pairs of California least tern were known from a colony near the lighthouse at the east jetty, although no terns currently are known from this location (Whetje 1997). Peregrine falcon (*Falco peregrinis*) presently occurs at coastal habitats at or near Ormond Beach and Mugu Lagoon (Jaques et al. 1996), and is known from the tall buildings of Holiday Inn at the beach Promenade near downtown San Buenaventura. Peregrine falcon is not indicated for the study area in Table 4.4-1 of the preliminary Draft EIS/EIR (Corps of Engineers 1997a). The pelican, tern, and falcon are all federally listed as endangered, and the plover is listed as threatened.

Under proposed federal rules (Fish and Wildlife Service 1995), Critical Habitat for western snowy plover is proposed for most Ventura County beaches, and in the project vicinity is proposed to proceed downcoast from the upper edge (longitude 119° 11' 58" W) of Port Hueneme Beach Park. The onshore location designated for disposal of dredge material is contiguous (immediately upcoast) with proposed Critical Habitat for the plover. Critical Habitat is defined as areas essential to the conservation of the species and that may require special management considerations or protection. Preliminary results from multi-year monitoring by Minerals Management Service (Pearson 1997) indicate that western snowy plover is observed frequently at Ormond Beach, although no data are available for Hueneme Beach.

Fishes

Waters of the Port provide habitat for northern anchovy (*Engraulis mordax*) and top smelt (*Atherinops affinis*) (Miller and Lea 1972), and both fishes subsequently are important food resources for California least tern (Atwood and Minsky 1983). The tern was observed foraging in waters of the Port, implying that the anchovy and smelt may be present. Both fishes feed on detritus, filamentous algae, zooplankton, and small crustaceans in the water column (Frey et al. 1983, Moran 1991). The Service informally consulted National Marine Fisheries Service (NMFS) about fish issues at the Port, and NMFS had no comments at that time (Hoffman 1997).

Grunion (*Leuresthes tenuis*) spawn on many Ventura County beaches between March and September, including Hueneme Beach. Grunion is a species of concern to California Department of Fish and Game (CDFG) because abundances generally are declining (Ono 1997). CDFG regulates grunion harvest through licensing.

Tidewater goby (*Eucyclogobius newberryi*), federally listed as endangered, is not expected at the Port although populations of this species occur nearby at lagoons and estuaries throughout Ventura County. Steelhead trout (*Oncorhynchus mykiss*), federally listed as endangered by NMFS on 11 August 1997, also is not expected at the Port, although this anadromous fish is present at Santa Clara River, located about 11 kilometers upcoast.

CONTENTS

INTRODUCTION

Pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and other authorities, this Coordination Act Report contains the analysis by U.S. Fish and Wildlife Service (Service) for the Port of Hueneme Feasibility Study conducted by Corps of Engineers, Los Angeles District (Corps). Pertinent portions of the Feasibility Study are described in a preliminary Draft Environmental Impact Statement (Draft EIS/EIR) prepared by the Corps (Corps of Engineers 1997a), and provided to the Service on 6 May 1997. The Draft EIS/EIR is a component of the Feasibility Study.

The scope of work for this Coordination Act Report is described in Corps of Engineers Order for Reimbursable Services No. E86-97-0044. The level of detail in this report is commensurate with the detail provided to the Service as a project description in the preliminary Draft EIS/EIR (Corps of Engineers 1997a) and other sources.

This Coordination Act Report provides technical assistance and constitutes the reporting requirements by the Service under Section 662(b) of the Fish and Wildlife Coordination Act. This Coordination Act Report does not constitute any formal consultation or biological opinion from the Service under the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884, as amended). Information in this report was obtained from previous reports on the study area, published research, communications with knowledgeable persons, experience with the study area by Service staff, and a field investigation by Service staff on 15 May and 5 August 1997.

LOCATION OF PROPOSED PROJECT

The proposed project is located within City of Port Hueneme (pronounced "why-nee-mee"), in coastal Ventura County, California, between the larger cities of San Buenaventura to the north and Oxnard to the south. The project area is a port complex that serves military and commercial purposes, primarily for United States Navy Construction Battalion Center ("Pacific Seabees") and Port of Hueneme Harbor (Port). The Port is administered by Oxnard Harbor District as the port authority agency. The Port is a major trading center for international commerce, and is the largest deep-water harbor between Los Angeles and San Francisco. Cargo specialities are petroleum products, automobiles, fresh fruit and produce, and forest product imports. The Port also serves as a major support facility for the offshore oil industry (City of Port Hueneme 1997, Oxnard Harbor District 1996).

Additional, detailed information on the environmental setting and study location is provided in the preliminary Draft Environmental Impact Statement (Corps of Engineers 1997a). Major elements of the Port complex include a west jetty, an east jetty, an approach channel, an entrance channel, and a central turning basin. Channel A, between wharf 1 and wharf 2, lies at the east portion of the Port, in the area administered by Oxnard Harbor District. Port Hueneme Beach (County) Park lies immediately downcoast of the site, and the stretch of beach including the County Park to the east jetty is known as Hueneme Beach.

DESCRIPTION OF PREFERRED PROJECT ALTERNATIVE

The project purpose described in the preliminary Draft EIS/EIR (Corps of Engineers 1997a) is to accommodate deep-draft vessels, increase cargo delivery efficiency, and reduce overall transportation costs. To fulfill this purpose, the preferred project alternative is to deepen the harbor by dredging the approach channel, entrance channel, central turning basin, channel A, and berthing areas along wharf 1 and wharf 2. The depth and corresponding volume for dredging are given in the Draft EIS/EIR as a range of four options, while the dredge material disposal sites

Hard-substrate Marine Communities

During the field investigation conducted by the Service on 15 May 1997, casual observation revealed a dense and diverse marine community on the intact wooden pilings at wharf 1. Visibility on that day allowed observations approximately two meters below the water level. The pilings were observed to be completely covered with invertebrate fauna showing characteristic vertical stratification into ecological niches. Animals were distributed several layers thick on the pilings, and several sea stars (*Pisaster* spp.) were up to 40 centimeters across in diameter.

Not visible during the field investigation were the approximately 1700 pilings identified as remnants from a "historic wharf" built in the 1930s and located in the vicinity of wharf 1 (Corps of Engineers 1997a). The 1700 pilings were reported to extend up to 0.5 meters above the mud line (Corps of Engineers 1997b), possibly in the area proposed for dredging. If a substantial number of these old piles emerge up to 0.5 meters above the sediment, they may support a hard-substrate marine community with significant ecological value. The potential for an ecologically significant marine community is increased by the prohibition on recreational and commercial diving in waters of the Port, resulting in minimal take of marine resources.

To assess the actual extent of old piles in the vicinity of wharf 1, an underwater diving investigation with video documentation was conducted for the Corps on 5 August 1997 by U.S. Navy civilian employees. Observations above water were made by the Service during this investigation. Results indicate that approximately 350 piles were present, not the 1700 pilings initially reported. The piles evident in the video recording did not support a substantial hard-substrate marine community, although a few crabs and anemones were present. A pile pulled to the surface as a test of extraction techniques was devoid of a marine community.

Benthic Marine Communities

Benthic infauna at the Port are expected to include polychaetes as the dominant taxonomic group, followed by crustaceans, molluscs, and echinoderms. Most of these faunal groups are burrowing animals that live in mud or sand (Shark 1971). Dredging operations would result in the elimination of sessile and some mobile benthic communities (Corps of Engineers 1978, Kellert 1993, Nichols et al. 1990). Recovery through colonization and ecological succession may take two to three years for a soft substrate marine community (Thistle 1981), and up to ten years for a hard substrate community (Corps of Engineers 1978), for the benthic infaunal community to resemble the structure and composition of the pre-disturbance conditions (Corps of Engineers 1977, Moran 1991, Morton 1977). The video recording from the underwater investigation on 5 August 1997 shows that tube anemones were evident throughout the central portion of wharf 1.

Molluscs (Pismo Clam)

Pismo clam (*Tivela stultorum*), a bivalve mollusc, may be present in both lower onshore and nearshore habitat at Hueneme Beach (Corps of Engineers 1994). A Pismo clam population is expected at Hueneme Beach (Los Angeles Times 1992b), although abundance and size distributions of clams is not known (Ono 1997). Pismo Clam is considered a sensitive resource by CDFG, and harvest is regulated by licensing. Clamming this recreational shellfishery is well known from California beaches, and detailed information about the biology and management of Pismo clam is described in a Fish and Wildlife Service technical report (Shaw and Hassler 1989).

Page 4-61 in the Environmental Assessment for maintenance dredging (Corps of Engineers 1994) outlines a survey and translocation protocol for Pismo clam at Hueneme Beach. Correspondence by California Department of Fish and Game (CDFG), dated 22 June 1994 and included in Appendix A of the Environmental Assessment, indicates that the survey and translocation of Pismo clams should be required before each maintenance dredging episode. Hence, for the proposed project, CDFG may consider the deposition of dredge material on clam beds to be a significant adverse impact unless the survey and translocation protocol is implemented and is consistent with CDFG guidelines for the elevational range of clam beds.

