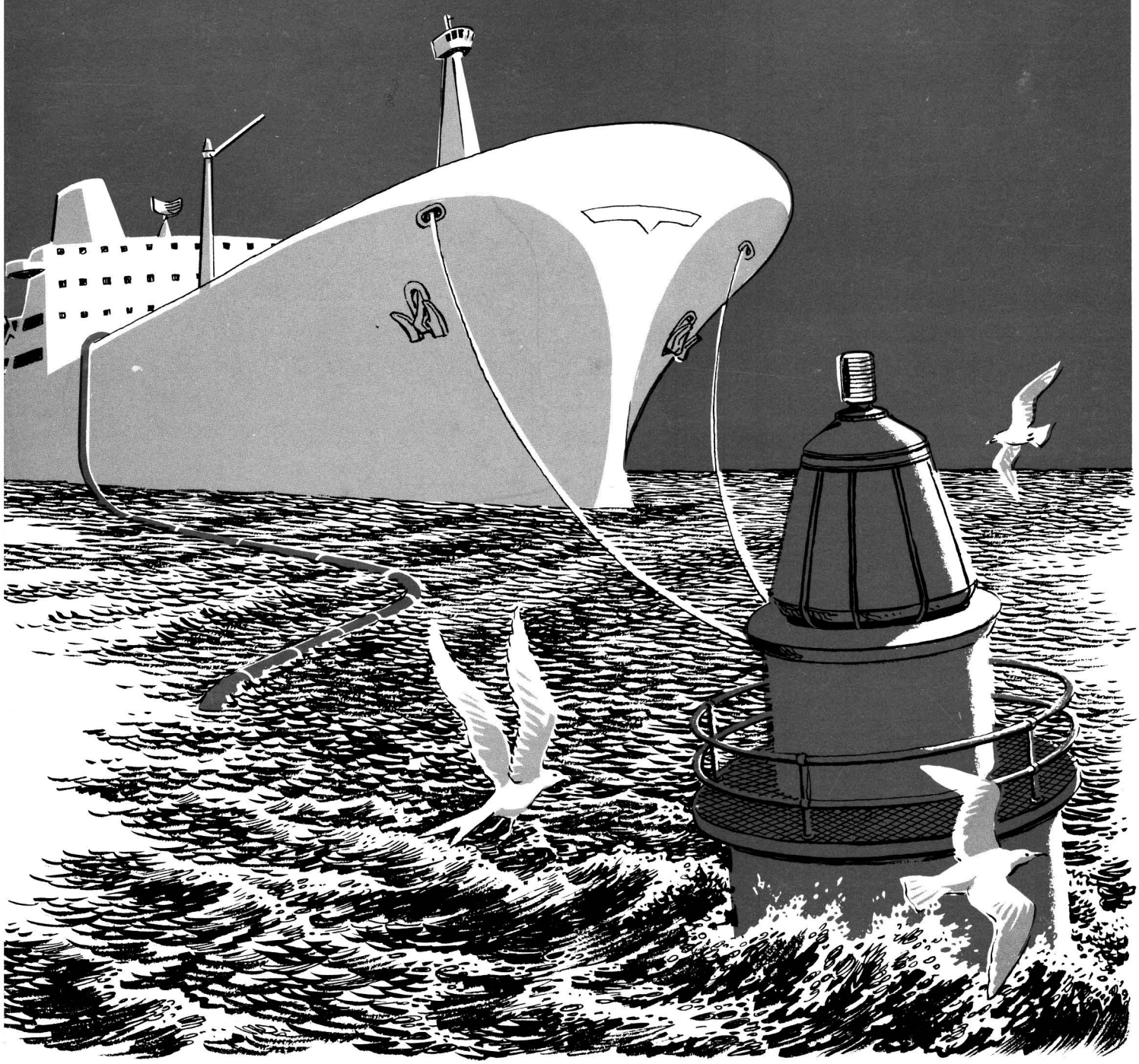
PLAN FOR DEVELOPMENT OF A TEXAS DEEP WATER TERMINAL

TEXAS OFFSHORE TERMINAL COMMISSION



TEXAS OFFSHORE TERMINAL COMMISSION

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To the Honorable William P. Hobby
Lieutenant Governor

To the Honorable Price Daniel, Jr.
Speaker of the House of Representatives

To the Members of the 63rd Legislature

The Texas Offshore Terminal Commission is pleased to submit its recommendations for offshore terminal facilities for Texas as directed in House Bill 52, 4th Called Session, 62nd Legislature.

Completion of this report has confirmed to the Commission that a desperate need exists for facilities for the efficient and economical import of large quantities of foreign produced crude oil, even in the face of a national policy aimed at self-sufficiency before 1980. Notwithstanding such a national policy, the Commission is acutely aware that the attached report will likely impact more heavily on the economic fabric of Texas than any other single project envisioned or undertaken within its borders in the 20th century. Moreover, inherent to this project is the most pronounced environmental awareness ever to be expressed for an endeavor of this magnitude.

During the long and sometimes tedious process of studying Texas' deepwater port needs, the Offshore Terminal Commission has taken testimony from private citizens, captains of industry, leaders from all subdivisions of government, and from highly specialized technicians and recognized experts in the fields of engineering, ecology, international law, and finance.

Such deliberations, and indeed some lively debate during that process, have resulted in a sound plan for Texas, a plan which puts the consumer interest and environmental considerations foremost in the developmental objectives envisioned by this Commission. The Texas Offshore Terminal Plan is ambitious, but its objectives are attainable. It cannot, however, come to fruition without positive action by the U. S. Congress. A deepwater ports bill with provisions reserving licensing consent rights to the state off whose coast a facility is to be built must therefore be enacted. Similarly, this plan should be sanctioned by the Legislature and enabling statutes enacted if the complete public interest is to be served.

We believe all aspects of the question have been examined in depth and in complete fairness to all divergent viewpoints, although there have been differences of opinion by those who have testified and in fact even between the various Members of this Commission from time to time on certain points--in the true American tradition.

The Commission is, however, unanimously committed to the submission of this report and recommends it to the Members of the 63rd Texas Legislature for consideration and enactment of appropriate enabling legislation. The Members and the staff of the Texas Offshore Terminal Commission stand ready to assist the Members of the Legislature in this landmark task.

Respectfully submitted,

Joel L. Allbritton

Joe L. Allbritton
Chairman

January 24, 1974

Plan For Development

Of A

Texas Deepwater Terminal

By The

Texas Offshore Terminal Commission

Approved

January 24, 1974

TEXAS OFFSHORE TERMINAL COMMISSION

Austin, Texas

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FOREWARD

Every Editorialist and Commentator who claims an expertise in the subject of Energy supply and use is currently and busily engaged in trying to acquaint the Public with what has been variously described as an Energy crunch, crisis, or shortfall, with each such description carrying the connotation that dire consequences will acrue to free world economies not internally endowed with sufficient supplies of fuel. Such a view is unrealistic of course for all save the very poorest developing nations who have but few natural or monetary resources.

It is, however, very likely that most authoritative sources will agree that a sustained world wide energy supply shortfall will indeed heavily impact on the economic stability of particular regions or countrys. Even so, in the final analysis such a sustained shortfall from traditional sources may, through economics, force other alternatives to become viable much earlier than might have otherwise been possible. Alternatives such as oil from Shale Rock, Geothermal Energy, Solar Energy, and Hydrogen Fuels were rarely mentioned except in the Scientific Community as recently as MidWinter 1973. Those same terms are now common topics from the lips of nearly every householder. Such sources of energy are still probably far from becoming readily available in economically attractive and useful quantities. However, in a decade such sources may be more readily available than presently.

In the meantime, the industries of our state and country, must continue to have fuels if we are to prosper and to grow. With demand increasing in the United States and domestic supplies declining, a shorter term alternative is therefore necessary. The plan contained in these pages addresses the basic questions begged by the situation as equated against the world political and economic situation in the present time frame.

The enabling legislation that created the Texas Offshore Terminal Commission focused attention principally on offshore terminals. A subsequent Attorney General's opinion sustained that philosophy in the Commission's work plan. Such a finding notwithstanding, the Commission felt compelled to examine several alternatives to the offshore monobouy system so that a base line comparison could be derived in the logic of the overall document. The conclusions specifically contained or inferred in the content of this report are therefore not singularly arrived at but are instead a derivative of much research and public testimony, all sifted and analyzed to obtain the greatest benefit for Texas.

The Commission has been honored to have been so chosen to serve the citizens of Texas and submits this report for the consideration of the elected leadership of our Great State.

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I. EXECUTIVE SUMMARY AND RECOMMENDATIONS

A. Authorization

The 62nd Texas Legislature established the Texas Offshore Terminal Commission through enactment of House Bill 52. The prime responsibility assigned the Commission by that legislation is that, "The Commission shall develop a plan leading to the development of deep draft terminals or harbors. . . ."

In response to the enabling legislation, the Commission has developed the plan consisting of the following parts: Environment, Socio-Economic, Site Location, Engineering, Use of Facilities, Finance, and Legal. The legislation requires that, upon completion of the plan, the Commission shall hold public hearings on the plan, formally adopt the plan, and then present it to the Legislature for its consideration. This document and its components comprise the plan.

B. The Plan

The basic assumption is that economic necessity dictates that there be a Texas deepwater port for receiving imported crude petroleum delivered by Very Large Crude Carriers (VLCC), and that this port should be constructed in the very near future. The long range alternative is a regional recession of significant impact upon Texas and several other states. Additionally, the economics tend to indicate that, in the future, Texas might be able to support an additional deepwater port for VLCC and possibly, as technology develops, a deepwater port for on/off loading of other cargoes.

Environmental necessity likewise dictates the development of a deepwater port for VLCC. The alternative is comprised of numerous smaller ships which, by number, greatly increase the probability of major oil spills and certainly the number of smaller spills. Additionally, environmental necessity dictates that the first deepwater port be developed offshore. The alternatives are considerable inshore dredging and/or large numbers of smaller and more obsolete ships making calls upon ports within the Texas bay and estuary system. Locations and types of subsequent port developments will be as dictated by then existing conditions.

From these assumptions, the Commission finds that an ultimate Texas deepwater ports system will consist of:

Port I: An offshore oil unloading facility to be constructed as soon as appropriate legislative, financial, environmental, and engineering plans are completed and enacted. Operation would commence in the 1976-1977 time frame. The passage of enabling legislation as suggested by the recommendations herein will permit the Commission to negotiate with appropriate entities and to subsequently build or cause to be built Port I.

Ports IIA and IIB: An oil unloading facility and a bulk cargoes on/off loading facility, both capacities possibly to be constructed into a single port as required by economics.

The Texas Offshore Terminal Commission therefore finds that, in the environmental and economic public interests of the citizens of Texas, the optimum first deepwater Texas port should be

1. Of the offshore type;
2. Located off Brazoria County;
3. Financed by revenue bonds; and
4. Publicly regulated by an agency of the State of Texas.

