3.0 ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

This section discusses all environmental impacts, beneficial and adverse, of the proposed action. Section 3.1 addresses construction-related effects including actual construction activities and impacts resulting from the presence of the installed facilities. Section 3.2 treats environmental impacts resulting directly or indirectly from the active operation of the facility. Section 3.3. discusses the residual environmental effect of the project after it is terminated and the facilities abandoned.

3.1 CONSTRUCTION

3.1.1 Land Features and Uses

3.1.1.1 Land Use

The land use patterns of the Oxnard-Port Hueneme area will not be significantly affected by construction of this project. The proposed facilities will be constructed over a 34-month period, commencing in September 1975. During this period, the construction areas will be restricted from public use.

Marine Facilities

The marine facilities will be located in an offshore area and will require 83 acres of leased subtidal lands. The area presently has limited recreational value owing to lack of a permanent beach. (The sand bypassing operation deposits in the area every two years.) The portion of the coastline to be enclosed by the breakwater will not be accessible during the proposed construction.

LNG Transfer Line

The LNG transfer line is planned to be constructed within the existing right-of-way of the Ventura County Railroad. It will not affect uses of the right-of-way.

Vaporization Facilities

Applicant has purchased 150 acres of land for the proposed project. The southern portion of the property is currently zoned for heavy industrial use, and the northern portion for residential-agricultural. This area is master-planned for industrial use (Gruen Associates, 1969, 1970). Thirty-eight acres of this will be used for the plant site. Therefore, the proposed industrial use for this land is consistent with the Oxnard General Plan for the area. The 38 acres to be used for the plant site represent only 0.04 percent of the land under cultivation in Ventura County in 1972. The proposed land use change will not have a significant impact upon the area.

Seawater Exchange Line

The seawater exchange line will be located on the eastern boundary of the property (Plate 1.2-2). At the southern end of the property, it will turn southeasterly and parallel the existing Edison fuel oil line. It will have no effect on existing land uses.

Surrounding Area

The construction labor force will be derived from the existing labor pool and no permanent in-migration of population will be attributable to this project alone. Therefore,

there will be no permanent demand created for residential or commercial improvements in the communities which would affect present or future land use.

3.1.1.2 Traffic

Road access to the construction site of the vaporization facility is presently available via McWane Boulevard from the east. Two additional access points from the north and west will be available for the purpose of minimizing construction traffic congestion around the site.

Automobile and truck traffic to and from the sites will consist primarily of the following:

	Plant Site	Berthing Facilities
Peak Construction Labor Force (Year of Occurrence)	1,050 (1978)	270 (1977)
Expected Daily Worker Vehicular Traffic	420	120
Total Concrete Truck Round Trips to Construction Facility	3,800	2,200

Traffic control personnel and equipment will be provided as necessary.

It is estimated that 80 percent of the daily vehicular traffic to and from the LNG plant site will utilize Saviers Road to the north. Current average daily traffic on this road is 7,670 vehicles and the maximum additional load imposed by the construction project will add an estimated 670 vehicles per day to this count--an increase of 8.7 percent. It is further estimated that 60 percent of the daily traffic associated with construction of the berthing facility will utilize Ventura Road.

This represents an increase in average daily traffic of 145 vehicles over the present count of 10,600 vehicles per day--an increase of 1.4 percent.

The ready-mix concrete trucks and other heavy vehicles traveling to and from the sites will utilize only those roads designated for truck traffic, except in the very immediate vicinity of the sites. The available truck routes to the sites are shown on Plate 3.1.1-1. Insofar as possible, routing of these vehicles will be dispersed among the several routes available in order to minimize the effect of truck traffic on any one geographic area.

Construction of the LNG transfer line between the berthing facility and the LNG plant site will require some temporary road closures at those points where the Ventura County Railroad right-of-way crosses Ventura Road, Surfside Drive, and Perkins Road. These closures, however, will be of short duration and will have only a minimal impact upon vehicular traffic flow.

The importation of 387,000 tons of quarry stone from Catalina Island for the breakwater will be made via barge. The total barge traffic created by breakwater construction is estimated to be about 220 round trips during the 12-month construction period. This represents an increase in annual ship traffic in the Port Hueneme area of approximately 43 percent.[1]

The construction sites are not within the established flight patterns of any local airports. The construction project

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[1]Estimated 1974 vessel traffic is 102 commercial and 140 military vessels, for a total of 242 vessels per year.

will not interfere with the operations of the Point Mugu or Port Hueneme Navy installations.

3.1.1.3 Topography, Soils, and Geology

Construction of the proposed LNG vaporization and storage facilities will result in terrain modification on the northern portion of the property. To improve drainage and to dispose of excess soil from excavations, the plant areas and the access road will be raised approximately 3 feet above the existing natural ground level during grading operations. The area west of the tanks will be used as a spoils area for about 180,000 cubic yards of material excavated for two LNG tank foundations. If the third tank is constructed, the excess material from its excavation will also be placed in this area.

In order to maintain the existing drainage pattern, the area will be sloped at a minimum of 0.5 percent in the general direction of existing flow. Storm water runoff will be collected by means of ditches and channels and directed to the Oxnard Industrial Drain.

Construction of the proposed facilities will affect the soils in the area only to the extent that excavations will be made and soil will be removed. Neither the ease nor rate of erosion of on-site soils will be affected by construction. No subsidence or significant settlement should occur due to construction of the proposed facilities. No over-steepened slopes or any other potentially unsafe condition will be created as a result of construction operations.

Construction of the proposed facilties will not deplete any existing mineral resources or require the

development of new sources for construction materials. Armor rock, required for construction of the breakwater, will be obtained from an existing operating quarry on Santa Catalina Island. Quantities of rock in excess of the requirements for this project are stockpiled at the quarry; therefore, no expansion of the quarry nor increased operation will be required for this project.

Construction of the proposed facilities will not affect the physiography, geology, or seismicity of Southern California or the Oxnard Plain.