Other Habitats and Biota

What vegetation is present in the immediate project area of the Port and Hueneme Beach is comprised of ruderal, weedy species with few, if any, native plant species present. The Port overall is classified best as a deepwater marine habitat, not a wetland, although some marine wetland occurs at the rocky intertidal habitat near the jetties and entrance channel. Hueneme Beach supports little or no vegetative cover because sources for vegetative colonization are distant and regular perturbations from wave action and placement of dredge material occur there.

Coastal dune, salt marsh, and associated wetlands are present at Ormond Beach and Mugu Lagoon, located downcoast starting two kilometers from Hueneme Beach. Ormond Beach and Mugu Lagoon support highly significant habitat value for southern California (Rick Alexander Company 1996). California sea lion (*Zalophus californianus*) was present in channel A during the field investigation on 15 May 1997, and this marine mammal is expected to be present regularly at the Port.

POTENTIAL FOR ENDANGERED SPECIES

Table 1 in this Coordination Act Report indicates federally listed endangered or threatened species that may occur in the study area. For this report, the study area is defined as beach, coastal dune, and salt marsh habitat in Ventura County. Table 1 also indicates the potential (rare, uncommon, or common) for each listed species to be present in the immediate project area of the Port and Hueneme Beach.

Section 4.4.1 of both the preliminary Draft EIS/EIR (Corps of Engineers 1997a) and the Environmental Assessment prepared by the Corps for maintenance dredging at the Port (Corps of Engineers 1994) provide a good overview of the potential for endangered, threatened, or other sensitive species to occur in the study area. Therefore, this Coordination Act Report does not repeat the details of the particular biological information that already is readily available. However, this report does include additional or more recent information about federally listed species in the study area, and this information is included above under the Assessment of Existing Biological Environment.

During the field investigation by the Service on 15 May 1997, casual observation revealed brown pelican roosting at wharf 1, California least tern feeding at Channel A, and western snowy plover feeding at Ormond Beach. While these observations certainly do not represent the entire avifauna, they do confirm the presence of these listed species within the Port.

ASSESSMENT OF SEDIMENTS AND CONTAMINANTS

Although physical conditions of the sediments (sand grain size, fraction of silt and clay, etc.) meet Corps guidelines and are compatible with beach sediments at Hueneme Beach, chemical compatibility may be uncertain for mercury. This trace metal bioaccumulates through the food chain and can be highly toxic to wildlife, especially to birds that feed on fish linked directly to mercury in an aquatic environment (Environmental Protection Agency 1995).

While the analytical methods for environmental contaminants are fairly standard and straightforward, interpretation of the results can be a subjective science. Depending on background contaminant levels, risk management criteria, and a host of other site-specific factors, what may be considered a high contaminant level for one site may be viewed as a low level for another apparently similar site. This is especially true for sediment analyses from aquatic systems in coastal California.

One approach commonly used to interpret contamination in sediments involves the sediment effects criteria developed by researchers from National Oceanic and Atmospheric Administration (Long and Morgan 1990). In this approach, the Effects Range - Low (ER-L) concentration represents the lower 10 percentile level of contamination, and the Effects Range - Mid (ER-M) concentration represents the median level (Long and Morgan 1990). Contaminant levels between the ER-L and ER-M concentrations are considered to have possible adverse effects, especially on sensitive species. Scientists who advise on risk assessment for contaminated sediments typically must balance set standards, such as the ER-L and ER-M concentrations, with professional judgement and results from other sites (Ross 1997).

Data Analysis and Interpretation

Sediment data and the associated chemical analyses are presented in Appendix C of the preliminary Draft EIS/EIR (Corps of Engineers 1997a). Except for the level of mercury from sample sites 5 and 10, the analyses show that trace metals are found below the ER-L level at all 12 sample sites. The sample sites were located uniformly throughout the Port. Sample 5 was obtained from the middle of the central turning basin, and sample 10 was collected from the middle of channel A. At sample sites 5 and 10, the analysis shows mercury levels of 0.31 mg/kg or ppm at both sites. This concentration of mercury is above the ER-L level of 0.15 ppm but below the ER-M level of about 1.3 ppm (Long and Morgan 1990). More recent research indicates an ER-M level of 0.71 ppm for mercury (Long et al. 1995). The data reviewed to develop the ER-L and ER-M standards largely are based on effects to benthic organisms, not potential effects through bioaccumulation in animals higher in the food chain.

To put the results from the Port in perspective, the sediment analysis shows that reference site LA2 (an offshore location near Long Beach, Los Angeles County) has a mean mercury concentration of 0.18 ppm, a "clean California" reference level is considered at 0.04 ppm, and a "screening level" (natural background level at Puget Sound, Washington) is identified as 0.21 ppm (Corps of Engineers 1997a). Although relatively old research, a level of 0.14 ppm for mercury has been proposed as a marine water quality standard for California (Klapow and Lewis 1979). However, to complicate this interpretation of relative mercury contamination, at Port of Los Angeles sediments with mercury levels greater than 0.70 ppm have been used as a "sand cap" over dredge materials with a much higher concentration of mercury (Ross 1997). Clearly, the mercury levels at sample sites 5 and 10 in the Port appear to be elevated, but not as much as at other coastal sites in southern California.

Potential Toxicity

Anthropogenic activities over many decades undoubtedly contributed to mercury entering the aquatic environment of the Port. Mercury in general has been used in fungicides, paints, batteries, and military ordnance, for instance, and fossil fuel combustion can lead to atmospheric deposition of mercury. Ionic mercury (Hg^{2+}) from the atmosphere readily transforms into methylmercury (CH_3Hg^+) under aquatic conditions with the presence of sulphate-reducing bacteria where organic material interfaces with sediments. Starting with unicellular algae, methylmercury bioaccumulates readily and comprises almost all of the mercury in larger fish (Environmental Protection Agency 1995). Methylmercury is 100% bioavailable following ingestion (Sundlof et al. 1994).

Mercury accumulation in avian and mammalian species is almost always via ingestion of contaminated food (Environmental Protection Agency 1995). In birds that consume fish, laboratory studies reveal that mercury levels of 1 ppm in blood and eggs and 5 to 40 ppm in feathers can be attained. In the wild, eggs of Forster's tern (*Sterna forsteri*) and black skimmer (*Rynchops niger*), both closely related to least tern, have exhibited mercury levels high enough to cause embryo and chick mortality, lowered hatchability, and decreased chick weight, all parameters that can diminish reproductive success (Berger 1995). Potential bioindicators to evaluate toxicity from mercury in aquatic birds can include teratogenesis, histopathology, and physiological alterations (Geological Survey, Biological Resources Division, 1997).

In the study area, mercury toxicity during dredging operations may affect California least tern (federally listed as endangered) because this species often feeds in waters of the Port (Whetje 1997) and other aquatic habitats with top smelt, northern sardine, and other fish food resources. If sediments containing mercury were placed on Hueneme Beach, western snowy plover (federally listed as threatened) may be affected because this species feeds on macroinvertebrates found on the beach (Page 1986).

RECOMMENDATIONS FOR MITIGATION AND FUTURE ACTION

Mitigation collectively includes measures for avoidance, reduction, and compensation for adverse environmental impacts. The Service recommends implementation of the following actions to mitigate for adverse effects of the proposed project and to reduce uncertainty in the ecological risk management.

Contaminants Analysis and Sediment Disposal

The Service recommends that the project descriptions and sediment contaminant analyses (Corps of Engineers 1994, 1997a) include more detailed guidance on interpretation of the results, especially on ecological effects. The Service, and likely the Dredging and Sediment Management Team of U.S. Environmental Protection Agency Region 9 (EPA), can assist with such guidance.

Because of concern with toxic effects to birds, especially California least tern and western snowy plover, the Service recommends that sediments in the middle of the central turning basin and channel A (the vicinity of sample sites 5 and 10) be sampled more intensively to determine the extent and magnitude of mercury contamination at these particular areas.

If mercury contamination is found to be localized at these areas, additional coordination should be undertaken between the Corps, Service, and EPA to formulate a plan, if needed, for isolation, disposal, or other appropriate management of these particular sediments. For instance, sediments with higher concentrations of mercury could be isolated during dredging operations for separate disposal at an appropriate landfill site instead of placement at the onshore or nearshore locations.

Dredge Material Placement and Timing

In consideration of the range of biological issues reviewed in this Coordination Act Report, the Service recommends the option for onshore disposal of the dredge material instead of the option for nearshore disposal. The Service acknowledges that opportunities for wave quality enhancement for surfing are lessened with the onshore option (comment letter in Environmental Assessment, Corps of Engineers 1994). The Service also recognizes that freshly deposited sediments on a beach may be malodorous (Ross 1997), but only for a short duration.