The offshore type of facility consists of an offshore pumping platform which will be connected by pipelines to two to six single point mooring buoys. The pumping platform will contain facilities required for operation. The buoys and the platform will be no closer than one mile from each other. From the platform, larger submarine pipelines will connect with the on land storage facilities. Transport of crude petroleum from the on land storage facilities to processing points will be via privately owned pipelines located as determined by private entities.

The location off Brazoria County provides an optimum economic balance of the offshore and onshore costs from the offshore components to extant refinery complexes on the Texas Gulf Coast. As importantly, this location is the most favorable by environmental parameters.

Public ownership provides the least costly financing alternative and thus provides the least cost to the ultimate user--the consumer--of the products resulting from the crude petroleum transported through the facility. The development costs of the facility shall approximate $400 million or less, which will be paid by the proceeds of revenue bonds issued by the State of Texas. Repayment of these bonds, plus operation and maintenance of the facility, will be from tariffs charged to those firms offloading crude petroleum through the facility.

To achieve this optimum facility, location, and financing, the Commission recommends that the Legislature establish an appropriate governmental entity capable of achieving these ends for the State of Texas and that enabling legislation contain sufficiently broad provisions permitting contracts to be made on lease purchase arrangement, lease/use contracts and user management contracts to enable the facility to function most efficiently.

C. Credits

In developing parts of the plan, in addition to original investigations, numerous entities and their publications, findings, testimony, and statements have been utilized. These entities include, but are not limited to:

State of Texas Entities:

- Office of the Governor
  - Division of Planning Coordination
    - Interagency Council on Transportation
    - Interagency Council on Natural Resources and the Environment
  - Office of State-Federal Relations
  - Office of Information Services
- 62nd and 63rd Texas Legislatures
- Office of the Attorney General
- Office of the General Land Commissioner
- Advisory Commission on Intergovernmental Relations
- Air Control Board
- Coastal and Marine Council
- Industrial Commission
- Parks and Wildlife Department
- Railroad Commission
- Water Development Board

Water Quality Board
Texas A & M University
The University of Texas
Texas Navigation Districts/Ports:
- Brazos River Harbor Navigation District
- Chambers-Liberty Counties Navigation District
- Galveston Wharves
- Nueces County Navigation District
- Orange County Navigation and Port District
- Port of Beaumont Navigation District of Jefferson County
- Port of Brownsville
- Port of Port Arthur Navigation District of Jefferson County
- Port of Port Mansfield

Federal Entities:
- Corps of Engineers
- Department of Commerce
- Department of the Interior
- Department of Transportation
- Department of the Treasury
- Environmental Protection Agency

Other Governmental Entities:
- Brazoria County Commissioners Court
- Louisiana Deep Draft Harbor and Terminal Authority
- Alabama-Mississippi Ameraport Council
- California Assembly Council on Science and Technology

Private Entities:
- American Association of Port Authorities
- American Petroleum Institute
- Arthur D. Little, Inc.
- Blyth Eastman Dillon and Co., Inc.
- Center for Strategic and International Studies
- Dillon, Read and Co., Inc.
- Goldman Sachs, Inc.
- Lazard Frères & Co.
- Mr. J. W. Hershey
- Marine Technology Society
- Merrill Lynch, Pierce, Fenner and Smith, Inc.
- Morgan Stanley and Co.
- National Petroleum Institute
- Offshore
- The Oil Daily
- Oil and Gas Journal
- John Pepe Engineering Company
- Petroleum Publishing Company
- Robert R. Nathan Associates, Inc.

Salomon Bros.
SEADOCK, Inc. (and its shareholding firms)
Smith, Barney and Co., Inc.
Soros Associates, Inc.
Texas Law Institute of Coastal and Marine Resources
Texas Superport Study Corporation
Underwood Neuhaus, Inc.

The Commission is appreciative of the information, data, and findings of the above sources. The responsibility for conclusions in the Commission's plan, as derived from information from those sources, rests with the Commission.

II. ENVIRONMENT

A. Scope

The legislation which established the Commission directed the Commission to include in the plan "...steps to be taken to insure the optimum protection of the environment." This skeleton part of the plan contains those steps.

The scope of the Commission's environmental considerations includes the construction and operation of a deepwater terminal. These categories include all physical appurtenances and immediate geographical surroundings of a deepwater terminal from the waterborne approaches to the terminal to the point from which and to which cargoes to be shipped through the terminal are directed. Pipelines extending landward from the on land storage facilities, downstream to refineries, etc., will not be specifically discussed in this plan. The financing, ownership, operation, regulation or other authority over such landside facilities will reside with other than this Commission.

Within practicalities, this scope will, however, include certain other activities and developments outside the categories described above, particularly if expected to have a causative effect on the coastal zone or any impact upon offshore marine areas, the tidal and estuarine zones, and land and air resources of the state.

B. Policy for Protection of the Environment

1. Policy

In the development of most major facilities, even in recent years where the ecology has received increased attention, economic considerations predominate. Environmental considerations have been added as a cosmetic afterthought. In exception to that usual approach, it is the finding of the Commission that environmental considerations are of major importance and shall therefore be weighed equally with economic considerations.

The Commission is cognizant of the limits of its authority, which is to "...develop a plan leading to the development of deep draft harbors or terminals..."

Nevertheless, the Commission believes that whether the Commission is the Plan's implementing entity or not, environmental considerations are integral to the plan, and its implementation must be in conformity with the most stringent environmental safeguards.

Accordingly, it is the policy of the Commission that these environmental safeguards shall be met through two complementing systems:

a. adherence to extant and future applicable requirements as promulgated by those governmental entities who have jurisdiction; and

b. an environmental anti-deterioration program.

In adopting this policy, the Commission is facing a difficult matter with total realism and candor. The Commission fully realizes that the construction and operation of any major facility can have an adverse effect upon the environment. The deepwater port is no exception.

The Commission's policy is oriented toward absolutely maximizing protection of the State's environment.

Concurrently, it is the Commission's finding that, properly planned, located, and operated, there will be a lower probability of adverse environmental impact with a separate Texas deepwater port than there will be without such a port.

It is a fact that there is and shall continue to be, even with use curtailment efforts, an increasing energy demand. Assuming that advanced research and development can produce practical energy from sources other than petroleum, the Commission concludes that it will, nonetheless, be a lengthy process, probably measurable in decades, before those sources are deliverable to energy use points.

Domestic crude petroleum supplies are declining. This combination of declining supply and increasing demand leaves a shorter term void which can only be filled by imported crude petroleum. The only practical

means of transporting this imported crude petroleum is via waterborne transportation: tankers.

The fulfillment of this void either requires large numbers of smaller tankers making numerous calls upon ports near refineries; or, such importation may be made through fewer, newer, larger tankers making fewer port calls. Due to improved tanker design and to the lessened probability of chronic and major oil spills, the latter alternative is environmentally preferred.

Numerous studies completed by other organizations conclude that an offshore location in deep water is environmentally preferred. Numerous reasons support that conclusion in those other studies.

An offshore location significantly reduces the major causes of ship accidents; congestion at port entrances. An offshore location provides more reaction time for containing possible oil spills. It also provides geographic spacing between potential spills and beaches and estuarine areas.

Large scale dredging may cause major adverse environmental effects. However, this does not imply that all dredging is detrimental. No studies presently argue that the dredging of a deep draft channel inside a coastline would be environmentally preferred to an offshore site. Nonetheless, this Commission has felt obliged to examine all possible siting alternatives.

2. Adherence to Requirements

Requirements exist which would generally govern the development and function of deepwater ports. Additionally, there is proposed legislation which would provide additional requirements specifically related to deepwater ports. These requirements are administered by the federal government.

Additional operational guides exist which are supported by international and private organizations. These requirements and guides are in addition to those administered by the State of Texas. It is the policy of the Commission that construction and operation of a deepwater port will be in accord with the

strictest adherence to such requirements.

a. Requirements promulgated by others

At the federal level, the Commission has established in the public records its support for those pending bills which would place federal licensing in a single federal entity with sufficient authority to expeditiously grant licenses, and which would provide that a State have consent involvement in those facilities planned for construction off its coast.

These bills provide that the licensing agency would have authority to issue reasonable rules and regulations for the construction and operation of deepwater port facilities.

Extant at the federal level are applicable requirements promulgated by the Coast Guard, Environmental Protection Agency (EPA), the Office of Pipeline Safety (Department of Transportation), and the Maritime Administration (Department of Commerce).

The Coast Guard is the primary agency responsible for the enforcement of federal merchant ship laws and pollution abatement regulations pertaining to pollution caused by ships and their operations.

Coast Guard anti-pollution regulations include: standards for ship design and construction; fire protection requirements; navigation equipment necessary for safe operation; cargo transfer regulations; and procedures for notifying proper authorities in the event of a spill.

The Environmental Protection Agency sets standards limiting the discharge of oil in U.S. navigable waters and on the Outer Continental Shelf (OCS).

The Office of Pipeline Safety has jurisdiction over certain oil and gas pipelines on the OCS for the purpose of setting safety standards for construction and design and for investigating related accidents.

The Maritime Administration has prescribed

the MarAd Pollution Abatement Specifications which require pollution control measures to be taken in the design and operation of merchant ships under the MarAd subsidy program.

Additionally, the National Oil and Hazardous Substances Pollution Contingency Plan, established in 1970 and administered by EPA and the Coast Guard, exists to minimize damage from oil and other discharges.
The Plan includes:

(1) Assignment of duties and responsibilities

(2) Establishment and identification of strike forces and emergency task forces

(3) A system of notification, surveillance and reporting

(4) Establishment of a national center to coordinate and direct operations in carrying out the Plan

(5) A list of chemicals approved for the treatment of oil spills

(6) Enforcement and investigative procedures to be followed

(7) Directions on public information releases

(8) Instructions covering on-scene coordination

More specific, complementing regional and State contingency plans exist.

International conventions relating to pollution abatement at sea are administered by the Intergovernmental Maritime Consultative Organization (IMCO), an agency of the United Nations. The primary convention is the 1954 International Convention for the Prevention of Pollution of the Seas by Oil. With limited qualifications, this

convention prohibits the discharge of oil by tankers. Two other conventions have been developed by IMCO. One provides nations the right to take actions outside their territorial waters against foreign flag vessels which present clear environmental danger. The other establishes rules governing the liability of tanker owners to governments and individuals for damages caused by pollution.

Additionally, the IMCO has adopted a resolution which established the International Fund for Oil Pollution Damage for compensating victims of marine oil pollution.

Private industry has cooperatively acted in oil pollution prevention and control in two methods, in addition to actions performed by individual firms.

First, cooperative insurance-type organizations--TOVALOP (Tankers Owners' Voluntary Agreement concerning Liability for Oil Pollution) which can be considered as supplemented by CRISTAL (Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution)--exist for reimbursement for the costs incurred by tanker owners or governments for oil spill cleanup operations.

Second, in several geographical areas, industrial groups have formed cooperatives to provide standby capabilities for the containment and cleanup of spills.