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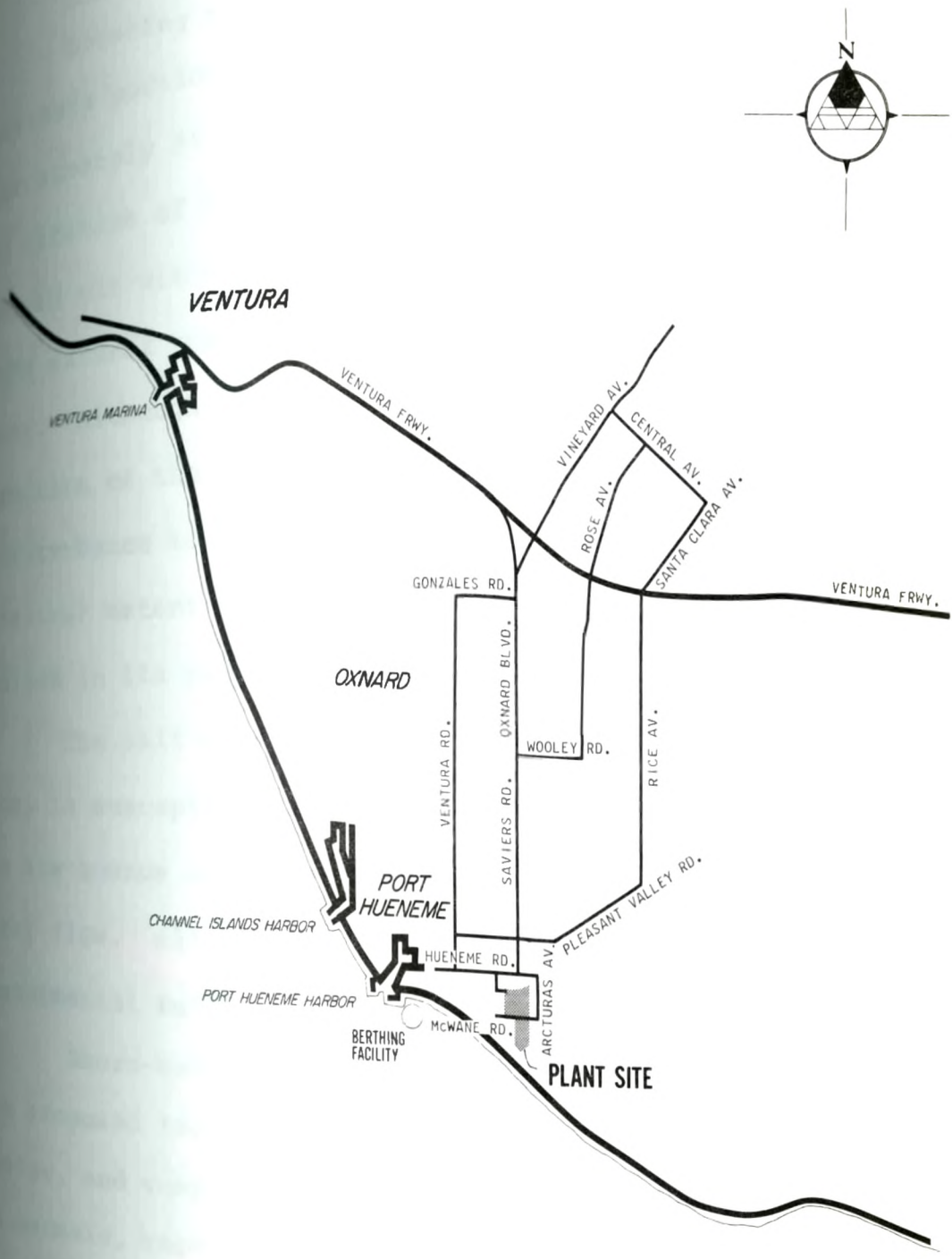

TRUCK ROUTES TO PROJECT SITES

0 1 2 3 4 5 6 7 8 9 10
SCALE IN MILES

DAMES & MOORE

PLATE 3.1.1-1

3.1.2 Species and Ecosystems

3.1.2.1 Terrestrial Biology

Vaporization and Storage Facilities

Locating the proposed facilities on the east side of the northern portion of the site will result in the elimination of approximately 38 acres of cropland (vegetables) during the actual lifetime of the project. This proposed transition will be carried out without significant long-term adverse impact upon the natural remnant plant communities and wildlife on the property. Although a portion of the property will be disturbed, construction of the proposed facilities will be carried out so that disturbance to surrounding habitats will be minimal. To the greatest extent possible, the salt marsh area will be maintained in its present condition.

The salt marsh, including the inland fresh water portion, is susceptible to the effects of terrain modifications within its bounds and on adjacent land because of the influence on water flow. All grading will be carried out in a manner not detrimental to the salt marsh or the Hordeum grassland.

Short-term adverse impacts associated with construction of the proposed facilities include those associated with dust and noise, and temporary reduction of the population sizes of small mammals, reptiles, and amphibians in the zones of terrain modification and lost weed and crop cover. Because the salt marsh and sand dunes will be maintained as natural habitats, it is unlikely that any species present will be permanently excluded from the property.

With the precautions to be taken, no significant short- or long-term detriment on the terrestrial ecology will result from the construction. A long-term benefit will be derived from preserving the salt marsh and surrounding native habitat and from adding trees during landscaping, which will provide a valuable but presently absent habitat.

Discharge of water from site dewatering or hydrostatic testing of storage tanks into the existing drainage canal would provide a short-term benefit by increasing (within the limits of normal storm runoff) the availability of standing fresh water on the site.

No rare, endangered, or protected species will be affected by construction of the facilities. Bird species in this category may be discouraged from using the preserved habitats on the property due to some of the temporary construction activities.

There will be no terrestrial biological impacts associated with the acquisition of the quarry stone from Catalina Island for the breakwater. The source quarry presently has sufficient material stockpiled for this project; no additional quarrying will be necessary.

LNG Transfer Line

Construction of the proposed LNG transfer line will require a zone of disturbance estimated to be about 50 feet wide, allowing for temporary storage and movement of equipment. The proposed and alternate LNG transfer line routes from the berthing facility to the plant site are shown on Plate 1.2-2.

The proposed railroad route for the LNG transfer line should not produce any significant adverse short- or long-term impacts. The alternate LNG transfer line route is primarily along an existing pipeline right-of-way and existing or future dedicated streets. It would cross the property north of the salt marsh in an already disturbed area. No significant adverse impacts appear to be associated with this route. No rare, endangered, or protected species will be affected and no migrations interrupted.

Seawater Exchange Pipeline

The width of the disturbance zone during construction of the proposed seawater exchange is estimated at about 50 feet. The proposed route of this pipeline (Plate 1.2-2) has been directed to existing pipeline and road rights-of-way. Short-term impact upon salt marsh and coastal strand plants and animals will be negligible. No long-term adverse impacts are associated with this route or construction. It will not affect animal migrations or any rare, endangered, or protected species.

1.1.2.2 Marine Biology

Construction-related impacts on the marine ecosystem at the berthing facility will be associated with breakwater and pier installation, dredging, and extension of the existing sand-bypass system. Hydrostatic testing of the LNG storage tanks and any dewatering at the plant site may also produce marine biological impacts. Breakwater construction will cause no marine biological impacts at the quarry site which is a land-only borrow site.

The existing Ormond Beach Generating Station offshore intake and discharge structures will not require modification for the proposed warmed seawater vaporization system. Thus, the selected seawater system will not result in any marine biological impact due to construction. Potential marine biological impact of construction of the alternate direct seawater system has been assessed and is discussed below.

Breakwater and Pier

The overall long-term marine biological impact resulting from construction of the breakwater and pier will be beneficial. This will result from the replacement of a small area of sedimentary habitat by a greater surface area of solid substrate. This change will yield greater diversity and productivity in the immediate area. Any biological impacts resulting from increased turbidity due to construction activity will be offset by a long-term decrease in ambient turbidity within the berthing area.