An advantage of onshore placement of dredge material over nearshore placement is that subsurface marine resources would not be buried, especially Pismo clam beds. In addition, turbidity plumes (Kuo 1991, Nichols 1990, Shark 1971) caused by nearshore discharge would be reduced, and any contaminants in the sediments would not be released acutely into the marine environment. Although still subject to littoral transport, the sediment placed onshore also could serve as a reserve of sand available for beach nourishment, dune construction, or other beneficial uses in the study area.

Disturbances to western snowy plover, although unlikely, may occur with the onshore disposal option because the onshore site is contiguous with proposed Critical Habitat for this threatened species. However, with implementation of the mitigation measures outlined below, especially timing of the operations, adverse impacts to western snowy plover would be avoided, and consultation procedures pursuant to Section 7 of the Endangered Species Act may not be required. Consultation procedures are required if an action may affect a listed species.

If a federally listed species may be affected by the proposed project, the Corps must consult with the Service (or National Marine Fisheries Service, as appropriate) pursuant to Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended. Informal consultation may be conducted to exchange information and to resolve conflicts with respect to listed species prior to a written request for formal Section 7 consultation. A federal agency is required to confer with the Service on any action that is likely to jeopardize the continued existence of any species proposed for federal listing.

To avoid or minimize disturbance to western snowy plover, the Service recommends that the Corps include the following measures into the final project design:

1. Placement of dredge material and onshore operations should be avoided during the plover breeding and nesting season from 1 March to 30 September, thereby leaving a five-month construction window from 1 October to 28 February;

2. Before dredge material is placed onshore, kelp wrack and other marine biomass that may support food resources (macroinvertebrates) for plovers should be collected in minimum two cubic meter increments, relocated at least one kilometer downcoast, and deposited between tidal elevations MHHW and MLLW;

3. Upon the completion of dredge material placement onshore, beach contours should be graded to the shallowest slope practicable, although care should be exercised to avoid burial of clams and other subsurface marine life below tidal elevation MLLW.

If onshore placement of dredge material must occur beyond the construction window ending 28 February, the Corps should initiate consultation with the Service a minimum of 135 days prior to the action, so any contingency measures could be developed concerning potential disturbances to plovers. A likely measure the Service may recommend could involve daily monitoring by a qualified biologist to determine the presence and behavior of any plovers at area. Should any plovers be present during placement of dredge material after 1 March, a contingency plan to be coordinated with the Corps subsequently could be developed under the consultation procedures.

Pismo Clam Assessment and Translocation

If the option for nearshore disposal of dredge material is exercised, and to address past and anticipated concerns by CDFG, the Service recommends that a systematic and quantitative assessment of the Pismo clam population first be conducted. Clam survey areas should include the portions of Hueneme Beach that CDFG indicates are suitable as clam habitat, expected to be elevational range plus 1 to minus 3 meters MLLW. Sampling methods for clams should be consistent with techniques already established by CDFG (California Department of Fish and Game 1992).

Based on results from the Pismo clam survey described above, if a substantial population of the clam, as coordinated with CDFG, is determined to occur at the area designated for dredge material disposal, the Service recommends that Pismo clams be translocated to a nearby habitat, likely at Ormond Beach, two kilometers downcoast. As a practical matter in anticipation of future placement of dredge material, clams found during the initial survey should be translocated regardless of abundances found.

The method for clam translocation is outlined on page 4-61 in the Environmental Assessment previously prepared by the Corps (Corps of Engineers 1994), although details on the translocation method should be coordinated further with CDFG. As a response to placement of dredge material removed from Channel Islands Harbor, a Pismo clam translocation effort was initiated by members of the local Rotary Club at Hueneme Beach in November 1992 (Los Angeles Times 1992a). This effort involved about 300 volunteers, including Corps staff (Los Angeles Times 1992b).

Conservation of Hard-substrate Marine Community

If consistent with the purpose and need of the proposed project, mitigation measures for adverse impacts to any hard-substrate marine community could include avoidance of the dredging operations in the vicinity of wharf 1. If avoidance is not practicable as mitigation, the Service recommends compensatory mitigation by construction of an alternative hard-substrate habitat ("artificial reef") suitable for colonization by marine communities. The extent, location, and composition of an artificial reef habitat developed as compensatory mitigation should be coordinated among pertinent agencies and organizations in the study area. Key state agencies include CDFG, State Lands Commission, and California Coastal Commission. The Nearshore Sportfish Habitat Enhancement Program of CDFG can assist with establishment and management of artificial reefs (Lewis and McKee 1989).

Assessment of Cumulative Impacts

The project description and analysis (Corps of Engineers 1997a) do not address the cumulative impacts from an increase in commercial activity at the Port. Construction of new roads, industrial facilities, or other related developments in Port Hueneme or Oxnard may affect wetlands, sensitive species habitats, or potential ecological restoration sites, especially at the greater Ormond Beach wetland complex (Rick Alexander Company 1996). The Service recommends that the issue of cumulative impacts be addressed by the Corps, with specific reference to how the proposed project relates to environmental review for an increase in commercial activity at the Port.

REFERENCES CITED

Atwood, J. L. and D. E. Minsky. 1983. Least tern foraging ecology at three major California breeding colonies. Western Birds 14:57-72.

Berger, J. 1997. Risk to birds from mercury. Rutgers University research summary at URL http://biology.rutgers.edu/burger/start/birdrisk.

California Department of Fish and Game. 1992. Field report prepared by I. K. Taniguchi for Pismo clam survey at Hollywood-by-the-Sea County Beach, Ventura County, 6 June 1992.

City of Port Hueneme. 1997. Draft Environmental Impact Report (April 1997), City of Port Hueneme General Plan Update, State Clearinghouse No. 93041012. Prepared by Cotton/Beland/Associates Inc., Pasadena, CA.

Corps of Engineers. 1977. Patterns of Succession in Benthic Infaunal Communities Following Dredging and Dredged Material Disposal in Monterey Bay. Technical Report D-77-27. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Corps of Engineers. 1978. Effects of Dredging and Disposal on Aquatic Organisms. Technical Report DS-7-5. U.S. Army Chief of Engineers Office, Washington, DC.

Corps of Engineers. 1994. Final (1 August 1994) Environmental Assessment for Channel Islands and Port Hueneme Harbors Maintenance Dredging Project. Los Angeles District, Corps of Engineers.

Corps of Engineers. 1997a. Preliminary (7 April 1997) Draft Environmental Impact Statement and Environmental Impact Report for Port of Hueneme Harbor.

Corps of Engineers. 1997b. Draft Administrative Environmental Assessment for the Port of Hueneme Deepening Project, Ventura County, California.

Environmental Protection Agency. 1995. National Forum on Mercury in Fish, Proceedings. Report EPA 823-R-95-002, June 1995.

Fish and Wildlife Service. 1995. Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. Proposed Rule, March 2, 1995. Federal Register 60(41):11763-11809.

Frey, H., J. Ginter, D. Huppert, A. MacCall, R. Methot, G. Stauffer, and C. Thomson. 1983. Northern Anchovy: Fishery Management Plan Incorporating the Final Environmental Impact Statement and Draft Regulatory Impact Review, Initial Regulatory Flexibility Analysis. Pacific Fishery Management Council and National Marine Fisheries Service, Fishery Management Plan Amendment No. 5, 156 pp.

Geological Survey, Biological Resources Division. 1997. Physiological and teratogenic effects of mercury on aquatic birds nesting along the mid-to lower Carson River and Vicinity, Nevada. Research summary by Patuxent Wildlife Research Center, Laurel, MD, at URL http:// www.pwrc.nbs.gov/hofman4s.

Hoffman, R. H. 1997. Personal communication, 19 June 1997. Fisheries Biologist, National Marine Fisheries Service.

Jaques, D. L., C. S. Strong, and T. W. Keeney. 1996. Brown Pelican Roosting Patterns and Responses to Disturbance at Mugu Lagoon and Other Nonbreeding Sites in the Southern California Bight. Technical Report No. 54. National Biological Service, Cooperative National Park Resources Studies Unit, University of Arizona, Tuscon, AZ.

Klapow L. A. and R. H. Lewis. 1979. Analysis of toxicity data for California marine water quality standards. Journal of the Water Pollution Control Federation 51(8):2051-2070.

Kellert, S. R. 1993. Values and perceptions of invertebrates. Conservation Biology 7(4):845-855.

Kuo, A. Y. and D. F. Hayes. 1991. Model for turbidity plume induced by bucket dredge. Journal of Waterway, Port, Coastal, and Ocean Engineering 117(6):610-623.

Lewis, R. D. and K. K. McKee. 1989. A guide to the artificial reefs of Southern California. California Department of Fish and Game, Nearshore Sportfish Habitat Enhancement Program.

Long E. R. and L. G. Morgan. 1990. Potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. National Oceanic and Atmospheric Administration Technical Memorandum NOS-OMA-52.

Long E. R., D. D. MacDonald, S. L. Smith, and F. C. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environmental Management 19(1):81-97.

Los Angeles Times. 1992a. Rotarians hope to rescue clams threatened by dredging project. Article published 14 November 1992.