This plan recognizes these contributions but the Commission finds that the machinery to assure implementation must be frequently examined and strengthened if necessary.

b. Requirements by the State of Texas

Legislation establishing the Texas Offshore Terminal Commission requires that the Commission "...proceed in the development of the plan in such a manner that there will be full coordination and cooperation between agencies... The Commission shall take affirmative steps to fully coordinate all aspects of the development of the plan with other federal, state, and local agencies..."

The Commission will coordinate all environmental aspects of deepwater terminals with other State agencies in accordance with the procedure herein following.

In the government of the State of Texas, interest in, and in some cases, regulatory jurisdiction over matters related to the environmental aspects of deepwater terminals resides in the member agencies of the Interagency Council on Natural Resources and the Environment (ICNRE), the member agencies of the Interagency Transportation Council (ITC), and the Texas Coastal and Marine Council (TCMC).

The ICNRE, which exists to coordinate State planning in natural resources and environmental matters, is comprised of:

Office of the Governor (Chairman)
Air Control Board
Department of Agriculture
Texas Forest Service
General Land Office
Bureau of Economic Geology
Highway Department
Industrial Commission
Parks & Wildlife Department
Railroad Commission
Soil and Water Conservation Board
Water Development Board
Water Quality Board
Water Rights Commission
Texas A&M University (ex officio)
Texas State Historical Survey Committee (ex officio)
The University of Texas (ex officio)

The ITC, which exists to coordinate State planning in transportation matters, is comprised of:

Office of the Governor (Chairman)

Aeronautics Commission
Highway Department
Legislative Budget Board
Mass Transportation Commission
Texas A&M University (ex officio)
The University of Texas (ex officio)
Air Control Board(ex officio)

Texas Offshore Terminal Commission	*Department of Agriculture (ex officio)*
Department of Public Safety	*Industrial Commission (ex officio)*
Railroad Commission	*Texas Coastal and Marine Council (ex officio)*

The Texas Coastal and Marine Council is comprised of sixteen (16) persons, four appointed by the Governor; six (including three Senators) appointed by the Lieutenant Governor; and six (including three Representatives) appointed by the Speaker of the House of Representatives. The Council provides advice and assistance to other State governmental entities regarding marine-related matters.

Coordination and cooperation has occurred on an informal basis. The more formal methods of coordination and cooperation are described below.

It is the intent of the Commission to prepare an Environmental Impact Statement (EIS) for review and constructive input by ICNRE, ITC, and TCMC. These entities have already participated in the process of reviewing EIS's. The Commission expects member agencies of ICNRE and ITC, and the TCMC, will provide original input into the EIS plan.

The EIS format will be:

1. *description of the project,*
2. *description of affected environment,*
3. *environmental impact of the project,*
4. *mitigating measures included in the project's plans,*
5. *adverse environmental effects which cannot be avoided,*
6. *relationship between local, short-term uses of man's environment and the maintenance and enhancement of long-term productivity,*

7. *irreversible or irretrievable commitment of resources which would be involved in the project,*

8. *alternatives to the project.*

Through the EIS process, the Commission's goals are that:

1. *All environmental aspects of a deepwater terminal be considered in depth;*

2. *coordination and cooperation with other agencies and with public groups will result in significant, meaningful inputs to the Commission's plan by interested parties; and*

3. *with full support of other affected agencies, legislation can be recommended which will provide a simplified permitting process for deepwater terminal matters related to the government of the State of Texas.*

3. Environmental Anti-Deterioration

The Commission proposes and supports the establishment of an Environmental Anti-Deterioration program integral to the planning, construction, and operation of a deepwater terminal. The requirements and guides, described above and which the Commission endorses, will serve environmental protection to a degree. However, the Commission's Environmental Anti-Deterioration program is designed to relate extant environmental quality with endeavors to maintain that quality. This program will be implemented through:

(a) *an in depth delineation of the present environmental quality of those geographical areas in which a Texas deepwater port may have environmental impact,*

(b) *development of construction and operations performance standards specifically designed to prevent deterioration of that environmental quality,*

(c) formulation of appropriate sanctions to insure performance standards are met.

Strong though this Environmental Anti-Deterioration policy may be, it is the Commission's belief that it is necessary in order to achieve the concurrent ends of:

(a) the highly significant environmental benefits of retaining the environmental quality of the Texas Gulf Coast and other areas affected by development of a deepwater terminal,

(b) the equally highly significant economic benefits of a deepwater terminal to the citizens of Texas.

Although the Commission is persuaded that there is a lower probability of adverse environmental impact with a properly planned, located, and operated deepwater terminal than without it, the Commission is fully cognizant that some adverse environmental impact may occur. This adverse impact does represent a loss, even when the loss is of an extremely small magnitude. Accordingly, there are limited qualifications to the Environmental Anti-Deterioration policy. They are:

(a) Whenever an intentional, unavoidable construction or operational action will occur which will have adverse environmental impact, that action must undergo the most intensive scrutiny for its necessity before a decision to perform or not perform the action is made;

(b) legislation providing reasonable regulatory powers by appropriate State and local entities to fulfill the above environmental anti-deterioration policy is required--model legislation to achieve such goals is available;

(c) the Commission appreciates the intentions inherent to the extant and expected requirements which will be placed upon deepwater port construction and operation. Concurrently, it recognizes, with complete candor, that although compensatory efforts will fulfill

legal and financial requirements, the loss of even the smallest magnitude of ecological resources must be considered as highly serious.

To achieve its policy, the Commission hereby adopts a two-part program. The first part consists of the in depth delineation of the current environmental status of those geographical areas which may be affected by the deepwater terminal. These areas include the terminal site and the related onshore, or offshore, areas which could reasonably be expected to be affected, including air, underground, and wetlands areas, and the environments of those areas which can reasonably be expected to be indirectly affected by a deepwater terminal. The primary example of the latter is projected refinery expansion/development locations.

The second part consists of the performance standards. The Commission believes there should be specified particular high levels of performance, with performance guarantees supported by sufficient sanctions to insure performance. For example, instead of a requirement for numbers and types of oil skimmers on standby, there will instead be the guaranteed capability of removing, at a minimum, a specific number of barrels of spilled oil through skimming and storage within a specific time limit of a spill's commencement, in certain sea/weather states. These performance standards will include construction and operations.

C. Conclusions

In this part of the plan, II. ENVIRONMENT, the Commission has stated, in skeleton form, the steps it believes must be taken to ensure optimum protection of the environment as affected by the deepwater terminal. The scope of that environment includes the terminal site and appurtenances, and also includes those areas which may be indirectly affected by the terminal.

The Commission's policy for environmental protection is in two components.

The first is a general endorsement of environmental protection requirements which are promulgated outside

the government of the State of Texas. Also, it proposes the simplified development and coordination of environmental state requirements through the use of the Environmental Impact Statement review system, with particular emphasis upon Texas' interagency planning councils. The Commission expects this process will provide comprehensive coordination and cooperation by all interested agencies in development of the Commission's plan.

The second component, an Environmental Anti-Deterioation program, is unique in that it proposes performance standards designed to prevent, with limited qualifications, deterioration of the environment from its present state.

After publication of this plan, but before construction of deepwater port facilities can begin, several very major environmental protection tasks remain to be accomplished:

1. *delineation of extant environmental quality in areas reasonably expected to be affected by the deepwater terminal*

2. *development of the Environmental Impact Statement, subsequent actions upon it by other appropriate entities, and Commission consideration of those actions*

3. *formulation of the performance standards oriented to Environmental Anti-Deterioration.*

The Commission believes that its position and policy on environmental matters comprise one of the strongest ever taken by a governmental or private entity related to the development of a major physical facility. The Commission adopts this position and policy without reservation. Inherent to this position by the Commission is total candor in environmental and all other matters considered or to be considered by the Commission. In that candor, the Commission recognizes that it is seeking to achieve new, high levels in environmental protection, and finds that environmental considerations rank equally with economic considerations of a deepwater terminal.

III. SOCIO ECONOMIC

A. Scope

The main socio-economic effects of a deepwater oil unloading facility can be derived from two indicators: employment and population. Other social and economic implications of such a facility can be estimated from the changes in employment and population which these facilities cause. For that reason, the concentration of this section of the plan is on changes in employment and population which can be expected if a deepwater oil unloading terminal is constructed on or near the Texas Gulf Coast.

These expected changes are the result of two distinct but related activities:

1. The construction of the facility itself.
2. The construction and operation of refineries and other industrial plants which would be dependent upon the unloading facility for assurance of adequate supplies of crude oil.

Texas has traditionally been a major refinery center, hosting nearly 28% of national refinery capacity, while using approximately 10% of the national refinery output. Whether Texas can expect continuance of such a large share of national refining capacity within its borders is a question, the answer to which is dependent on many factors--some of them beyond the scope of this plan.

The main criterion for locating refineries has traditionally been the ready availability of crude oil supplies; thus Texas, with its large reserves of domestic crude, has proven a popular refinery location up to now. However, in the period from 1975 to 2000, it is estimated that refining capacity on the Texas Gulf Coast will probably need to be expanded from approximately 3.2 million barrels per day to nearly 9 million barrels per day. This figure is the result of allocating the projected national demand for refinery products among existing refinery centers.

B. Economic Advantages (if built)

1. Refinery Employment

a. Productivity

One factor which will greatly affect the employment in new refineries is the increasing productivity per employee. Due in large measure to increased automation and new refining techniques, average productivity in refineries has increased from a nationwide average of 41 BBL/Day in 1948 to 121 BBL/Day in 1968.

However, the average figures do not accurately reflect the large increases in productivity realized by new refineries. While the national average productivity was 121 BBL/Day in 1968, the average for refineries which began operation during 1968 was 380 BBL/Day per production employee, more than three times the national average.

The average productivity will increase to 500 BBL/Day per production employee for new refineries by 1980 and 1,000 BBL/Day per production employee for new refineries by 2000.

NATIONAL REFINERY CAPACITY AND EMPLOYEE PRODUCTIVITY

YEAR	TOTAL EMPLOYEES (x1000)	RATIO OF TOTAL TO PRODUCTION EMPLOYEES	PRODUCTION EMPLOYEES (x1000)	REFINING CAPACITY (xBBL/Day)	BBL/DAY PER PRODUCTION EMPLOYEE
1968	151	1.64	92	11,171,694	121.442
1963	154	1.62	95	9,814,791	103.313
1958	190	1.54	123	9,450,741	76.835
1953	206	1.40	147	7,782,103	52.939
1948	197	1.29	152	6,230,505	40.990

The ratio of refinery total employment to refinery production employment has increased from 1.3 in 1948 to 1.5 in 1958, 1.62 in 1963, and 1.64 in 1968.

This ratio is not expected to increase beyond 1.75 in 1980 or 2.0 in 2000.

This increase represents not increasing numbers of auxiliary employees, but decreasing numbers of production employees as refinery productivity increases.

b. Capacity

From 1968, when 270 refineries had a capacity of 11,172,694 BBL/Day, to 1970 when 262 refineries had a capacity of 11,882,393 BBL/Day, the average capacity of new refineries was 96,700 BBL/Day.