Breakwater and pier installation at the proposed berthing site will have initial detrimental direct impacts associated with the physical damage to surface and subsurface faunal elements which lie beneath the base of the breakwater and the piles of the pier. The surface area of available sedimentary habitat which will be affected is estimated at 325,000 square feet, based on a breakwater of 3,245 feet in length and an average base width of 100 feet, and a pier with approximately 200 piles of 1.5 feet in diameter. Some of this area will be recoverable to the infauna subsequent to installation because spaces will exist between the bottom layer of armor stone pieces

The direct detrimental impacts associated with the substrate changes from this installation are the short-term loss of those elements of the existing habitat which will be lying in the path of the breakwater installation and are insufficiently motile to escape from beneath either pile or armor stone placement (most of the benthic invertebrates), and the long-term loss of available sedimentary substrate beneath the structures.

The direct beneficial impacts are the long-term increase in species diversity and in sport fishing potential related to the increase in the amount of solid substrate available and shelter and local vertical relief. The net direct effect for this area should be a long-term benefit to the ecology of the berthing area.

The surface area of solid substrate which will be available for colonization by epifaunal species from the addition of the pier piles and breakwater will lie between 400,000 and 4,000,000 square feet, depending on the extent of the surface area of the individual pieces which bear upon each other or the bottom. The addition of solid substrate into a predominantly sedimentary habitat usually results in an increase in species diversity and in primary productivity. The nearest natural solid substrate in this area is 7 miles offshore, and the nearest natural coastal solid substrate is 11 miles downcoast (see Section 2.2.2.2). A number of artificial substrate additions have been made in the area, including the breakwaters at Hueneme and Channel Islands Harbors, the groins at the Mandalay Generating Station's discharge, and the rip-rap and risers of the Ormond Beach Generating Station's intake and outfall. Despite

the number of these additions, because of their small relative sizes, the substrate in this area is still predominantly sedimentary.

The availability of epifaunal and benthic algal species as prey items and the presence of both shelter and relatively high vertical relief will all tend to aggregate and maintain populations of fishes which are presently either absent or uncommon in the area (Turner, et al., 1969). This will result in an addition to the sport fishing potential of the area. The addition of this new solid substrate will provide a long-term, local net increase in primary productivity and species diversity.

Construction activity will cause a temporary increase in local turbidity. The presence of existing solid substrate habitat (e.g., the south jetty of Port Hueneme Harbor) will increase the potential for detrimental effects from this turbidity over that for sediment-only habitats. These effects would include a local decrease in benthic primary productivity, interference with the feeding mechanisms of some filter and deposit feeders (most of the nonpredaceous and/or scavenging invertebrates), and behavioral modifications in species whose actions are keyed by light intensity. Increases in turbidity caused by changes in wave refraction due to the breakwater will be restricted to the area outside of the new breakwater and in the surf zone. This area has no existing solid substrate and is an area of high natural turbidity. No effects from that increase are anticipated. The influence of the remaining sources on short-term turbidity increase should be slight and should produce only very localized negative impacts of small scale.

The surrounding solid substrate increases the potential for beneficial impacts from a long-term decrease in turbidity over that for sediment-only habitats. These benefits will be realized principally in increases of both primary productivity and standing crop of benthic algae. These increases should be passed along by food web and symbiotic relationships, resulting in increases in higher order productivity and standing crop, including increased potential for sport fishing.

The long-term decrease in turbidity due to the impact of pier and breakwater installation should produce a beneficial impact. The detrimental effects are short-term, local, and small in scope. The beneficial impacts will be local (but of broader influence than the detriments) and of moderate scope.[1]

Another indirect effect of breakwater installation will be the creation of a relatively low energy environment within the berthing area as a result of the protection afforded by the new breakwater. The creation of a protected, coastal, solid substrate habitat could lead to the development of biotic assemblages which would be uncommon in Southern California. Adding to the uniqueness of parts of these potential assemblages is the proximity of Hueneme Submarine Canyon. This submarine feature should allow the continued successful establishment of populations of species which are normally found only much further north or in deeper water.

In summary, the potential long-term beneficial impacts of pier and breakwater construction outweigh the short-term

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[1] Having measurable effects through more than one trophic level, though not leading to significant modification of the community.

detrimental impacts. All of the impacts of this part of the construction will be local, and only the beneficial impacts would appear to have more than small scope and to produce significantly unique effects.

Dredging

Dredging for the ship basin will result in short-term detrimental impacts to the marine biota. Existing fauna and habitat over 32 acres will be removed. Ultimately the new sedimentary habitat, which will have a greater surface area, will be recolonized by benthic fauna. The potential long-term impact due to a possible release of toxic substances from the dredge spoil does not appear likely; bioassays on the sediments to be dredged indicate that such effects will not be significant.

Removal. Mechanical removal of that part of the benthic fauna in the dredge path which cannot react in sufficient time to avoid the cutter head will result in a short-term detriment to the local environment. The species whose natural motility and sensory limitations would prevent them from moving out of the way of the dredge are most of the benthic invertebrates (see Tables 2.2.2-XII and -XIII). None of these species are of sport or commercial importance, and none are protected, rare, or endangered. While many of these species are linked by food webs to species of commercial or sport interest, the quantities of individuals to be removed, when compared with the numbers available, and the distributional densities and forage ranges of their vertebrate predators, make this potentially detrimental impact negligible. Further, the high densities

of the abundant species in the area (Intersea Research Corporation, 1972, et seq.), the tendencies of temperate invertebrate infauna toward short life spans and either high reproductive rates or brooding of young (Thorson, 1957), and the elimination of predators should result in a rapid recolonization of the dredged area.

There are both varietal and distributive differences between the 20- and 40-foot depth benthic faunas of the sedimentary habitats in Southern California (Jones, 1969; Intersea Research, 1972, et seq.; Fager, 1968). Hence, there will be a long-term change in the composition of the fauna of the deepened dredged area. Due to the extent of faunal similarity between Ventura and Point Dume (Section 2.2.2), these long-term changes over 32 acres are judged to be neutral, i.e., in both scale and scope of effect, neither beneficial nor detrimental.

The significant long-term change, then, would be in faunal quantity. Since the distribution of abundance of benthic invertebrates and their associated vertebrate components (mostly predatory fishes) within areas of similar substrate and productivity is proportional to available area, the long-term direct effect of the dredging will be to increase the quantity of the benthos in the directly affected area.[2] Thus, the direct effects in dredging the berthing area are seen to be beneficial in the long-term.

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[2]The area of any "bowl" surface being greater than the surface area of the "cover" over that bowl. Here the projected increase in surface area of the dredged portion of the berthing area is estimated at 15 percent.

The short-term detrimental effects of direct removal (discounting the stimulative effects of disbursing these injured or destroyed individuals back to a food-limited habitat; see Thorson, 1957) would appear to be outweighed by the increase in area of habitable substrate following the dredging activity. This increased area would have the indirect effect of supporting greater numbers of foraging predators and scavengers from the breakwater areas (mostly fishes and crustaceans).

Turbidity. One of the effects of dredging will be a change in ambient turbidity which results from any marine dredging process. After construction, decreases would result from the combination of the reduced wave energy (caused by and within the protective influence of the breakwater) and the deeper nearshore contours produced by the dredging activity.