Los Angeles Times. 1992b. Bucket brigade: Clams threatened by dredging are moved to new digs. Article published 22 November 1992.

Miller, D. J. and R. N. Lea. 1972. Guide to the coastal marine fishes of California. Fish Bulletin 157, California Department of Fish and Game.

Moran, P. J. 1991. The effects of dredging on the larval settlement and community development of fouling organisms in Port Kembla Harbour, Australia. Water Research 25(9):1151-1555.

Morton, J. W. 1977. Ecological Effects of Dredging and Dredge Spoil Disposal: a Literature Review. Technical Paper No. 94, U.S. Fish and Wildlife Service.

Nichols, M., R. J. Diaz, and L. C. Schaffner. 1990. Effects of hopper dredging and sediment dispersion, Chesapeake Bay. Environmental Geology and Water Sciences 15(1):31-43.

Ono, D. 1997. Personal communication, 21 May 1997. Marine Biologist, Marine Resources Division, California Department of Fish and Game.

Oxnard Harbor District. 1996. Web site at URL http://pacificagricenter. com/harbor/index.shtml.

Page, G. W., F. C. Bidstrup, R. J. Ramer, and L. E. Stenzel. 1986. Distribution of wintering snowy plovers in California and adjacent states. Western Birds 17:145-170.

Pearson, M. 1997. Personal communication, 27 May 1997. Staff scientist, United States Department of the Interior, Minerals Management Service, Camarillo, CA.

Alexander Company. 1996. Ormond Beach Consensus Plan, Final Draft, 31 May 1996. Prepared for Oxnard City Council.

Ross, B. 1997. Personal communication, 21 May 1997. Life Scientist, Dredging and Sediment Management Team, U.S. Environmental Protection Agency, Region 9.

Shaw, W. and T. Hassler. 1989. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Southwest)--Pismo Clam. U.S. Fish and Wildlife Service Biological Report 82(11.95).

Shark, J. A. 1971. Effects of suspended and deposited sediments on estuarine organisms. Chesapeake Biological Laboratory, Contribution No. 443. University of Maryland.

Sundlof, S. F., M. G. Spalding, and J. D. Wentworth. Mercury in livers of wading birds (Ciconiiformes) in southern Florida. Archives of Environmental Contamination 27:299-305.

Thistle, D. 1981. Natural physical disturbance and communities of marine soft benthos. Marine Ecological Progress Series 6:223-228.

Whetje, M. 1997. Personal communication, 20 May 1997. Wildlife Biologist, California Department of Fish and Game.

TABLE 1

Federally Listed Endangered or Threatened Species that May Occur in the Study Area

PORT OF HUENEME FEASIBILITY STUDY
VENTURA COUNTY, CALIFORNIA

Species	*Federal Listing Status*	*Potential * Presence*
FISHES		
Tidewater goby (*Eucyclogobius newberryi*)	FE	rare
Steelhead trout (*Oncorhynchus mykiss*)	FE	rare
BIRDS		
Brown pelican (*Pelicanus occidentalis*)	FE	common
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT	common
California least tern (*Sterna antillarum browni*)	FE	common
Peregrine falcon (*Falco peregrinus*)	FE	uncommon
Light-footed clapper rail (*Rails longirostris levipes*)	FE	rare
PLANTS		
Salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*)	FE	rare

---

FE Federally listed as **endangered**
FT Federally listed as **threatened**

* **Potential Presence** follows the nomenclature (rare, uncommon, common) used by the Corps and indicates the likelihood for the species to be present in the immediate project area of the Port and Hueneme Beach.

S:\HABITAT\FEDPROJ\PROJECTS\POHH\REPORTS\CARPORT2.WPD

APPENDIX B

404(b)(1) Evaluation

material has been placed on this beach from the Channel Islands Harbor/Port Hueneme O&M dredging projects biennially to aid in shore stabilization. The benefits of placing material here are of great value. Material placement could occur as follows:

Onshore Placement. A hydraulic cutter pipeline dredge with pumpout capability would be used to place material between 0 and +4.9 m MLLW, then material would be graded to match the existing beach profile.

Nearshore Placement. A bottom dump hopper or clamshell dredge would be used to place sediment in a mound parallel to the shore in the littoral zone, at depths ranging from -6.1 to -10.6 m MLLW (Figure 3.2-1). Wave energy would naturally rebuild the beach by carrying sediments onto the beach profile. Dredged material will be discharged at Silver Strand and/or Hueneme beaches. The following disposal methods are viable: 1) onshore disposal (0 and +16 feet MLLW), and/or 2) nearshore disposal (-10 and -30' feet MLLW). The characteristic habitat type subject to impact by dredge material discharge is open-coast sandy beach and nearshore inter-/subtidal soft-bottom sandy habitat.

f. <u>Description of Dredging and Disposal Methods</u> [3.2.1]: It is anticipated that a hydraulic cutter pipeline dredge with pump-out capability would be used for material dredging and placement activities associated with an onshore effort and a bottom dump hopper or clamshell dredge for a nearshore effort

g. <u>Timing and Duration of Discharge</u> [3.2.2]: By using a hydraulic dredge, approximately 10,000 M^3 per day on average can be piped to the beach. The equipment typically operates on a 24-hour continuous basis. Approximately 2.5 to 4.5 months will be required to dredge and place between 300,000 and 750,000 M^3 of sand, depending on which alternative is implemented. Time also includes one month for mobilization and demobilization activities.

If a joint operation occurs where sand is placed both on the beach and in the nearshore zone, approximately 3 to 5 months will be required to dredge and place between 300,000 and 750,000 M^3 of sand, respectively. (It is assumed the clamshell will remove material from the pier pile zone, and the cutterhead will remove any additional material.) Time includes one month for mobilization and demobilization.

The wharf modifications and toe wall installation is estimated at 5-6 months. This work is expected to occur simultaneously with other dredge operations.

The proposed project is planned for a construction start in FY00. Due to potential biological concerns related with the presence of endangered species being onsite for a portion of the year (Section 4.4.1.7), construction activities have been planned to occur during the time of year when these species are not present, between October 1 and March 1.

III. FACTUAL DETERMINATIONS.

Disposal Site Physical Substrate Determinations:

1. Substrate Elevation and Slope: Port Hueneme is located within the Santa Barbara littoral cell that is bounded by Point Conception and Point Mugu. The 154.5 km cell is the longest shoreline unit in Southern California. The harbor area is bounded by the Silver Strand Beach and Hueneme Submarine Canyon. Littoral transport of sand along the Santa Barbara cell is most influenced by the material source and the physical processes acting on the material source. Materials in the local area have been classified as fine-grained sands. The dominant direction of movement is from north to south in response to an alongshore component of wave energy that is oriented downcoast. The net total transport volume is about 917,500 M^3 per year on average (Noble Consultants 1989). Silver Strand Beach, located between Channel Islands Harbor and Port Hueneme, has been relatively stable over the past 50 years. The shoreline has formed a state of equilibrium, with a zero net longshore transport rate. From Port Hueneme to Point Mugu, it was estimated that about 688,100 M^3 per year is transported downcoast (Bailard 1985). [4.1.1]

2. Sediment Type: The sediments in the project area have been characterized as alluvium. The deeper layers, below 600 M, have been characterized as deposits of non-marine clay, silt, sand, and gravel possibly from the late Pleistocene. The top layers consist of lenticular beds of gravel, sand, silt and clay. In March 1996, twelve sediment samples were collected from the proposed dredge area to determine sediment profiles. The average (d_{50}) grain size was 0.20 millimeter (mm). Historical data

**THE EVALUATION OF THE EFFECTS
OF THE DISCHARGE OF DREDGED OR FILL MATERIAL
INTO THE WATERS OF THE UNITED STATES
404(b)(1) Evaluation
For
PORT HUENEME HARBOR DEEPENING PROJECT
PORT HUENEME, VENTURA COUNTY, CALIFORNIA**

I. INTRODUCTION. The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), as amended by the Clean Water Act of 1977 (Public Law 95-217). Its intent is to succinctly state and evaluate information regarding the effects of discharge of dredged or fill material into the waters of the U.S. As such, it is not meant to stand alone and relies heavily upon information provided in the environmental document to which it is attached. Citation in brackets [] refer to expanded discussion found in the Environmental Assessment (EA), to which the reader should refer for details.