The trend is to larger and more efficient refineries with refineries of 350,000 BBL/Day capacity becoming common. It can be expected, therefore, that additional refinery capacity to be built between now and 1980 and between 1980 and 2000 will be increasingly larger and more efficient.

Refinery capacity on the Texas Gulf Coast is projected to reach 5,880,000 BBL/Day by 1980 and 8,863,000 BBL/Day by 2000 assuming that the Texas Gulf Coast is to retain its current percentage share of the market.

Deducting present refining capacity of 3,200,000 BBL/Day, this implies that new refineries with aggregate capacities of 2,680,000 BBL/Day by 1980 and 5,663,000 BBL/Day by 2000 will be needed to meet the demand.

Using the figures of 500 BBL/Day per production employee for refineries built by 1980 and 1,000 BBL/Day for refineries by 2000, this implies total new refinery production employment of 5,360 by 1980 and 8,343 by 2000.

NATIONAL AVERAGE REFINERY CAPACITY FOR SELECTED YEARS
(BBL/DAY)

YEAR	NUMBER OPERATING	CAPACITY	AVERAGE CAPACITY
1970	262	11,882,393	45,352
1968	270	11,172,694	41,380
1963	287	9,814,791	34,197
1958	289	8,939,907	30,934
1953	315	7,481,701	23,751
1948	352	5,825,566	16,550

The ratio of total refinery employment to refinery production employment implies total new refinery employment of 9,380 by 1980 and 14,600 by 2000.

c. Related employment

Employment in industries related to refining has experienced 38 new jobs for every 5.5 refinery employees. This implies that total employment resulting from new refining capacity will be 73,334 by 1980 and 114,145 by 2000.

d. Related economic effects

Studies by the Office of the Governor, Division of Planning Coordination, have shown that for every dollar of output of products refined from imported crude, $1.93 is generated in the state economy from related activities. This amount represents goods and services demanded by refineries and their employees.

As shown below in Section C.1., the volume of Texas refining without a deepwater terminal is expected to reach 4.10 MMBBL/Day (million barrels per day) by 1980 and 7.70 MMBBL/Day by 2000.

With a deepwater oil unloading facility, these volumes are expected to reach 5.88 MMBBL/Day by 1980 and 8.86 MMBBL/Day by 2000.

This loss of potential refinery capacity, amounting to nearly 1.8 MMBBL/Day in 1980 and 1.2 MMBBL/Day in 2000, would have a substantial impact on the Texas economy. Such a loss would amount to $6.8 billion per year by 1980 and $4.5 billion per year by 2000, in current dollars, using $1.93 loss per lost dollar of refinery output of $5.34 per barrel.

This represents a potential loss to the Texas economy if a deepwater facility is not constructed on the Texas coast for unloading petroleum.

2. Construction

a. Refinery construction

Present cost for constructing a 350,000 BBL/Day capacity refinery runs approximately $500,000,000---or, about $1,437,500 per 1,000 BBL/Day of capacity. Using this figure, construction cost of needed new refinery capacity would be $3,852 million, and an additional construction cost by 2000 of $4,288 million. This is equivalent to $550 million per year in new refinery construction from 1974 through 1980, and an average of $214 million per year of new construction from 1981 to 2000.

Local labor cost generally accounts for approximately 14% of the cost of construction of refineries. Construction of new refinery capacity can be expected to result in $77 million in construction wages per year from 1975 to 1980, and $30 million per year in local construction wages from 1981 through 2000.

b. Deepwater terminal construction

Construction of a crude oil unloading terminal and related facilities, including on land storage facilities and crude oil pipelines, would require a total of $370 million by 1981 in construction, or $52 million per year from 1975 to 1980 in addition to the refinery construction. Local labor accounts for 53% of the cost of construction of pipelines, tank farms, and related facilities, and about 15% of offshore pipelines, platforms, etc. This would imply that an average of $17.7 million per year in local construction wages will result from the construction of the unloading terminal and related facilities for the years 1975-1981.

Construction of a deepwater breakwater type island or a turnkey dredged and constructed pier type of offloading facility would cost

considerably more--variously estimated at from one to two billion dollars depending on the location and type construction and/or dredging selected.

However, the local labor percentage share in construction costs remains the same, hence the decision on the type facility to be built should reside in the environmental and cost/benefit arena. Subsequent investigations may reveal that expanded facilities capable of handling other types of cargo will be required.

c. Related economic effects

The effect of construction costs on the Texas economy is the product of many interrelated factors. These factors are largely the result of the purchase of goods and services by the construction industry from other areas of the Texas economy. With the aid of the Texas Input/Output Study prepared by the Office of the Governor, Division of Planning Coordination, the "spin-off" from construction costs can be calculated rather closely. These studies show, for example, that each dollar spent for construction of a new refinery generates about $3.22 of total commerce. Similarly, for each dollar spent on the construction of pipelines and related facilities, about $3.00 of total commerce is generated.

From these figures, it can be expected that construction of a deepwater oil unloading facility will generate $156 million per year from 1975 through 1981. New refinery construction will generate $1,772 million per year from 1974 through 1980, and $690 million per year from 1981 through 2000.

These figures represent the total economic effect on Texas of the construction requirements for the deepwater facility itself, the related components, including on land storage facilities and pipelines, and from the

construction of new refineries to meet demand.

3. Tax Revenues

State revenues from sales and use taxes will be an additional incentive favoring construction of the deepwater oil unloading facility.

Construction of the facility itself will produce some $2.3 million in tax revenue between 1975 and 1981. Construction of refineries will produce more tax income, approximately $21 million, between 1975 and 1981 and an additional $23 million between 1981 and 2000.

These figures are at present tax rates and do not assume any new taxes or any higher rates. The estimates are based on the current ratio of construction costs to state taxes as calculated in the Texas input-output model developed by the Office of the Governor, Division of Planning Coordination.

C. Economic Disadvantages (if not built)

Without a Texas deepwater oil unloading facility, imports to Texas of crude oil are expected to reach 1,757,000 BBL/Day by 1980, and 6,137,000 BBL/Day by 2000. With a deepwater facility, these volumes would reach 3,540,000 BBL/Day by 1980 and 7,337,000 BBL/Day by 2000.

The transportation costs per barrel in current dollars with and without a deepwater port are summarized below.

VOLUMES OF CRUDE OIL IMPORTS TO TEXAS

	WITHOUT DEEPWATER FACILITY		WITH DEEPWATER FACILITY	
YEAR	DAILY VOLUME (1000 BBL/Day)	COST/BBL	DAILY VOLUME (1000 BBL/Day)	COST/BBL
1980	1,757	$1.23	3,540	$0.53
2000	6,137	$1.17	7,337	$0.85

1. Refinery Employment

The lower refinery capacities resulting from the absence of a deepwater oil unloading facility imply lower employment and the resulting economic detriment to Texas.

The loss of 1.8 MMBBL/Day (million barrels per day) in 1980 and 1.2 MMBBL/Day in 2000 of imported crude implies a similar reduction in Texas refining capacity.

With present supplies of Texas crude fully committed and unlikely to increase substantially, any decrease in the amount of imported crude--because of the unavailability of facilities or more economically attractive alternatives--implies a proportionate reduction in Texas refining capacity.

Using the figures derived for the economic effects of refining activities, the economic loss to Texas would be 50,000 jobs lost by 1980 and 30,000 jobs lost by 2000. Comparing the figures for expected employment if the facility is built indicates that refinery and related employment will rise from 250,000 in 1973 to 272,000 in 1980 and 334,000 in 2000 if the facility is not built, and from 250,000 in 1973 to 323,000 in 1980 and 364,000 by 2000 if the facility is built.

These changes in employment are summarized in the table below.

CHANGES IN EMPLOYMENT IN REFINING AND RELATED ACTIVITIES WITH AND WITHOUT A DEEPWATER OIL UNLOADING FACILITY

YEAR	1973	1985	2000
Employment without	250,000	273,000	334,000
Employment with	250,000	323,000	364,000
NET CHANGE		50,000	30,000

2. Construction Industry

Approximately $52 million per year from 1975 through 1981 for construction of the deepwater terminal and related facilities would not be added to the Texas economy, of which 34% or $17.7 million per year would be lost wages in the construction industry. Moreover, the smaller refinery capacity which could be expected if the facility were not built would result in lost construction worth $2,587 million by 1980 and an additional $1,725 million by 2000. Of this amount, 14% represents lost wages to the local construction industry, or $36 million per year from 1975 to 1981 and $8.4 million per year from 1982 to 2000.

Moreover, for every dollar lost in construction of refineries, $3.22 are lost to the overall Texas economy. In addition, $3.00 are lost to the Texas economy for every dollar not spent on construction of the deepwater terminal.

3. Tax Revenues

If the facility were not built, approximately $14 million in tax revenue would be lost between 1975 and 1981 with an additional $9.4 million being lost between 1982 and 2000. These losses do not include the $2.3 million in tax revenue which would be lost on the construction of the terminal itself.

These figures are in addition to losses of federal revenue sharing funds caused by lower personal and business income resulting from lower refinery capacity and resulting lower levels of general business activity.

Nor does it include the losses to local communities of lower property valuations, lower sales and use taxes, lower revenue sharing, etc., because all of these are dependent upon local tax rates, income levels and federal legislation.

D. Social Aspects

1. Population

The population of Texas at the end of 1970 was 11,196,730 of whom approximately 4,527,800 were employed. This ratio of 2.47 total population per individual employed can be used to calculate the total population increase to be expected from increased refinery employment.

New population resulting from new refinery and related employment is expected to reach 182,000 by 1980 and 282,000 by 2000.

These changes in population are summarized in the table below.

REFINING RELATED
CHANGES IN POPULATION WITH AND
WITHOUT A DEEPWATER OIL UNLOADING FACILITY

YEAR	1980	2000
Population change without	+ 59,000	+ 208,000
Population change with	+ 182,000	+ 282,000
NET DIFFERENCE	+ 123,000	+ 74,000

2. Consumer Costs

With Texas petroleum energy demands increasing even faster than the national average, and expected to reach 19% of the estimated national demand of 36 MMBBL/Day by 2000, the higher costs intimate increased costs for the Texas consumer of refined petroleum products.

As is shown in the Table, Transportation Costs of Crude Oil Imports to Texas, below, the added cost per barrel without a deepwater unloading facility would reach 70.6 cents per barrel by 1980 and decline to 32 cents per barrel by 2000. This is a 22% increase in cost at $3.20 per barrel in 1980 and 10% at $3.20 per barrel in 2000.

Without a Texas deepwater oil unloading facility, imports to Texas of crude oil are expected

to reach 1,757,000 BBL/Day by 1980 and 6,137,000 BBL/Day by 2000. With a deepwater facility, these volumes would reach 3,540,000 BBL/Day by 1980 and 7,337,000 BBL/Day by 2000.