Increases in turbidity could result in significant detrimental impacts on the local biota, including reduced primary productivity, interference with feeding in certain nonparcel-feeding species and negative aberrant behavioral modifications. Although all effects which are directly produced by construction activities are temporary, it is possible for a short-term detriment to outweigh a long-term benefit. Since maximum detrimental turbidity effects are associated with solid substrate habitats, disposing of the spoil will be done beyond the breakwater as is necessary to minimize potential detrimental effects.

Toxicity. The other indirect effect of dredging activity is to resuspend in the water column sediments which

might contain toxic substances. An examination of the geochemical properties of the sediments (Section 2.1.2.3) and the potential effects on water quality of dredging (Section 3.1.4.4) concluded that the sediments may be considered unpolluted according to Dredge Spoil Disposal Criteria (EPA, 1973).

To examine possible deleterious effects of multiple suspended toxicants, it was necessary to perform bioassays. Two types of bioassays were performed on sediment cores collected for this investigation: fish and algal (chlorophyll a). In the first case, determination of whether or not the chemical constituents of the resuspended sediments are acutely toxic was made. The likelihood of stimulating excessive algal blooms was assessed in the second case. In both cases, results were negative. Over the 96-hour fish bioassay experiments, the sediments were shown not to be acutely toxic (Table 2.1.2-XIII). In 20 of the 21 samples tested, all test fish survived. During the bioassay test of Sample C-3, one fish died. However, the sample was collected outside of the area to be dredged. Given the high survival of test organisms, it is probable that the single specimen which did die may have been injured in handling or succumbed due to other causes not related to the sediments. There was no mortality in the controls. EPA Region IX proposed criteria (1972) for algal bioassays state that chlorophyll a concentration must not be increased more than 25 µg/l above controls. Average chlorophyll a concentration was increased only 0.008 µg/l.

Algal and fish bioassays are complementary. For instance, if only algal bioassays were conducted it would be possible to argue that:

1. trace nutrient concentrations are so low that chlorophyll a production was not stimulated, or

2. toxic substances in the water retarded algal growth.

High fish survival in the fish bioassay tests argues strongly in favor of the first alternative. These data strongly suggest that sediment-suspended substances are not toxic to fish and do not stimulate primary productivity. No detectable adverse effects on the biota resulting from soluble entrained sediment toxicants is expected during or following dredging activities. The results of the biological tests, and also of conclusions based solely on the chemical and physical properties of the sediments themselves, lead inevitably to the conclusion that the sediments of the berthing area are not polluted and will not have significant detrimental biological impacts.

Direct Seawater System (Alternative)

Biological impacts from the possible pipeline installation would result from removal of the intertidal and subtidal fauna along the path required to bury the pipelines, possible burial of adjacent faunal elements due to back-filling, turbidity, and addition of new solid substrate of the intake and outfall and associated rip-rap.

If this alternate system were constructed, the biological impacts would be similar to, but of much smaller magnitude than, those associated with the berthing facility.

the area affected by dredging would be small and will be recolonized. There would be a small addition of solid substrate. Additional effects from this construction would be a temporary disruption in the intertidal zone and possible burial of faunal elements during backfilling. These are considered local and short-term impacts of negligible scope.

The maximum area which would be removed along the dredge path is estimated at 65,000 square feet based on side-by-side installation of two pipelines of 9 and 5.5 feet in diameter and 2,100 and 6,000 feet in length, respectively. This would pass through the intertidal and subtidal zones. The most extreme assumption is that all the individuals in this path would be destroyed. There are no available data to calculate an accurate survival estimate, but it is reasonable to assume that much of the meiofauna[3] would survive if hydraulic dredging were used. If the area from one mile northwest of the Mandalay Beach Generating Station to one mile south of the Ormond Beach Generating Station (with the exception of the Hueneme Canyon) is taken as a local, homogeneous unit (see Section 2.2.2), the dredge path represents less than 0.03 percent of that habitat assemblage. From Jones (1969) it can be seen that a general faunal assemblage continuity in fact extends from north of Ventura to Point Dume along the Southern California Bight.

The intertidal fauna which might be adversely affected by the dredging activity in this area is dominated by species

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[3]That part of the infauna smaller than the sediment particles which they live between.

which move both vertically and laterally along the beach with tides, season, storm waves, and associated changes in sediment grain size. Because of the high spatial and temporal variations in the distributions of the component populations of this biota, any effects of the dredge cut, beneficial or detrimental, will be extremely short in duration.

The possible burial of faunal elements adjacent to the dredge path by the sediments which are displaced by the introduction of the pipeline would have a similar negligible impact. The area affected would be greater (the estimated maximum area to be buried under ten or more cm of sediment would approximate 3 times the width of the dredge path[4]) and the mechanical damage much less than that associated with the direct removal of the dredge cut. The net impact would be local, short-term, and negligible.

Since the area is one of naturally high nearshore turbidity (see Water Characteristics in Section 2.4.3.4 and Kolpack and Straughan, 1972, p. 164), the effects of dredge-induced turbidity on the small existing benthic algal populations

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[4]The ten cm limitation on the calculation is based on the projected survival of the slower moving species (most infaunal invertebrates). The accretion of new sediments at the edge of the distribution zone which will not ever exceed 10 cm in new sediment depth should be slow enough to allow almost all of that fauna sufficient time to adjust their position in the sedimentary column. Most of these species are naturally distributed through the upper 10 cm of the undisturbed habitat. Those which live deeper in the sediments are generally more motile and should be able to survive a greater burial depth. In the intertidal the macrofaunal species are generally very active burrowers and the width of the area adversely affected by the wind and wave-induced redistribution of displaced sand should, consequently, be less.

on phytoplankton populations should be insignificant. Due to both the local and transitory nature of the dredging activity such effects are considered to be inconsequential to areal stability of community composition, structure, or productivity. Turbidity-induced impacts in this area will not adversely affect any commercial or sport fisheries or any protected, rare or endangered species either directly or indirectly. All effects of this turbidity increase are considered to be local, short-term, and insignificant.

The additions of an intake riser, outfall diffuser, and associated rip-rap would provide a small-scale addition to the locally available solid substrate, which would contribute new shelter and significant additional local vertical relief. The result would be an increase in local productivity and species diversity.

Plant Site Discharges

Discharge of hydrostatic test water from the LNG tanks and any dewatering discharge are not expected to produce any significant detrimental impact on the marine biology. There will be reduced salinity in the upper layers of the sandy intertidal zone and in the surf zone near the discharge point which will be rapidly dissipated. The effect will be less than that produced by normal storms in the area (see Section 3.1.4.4), and complete recovery of the area will be immediate.

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3.1.3 Socioeconomic Considerations

3.1.3.1 Labor Force and Employment

The construction project is expected to require a peak labor force of about 1,200 workers sometime during 1977. A forecast of average annual construction manpower requirements is as follows:

Forecast of Construction Labor Force

	Sept 1975 to June 1976	July 1976 to June 1977	July 1977 to Oct 1978
Average Manpower	50	550	765
Peak Manpower	90	1,190	1,080

This labor force will consist of employees of both the prime contractor and subcontractors. Construction is planned to begin in September 1975 with completion in October 1978. As of November 1973, the California Department of Human Resources Development (1973) had estimated that a total of 5,300 persons were engaged in contract construction in Ventura County. Total Ventura County population at this same time was estimated at 444,230 by the Ventura County Planning Department; thus, construction employees represent 1.2 percent of the total population. Applying this percentage to a 1978 population forecast of 545,000 persons in Ventura County (midpoint of high and low forecast, see Table 2.3.1-III), it is forecast that the number of construction employees will grow to about 6,500 persons by that time. The project's peak requirement of about 1,200 persons represents 18.3 percent of the available local pool.