II PROJECT DESCRIPTION.

a. Location [2.1]: The proposed navigation deepening project is located in the Port of Hueneme Harbor (PoHH), which is located in the city of Port Hueneme, Ventura county, California. The PoHH is located on the coast approximately 105 kilometers (km) northwest of Los Angeles. The project area is shown on Figure 2.1-1 in the attached Environmental Assessment.

b. General Description [3.4]: The proposed plan consists of increasing the depth of the entrance channel and inner harbor from -10.7 meters (35 feet) MLLW to 12.2 meters (40 feet) MLLW. The plan includes stabilizing the entrance channel wharf as well as wharves 1 and 2 and dredging berthing areas 1 and 5 which are located along Wharves 1 and 2. Dredged material will be placed on or near shore of Hueneme Beach, located south of Channel "A". Dredged material quantities for the entire Recommended Plan are itemized as follows:

Approach Channel	62,000m3
Entrance Channel	77,000m3
Turning Basin	200,000m3
Berth 1	7,653m3
Berth 5	4,935m3

Dredge material quantities, including the berthing area totals approximately 485,000 cubic meters (630,000 cubic yards).

c. Authority and Purpose [2.2 & 2.3]: This evaluation has been prepared pursuant to Section 404(b)(1) of the Clean Water Act of 1977 (33 USC 1344) which applies to the discharge of dredged or fill material into navigable waters of the U.S. The primary purpose of the project is to more efficiently accommodate larger, deep-draft vessels, increase cargo efficiency of product delivery and reduce overall transportation costs.

d. General Description of Dredged or Fill Material [4.1.1.1]: The areas to be dredged have traditionally generated sediments characterized as alluvium. The deeper layers, below 600 M, have been characterized as deposits of non-marine clay, silt, sand, and gravel possibly from the late Pleistocene. The top layers consist of lenticular beds of gravel, sand, silt and clay. In March 1996, twelve sediment samples were collected from the proposed dredge area to determine sediment profiles. The average (d_{50}) grain size was 0.20 millimeter (mm). Historical data indicate that Hueneme Beach sediments average a (d_{50}) grain size of 0.123 mm. Sediment profiles indicate that both areas, on average, consist of fine-grained sands.

e. Description of the Proposed Discharge Sites [2.1, 3.1.2.2]: Testing results indicate proposed project sediments are physically and chemically compatible with beach sediments at Hueneme Beach . Material testing results indicate that proposed dredge materials are suitable for beach nourishment at Hueneme Beach, therefore, other disposal options are dismissed. Hueneme Beach is located southwest of PoHH (Figure 1.2-1). Hueneme Beach is 64 m in length and 37 m in width. Due to the construction of the Port of Hueneme and the Channel Islands harbors, Hueneme Beach's natural transport of littoral material has been altered and resulted in periodic erosion. As this beach is heavily used, beach nourishment has been deemed necessary to maintain the beaches for shoreline protection and recreation uses. Over the past twelve years, 1.46 million m^3 of indicate that Hueneme Beach sediments average a (d_{50}) grain size of 0.123 mm. Sediment profiles indicate that both areas, on average, consist of fine-grained sands. [4.1.1.1]

3. Dredged/Fill Material Movement: Material would be excavated when eater flow is minimal. In addition a low-flow channel would be created during construction and future debris removal operations. Excavated material would be placed onshore or/and nearshore of Hueneme Beach.

4. Physical Effects on Benthos : The proposed dredge area is characterized predominantly by deep water, subtidal soft bottom habitat, and the receiver site by nearshore shallow water, soft bottom habitat and sandy beach. Subtidal habitats consist of unconsolidated, fine-grained sands, which typically support limited vegetation opportunities. In addition, the harbor, on average, is dredged biennially for maintenance purposes. The overall conditions in the PoHH support limited opportunities for marine vegetative growth. If vegetation is present, species diversity and density is expected to be low and would consist of species of algae.

The neighboring breakwaters, jetties, and pier pilings are expected to support algal growth typical of rip-rap communities.

Hueneme Beach has little or no plant growth due to seasonal erosion processes, beach nourishment projects, and high recreation use.

The predominant fish assemblage is expected to be characterized by the dominance of the soft bottom habitat. Common fishes recorded in shallow offshore environments near Channel Islands Harbor included thornback rays, lizard fish (Dames and Moore 1980), speckled sanddab, northern anchovy, white croaker and walleye surfperch (MBC 1975). These species are also likely to exist in the PoHH and adjacent coastal waters.

Between March and September, grunion may spawn on Hueneme Beach. These schooling fishes, which are members of the silversides family, lay their eggs on sandy beaches at the mean higher high water (MHHW) line during nighttime spring tides.

While several species of whales, dolphins, porpoises, harbor seals and sea lions are frequently seen offshore, only the

California sea lion and the harbor seal are likely to forage in the harbor waters and haul-out on the breakwater and jetties. [4.2.1]

Temporary short-term impacts will occur; however, no long-term significant impacts are expected.

5. Actions taken to Minimize Impacts: The proposed project is planned for construction to start in FY00. Due to potential biological concerns related with the presence of endangered species being onsite for a portion of the year, construction activities will occur during the time of year when these species [4.2.1.7] are not present, between October 1 and March 1. Pilings from the historicpierwill be removed as intact as possible to minimize release of creosote into the marine environment.

B. Effect on Water Circulation, Fluctuation, and Salinity Determinations:

1. Effect on Water [4.1.1.3]. The following potential impacts were considered:

a. Salinity _____N/A__X__INSIGNIF.____SIGNIF.
Water Chemistry
(pH, etc.) _____N/A__X__INSIGNIF.____SIGNIF.
c. Clarity _____N/A__X__INSIGNIF.____SIGNIF.
d. Color _____N/A__X__INSIGNIF.____SIGNIF.
e. Odor _____N/A__X__INSIGNIF.____SIGNIF.
f. Taste __X__N/A____INSIGNIF.____SIGNIF.
g. Dissolved gas levels ____N/A__X__INSIGNIF.____SIGNIF.
h. Nutrients ____N/A__X__INSIGNIF.____SIGNIF.
i. Eutrophication ____N/A__X__INSIGNIF.____SIGNIF.
j. Others ____N/A__X__INSIGNIF.____SIGNIF.

2. Effect on Current Patterns and Circulation. The potential of discharge or fill on the following conditions were evaluated:

a. Current Pattern and Flow
____N/A__X__INSIGNIF.____SIGNIF.
b. Velocity ____N/A__X__INSIGNIF.____SIGNIF.
c. Stratification ____N/A__X__INSIGNIF.____SIGNIF.
d. Hydrology Regime ____N/A__X__INSIGNIF.____SIGNIF.

The project as proposed is not expected to significantly affect current patterns or circulation.

3. Effect on Normal Water Level Fluctuations. The potential of discharge on fill on the following were evaluated:

a.	Tide	____N/A__X__INSIGNIF.____SIGNIF.
b.	River Stage	__X__N/A____INSIGNIF.____SIGNIF.

The project as proposed is not expected to significantly affect the normal water level fluctuations.

C. Suspended Particulate/Turbidity Determinations at the Disposal Site: Both the dredging and deposition operations are expected to result in temporary increased suspended particulates and turbidity of adjacent and coastal waters.

1. Expected Change in Suspended Particulate and Turbidity levels in Vicinity of Disposal Site: The operation will occur during winter months when turbidity levels are generally higher and productivity levels lower. These impacts are considered insignificant because they will be distributed over a relatively small area and will be short term in duration.

Impact: ____N/A__X__INSIGNIF.____SIGNIF.

2. Effects (degree and duration) on Chemical and Physical Properties of the Water Column:

a. Light Penetration
____N/A__X__INSIGNIF.____SIGNIF.
b. Dissolved Oxygen
____N/A__X__INSIGNIF.____SIGNIF.
c. Toxic Metals & Organic
____N/A__X__INSIGNIF.____SIGNIF.
d. Pathogen
____N/A__X__INSIGNIF.____SIGNIF.
e. Aesthetics
____N/A__X__INSIGNIF.____SIGNIF.
Others
____N/A__X__INSIGNIF.____SIGNIF.

3. Effects of Turbidity on Biota: The following effects of turbidity on biota were evaluated [7.2]:

Primary Productivity	____N/A__X__INSIGNIF.____SIGNIF.
Suspension/Filter Feeders	____N/A__X__INSIGNIF.____SIGNIF.
Sight feeders	____N/A__X__INSIGNIF.____SIGNIF.

Documentation: Detailed impact discussion provided in Section 7.2 of the attached EA. Impacts will be temporary and adverse, but not significant.

1. Actions taken to minimize Impacts.
Needed?: _____YES __X__NO

If Needed, Taken:
_____YES _____NO

2. Contaminant Determination:

The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate).

3. Physical characteristics..................... _X_

4. Hydrography in relation to known or anticipated sources of contaminants.............................. _X_

5. Results from previous testing of the material or similar material in the vicinity of the project................................. _X_

6. Known, significant, sources of contaminants (e.g. pesticides) from land runoff or percolation............ __

7. Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances................................. __

8. Other public records of significant introduction of contaminants from industries, municipalities or other sources.................................... __

9. Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities.......... __

10. Other sources (specify)................... __

An evaluation of the appropriate information above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to constraints. The material meets the testing exclusion criteria [4.1.2].

YES__X__NO_____

Impact: ____N/A__X__INSIGNIF._____SIGNIF.