The costs per barrel with and without a deepwater port are summarized below:

TRANSPORTATION COSTS OF CRUDE OIL IMPORTS TO TEXAS

Year	Cost Without Deepwater Facility		Cost With Deepwater Facility		Cost Differential*	
	Volume (1000 BBL/Day)	Annual ($1000)	Volume (1000 BBL/Day)	Annual ($1000)	Annual ($1000)	$/BBL
1980	1,757	789,444	3,540	677,910	111,534	.70
2000	6,137	2,624,436	7,337	2,279,206	345,230	.32

*These figures represent the annual dollar savings and the savings per barrel with a deepwater facility over not having such a facility.

E. Conclusions

Building a deepwater oil unloading terminal on the Texas Gulf Coast will have sizeable direct and indirect social and economic benefits. While the size of the project and its related economic activities are large enough to provide an incentive to build the facility, and large enough that failure to build it would be a detriment to the economy, the project is not so large as to create crowding of needed services or population displacements.

There will be some social costs involved, but these are expected to be small in comparison to the anticipated larger economic benefits.

Among the economic detriments to be expected if the facility is not built is a ten to twenty percent (10-20%) increase in the cost of crude oil to Texas refineries, with the resulting large increases in the cost of refined petroleum products. Since nearly every good or service depends on refined petroleum products to some extent, the resulting increases would be highly detrimental to the Texas economy.

IV. SITE LOCATION

A. Authority

Legislation establishing the Commission directs consideration of sites for the deepwater terminal. The Commission finds that there is an immediate environmental and economic requirement for a Texas oil offloading facility (Port I) in sufficiently deep water to accept the Very Large Crude Carrier. It is the Commission's opinion that future economic requirements, coupled with strict environmental considerations, might result in the necessity for one or two additional Texas deepwater terminals (Ports IIA and IIB). One such terminal might also be an oil offloading facility; the other might be an on and offloading facility capable of transferring a variety of cargoes. On the other hand, these two future capabilities could perhaps be combined into one facility.

This part of the Plan includes site considerations relative to Port I. Site selection is based on many factors, all of which can ultimately be classified within two equally important areas:

1. environment,

2. economics.

B. Environment

1. General Considerations

As elaborated upon in a separate part of the Plan (Part II. ENVIRONMENT), the Commission forecasts a lower probability of adverse environmental impact with a deepwater port than without one, provided the port is properly planned, located, and operated. The alternative of numerous smaller ships transporting crude petroleum to the Texas Gulf Coast significantly increases spill probabilities.

Studies by other authoritative organizations conclude that offshore port development, utilizing either artificial islands or monobuoy systems, appear to have several environmental advantages over dredged channels. These include fewer adverse construction and maintenance impacts, reduced probability that spilled oil will reach productive coastal areas, increased probability of weathering and dilution of toxic factions in the event of a major spill.

From these factors, the Commission concludes that the first port--the oil off loading facility--should be located offshore. This location should be in sufficiently deep water to obviate long-term maintenance dredging and to minimize short-term construction dredging.

2. Offshore and Related Development Considerations

The offshore alternative consists of two possible types of facilities: artificial islands and monobuoy systems.

Due to the slightly higher adverse environmental impact, mainly caused by construction, and the significantly higher construction costs of artificial islands, the Commission finds that the monobuoy-type system, located in sufficiently deep water to minimize dredging, is the most appropriate for the first port for present and projected VLCC's; that depth is approximately 100 feet.

With these conclusions, site selection is designation of a location at the 100' depth which minimizes offshore environmental impact, and which concurrently minimizes direct and indirect onshore environmental impact. Three parameters may be utilized to measure the intensity of that impact:

a. proximity to cuts in barrier islands through which an oil spill could pass, thereby causing the most severe damage possible from an oil spill: oil pollution

in the bay and estuary system,

b. near shore land configurations which would be least disrupted environmentally by pipeline and onland storage facility construction and operation, and

c. the capability of extant coastal zone utilization in the vicinity of the onshore facilities of the terminal to absorb and provide for additional development in the general area.

3. Specific Sites

Based on the requirement of 100' water depth off the Texas Gulf Coast, there is a continuum of possible sites located at that depth running the length of the coast. That depth occurs at approximately 15 miles from the shore near Brownsville, increasing to approximately 63 miles from the shore near Port Arthur. On the shore side of that continuum are numerous cuts through the barrier islands. The Texas bays and estuaries are located inland, including Laguna Madre, Baffin, Corpus Christi, Copano, Aransas, San Antonio, Espiritu Santo, Lavaca, Matagorda, Christmas, West, Galveston, and East Bays, and Sabine Lake. Along the Texas Gulf Coast, the environment of selected dry land areas extending inland from the coast in and near Brazoria and Jefferson Counties would be the least impacted by the construction and existence of pipelines from offshore to onshore facilities. Extant onshore development generally increases from light on the lower Texas Gulf Coast to heavy at the upper end, with some intensity in the Valley, Victoria, and Freeport locations, a higher intensity in the Corpus Christi area, and with a much higher intensity from Galveston eastward.

Along that continuum, specific, representative locations have been examined by the Commission. These sites are in general locations off the coasts of Cameron County, Nueces County, Calhoun County, Brazoria County, Galveston County, and Jefferson County. Comparisons of these sites are exhibited in the following chart, with qualitative and quantitative measurements of environmental impact in the three previously described parameters.

COMPARISONS OF SITES BY THREE ENVIRONMENTAL PARAMETERS

SITE	PROXIMITY OF BARRIER CUTS*	NEAR SHORE LAND CONFIGURATIONS**	EXTANT DEVELOPMENT***	TOTALS, QUANTITATIVE IMPACT
Cameron County	close (1)	bay (1)	low intensity (0)	2
Nueces County	close (1)	bay (1)	intense (1)	3
Calhoun County	close (1)	bay (1)	low intensity (0)	2
Brazoria County	close (1)	land (0)	low intensity (0)	1
Galveston County	not close (0)	bay (1)	high intensity (2)	3
Jefferson County	not close (0)	land (0)	high intensity (2)	2

* 1 = close
0 = not close

** 1 = bay
0 = land

*** 2 = high intensity
1 = intense
0 = low intensity

Each of the parameters in the preceding table represents categories of environmental impact. The Commission is strongly interested in the individual components of these categories, and will examine these components in preparation of the in-depth environmental delineation described in Part II of this plan. The Commission believes that a significantly adverse overall impact in any of these parameters for any site is generally sufficient to preclude further examination of that site.

From the comparisons in these parameters, a Brazoria County site would experience the least environmental impact. Further examinations of that general site indicate that it does not conflict with sport fishing areas and has very limited conflict with commercial fishing areas. Its distance from shore provides a response time in case of large spills.

From these indications, the Commission finds the Brazoria County site to be the most environmentally acceptable. The Commission does qualify that finding to the extent that should a major environmental problem be found in the in-depth environmental delineation of the site, the Commission will consider that problem relative to the environmental problems described above at the other sites.

C. Economic Considerations

1. Current Importing Methods

To import the amounts of petroleum which will be necessary to supply the demand expected on the Texas Gulf Coast will require substantial increases in tanker deliveries if these imports are to continue using the same shipping patterns as in the past.

Presently, tankers in the 30,000-50,000 DWT class are used to transship crude oil from terminals in the Bahamas to various ports on the Texas Gulf Coast.

Imports of crude oil to the Texas Gulf Coast are projected to reach 1,757,000 BBL/Day by 1980, and 6,137,000 BBL/Day by 2000, without the construction of a deepwater port.

The size of tankers which are capable of using the present port facilities implies 6.3 calls per day by 1980, and 22 calls per day by 2000 of tankers with average capacities of 40,000 DWT, compared to the average of 3.0 tankers per day presently used to import crude oil to Texas.

A long term average cost of operation tankers of the size presently in use can be calculated at approximately $13.00 per ton, compared to $6.50 per ton for 250,000 DWT VLCC's from the Persian Gulf to the Texas Gulf.

The additional cost of unloading and reloading the oil in the Bahamas for transshipment must also be included in the total cost of present shipping practices for crude oil.

The table below, Transportation Costs of Crude Oil Imports to Texas, summarizes and/or projects the average annual cost of importing crude oil using existing facilities and typical procedures. Figures are quoted in 1973 dollars.

TRANSPORTATION COSTS OF CRUDE OIL IMPORTS TO TEXAS
(USING CURRENT METHODS)

YEAR	VOLUME (1000 BBL/Day)	ANNUAL COST ($ Million)	COST Per Barrel
1972	1,233	563	1.25
1980	1,757	790	1.23
2000	6,137	2,624	1.17

Estimated costs and savings with a deepwater port are summarized below.

TRANSPORTATION COSTS OF CRUDE OIL IMPORTS TO TEXAS
(USING DEEPWATER PORT)

YEAR	VOLUME (1000 BBL/Day)	ANNUAL COST ($1,000)	($/BBL)	SAVINGS* ($1,000/Yr)	($/BBL)
1980	3,540	677,910	.53	111,534	.70
2000	7,337	2,279,206	.85	345,230	.32

*These figures are Corps of Engineers estimates. An independent source has estimated the savings per barrel at $0.20/BBL in 1980 and $0.30/BBL in 2000.

2. Dredged Channel Alternative

Costs of dredging are determined for a given volume of material to be removed, by three factors:

a. type of material to be dredged,

b. size and type of dredge,

c. hauling distance to spoil areas.

The type of material to be dredged influences both the speed of dredging and the particular types of dredging equipment which can be utilized.

According to the Bureau of Economic Geology at the University of Texas a typical composition of the submerged lands close to shore in the Gulf would be:

sand and silt	37%
sand and clay	38%
clay	25%

Because only a limited amount of core samples have been taken in the area between the shoreline and the 100' contour, and because the soil composition varies by area, and even within an area, this composition is intended to represent the average or typical composition and not to imply that the entire area is of uniform consistency.

Of the three types, the sand/silt mixture is cheapest to dredge, while clay is the most expensive. Dredging clay typically costs about 2.7 times as much as dredging sand and silt, while dredging a mixture will cost about 1.85 as much as sand/silt and 0.7 as much as clay.

The principal types of dredge used for this work may be roughly classed as foreign and domestic. The foreign dredges are somewhat larger and more efficient than the domestic variety and have seen extensive use in Europe. They are prohibited by Federal law from being used in this country, and it would require an Act of Congress to permit their use in construction of a Texas deepwater port.

The type of dredge used domestically is smaller and somewhat less efficient than the European version but is readily available in this country without a special law.

Typical costs for dredging the materials found off the Texas Gulf Coast with each of the dredge types are shown below:

DREDGING COSTS BY TYPE OF MATERIAL AND TYPE OF DREDGE
($/yard^3)

MATERIAL	DOMESTIC	FOREIGN
Sand and silt	$ 0.65	$ .35
Sand and clay	1.20	.65
Clay	1.75	.95

In addition to dredging costs, hauling spoil to

spoil disposal areas costs in the neighborhood of $50,000/million cubic yards per mile.