The Ventura County Building and Construction Trades Council has estimated that a minimum of 90 percent of the required labor force will be drawn from within the Ventura County labor pool. Those from outside the county will fill certain specialized skills not readily available within this labor pool. On-site housing is not planned for the construction workers, since most will be residents of the area.

The construction labor required for this project is similar in scope and skills to that for the Ormond Beach Generating Station. Its construction began in 1969 and involved a peak of approximately 800 construction workers, most of whom were drawn from the Ventura County labor pool.

Gross direct wage payments to the construction labor force are estimated at about $34.6 million over the duration of construction. Estimated annual gross payroll and disposable income during construction are presented in Table 3.1.3-I.

At its peak, this construction project will be one of the largest "employers" in the Oxnard-Port Hueneme area, with the exception of the U.S. Government. The economic impact of this payroll upon Ventura County is discussed in Section 3.1.3.4.

3.1.3.2 Population and Housing

In keeping with the Ventura County Building and Construction Trades Council estimate, the maximum number of workers drawn from outside Ventura County will be approximately 120 (10% of the peak requirement of about 1,200 workers). Most of them will come from the greater Los Angeles area. It is typical for these workers (mostly with special skills not readily available from within Ventura County) to commute on

a weekly basis to the job site from their residences. Thus, a small demand will be placed upon rental-type living accommodations, i.e., apartments, motels, and hotels. Some will also live in campers or trailers. The total impact upon housing demand will be insignificant.

The construction phase will draw no new permanent residents to the area except for employees of the Southern California Gas Company, whose responsibilities, after completion of construction, will carry over into the operation phase. This impact is discussed in Section 3.2.3 of this report.

3.1.3.3 Public Services

Protective Services

Additional municipal fire and police equipment will not be required for the construction phase. All construction methods, procedures, and equipment will conform to the appropriate codes and standards. The required on-site hydrants, protective equipment, and emergency communications systems will be installed.

The closest station of the Oxnard Fire Department is located at Pleasant Valley and Cypress Roads, approximately 1.5 miles from the vaporization facility site. Port Hueneme is served by the Ventura County Fire Department, whose nearest station is at Clara and Second Streets in Port Hueneme. Additional facilities will not be required for either station. The U.S. Naval Station has their own fire department.

The three fire departments have executed a mutual aid agreement among themselves, making the resources of all three available in an emergency. In addition to the land-based

facilities, the Navy maintains a fireboat for offshore emergencies.

Neither the fire nor police departments will require additional personnel for the construction phase. Control and direction of vehicular traffic on and around the sites will be accomplished with privately employed flagmen and traffic patrols.

Schools

Since construction workers will be drawn primarily from the existing Ventura County labor pool, little relocation or importation of school age children is anticipated and, therefore, there will be no adverse impact upon the schools in the area.

Hospitals

Three hospitals are located in the general vicinity of the two construction sites. St. John's Hospital, a 316-bed general hospital, 5 miles north of the vaporization site, provides emergency treatment and is equipped with a helicopter landing pad. The Oxnard Community Hospital is a 49-bed facility located 4 miles north of the site. In Port Hueneme, emergency services are provided by Belinda Hospital, approximately one mile north of the proposed berthing facility. No significant impact upon hospital facilities or staff is expected.

Utilities

The vaporization plant site is presently served by a 10-inch sewer line and a 12-inch city water main, both located in McWane Boulevard. This capacity is sufficient for the needs during construction.

Sanitary facilities required during construction will be provided by portable chemical toilets. Upon completion of construction, these toilets will be removed. No impact is expected.

Railroad

Rail service is currently available to the LNG plant site along the eastern site boundary and is an extension of the Ventura County Railroad. Originally used during construction of the Ormond Beach Generating Station, the spur track is now seldom used. The spur was built with heavy duty 110-lb rails, fully adequate for the needs of the construction project. Approximately 200 rail cars of steel will be delivered to the site for tank construction. No adverse effect upon the rail system is anticipated.

3.1.3.4 Tax Benefits

The principal beneficial effects resulting from construction of the project are economic. The total construction payroll is estimated at $34.6 million over the 3-year construction period, of which $26.6 million will be disposable income (Table 3.1.3-I). An estimated 90 percent of this amount ($23.9 million) will go to those residing in the Ventura County area and will, to a large extent, be injected into the local economy. Typically, the major categories of expenditures would be as shown in Table 3.1.3-II. Expected sales tax revenue on the taxable portion of these expenditures (estimated at $12.3 million) is as follows:

Cities and County (1%)	$123,000
State of California (4%)	492,000
Total Tax Revenue	$615,000

Building permit and plan-check fees paid to the County of Ventura and the cities of Oxnard and Port Hueneme are based upon the value of construction and represent an impact upon their revenue (Table 3.1.3-III).

Ad valorem taxes on the partially completed facilities during the 3-year construction period is a third source of economic benefit to the communities. Table 3.1.3-IV summarizes the forecasted ad valorem tax on the improvements prior to completion of the project in October 1978.

Approximately $2.5 million in additional property tax revenue will be made available to the various government agencies during the 3-year period. Of this, more than $1.4 million will be directed to local schools in the area, although little additional burden will be placed upon these schools (see Section 3.1.3.3). Property taxes amounting to $181,600 designated for the city of Port Hueneme represent an approximate 57 percent increase in the property tax revenue to that city over the base fiscal year of 1971-72 (Table 2.3.4-IV).

Other beneficial effects include the purchase of construction materials such as concrete, and other locally available items.

3.1.3.5 Relocation

There will be no need for relocation of residences or businesses from the subject sites.

3.1.3.6 Public Access and Recreation

Public access to the sites will not be provided during the construction phase. Access by the public to the Port Hueneme waterfront area from the existing jetty to a point approximately

2,500 feet east will be hindered during construction of the berthing facility. In addition, recreational boating in the area of the proposed berthing facility will be curtailed during the construction period. Most recreational activities at the beach, however, are presently confined to the areas adjacent to and east of the Oxnard-Santa Clara Lemon Association building. Consequently, the construction impact upon the total recreational and economic value of the Port Hueneme beach areas will be small.

3.1.3.7 Visual Impact

General

Visual impact will result from the construction of the breakwater and the LNG storage tanks and vaporization facilities. The following paragraphs discuss the analysis of visual impact of the proposed structures upon the residents, commuters, and the recreational users of the area. Prior to summarizing the visual impact of the proposed construction, the approach, procedures, and analysis are outlined. Numbers in parentheses presented in this section correspond to the columns in Table 3.1.3-V.