If the material does not meet the testing exclusion criteria above, describe what testing was performed and results: N/A

11. Effect on Aquatic Ecosystem and Organism Determinations: The Following ecosystem effects were evaluated [4.4.2]:

On Plankton ____N/A__X__INSIGNIF.____SIGNIF.______
On Benthos ____N/A__X__INSIGNIF.____SIGNIF.______
On Nekton ____N/A__X__INSIGNIF.____SIGNIF.______
Food Web ____N/A__X__INSIGNIF.____SIGNIF.______

12. Sensitive Habitats:
13. Sanctuaries, refuges __X__N/A___INSIGNIF.____SIGNIF.
14. Wetlands __X__N/A___INSIGNIF.____SIGNIF.
15. Mudflats __X__N/A___INSIGNIF.____SIGNIF.
16. Eelgrass beds __X__N/A____INSIGNIF.___SIGNIF.
17. Riffle and Pool Complexes_X_N/A__INSIGNIF.__SIGNIF.
18. Threatened & Endangered Species
____N/A__X__INSIGNIF.____SIGNIF.
19. Other Wildlife (grunion, Pismo clams)
____N/A__X__INSIGNIF.____SIGNIF.

20. Actions to Minimize Impacts:

Construction will be permitted to occur between 1 September and 15 March. If construction is proposed to occur outside of this window, additional resource agency coordination and environmental documentation will be required pursuant to the NEPA and the ESA prior to construction. Pismo clam and grunion impacts will be minimized and/or avoided by placement techniques.

21. Proposed Disposal Site Determinations: Is the mixing zone for each disposal site confined to the smallest practicable zone?

__X__YES ____NO

22. Determination of Cumulative Effects of Disposal or Fill on the Aquatic Ecosystem [4.1 - 4.10]:

Impacts: ____N/A__X__INSIGNIF.____SIGNIF.

23. Determination of Indirect Effects of Disposal or Fill on the Aquatic Ecosystem [4.1 - 4.10]:

Impacts: ____N/A__X__INSIGNIF.____SIGNIF.

IV. FINDING OF COMPLIANCE.

A review of the proposed project indicates that:

24. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose

__X__YES _____NO

25. The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and 3) violate requirements of any Federally designated marine sanctuary.

__X__YES _____NO

26. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values;

__X__YES ____NO

27. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

___X__YES _____NO

On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material is:

_______ (1) Specified as complying with the requirements of these guidelines; or,

___X___ (2) Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

_______ (3) Specified as failing to comply with the requirements of these guidelines.

Prepared by: Lois Goodman Position: Biological Sciences Environmental Manager
and Priscilla Perry Environmental Engineer

Date: February 10, 1999

APPENDIX C

COASTAL CONSISTENCY DETERMINATION

Determination of Consistency
with the
California Coastal Act of 1976

Port of Hueneme Harbor Deepening Project
Ventura County, California

February 1999

DETERMINATION OF CONSISTENCY

INTRODUCTION

This consistency Determination (CD) has been prepared by the U.S. Army Corps of Engineers, Los Angeles District (Corps) in support of the proposed harbor deepening project located in the Port of Hueneme Harbor (PoHH) in Ventura County, California.

As a Federal agency, the Corps is responsible for ensuring project compliance with the Federal Coastal Zone Management Act of 1972 (CZMA). Section 307 of the Act [Title 16, U.S. Code Section 1456(c)] states that Federal Actions must be consistent with approved state coastal management programs to the maximum extent practicable. The California Coastal Act is California's approved coastal management program applicable to the Proposed Project. To document the degree of consistency with the state program, the Act requires the preparation of a Consistency Determination (CD) when a project could have a direct effect on the coastal zone. This CD provides a description of the Proposed Project, identifies each relevant policy of the California Coastal Act, discusses the proposed project's consistency with each of those policies, and where applicable, describes measures, which when implemented, will result in project consistency with the policies to the maximum extent practicable.

The Corps has completed a Draft Environmental Assessment (EA) which identifies and discusses the purpose and needs related to this action, describes the existing environment, evaluates alternatives, and addresses the impacts of the Proposed Project alternatives as part of the decision process. The determination of consistency with the California Coastal Act is based on the analysis performed for both this CD and the EA. The EA was prepared in compliance with the Council on Environmental Quality (CEQ) Regulations (40 C.F.R. 1500-1508); and the procedural provisions of Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321, as amended.

CALIFORNIA COASTAL ACT

California's coastal management program was implemented by the California Coastal Act of 1976, and has been amended numerous times. The following portions of the Act provide relevant policy guidance of the CD:

- Declarations (Section 30007.5)
- Public Access (Sections 30210-30214)
- Recreation (Sections 30220-30224)
- Marine Environment (Sections 30230-30237)
- Land Resources (Sections 30240-30244)
- Development (Sections 30250-30255)

FEDERAL PROJECT OBJECTIVE

The primary planning objective identified is to direct formulation and evaluation of alternative plans based on the analysis of the identified problems, needs, and opportunities and the existing physical, human, and environmental conditions of the study area to increase the efficiency of cargo product throughput in a way that maximizes net benefits to the national economy, while having the least impact on the environment.

This objective concerns compliance with Federal, State, and local environmental statutes, regulations, laws, and policies, and is characterized by the following four environmental goals: 1) avoid any unacceptable adverse impact on environmental resources; 2) where impacts are not avoidable, they should be minimized to the greatest possible extent; 3) any remaining unavoidable impact must be mitigated to a level that is not significant; and 4) improve or restore environmental quality wherever possible without adding undue cost or compromising the primary objectives.

SUMMARY OF PROPOSED ACTION

PROJECT DESCRIPTION

Port modifications involve dredging the approach and entrance channels, the turning basin, channel A, and channel A berthing areas, and placing the material on-shore or near-shore at Hueneme Beach. A site screening process was implemented to test material suitability for beach compatibility. Test results indicate that project sediments are physically and chemically compatible with beach sediments. Under the Recommended Plan, the Main Approach Channel would be dredged to -13.2 m MLLW, and the Entrance Channel, Turn Basin, Channel A, and Berthing Area would be dredged to -12.2 m MLLW. Approximately 485,000 m^3 of material would be dredged over 3.5 months (including mobilization and demobilization).

PURPOSE AND NEED

The project purpose is to efficiently accommodate larger, deep-draft vessels, increase cargo efficiency of product delivery and reduce overall transit costs. The Environmental Assessment (EA) provides greater detail on the proposed project, the existing environment, and the project's potential environmental effects.

COASTAL POLICIES AND POTENTIAL EFFECTS

All Federally conducted or supported activities directly affecting the coastal zone are to be undertaken in a manner consistent to the maximum extent practicable with approved state coastal management programs. Under Section 930.32 of 15 CFR, Chapter IX, the term "consistent to the maximum extent practicable" describes the requirement for Federal activities to be fully consistent with state coastal management programs unless compliance is prohibited based upon the requirements of existing law applicable to the Federal agency's operations.

In the sections that follow, each relevant policy from the California Coastal Act is provided (in italics). Following each policy is a brief discussion of project consistency with each element of the policy.

DECLARATIONS

Section 30007.5:

The Legislature further finds and recognizes that conflicts may occur between one or more policies of the division. The Legislature, therefore, declares that in carrying out the provisions of this division, such conflicts are to be resolved in a manner which, on balance, is most protective of significant coastal resources. In this context, the Legislature declares that broader policies which, for example, serve to concentrate development in close proximity to urban and employment centers may be more protective, overall, than specific wildlife habitat and other similar resource policies.

PUBLIC ACCESS

Section 30210:

In carrying out the requirements of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse. (Amended by Ch. 1075, Stats. 1978.)

The proposed POHH deepening and improvement project with disposal of dredged material at Hueneme Beach will not cause a significant adverse impact upon public access to the harbors, local beaches, or associated recreational facilities. Public access will need to be limited within the immediate area of the dredging and disposal operations for safety reasons. If the on-shore disposal option is used, temporary ramps will be built over the pipeline at road crossings, and at intervals along the beach, to maintain public access to the maximum extent practicable. If a hopper dredge or clamshell dredge is used, some temporary restrictions on swimming, surfing, and surf fishing may be required, for safety reasons, in a limited area. Navigation is not expected to be significantly impaired during the construction period. The Proposed Project is, therefore, consistent to the maximum extent practicable with this policy section.

Section 30211:

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

As discussed under **Section 30210**, the proposed project will not significantly interfere with the public's right of access to the Pacific Ocean and Hueneme Beach where existing access has been previously provided. Access ramps would be provided if a pipeline is placed on the beach. Construction activities, including beach disposal, would be conducted, primarily in the fall and winter, when recreational use is lower. The longer-term effect of the disposal action will be a wider, sandier beach, providing a higher quality recreational experience than under existing conditions. Therefore, the Proposed Project is consistent with this policy section.

Section 30212:

(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,

Public access will be limited only near the construction equipment for safety purposes thus, this policy is consistent with the need to maintain public safety. The proposed action is not a new development, but an improvement of an existing facility. Therefore, the Proposed Project is consistent with this policy.

(2) adequatee access exists nearby, or,

If on-shore disposal is used, temporary ramps will be built over the pipeline at road crossings, and at intervals along the beach, to maintain public access to the maximum extent practicable. The Proposed Project is, therefore, consistent to the maximum extent practicable with this policy section.