The cost is roughly the same for either foreign or domestic dredges. The foreign dredges are larger and cost more to operate and take out of service for hauling, while the domestic type is smaller but cheaper per hour to operate for hauling.

The net effect is that the hauling costs are roughly equal.

The total hauling cost will be dependent on the volume of material and the hauling distance.

Current standards for harbor channel dredging of this depth are to dump all spoil either on land or beyond the eight (8) fathom line, and two (2) n.m. down current from the channel to insure that the spoil does not interfere with navigation of other ships. This is particularly important when a long narrow channel is being considered.

Both hauling distances and volumes of material to be removed are related to channel length and bottom contour.

The Gulf Coast of Texas has a fairly constant slope from the shore to the 100' contour which makes the calculation somewhat easier.

While an accurate calculation would require an accurate chart of bottom slope, core samples, soil analyses, and other factors, a working estimate can be calculated.

The standard channel configuration, according to the Corps of Engineers, would be 1,000' bottom width and 100' depth, with 1:10 sloped sides. The average net amount of material to be removed is thus 8,333 yards^3 per lineal yard of channel or 18.66 million yards^3 per nautical mile of channel.

From this figure, the present channel volume must be subtracted.

The table below shows the approximate direct line distance from various Texas ports to the 100' depth contour.

DISTANCE FROM 100' CONTOUR TO WHARF

PORT	DISTANCE (NM)
Galveston	39
Freeport	26
Corpus Christi	15.8

The following table shows the net amount of material to be removed to construct the described channel to the ports listed, using the figures given above.

REQUIRED DREDGING TO SELECTED TEXAS PORTS (IN MILLIONS OF CUBIC YARDS)

PORT	VOLUME
Galveston	578
Freeport	392
Corpus Christi (Harbor Island)	235

Using the soil composition above, the aggregate cost of dredging can be calculated for foreign and domestic dredges as shown below.

DREDGING COSTS ($/Yard^3)

		Foreign Dredges		Domestic Dredges	
Percentage		Unit Cost	Extension	Unit Cost	Extension
Sand/Silt	37%	$ .35	$0.1295	$ .65	$0.2275
Sand/clay	38%	.65	0.247	1.20	0.456
Clay	25%	.95	0.2375	1.75	0.4375
(Aggregate Total)			$0.614		$1.211

DREDGING COSTS (IN MILLIONS OF DOLLARS)

PORT	VOLUME	FOREIGN DREDGES RATE	FOREIGN DREDGES EXTENSION	DOMESTIC DREDGES RATE	DOMESTIC DREDGES EXTENSION
Galveston	578	0.614	$354.9	1.211	$699.9
Freeport	372	0.614	240.7	1.211	474.7
Corpus Christi	235	0.614	144.3	1.211	284.6

HAULING COSTS (IN MILLIONS OF DOLLARS)

PORT	VOLUME	AVG. DISTANCE (NM)	TOTAL
Galveston	578	6	$173.4
Freeport	392	4.6	90.2
Corpus Christi	235	3.6	42.3

The hauling costs shown in the table above are calculated at a rate of $50,000 per million cubic yards per mile at an average distance equal to 10% of the channel length plus two n.m. This formula corresponds closely to actual distance measurements from charts. This assumes all spoil is dumped below the eight (8) fathom line, and no spoil is dumped closer to the surface than eight (8) fathoms.

Adding the dredging costs to the hauling costs, the total dredged channel costs are shown in the table below.

TOTAL DREDGED CHANNEL COSTS (IN MILLIONS OF DOLLARS)

PORT	FOREIGN DREDGES	DOMESTIC DREDGES
Galveston	528.3	873.9
Freeport	330.9	564.9
Corpus Christi	186.6	326.9

The annual maintenance cost can be expected to reach 10% of the indicated initial cost. The maintenance cost is higher because of the relatively deep channel.

The channel dimensions used represent the minimum safe dimensions as recommended by the Corps of Engineers.

In addition to the channel dredging costs shown above, the onshore storage facilities would cost an additional $107 million, much the same as similar facilities required for storage of the imports coming in through an offshore facility.

3. Offshore Facilities

a. Artificial islands

The Corps of Engineers, in its report on Gulf Coast Deepwater Port Facilities, studied the comparative advantages of artificial islands and monobuoys as offshore deepwater oil unloading facilities. The Corps reached the conclusion that construction of an artificial island, aside from its ecological disadvantages, discussed above, was economically less advantageous than a system of monobuoys with a pumping platform.

Construction of such an artificial island, including caissons, breakwater and dredged fill, is calculated to cost approximately $1,500 million.

Because this figure is at least $1,000 million more than the cost of any other alternative considered, an artificial island was eliminated from further consideration as clearly economically unattractive.

Because the major cost of an artificial island is the island itself, the location had little effect on the cost, compared to the overall cost.

b. Monobuoys

Configured as described in this plan, an offshore oil unloading facility of the monobuoy type appears to be the most economically attractive.

Further study of possible sites for a monobuoy-type facility in addition to that undertaken by the Corps of Engineers has shown that the costs of such a facility are directly

proportional to the distance from shore at which the facility is located.

This relationship is reasonable if it is remembered that the cost of the platform and buoys are relatively fixed and independent of location, similar to the costs for the artificial island.

The variable costs will depend on the size of pumps and the length of underwater pipeline required, both of which are directly proportional to the distance from the offshore facility to the on land storage facility.

Thus, where water of the depth needed is closer to the on land storage facility, the pumping and pipeline portion of the facility will be lower in cost.

A comparison of five alternative locations along the Texas Gulf Coast, ranging from Corpus Christi on the south to Port Arthur on the north, was used to determine the sensitivity of cost to location.

The costs for the five sites including the buoys, platform, pumps, underwater pipelines, and on land storage facilities, ranged from $408 million to $697 million.

As could be expected, the highest cost, $697 million, was in the Port Arthur area, where the much greater distance to 100' deep water (approximately 63 miles) was responsible for the high cost.

At Galveston, where the 100' water depth occurs approximately 42 miles from shore, the cost was $552 million for the complete facility.

From the Freeport area, where the 100' depth is 26 miles from shore, south to Corpus Christi, where the facility would be located 19 miles from shore, the variation in cost was comparatively small, with only 2.4% difference between the most and least expensive

of the three remaining alternatives.

These costs are summarized in the table below.

ESTIMATED FACILITIES COSTS----MONOBUOY ALTERNATIVES
($ Million)

SITE	TOTAL COST	PERCENT INCREASE*
Jefferson County	697	70.8
Galveston County	552	35.3
Brazoria County	417	2.2
Calhoun County	418	2.4
Nueces County	408	---

*Percent increase in cost over lowest estimated cost

Since costs for sites offshore of Nueces County, Calhoun County, and Brazoria County differ by such a small percentage, the economic attractiveness of these sites should be considered equal. It is important to realize that these cost estimates are only accurate to within five percent (5%) of the total cost, and cost differences less than five percent are not meaningful. Sites offshore of Aransas, Kleberg, Kenedy, Willacy and Cameron Counties will also be approximately equal in cost to each other and to sites offshore of Brazoria County, Calhoun County, and Nueces County.

It should be noted, however, that 2.7 million BBL/Day, out of a total of 3.2 million BBL/Day, of the refining capacity on the Texas Gulf Coast is located north of Freeport.

If the cost of transporting the imported crude to existing Gulf Coast refineries is included in the calculation, a site location off Brazoria County has a distinct cost advantage over any more southern site.

ESTIMATED FACILITIES COST--INCLUDING STORAGE
($ Million)

PORT/COUNTY	DREDGED CHANNEL*	MONOBUOY	PIPELINE COSTS****
Port Arthur/Jefferson	**	697	110
Galveston/Galveston	981 (635)	552	96
Freeport/Brazoria	672 (438)	417	120
Victoria/(Calhoun)	***	418	183
Corpus Christi/Nueces	434 (494)	408	208

* Using domestic dredges; an Act of Congress authorizing the use of foreign-made dredges would result in a savings of about 45% on the dredging portion of the costs. (Figures in parentheses are for foreign-type dredges)

** Higher cost than Galveston Dredged channel.

*** Higher cost than Corpus Christi dredged channel; lower cost than Freeport dredged channel. Costs for Corpus Christi dredged channel used as estimate. No port suitable for dredging in close proximity.

**** To existing refineries; not intended as part of facility but included to determine most economical alternative.

COMPARISON OF SITE AND TYPE ALTERNATIVES

PORT/COUNTY	LOWEST COST	TYPE	TYPE SAVINGS	SITE SAVINGS
Port Arthur/Jefferson	807	Monobuoy	35%	50%
Galveston/Galveston	648	Monobuoy	66%	20%
Freeport/Brazoria	537	Monobuoy	47%	--
Victoria/(Calhoun)	601	Monobuoy	2.6%	12%
Corpus Christi/Nueces	616	Monobuoy	4.2%	15%

D. Conclusions

The Commission finds that the costs, environmentally and economically, are relatively higher for a deepwater terminal which requires extensive dredging, or for which construction requires artificial islands. The Commission believes that an offshore monobuoy system is the most appropriate for Port I, the immediately required deepwater oil offloading facility.

For Port I, one site, more than the other possible sites, approaches minimization of environmental impact and maximization of economic factors. That site is generally located off Brazoria County at the 100' water depth.

The three major categories of environmental impact support that conclusion. The prevention of potential oil pollution from entering the bays and estuaries is more feasible in the upper Texas Gulf Coast than in the lower due to the proximity of entrances to those areas. Extant development on shore is less intense in the lower coast than in the upper coast, and thus is more capable of absorbing new development. The Brazoria County site represents a balance of these factors. Additionally, it is one of two possible sites in which construction for the terminal's on-shore facilities will tend not to disrupt wetlands areas.

Separately, the Brazoria County site represents a balance of cost factors. The cost of the offshore component of the facility increases with distance from the shore, and such distance increases from the lower coast to the upper coast. Conversely, the cost of land transport sytems, due to existing refinery locations, decreases from the lower coast to the upper. The Brazoria County site represents an optimization of these factors, thereby providing the least cost.

V. ENGINEERING

A. Basis

The enabling legislation which established the Texas Offshore Terminal Commission provides that the Commission shall describe its recommended general design of facilities. The Legislation also provides that engineering of these facilities shall be accomplished by other entities. The Commission interprets these provisions as follows:

1. The Commission will, on the basis of studies already compiled by other organizations, recommend that particular type of deepwater port physical facilities, in conceptual form, which the Commission believes most economically and environmentally advantageous to construction of the Texas deepwater port;

2. Description of those facilities included in the Commission's plan will be as described by other organizations;

3. Specific, or design engineering of those facilities will be subsequently accomplished by an appropriate consulting firm or similar entity.

4. This part of the plan implements this interpretation by the Commission.

B. General

From the numerous studies of deepwater terminals, there is continuous, substantial evidence that, where natural deep water does not exist at or close to shore, an offshore facility located in sufficiently deep water to preclude substantial dredging is significantly preferable for an oil offloading facility. Further, this evidence, for environmental and economic reasons, weighs strongly in favor of the single point mooring (SPM) system as that offshore facility. The Commission is in agreement with these conclusions and hereby adopts the position that SPM system is that most appropriate for the first Texas deepwater port. The following components of this part of the Commission's plan describe that system, including an

overall conceptual view, the offshore facilities, and the onshore facilities.