Approach

The Ormond Beach Generating Station is the largest existing industrial facility present in the general area of the proposed project. It is presently the only widely visible facility in the area. Therefore, the proposed construction will be conspicuous to the four categories of people who live in the area or use its recreational facilities (1). In the area under consideration, where large industrial complexes do not dominate the landscape, the degree of visual impact can be defined in

terms of the amount of exposure that the proposed construction may have.

For simplicity, it is assumed that human reaction to sight of the proposed construction will be negative, although it is fully recognized that not all people will be equally affected at all times by the visual exposure to the proposed facilities. This assumption results in the exaggerated conclusions present in this section.

Considering the above, the visual impact of the proposed construction may be expressed in terms of a percent exposure number on a 0 to 100 scale (3). The 0 end of the scale indicates no one exposed, while 100 percent is the maximum possible exposure for the categories of persons considered. However, percent exposure without the time element (duration of exposure) is incomplete.

In order to reflect the time element, the duration of exposure (hours) is introduced in the analysis (4). The fraction of the exposed time is also determined from a 0 to 100 percent scale. In this case the 100 percent reflects that maximum fraction of the time that a person with normal daily activities (8 hours sleeping, 8 hours work, etc.) can possibly be exposed to the facilities (5). The product of the number of individuals exposed (2) x (3), the maximum exposure hours (4), and the percent exposure duration (5) results in the man-hours per day unit which defines the amount of exposure (6).

Procedures

The procedure used for determining the exposure of the LNG tanks to four categories (1) of the human inhabitants of the

general area considered are presented below.

The method chosen utilized helium-filled balloons flown at 121 feet above grade over each proposed tank location. All of the major streets in the area were driven to ascertain the visibility of the tanks (balloons) from various vantage points.

The visibility studies were carried out for an area defined by a circle of 2-mile radius which includes residential/recreational neighborhoods and two agricultural districts (Plate 3.1.3-1). Information on residential population was obtained from census reports (U.S. Department of Commerce, 1972). Published information on daytime population of parks and beaches was not available, but approximations were obtained from the Ventura County Planning Department (1973). Land use information was obtained from 1970 aerial photographs and site visits.

Analysis of Data

Analysis of the visibility survey data, summarized on Plate 3.1.3-1, was made to assist in further quantifying the visual exposure. On the basis of estimated numbers, four residential neighborhoods (III, IV, V, and VI) had the greatest exposure.

Actual visibility, however, in Neighborhoods V and VI will be less than the original estimates. Both of these neighborhoods border on Saviers Road, and Saviers Road was initially in direct alignment with the tanks, making them highly visible. On the basis of these findings, the tank layout has been changed to be off of this alignment. Further, a check of the interiors of Neighborhoods X and XI has revealed that little, if any, exposure will actually occur. It is concluded

from this that the actual visual impact on X and XI will be much smaller than suggested by the initial survey.

Neighborhoods III and IV are directly north of the site, and the potential for exposure to the present and future residents is relatively much higher than all other neighborhoods. Bubbling Springs Community Park, however, will not be visually exposed to the LNG tanks.

Using the data depicted on Plate 3.1.3-1, plus census data, aerial photographs, traffic data, and recreational use data, it was possible to estimate the number of man-hours per day that residents, recreationists, and commuters will be visually exposed to the LNG tanks. These estimates are presented in Table 3.1.3-V.

Visual Impact Assessment

The significance of the adverse visual impact of the proposed construction is judged on the basis of estimated man-hour exposure expressed in terms of percent of the maximum possible man-hours per day exposure (7). Visual impact assessment for the breakwater and the LNG storage tanks on this basis are presented below.

Breakwater. The 20-foot-high breakwater will be visible to the people using the beach and to residents of the three-story beach-side condominiums adjacent to the existing harbor. Otherwise, the new breakwater will have negligible visibility from the land.

As many as 5,000 individuals use the beach on an average summer weekend day (County of Ventura, 1973). It is judged that the visual impact of the breakwater on the

recreational users will be significant. The overall effect of the breakwater construction will be general scenic degradation of the immediate beach area.

A rough estimate suggests a potential visual exposure of about 200 residents of the three-storey condominiums. The proposed breakwater will not cut off the view of the water from any of the residential dwellings. It is estimated that the visual impact of the breakwater on the condominium dwellers will be moderate. The breakwater will not be visible to onshore commuters.

It should be recognized that both the condominum residents and the beach users are only a fraction of the people who live in the Oxnard and Port Hueneme area. The visual impact of the proposed breakwater on the total inhabitants of the Oxnard-Hueneme area will be insignificant.

LNG Storage Tanks. The visual impact of the proposed LNG storage tanks in terms of man-hour per day exposure will be similar to the visual impact of the breakwater presented above, except that the proposed storage tanks will have a moderately significant impact on the commuters.

The overall adverse visual impact of the proposed vaporization facilities, which include the proposed storage tanks, will be greatly reduced by the planned extensive landscaping described in Section 4.2.2. Further, the height of the tanks was reduced to 109 feet above ground level. The lowering of the tanks will not significantly reduce the amount of man-hour per day exposure. However, it will lessen the visual intrusion.

3.1.3.8 Other Impacts

The construction project will not affect historical, archaeological, or cultural sites. Any archaeological discovery during construction will be evaluated by qualified specialists before further disturbance or removal. Preconstruction landscaping at the plant site will help reduce the visual and noise effects of construction activities. The project will have no effect upon the operations of the Point Mugu and Port Hueneme Navy installations.

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LNG TANK VISIBILITY

0 1 2

SCALE IN MILES

DAMES & MOORE

PLATE 3.1.3-1

TABLE 3.1.3-I

FORECAST OF CONSTRUCTION DIRECT WAGE PAYMENTS
IN 1973 DOLLARS
($ millions)

	1975 (3 months)	1976	1977	1978 (9 months)	Total
Gross Payroll*	$0.5	$3.6	$12.4	$18.1	$34.6
Disposable Income**	$0.4	$2.8	$9.5	$13.9	$26.6

*Includes allowances for overtime; does not include fringe benefits.

**After allowance for taxes, disability insurance, social security.

TABLE 3.1.3-II

PROJECTED EXPENDITURE OF DISPOSABLE INCOME IN VENTURA COUNTY

(1973 Dollars in Millions)

Item	Typical Percent Allocation	Expenditures Resulting From Project Construction Wage Payments (3 Years)
Food and Beverages	19.0	$4.54 million
Housing & Household Operating Expenses	19.0	4.54
Clothing and Shoes	7.5	1.79
Autos and Parts	7.5	1.79
Furniture and Household Equipment	7.0	1.67
Medical and Other Services	13.0	3.11
Other Uses (Including Savings)	27.0	6.46
TOTAL	100%	$23.90 million

TABLE 3.1.3-III

PERMIT AND PLAN CHECKING FEES

Jurisdiction	Estimated Permit Value of Construction	Building Permit and Plan Checking Fees[1]
County of Ventura (unincorporated)	$66.621 million	$166,100
City of Oxnard[2]	3.667 million	5,800
City of Port Hueneme	27.887 million	42,200
Sub-Total	$98.175 million	$214,100
State of California Surcharge[3]		6,900
Total Fees		$221,000

[1]The County of Ventura has adopted its own schedule of fees; the cities of Oxnard and Port Hueneme utilize the Uniform Building Code guidelines to derive fees.