(3) agriculture would be adversely affected. Dedicated access way shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

This policy is not applicable to the Proposed Project.

RECREATION

Section 30220:

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

The proposed POHH deepening and wharf modification activities are intended to provide a safe navigable channel for deeper-draft vehicles. The disposal of dredged material will provide a well-nourished beach. Recreational uses of the area are heaviest in the summer and are not expected to be significantly adversely affected, since the construction activities are scheduled for the fall and winter months. Public access to nearby recreational facilities at the selected disposal site will remain available during the construction period. Disruption to the recreational facilities within the project area is considered minimal and short-term, and the nourished beach will be expected to increase recreational opportunities in the area. Therefore, the Proposed Project is consistent to the maximum extent practicable with this policy section.

MARINE ENVIRONMENT

Section 30230:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

The affected habitat consists primarily of marine waters including portions of soft bottom habitats and sandy beaches. (A more detailed discussion of the existing marine resources is provided in Section 4.2 of the EA. A detailed discussion of the project impacts, including measures to avoid or minimize such impacts is provided in Section 7. 2). The following is a summary of the marine resource impacts and the mitigation measures designed to minimize impacts to a level of insignificance.

Activities at the dredge and disposal sites will result in temporary beach, intertidal, and soft-bottom impacts. Dredging, disposal, and wharf improvement activities will have noise impacts to marine life (i.e., fishes, marine mammals, and marine birds).

The most direct impact of dredging will be the elimination of all benthic organisms from the immediate dredging areas. A secondary impact of the dredging will be the redisposition of suspended sediments on adjacent areas. If the rain of fines is minimal as it will be with hydraulic dredging, adjacent animals may work their way up through the sediment (Soule and Oguri 1976). All of the organisms that live in and on the sediment in the channels to be dredged and on the pier piles to be removed will be displaced or destroyed. After the termination of the dredging, the affected area will be recolonized.

Potential water column impacts at the dredging site include increased turbidity, increased oxygen demand and release of contaminants and nutrients. Because the material to be dredged is expected to be clean sand, oxygen depletion, eutrophication, and resuspension of contaminants are not likely to be problems (also see Section 7.1 of the EA, Oceanography and Water Quality Effects). Water column effects will be largely limited to turbidity in the immediate vicinity of the dredge site.

Turbidity impacts on plankton, and benthic organisms is discussed in the EA in Section 7.1.

Fishes and marine birds that feed on benthic invertebrates will also suffer a localized, short-term loss of food. Because the area which will be dredged is such a small portion of the local habitat, the impact of loss of food on fish populations is judged to be adverse but not significant.

Impacts of dredging on fish will largely be limited to temporary avoidance of the dredging area and localized loss of some food resources. Lethal effects of suspended sediment on fishes are not anticipated. Because turbidity is expected to be localized in time and space and because fishes will be able to avoid the turbidity plume, these impacts will not be significant.

Construction operations will also create noise that may have impacts on marine life. The noise and activities in the harbor and offshore may disturb fishes, marine mammals, or seabirds. The noise of the proposed operations will occur against a background area with large amounts of vessel traffic, although construction noise from wharf modification activities are expected to be above background noise levels. Noise impacts on fishes are judged to be adverse, but not significant.

Marine mammals are sensitive to noise and disturbance from dredging and construction activities also. The marine mammals most likely to be impacted will be gray whales, common dolphins, harbor seals, and sea lions because those are the species that occur with any frequency in the nearshore waters where the project will take place.

Impacts of noise on gray whales (recently removed from the Federal Endangered Species list), and other cetaceans has been a particular concern. Gray whales normally occur several miles offshore during migration, outside the range of noise impacts, but some individuals have been known to occur closer to shore. Acoustic signaling appears to be a critical factor in the communication of many cetaceans, and acoustic emissions presumably play an important role in food finding, navigation, and predator detection (Hermand and Tavolga 1980; Norris and Dohl 1980). Factors that mask these acoustic signals and other emissions, or otherwise interfere with the reception of important environmental sounds, can be deleterious to cetaceans. The noise of the dredge will be a steady machinery noise rather than a loud startling noise, and it will occur against a background of other vessel activities. Construction noise associated with the wharf modifications would be louder than ambient, and may cause cetaceans to temporarily avoid the area. Pinnipeds, primarily harbor seals and sea lions, may also avoid the immediate construction area, although these animals often frequent areas of human activity. Because no rookeries or major haul out sites are within the project area, impacts to seals and seal lions will be adverse, but nonsignificant.

There may also be localized disturbance to seabirds from the noise and activity of the dredge and construction equipment at the wharf modification site. As the dredge and other equipment will not be operating in the immediate vicinity of any important seabird breeding areas, noise impacts are judged to be adverse, but nonsignificant.

Turbidity can impact visually foraging seabirds by making it difficult for them to see their prey. Because turbidity from the dredge is expected to be short-term, localized, and near the bottom (for a cutter-head dredge), impacts on visually feeding seabirds are expected to be insignificant.

Visually feeding birds will also likely avoid foraging in areas near the immediate vicinity of the dredge because of the increased turbidity. Disturbance of feeding or roosting birds will probably result in temporary dispersal away from the dredging area. Birds will be expected to return after the termination of dredging. Impacts of dredging on birds will be insignificant.

Of the threatened and endangered species, only the brown pelican and the least tern will potentially occur within the dredging area and wharf modification areas. The noise and activity of dredging will likely disturb the pelicans which rest on the nearby breakwater and jetties. However, there are several other loafing areas available in the local area for the pelicans to use. Turbidity from dredging and disposal may prevent pelicans and least terns from foraging in the vicinity of the dredge and disposal sites; however, sufficient additional feeding areas are available in the project vicinity. In addition, the project is expected to be completed prior to the least tern breeding season.

In addition to turbidity impacts, the resuspension of sediments can expose organisms to contaminants associated with the sediment. Sediments in the proposed dredge area have been analyzed for toxicity, and the levels of contaminants are generally low (also see Section 4.1.1.3, Chemical Properties, of the EA).

Disposal activities will affect organisms that use the beach and the nearshore waters. Sandy beach invertebrates such as beach hoppers and sand crabs will be crushed and/or buried. These species are adapted to periodic disturbance. Recovery of the community will be expected to occur rapidly (within a year). Because recovery will be expected to occur within a year, impacts on beach organisms will be adverse but insignificant.

Some activity may also occur in the intertidal zone. (This environment is a rigorous one of constantly shifting sand.) Most of the dredged sediments will consist of large grained sand particles and will sink rapidly. Sediments may be expected to remain in suspension approximately 15 minutes or less (Corps-LAHD 1992). Silt fractions may remain in suspension for up to 30 minutes and some of the fine grained material may drift as far as 3,000 feet or less from the discharge site. Although there may be some minor turbidity impacts from this discharge on planktonic organisms, benthic organisms, fishes and visually feeding seabirds and marine mammals, these impacts are expected to be adverse but insignificant because impacts will be localized to within 3,000 feet or less from the receiver site. Impacts on intertidal marine life will be adverse but insignificant.

Effects of disposal on marine life offshore will result primarily from turbidity and suspended sediments. Impacts are as discussed above and in Section 7.1 of the EA.

Disposal activities, including human and equipment activity, may also disturb shorebirds foraging in the vicinity of the disposal site. Impacts on shorebirds will be adverse but not significant because only a small area of the sandy beach or nearshore waters will be disturbed on a daily basis, the disturbance is temporary (3.5 months), the adjacent undisturbed beach will be available for shorebird foraging, and the displaced birds will be expected to immediately return to the area when disposal and grading of the beach ceases. Some shorebirds may actually be attracted to the site to forage on organisms dredged with the sediments.

There may be a potential for a spill or an accident which will cause an unplanned release of materials from the dredge or construction equipment at the wharf. Minor spills or leaks are not expected. If one occurs, it will be short term and localized and will not be expected to have a significant impact on marine life. If a large fuel spill occurs in the ocean waters, it will have a significant adverse impact on marine life. However, because all operations will follow accepted safety standards, the likelihood of a disastrous accident is low (Section 7.5.2 Vessel Transportation of the EA).

It is also possible that a fuel spill could occur from a cargo vessel entering the Port; however, this is also unlikely. The proposed action would result in fewer, but larger, vessels using the harbor. The potential for a spill would be reduced, due to fewer vessels; however, the magnitude of a spill, should it occur could be higher than under existing conditions.

Dredging and disposal are scheduled to occur between October 1 and March 1. This schedule will avoid impacts to the Endangered least tern and Threatened snowy plover. The Endangered brown pelican is expected to avoid the area at any time of the year and would not be affected. The wharf construction schedule could extend beyond March 1, however, the brown pelican is the only listed species potentially found in that area, and it would temporarily avoid the area. The construction schedule will also avoid impacts to California grunion, a unique and sensitive species. Impacts to the Pismo clam, another sensitive species, will be minimized by disposing above +0 m MLLW with on-shore disposal or below -3 m MLLW. The Proposed Project is consistent to the maximum extent practicable with this policy section.