C. Facilities

1. Overall Conceptual View

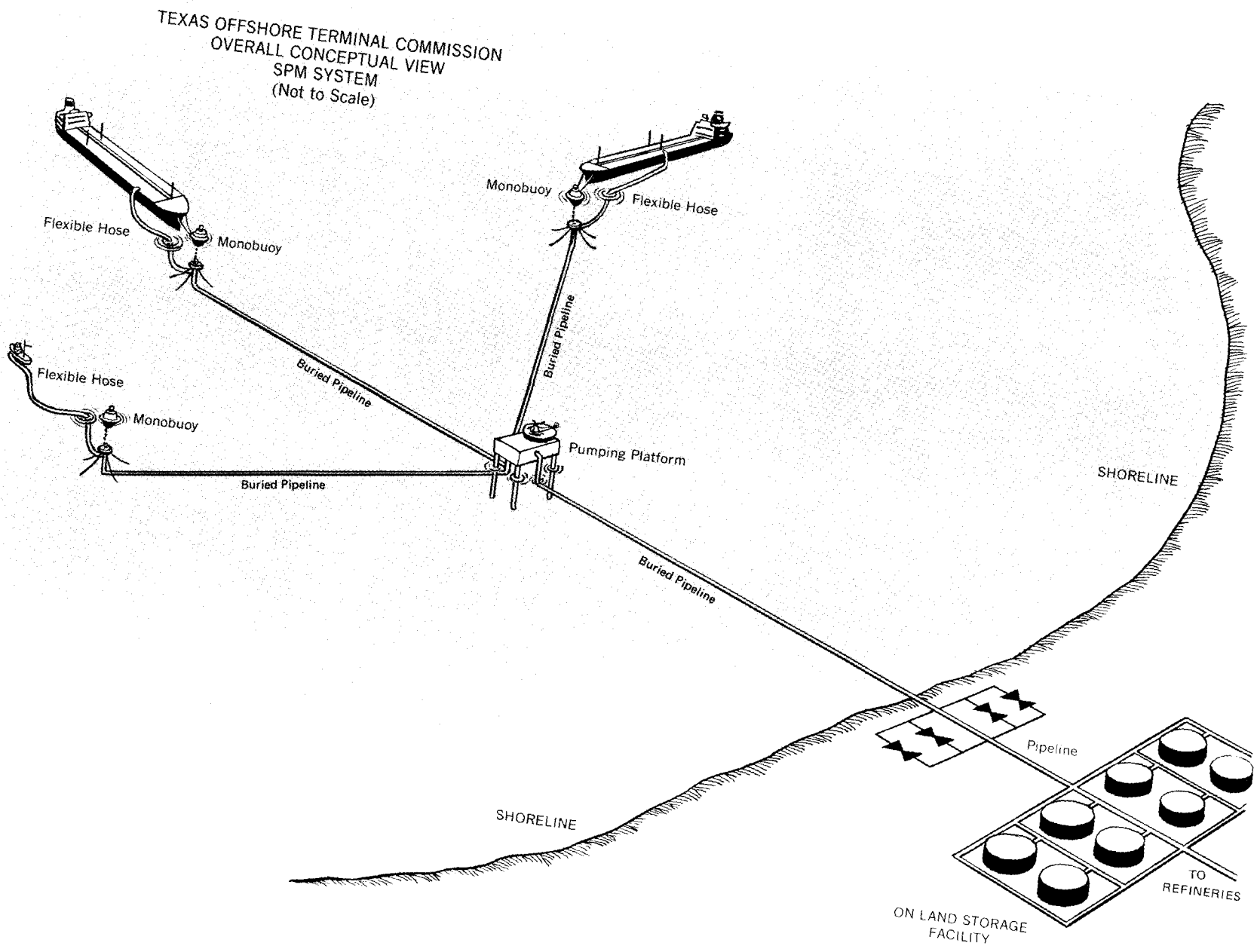
The offshore part of the system will include two to six monobuoys located around a pumping platform. The pumping platform will be located in the area of 100 to 110 feet of water depth. Pipelines for the transport of the received crude petroleum to the onshore facilities will connect the monobuoys to the pumping platform and from the pumping platform to the onshore facilities. The onshore part of the system will consist of pipelines from the offshore pipelines to the remaining component of the onshore facilities: the storage tanks.

A visual representation of this system is on page 47.

2. Offshore Facilities

The offshore facilities will have these major parts: the monobuoys; the pumping platform; and the pipelines to and from shore. The most succinct description of the monobuoys is contained in Environmental Impact Statement, Deepwater Ports, U. S. Department of the Interior. As the monobuoys are the heart of the SPM system, that description, in part, is included herein as follows:

> *Single point moorings, also referred to as monobuoys, consist of a flat cylindrical buoy with its axis vertical and held in place with chains anchored to piles driven into the ocean floor.*
>
> *The SPM's are principally used as terminals--both loading and discharge--for crude oil and petroleum products. The oil is transferred from the midship tanker manifold to the buoy (or vice-versa) through floating hoses. When not in use, these hoses are normally allowed to swing freely on the*


TEXAS OFFSHORE TERMINAL COMMISSION
OVERALL CONCEPTUAL VIEW
SPM SYSTEM
(Not to Scale)
Flexible Hose
Monobuoy
Monobuoy
Flexible Hose
Buried Pipeline
Buried Pipeline
Flexible Hose
Monobuoy
Buried Pipeline
Pumping Platform
SHORELINE
Buried Pipeline
Pipeline
SHORELINE
TO
REFINERIES
ON LAND STORAGE
FACILITY

water surface; however, newly designed hoses are able to sink to the bottom when out of use to reduce damage from adverse wave conditions and ships maneuvering. When tankers are moored, the hoses are brought alongside by a launch and hoisted to the tanker deck by winches.

The hoses are connected to a swivel on the buoy which allows the hoses to rotate through 360 degrees. The oil is transferred through the buoy to a submarine line by flexible hoses which allow free movement of the buoy in response to wave and tidal action.

The tanker is generally moored with two nylon hawsers running from the turntable on the buoy to the bow of the ship. This permits the tanker to be berthed into the prevailing weather conditions and for the tanker to move with the change in current, wind, and wave forces while at berth. Therefore, a minimum of force caused by these elements is transmitted to the mooring.

In principle, tankers will moor at SPM's without tug assistance. To berth safely at SPM's, a 4,000-foot maneuvering radius is required. At some locations the use of high-power launches or low-power tugs may be operationally desirable to reduce berthing and deberthing times of large tankers. A launch of sufficient power should remain by the tanker to keep it at a satisfactory distance from the buoy, because a disadvantage of the SPM is that a tanker tends to creep toward the buoy during periods of calm weather and slack tide. This could result in the tanker fouling the mooring chains or submarine hoses.

For the maintenance of submarine hoses and anchor chains, a craft equipped with suitable lifting gear and diving equipment is needed. Regular inspection, maintenance, and repairs of buoy, hoses, chains, and anchors, is required for a successful operation. The hoses must be replaced regularly. Drydocking

of the buoy might be required every three to five years, depending upon the site.

SPM's are suitable for operation in remote offshore locations where sea and weather conditions may be severe. This type of mooring may be designed for head waves with a height of 15 to 20 feet occurring simultaneously with high winds and currents. Launch operations, however, are precluded in over six to eight foot seas. Therefore, although a vessel can remain moored or leave the berth during severe weather, it can berth only during periods where launch operations are possible.

SPM's will be located far enough offshore and in deep enough water to obviate the need for dredging; however, if the location of the buoy should be too far from onshore storage/utilization facilities, it may be necessary to provide auxiliary pumping capacity mounted on a fixed platform near the buoy.

Units located in the Atlantic and Gulf of Mexico would likely be in water depths of 100 to 120 feet, and in most instances would range from 15 to 30 miles offshore.

The single point mooring system is presently quite well developed for the petroleum industry and in use worldwide, but not in the U. S. There are over 100 installations in use at the present time, (seven of which, located in Japan, the Philippines, Taiwan, and Vietnam, are owned by the U. S. Armed Forces), and at least 13 more are on order for 1973 and 1974 delivery.

At the distances necessary off the Texas Coast to obtain sufficiently deep water, the "auxiliary pumping capacity" referenced above will be necessary and is a part of the pumping platform in the Commission's plan. Ships' pumps should be sufficient to move the imported crude petroleum from the ship through the monobuoy and through the one to three miles from the monobuoy to the pumping platform. The platform would then provide the

pumping capacity necessary to move the crude petroleum from there to the onshore facilities. The monobuoys would be in sufficiently deep water to accommodate at least 500,000 DWT and larger tankers.

Pumping capacity of the platform would be in the magnitude of 150,000 BBL/hour. This platform would serve important other functions. Radar, sonar, and communications capabilities, with other navigation and safety aids, would be located at the platform. The sophistication and fail-safe redundancy of these capabilities would be well beyond those now extant. For support, crews' quarters and power generating facilities would also be at this platform. Most importantly, at the platform would be oil spill containment and fire fighting equipment on a continuous standby basis.

The connections from the platform to shore would be those pipelines necessary to transport crude petroleum from the tankers to the on land storage facilities. All such pipelines will be buried.

3. Onshore Facilities

The onshore facilities will consist of two components: onshore pipelines to the on land storage facility, and the facility itself.

The on land storage facility will serve several purposes. Primarily, it will provide a brief, interim storage for imported crude petroleum on its way to the refineries. It will provide a means for inventory of incoming supplies. Transport from the on land storage facility will be via other, independent pipelines.

Several characteristics of the on land storage facility prevail. Its design will be oriented, primarily, toward maximum safety and environmental protection. Full automation will exist, coupled with ample staffing of on-site personnel for in-person checking of automated facilities and their function.

D. Conclusions

In this part of the Commission's plan, a conceptual picture of the deepwater port facilities, as proposed by the Commission, has been presented. These facilities, if implemented as perceived here, will represent a major new step in ocean technology. This major step represents innovation, not in proposing new, undeveloped processes, but rather in the planned environmental protection and safety at the magnitude of this facility, and its combination of existing technology.

In the candor expressed by the Commission in other parts of this plan, the Commission is fully aware of the responsibility placed upon it by the Legislature. Acordingly, the Commission is cognizant that it may not be the implementing entity of the Texas deepwater port plan. However, at a minimum, the Commission believes that the far-reaching tenets of this part of the plan--Engineering--have a higher probability of being implemented because the Commission has endorsed them.

At the other end of the spectrum, if the Commission is the entity charged by the State's elected leadership with implementing this plan, the Commission fully intends to equal or better the high standards and previously unreached levels of development proposed by the Commission in this and other parts of the plan.