[2]Includes that portion of LNG pipelines which passes through the City of Oxnard.

[3]Surcharge imposed by State of California Division of Mines and Geology for seismic instrumentation.

Reference: County of Ventura, 1973; City of Oxnard, 1973; City of Port Hueneme, 1973; State of California, 1973.

TABLE 3.1.3-IV

PROJECTED AD VALOREM (PROPERTY) TAX PAYMENTS DURING CONSTRUCTION

	Tax Year			
	1976-77	1977-78	1978-79	Total
Property Tax Assessment Made on March 1	1976	1977	1978	-
Estimated Value of Construction Completed on Assessment Date Within:				
County of Ventura	$1.3 million	$ 8.0 million	$40.0 million	-
City of Oxnard	0	1.6 million	3.3 million	-
City of Port Hueneme	3.0 million	12.5 million	25.1 million	-
TOTAL	$4.3 million	$22.1 million	$68.4 million	-
Property Tax Revenue to:				
General County of Ventura	$ 26,200	$134,700	$ 417,000	$ 577,900
City of Oxnard	0	6,600	13,200	19,800
City of Port Hueneme	13,400	55,900	112,300	181,600
Schools	65,400	335,900	1,039,600	1,440,900
Other	17,500	90,300	209,000	316,800
TOTAL	$122,500	$623,400	$1,791,100	$2,537,000

Notes:
1) Calculations based upon FY 1972-1973 property tax rates.
2) Includes only incremental additions to total property value; therefore, land value has been excluded.
3) Assessed valuation at 25% of construction value.

Reference: Property tax rates from Ventura County Tax Assessors Office, 1973.

TABLE 3.1.3-IV

DAMES & MOORE

TABLE 3.1.3-V

VISUAL IMPACT ANALYSIS[1]

FOR STORAGE TANKS, SHIPS, AND BREAKWATER

Categories Considered	Number Exposed		Duration Exposed		Visual Impact	
	Maximum No. that can be exposed[2]	Estimated % that will be exposed	Maximum hours/day people can be exposed[2]	Estimated % duration people will be exposed	Estimated Exposure[3]	% of maximum possible exposure
	People	%	Hours/day	%	Man-hour/day (2)x(3)x(4)x(5)=(6)	% (6)÷[(2)x(4)] =
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Residing in the general area of Oxnard-Hueneme	102,670	35	8	10	28,747	3.5
Condominium dwellers	200	75	8	40	480	30
Commuters[4]	4,550	80	0.4	50	728	40
Recreational uses	1,430	100	1.4	100	2,000	100

[1]The analyses account for residents who are also commuters and beach users.
[2]The values in columns (2) and (4) are averaged for 365 days (one year).
[3]Man-hour exposure per day will vary with the population trends. However, the percentages will remain constant.
[4]This table is applicable for the visual impact of the breakwater with the exception of the commuter category.

3.1.4 Impact on Air and Water Environments

3.1.4.1 Air Quality

Construction of the Port Hueneme LNG vaporization facility will not have a significant impact on the existing air quality of the area. During initial site preparation activities, brush and debris will be hauled away for suitable disposal. There will be no air pollution from on-site open burning.

Movement of vehicular traffic, construction equipment, and other construction activities may cause localized short-term particulate loadings of vagrant dust in the atmosphere in the vicinity of the site. Amelioration or abatement of this problem will be accomplished by a program of wetting temporary roads and paving or oiling permanent construction and access roads, and restricting traffic when possible to these roadways. Additionally, any areas to be graded where significant amounts of earth moving are required will be wetted to reduce dust.

There will be only minor emissions of air contaminants from the site during the construction phase. Emissions will be limited to sources such as gasoline and diesel-powered construction equipment, and space heaters. Inconsequential emissions of volatiles and dust may result from painting and insulation application.

3.1.4.2 Noise

A construction site, with both stationary and moving equipment, is a complex noise source. The noise levels are functions of time, position, and type of work in progress. Studies of "typical" construction sites have been performed and "typical" levels reported (Bolt, Beranek, and Newman, 1971). "A" weighted noise levels, measured at 50 feet to 200 feet, ranged from 70 to 90 dBA. The measurements were made in communities with a 50 dBA ambient level, and they reflect the complexity of the source. The L_{50} noise levels measured for this project are similar to the communities used in the referenced report. The L_{10} or intrusive noise levels measured for this project are about 10 dBA above the ambients (see Plates 2.4.3-4 through -12).

Periodic checks will be conducted to insure that the L_{50} levels in the community are not being severely affected. The project is anticipated to have little impact on the present noise environment as most work will be performed during the day. Noise impact from construction will be minimized by careful selection of equipment, proper scheduling of construction, and meeting the requirements of OSHA for worker hearing protection. Contractors will be made aware of the noise sensitive areas adjacent to the construction site. No blasting operations are anticipated.

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*Bolt, Beranek, and Newman, 1971, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, U.S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C.

3.1.4.3 Surface and Groundwater Hydrology

Construction will be planned such that the surface runoff south of the Oxnard Industrial Drain will continue to flow into the fresh water portion of the salt marsh at the southern end of the property where natural ponding presently occurs. The quantities and rates of the runoff during construction will be controlled to prevent any adverse impacts. Erosion will be controlled to reduce turbidity and sedimentation.

Construction of the proposed facilities will not significantly affect the groundwater regime. Dewatering of construction excavations will remove some water from the presently unused and poor quality semi-perched aquifer, but will not affect the deeper Oxnard Aquifer.

Chemical toilets will provide sanitary facilities during construction, and these will not impact any local water resources.

3.1.4.4 Physical Marine Environment

Effects of the proposed construction on the physical marine environment will result from dredging and breakwater emplacement, and from discharges of groundwater and hydrostatic test water into the sea. More significant effects on the marine environment will be on the biota as discussed in Section 3.1.2.2. This section addresses the probable influence of construction of the proposed facility on water quality, sedimentation, and oceanography.

Dredging

Sediments will be dredged from an area of approximately 32 acres to a depth of 48 feet below mean lower low water (MLLW) in order to accommodate LNG ships (Plate 1.3-1). The present water depths range from 8 to 48 feet MLLW. The volume of material to be removed is approximately 2 million cubic yards (see Sections 1.4.1.3 and 1.5.7). A hydraulic dredge with a cutterhead will be used to remove the sediment. A pipeline connected to the dredge will convey seawater and the dredged sediments, normally in a ratio of approximately 5 to 1, to the east side of the proposed breakwater on the northern end of Ormond Beach.

Discharge of these dredged sediments will result in a change similar to, but of a lesser magnitude than, the Corps of Engineers' biennial sand-bypassing project. This operation also uses hydraulic dredging techniques and discharges an average of approximately 2.5 million cubic yards of beach sand in the same general area, temporarily widening the beach by 75 to 100 yards (see Section 2.1.2.3).