Section 30231:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection *of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

A discussion of the relationship of the project to biological productivity and quality of coastal waters was addressed above in response to Section 30230. It is anticipated that productivity lost due to dredging, disposal, and wharf construction activities is relatively short-term with reestablishment of an "equilibrium" type benthic community within a year. This project will not have a significant impact on the biological productivity and the quality of coastal waters, and will not affect streams, wetlands, estuaries, and lakes.

This project will not generate an additional significant load of waste water or require fresh water supply that will deplete ground water supplies nor does it significantly affect surface water flow. The Proposed Project is, therefore, consistent to the maximum extent practicable with this policy section.

Section 30232:

Protection against the spillage of crude oil, gas, petroleum products, of hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Vessel and safety impacts can occur since dredging and disposal activities will require the use of some heavy equipment, potentially including tug boats, barges, dredges, cranes, and support vehicles. To minimize safety concerns, activities will occur primarily during the off-tourist season. Work crews only will be permitted access to project areas.

Water-related impacts may occur with vessel traffic in the project area and the near vicinity as a whole. Because various types of vessels, such as fishing boats and recreational boats, traverse the proposed project area, there is a potential for vessels to collide with edge or support vehicles. Thus, the project construction area imposes potential safety concerns. To minimize the potential concerns, equipment will be properly marked, the project area will also be appropriately marked with buoys and caution flags, and notifications will be posted, as discussed in Section **7.5.2.1** of the EA.

If a pipeline is used to transport material from the harbor to Hueneme Beach, additional vessels will be used to lay the pipe from the dredge site to the receiver beach. (The pipeline will be appropriately marked.) Because this increase of a few pieces of equipment is negligible as compared to the total areal vessel traffic, and the limited distance of travel to set and remove the pipeline along with the limited nature to conduct the beachfill, the additional construction-related vessel traffic will not result in a significant impact.

If a hopper dredge or clamshell dredge is used, a barge and possibly a tug will be operating continuously during construction. Because travel distance will be primarily associated with dredging activities, there will be minimal daily movement. This additional increase in traffic will be negligible. Because these vessels often operate in the presence of other vessels and obstacles with little problem, safety impacts will be considered insignificant.

Since the appropriate notices will be given, and based on the relatively few number of trips required and the limited duration of construction, vessel traffic associated with construction will cause minimal interference with public uses. In addition, craft should be able to navigate around obstacles created by the construction equipment. Construction will not impede access to any channels or entrance ways. Potential impacts will be adverse for the duration of the project, but not significant.

Beach impacts will be primarily related to the spreading of beach material by earth moving equipment. Because flagmen, if necessary, will be used to direct pedestrians and other vehicles using the area and signs will be posted to warn of the construction activities, ground traffic impacts will not be classified as significant.

A potential exists for accidental spillage of fuels, oils, lubricants, and other hazardous materials from temporary storage tanks, 55-gallon drums, or other containers brought to the site for the proposed activities. A similar potential exists for accidental spillage to occur from construction equipment fuel tanks. During all phases of project construction, all drums, containers, and temporary storage tanks containing fuels, oils, coolants, or other potentially hazardous liquids will be confined to the staging area and will be stored in a bermed area with an impervious floor located at least 100 feet from the waters edge. If a spill occurs, measures will be in-place to promptly and properly cleanup the spill. Impacts will be adverse, but not significant.

The potential also exists for equipment to leak fuel due to a mechanical or structural failure, or from grounding. The potential for a mechanical or structure failure is similar to that of other vessels, which is typically extremely low. Likewise, the potential for a grounding is also low because the vessel operator will be familiar with the area and will not operate under extreme weather conditions. Since the overall probability of a leak is unlikely and the amount of fuel that may be leaked is minor, potential impacts will be classified as not significant.

Initially, the Recommended Plan will reduce the number of deep draft vessel calls by 3 shipments per year. By the year 2020, the annual draft vessel calls to the Port will be reduced from 28 shipments annually without project to 20 shipments annually with project. This amounts to an approximate 30% annual reduction in the number of deep draft vessel calls to the Port. The size of vessels will increase, but this will not increase the potential for transportation incidents. In actuality, the reduced traffic and harbor improvements will increase overall navigation safety, with reduced probability of spills of contaminants. The Proposed Project is consistent to the maximum extent practicable with this policy section.

Section 30233:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following: (1) New or expanded port (harbor), energy, and coastal-dependent industrial facilities, including commercial fishing facilities... (b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems...

This project does not involve any diking or filling activities. The Proposed Project will involve dredging to deepen an existing harbor, which would not be considered open coastal waters. Dredging and spoils disposal have been planned and carried out to avoid significant disruption to marine wildlife habitats and water circulation The material has been determined suitable for beach disposal and will be disposed either onshore and/or nearshore at Hueneme Beach. Dredge spoils are suitable for beach replenishment and will be transported for such purposes to an appropriate beach, consistent with this policy section. The proposed Project is consistent to the maximum extent practicable with this policy section.

LAND RESOURCES

Section 30240:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.

The proposed action will not significantly disrupt any sensitive land habitats. Beaches will be restored to higher quality habitat than under pre-project conditions. The project will be timed and otherwise designed to avoid impacts to sensitive species found at the interface between the marine and land. The proposed Project is, therefore, consistent to the maximum extent practicable with this section.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

Beach disposal may temporarily disrupt a portion of Hueneme Beach, a popular recreation area, however the long-term effect of the beach nourishment aspect of the project will be beneficial for recreation and natural resources associated with the disposal area. Beach nourishment is the disposal option of choice when sediments are suitable. The Proposed Project is, therefore, consistent to the maximum extent practicable with this section.

Section 30244:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Currently there are no shipwrecks within the area of potential effects for the proposed project for any proposed alternative. There will be no impacts associated with wharf replacement as the original wharf is long gone. No impacts to cultural resources are expected. The Proposed Project is consistent to the maximum extent practicable with this section.

DEVELOPMENT

Section 30250:

(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.

The harbor deepening and wharf improvements will occur entirely within the existing harbor facilities. The Proposed Project is consistent to the maximum extent practicable with this section.

(b) Where feasible, new hazardous industrial development shall be located away from existing developed areas.

This policy is not applicable to the Proposed Project.

© Visitor-serving facilities that cannot feasibly be located in existing developed areas shall be located in existing isolated developments or at selected points of attraction for visitors.

This policy is not applicable to the Proposed Project.

Section 30251:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character surrounding areas, and where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Temporary aesthetic impacts will occur on Hueneme Beach, especially if on-shore disposal is used. The area is used for recreational purposes year-round and has a high level of visual sensitivity, especially in the peak summer season. To offset the impacts, activities have been scheduled to occur primarily during the low peak season. Therefore, disruptions will likely have a greater effect to the residences along the beach than to beach goers due to the time of the year. Although adverse aesthetic impacts will occur during the project duration, no residual impacts will occur. The proposed project will not result with incompatible structures and will not significantly alter the current character of the viewshed. Although the short-term visual impact will be adverse, the long-term effect of beach nourishment will be beneficial. The project is, therefore, consistent to the maximum extent practicable with this section.

Section 30253:

New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

This policy is not applicable to the Proposed Action.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

The proposed action would neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. The project is, therefore, consistent to the maximum extent practicable with this section.

(3) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.

The analysis in Section 7.6 of the EA demonstrates that emissions will not exceed *de minimus* standards. Prior to construction, coordination will take place with the Ventura County Air Pollution Control Board (VCAPCB) and if necessary an Authority to Construction/Permit to Operate would be obtained. The project is consistent to the maximum extent practicable with this section.

(4) Minimize energy consumption and vehicle miles traveled.

This policy is not applicable to the Proposed Action.

(5) Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.

This policy is not applicable to the Proposed Action.

Section 30255:

Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.

The proposed action is coastal-dependent. The proposed project is not sited in a wetland. The proposed Project is, therefore, consistent to the maximum extent practicable with the above policy.

DETERMINATION OF CONSISTENCY

The Corps has carefully evaluated the proposed Federal Action associated with the proposed harbor deepening, disposal, and wharf improvements. A determination of consistency with the relevant policies of the California Coastal Act for the Proposed Project has been formulated based on the following items:

- An analysis of project construction and the potential for direct adverse impacts to the resources of the coastal zone;

- The formulation and implementation of proposed mitigation measures to offset project impacts; and

- The policies of the State of California related to the Proposed Project as outlined in the findings and declarations of the California Coastal Act of 1976, as amended.

This coastal consistency determination declares that the actions that comprise the Proposed Project are activities that are consistent to the maximum extent practicable with the approved state management program, as specified in the Coastal Zone Management Act of 1972, as amended, Section 307(c)(1). Thus, the Corps has determined that the project is consistent to the maximum extent practicable with the California Coastal Act of 1976, Chapter 3, Coastal Resources Planning and Management Policies" as amended February 1982, for the reasons stated above and in this determination.