The median grain diameter of the sediments which will be dredged for this project (see Table 2.1.2-XII) is equivalent to that which has been found in approximately 12 to 18 feet of water in the site vicinity (U.S. Army Corps of Engineers, 1970). When the dredged sediments are introduced into the surf zone, wave action will redistribute the sediments, leaving the coarser material on the beach and allowing deposition of finer sizes farther offshore from the surf zone to water depths of 12 to 18 feet or more. Disposal of the dredged sediments will have a short-term beneficial impact on the Ormond Beach area and the beaches to the southeast of the discharge area. The added sediment will widen these beaches, affording the backshore greater protection from wave erosion and increasing the area of recreational beach available to the public.

Placement of the dredged sediments in the surf zone will result in the suspension of the fine fraction of the sediments and will temporarily increase turbidity in the nearshore zone for some distance to the southeast. Turbid water is aesthetically displeasing, so dredging will be conducted during the winter when beach use is at a minimum. The proposed disposal site is adjacent to the disposal area for sediments from the sand bypassing program, thus the turbidity resulting from dredging operations will not be unprecedented. However, turbidity from this dredging will be greater since there is a higher proportion of fine sediments in the materials to be dredged. The turbidity will be temporary and will have no long-term adverse effect on the nearshore water quality.

In order to determine whether the sediments from the proposed berthing area could release toxic or biostimulatory chemicals into the water column during dredging and disposal operations, bottom sediment analyses and sediment-seawater elutriation experiments were conducted. Descriptions of the sediment core samples and results of the experiments are given in Section 2.1.2.3.

The bottom sediments are granular materials in the sand and silt size ranges and contain very low (less than 5%) amounts of clay (see Section 2.1.2.3). Of the 21 samples analyzed, none exceeded any of the limits for the five parameters (mercury, cadmium, lead, zinc, and oil and grease) established by the Environmental Protection Agency, Region IX, Dredge Spoil Disposal Criteria (DSDC) (1973a).

The results of the bottom sediment chemical analyses and the sediment-seawater elutriation experiments indicate that an oxygen demand will be placed on the receiving waters in the dredge spoil disposal area, but that neither pesticides nor trace metals will be dissolved in the ocean waters in concentrations sufficient to degrade the quality of those waters. The oxygen demands are not expected to cause a significant depression in dissolved oxygen concentrations in the receiving waters because the nearshore waters constitute a zone of intensive mixing and rapid transfer of oxygen across the air-water interface.

Results of the fish bioassay tests run on all of the samples (Table 2.1.2-XII show that the sediments proposed to be dredged are not toxic. The toxicity concentrations of

all of the sediments which were tested within the area proposed to be dredged is zero (see Section 3.1.2.2). In addition, literature search and a diving survey has indicated that the water and sediments at and near the dredging site support healthy populations of fish and shellfish, and that the biota associated with the material to be dredged are typical of a healthy ecosystem (see Section 2.2.2). All of these results indicate that the sediments proposed to be dredged and discharged during construction of the LNG marine facilities are unpolluted according to criterion "b" of the EPA Final Regulations and Criteria for Ocean Dumping (1973b) and the EPA Region IX DSDC (1973a).

Present plans call for a seawater exchange system with the Ormond Beach Generating Station to provide warm water as a heat source for LNG vaporization. If this preferred alternate is not utilized, a direct seawater circulation system would be constructed.

In the event that an independent seawater circulation system is constructed, some dredging will be required to bury the intake and discharge lines. The pipelines would be buried under the beach and through the surf zone to a point just offshore which has yet to be determined (see Plate 1.2-2). The sediments in this nearshore area are composed primarily of sand-sized material (U.S. Army Corps of Engineers, 1970) and can be expected to be virtually unpolluted. The granular sediments will settle out rapidly and will not create turbid zones outside of the immediate area of the pipelaying operations.

The impact of this turbidity will be short-term and insignificant.

Breakwater and Pier

The emplacement of the pier and protective rock breakwater will involve pile installation and dumping of rock on the existing bottom. Effects of this installation will include a short-term local increase, and a long-term local decrease in turbidity. The increase will be associated with the suspension of bottom sediments from pile driving and rock placement. The long-term decrease in turbidity will be associated with reduced wave action and currents within the berthing area resulting from the protection afforded by the new breakwater.

The proposed construction of the pier and breakwater for the LNG marine terminal is expected to have little effect on the oceanographic conditions in the area. The breakwater will be constructed prior to the commencement of dredging operations to protect dredging equipment from wave forces. The discharge of dredged sediments on the east side of the already constructed breakwater will minimize the amount of material which is washed back into the dredged area by currents.

Some local changes in current patterns in the immediate vicinity of the breakwater may occur. Local eddies may develop as currents are deflected around the outer edges of the breakwater; however, no significant changes in current strength are anticipated.

The area south of the breakwater may be subjected to some additional wave action due to the reflection of waves from

the breakwater. However, the change in wave intensity should be restricted to a smaller area, primarily to the southeast of the breakwater.

Even though the protective breakwater will project approximately 450 yards offshore, its effect on sediment transport in the littoral zone will be negligible. Essentially all of the beach sand moving downcoast towards Port Hueneme is intercepted by either the Channel Islands Harbor sandtrap or by the head of Hueneme submarine canyon. As a result, only an insignificant amount of sand naturally bypasses the mouth of Port Hueneme. The proposed harbor, therefore, will not interrupt existing along-shore sediment transport (see Section 2.1.2.3).

LNG Vaporization Plant

Dewatering of excavations will be necessary during the construction of the onshore facilities. Discharge of the water will be into the Oxnard Industrial Drain and from there into the ocean. Results of chemical analysis of a single shallow sample of groundwater from the site is presented in Section 2.4.2.3. These data suggest that the water is not highly contaminated. The water has a lower salinity than is found in the ocean, so there will be a short-term decrease in salinity of the ocean water near the point of discharge. This discharge will not be unprecedented because the water which ordinarily flows into the ocean from the industrial drain is primarily low salinity water. Any groundwater resulting from dewatering operations will meet the requirements which will be specified by the California Regional Water Quality Control Board prior to discharge.

Approximately 11.5 million gallons of fresh water will be utilized for hydrostatic testing of the LNG storage tanks. If scheduling permits, the same water will be used for testing each of the tanks. Discharge of these waters will have an insignificant effect on the marine environment, since the volume to be used is roughly equivalent to the flow from the "J" Street drain alone during a period of only 2 to 3 hours during a moderate storm (see Section 2.4.6.3). Accidental spillages of petroleum products or other materials such as crankcase lubricants or solvents will be of such small magnitude that their effect on the environment will be negligible.

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3.3.5 Waste Disposal

All organic waste, except top soil and some of the inorganic waste material, will be disposed of in existing operating disposal areas. Dewatering of construction excavations will be necessary. This water will be filtered as required and piped to the Oxnard Industrial Drain. No water pumped from excavations will be directed into the salt marsh. The lateral extent of the dewatering operations will not remove any water from the salt marsh.

Water used to perform hydrostatic tests on the tanks will also be discharged into the Oxnard Industrial Drain.

Sanitary facilities during construction will be provided through the use of chemical toilets.