VI. USE OF FACILITIES

A. General

The initial facility would operate as a public dock accepting crude oil from any tanker meeting the criteria below and transporting it by pipeline to an on land storage facility. At the on land storage facilities, the oil would be stored until called for by the owner.

As Section V (ENGINEERING) has described the planned facilities, the on land storage facilities would include storage sufficient to accommodate projected needs.

The facility contemplated will operate as a public dock or wharf offering specialized unloading equipment services to anyone desiring to use them. As a practical matter, use of the facilities will be restricted to tankers too large to use existing ports and which have the necessary on-board equipment and pumps for mooring and unloading.

Operating procedures for marine operations will be established in accordance with applicable provisions of the International Oil Terminal and Tanker Safety Guide, U.S. Coast Guard Regulations. A Terminal Procedures Manual, outlining required safety regulations and other terminal information, will be prepared and made available to all tankers calling at the terminal. Any tanker failing to comply fully with all required safety features will not be permitted to offload at the terminal.

The tanker unloading facilities will be designed with emphasis on safe movements and mooring of tankers and prevention of oil spills during tanker unloading.

Application will be made to appropriate governmental authorities to establish new dedicated approach and departure sea fairways of adequate width and separated by a clear buffer zone. Application will also be made to establish anchorage areas, located in water depths equal to or greater than that of the mooring area and away from all pipelines. The fairways and anchorages will be marked by marker buoys.

The single point moorings (SPM's) will be located in water depths sufficient to provide a safe minimum under-keel clearance over any obstruction in the approach

area and within the turning circle. Tentative recommendations are for a clearance of 12 feet for vessels up to a maximum draft of 75 feet and for a clearance of 15 feet for vessels up to a maximum draft of 95 feet. Final clearance recommendations will be based on further studies of meteorological/oceanographic data and on research studies of vessel motion.

For adequate maneuvering clearance for tankers, a minimum spacing of 8,000 feet will be provided between SPM's and platforms, and 5,000 feet between SPM's.

SPM's, SPM hoses and offshore platforms will be equipped with navigational aids (signal lights, fog horns, and hose winker lights) in accordance with U.S. Coast Guard regulations. In addition to the required navigational aids, radar transponders will be installed on the SPM's and platforms, and radar units will be installed at each platform complex control center.

Design of all hoses will be in accordance with industry codes which specify a maximum working pressure as a fraction of the minimum burst pressure allowing an ample safety margin. The hoses will be selected with a working pressure equal to or greater than the maximum pressure which can be developed by the tanker pumping system.

All tankers unloading at the terminal will be equipped with a relief by-pass system or other effective controls to limit the maximum tanker-developed pressure to the working pressure of the hoses.

All floating hoses will be equipped with valves located at the free end of the hose adjacent to the flange for connection to the tanker manifold.

B. Supervision

Supervision and control of the facility would be by a facilities manager who would be responsible for all aspects of the operation and use of facilities. The operational staff would supervise the approach, mooring connecting, hose testing, unloading, pumping, tanking, disconnection, casting off, oil transfer and all other aspects of the operation.

This operational staff would be responsible to the

facilities manager for enforcement of environmental, safety and other regulations.

The facilities manager would also be responsible for mobilizing the necessary safety and environmental forces in the event of possible spills, accidents, or other emergencies.

The facilities manager, and the operational staff, would be employees of the owner of the facility, or, if operation of facility were contracted to a third party, employees of the contractor.

The primary emphasis of the supervisory and operational staff will be safe, pollution-free operation of the facility. The second, and equally important, responsibility will be reacting quickly and efficiently to minimize the effects of any incidents which occur.

Operating facilities and procedures for the facilities will be designed and established to maximize the safety of tanker unloading and pipeline operations. Highly trained personnel will be assigned for operation of the system.

Operation of the system will be directed from a control center located at the onshore terminal. A computer-based supervisory control system operating over communication circuits will be provided for remote control and monitoring from the control center of each operated facility.

A full complement of operational computer programs will be provided to assist the dispatcher in safe operation of the system. The computer will monitor equipment status and critical operating variables and alert the dispatcher to any unauthorized change or deviation from normal. Other computer programs will relieve the dispatcher of routine calculations and operating functions and permit his attention to overall safety and efficiency of operation.

The use of scheduling, control, reliable communications, navigational aids and platform-based radar units coupled with the sophisticated radar and guidance system on board the ships will increase the safety of tanker movements.

Under normal conditions, the shift dispatcher will control the principle pipeline operating functions directly from the control center. Auxiliary operating functions incidental to main line operations will be performed by local personnel. Local personnel will also investigate and correct equipment problems and be available for back-up assistance to the dispatcher if required.

Marine operations (mooring of tankers, connection of hoses, etc.) will be handled by offshore crews under local platform-based supervision.

Extensive communications facilities will be provided to assure safe operations, both under normal and emergency conditions.

C. Charges

The proposed facilities, which are intended for the unloading of crude oil cargoes from ships, will be operated as public docks. It is anticipated that the facilities, if State financed, would charge rates sufficient to cover the costs of operation, debt service and contingencies without artificially raising the price of oil to the ultimate consumer. If the facilities are privately financed, the charges will be higher because of the necessity for providing a sufficient return on the private investment. It is expected that the charges for a privately financed terminal would be higher by an annual amount equal to approximately 7% of the capital investment.

Because a deepwater oil unloading facility is of such critical importance to the people and the economy of Texas, it is important that it perform its public service in an economical and nondiscriminatory manner, charging the same rates to all and setting those rates no higher than is necessary for economic operation.

To the extent that those using the terminal were common carriers by water, within the meaning of the Shipping Act of 1916, as amended, the rates charged to those carriers would be subject to regulation by the Federal Maritime Commission, and the terminal would be regulated by that agency.

D. Communications

Communications with tankers, other than in the immediate terminal area, will be conducted from the control center over a private voice radio system operating in the International Marine medium frequency (MF) band. This will avoid the congestion of public radio systems and insure reliable medium range communications. Once inside the immediate terminal area (20-30 miles), communications will be established in the International Marine very high frequency (VHF) band. Communications with launches, helicopters, and Mooring Masters onboard tankers will be over a private ultra high frequency (UHF) radio system. Communications capability in the VHF and UHF bands will be provided from each platform area and from the control center. The multiple radio systems will enhance reliability by providing an alternate communications path should one system be out of service.

E. Scheduling

Schedules for all vessels using the facility will be required to be furnished by the owner of the oil being transported. This will enable coordination of incoming arrivals and operation of the terminal in an orderly manner.

Ships approaching the unloading area will be required to make radio contact with the onshore control center which will direct all movements into and away from the facility. Ships will be required to contact the control center 72 hours prior to arrival and again 24 hours and 12 hours prior to arrival.

F. Mooring

Upon arrival in the vicinity of the terminal area, ships will be directed to proceed to a buoy or given anchorage instructions. Before proceeding to the mooring area, a Mooring Master and other trained personnel will board the tanker and direct all mooring and subsequent unloading operations.

The Mooring Masters will be fully qualified individuals holding master's licenses.

A mooring launch will be used to pass the mooring lines

to the tanker. Once the tanker is moored, bow first, to the monobuoy, the launch will pass the hoselines to the tanker which will use an on-board hoist to lift the hoses out of the water and hold them during the unloading operation.

G. Connection

All hose handling procedures including connecting to the tanker manifold and disconnecting will be conducted in accordance with strict operating procedures and under the direct supervision of qualified personnel to avoid potential oil spills. Hoses and hook-up equipment will be inspected prior to the mooring of each tanker. When not in service, the hose end valve will be closed and a blind flange attached. The blind flange will not be removed until the hose is in place over the oil catch pan onboard the tanker and will be reinstalled before the hose is lowered into the water after unloading is completed.

At the start of pumping operations, pressure will be increased slowly to insure integrity of hoses and connections. Inspection and surveillance by on-site personnel and monitoring at the onshore control center will be maintained continuously during the discharge operation. Once the integrity of these hoses has been determined, the ship's pumps will be engaged. The ship's pumps will provide sufficient boost to unload at a rate of 50,000-150,000 BBL/hour to the pumping platform, which will provide sufficient pumping capacity to transfer the crude oil to the onshore tanks where it is stored pending further shipment by pipeline or barge.

After the mooring and hose connection is completed, the Mooring Master onboard the tanker will request permission from the control center to commence pumping operations. The control center will be responsible for correct valve line-up to onshore tankage, for control of platform pumping and for monitoring the safety of all pipeline operations.

H. Casting Off

Upon completion of unloading or at the outset of impending severe weather, all operations will be shut down and the system secured. When all valves are closed and the system secured, the hoses will be disconnected,

re-flanged and lowered into the water, the mooring lines released and the tanker will back away from the buoy and depart the terminal area.

Established operating procedures will restrict operations in severe weather or high seas. Tentative restrictions are a maximum of six to eight-foot significant seas for mooring operations. Unloading operations will cease if seas build to greater than twelve feet, and tankers will leave the berth if seas continue to build to greater than fifteen feet.

VII. FINANCE

A. Scope

The Commission's plan is legislatively required to "...contain specific means by which the terminals may be financed..." The Commission finds that there are several viable financing alternatives. Hence, this part of the Commission's plan presents those alternatives. The descriptions, advantages, and disadvantages of these alternatives are described below. At the end of this part of the Commission plan, Pages 72 to 85 are cash flow charts reflecting these basic alternatives and variations thereof. Further elaboration upon the financing alternatives discussed below is presented through the detailed data in these charts.

The Commission recommends that legislation be enacted which would provide for implementation of any one, or a combination of these alternatives. Proposed federal legislation regarding deepwater ports (H. R. 10701) is now pending before the national Congress, and is supported by resolution of this Commission. Passage of both the federal and complementing state legislation will permit the Commission to develop the financing alternative in the best interests of the citizens of the state, and in the economic interests of all citizens impacted by the actions of the State government of Texas.

B. General Description of Financing

1. Method

The financing of revenue producing facilities of the type and magnitude of a deepwater port is often accomplished through the sale of bonds to the extent necessary to obtain sufficient funds to pay for construction of the facility. Once the facility is completed, those who utilize it pay fees for that use. The revenues from those fees are utilized to repay, with interest, those investors who purchased the bonds, and also to pay for the costs of operation and maintenance of the facility. Those who would use a deepwater port facility are firms bringing imported crude petroleum into Texas. The fees they would pay would be for docking at the facility, for pumping the oil from the ship to the on land

storage facility, and for storage of the oil at the storage facility.

Financing of the deepwater port, as recommended herein is no exception to this usual method.

The variations of this usual method are whether the financing is to be public or private, and what security is utilized to ensure full repayment of the bonds.

2. Common Factors

There are common factors to all the financing alternatives presented by the Commission. They are:

(a) The facility includes all components, as described in Part V. ENGINEERING, up to the petroleum departure point from the on land storage facility.

(b) The magnitude of the cost of constructing this facility is $400 million during 1975-76, plus $20 million for facility expansion in 1979, including eight percent (8%) interest cost for the interim construction finances. In the cash flow charts, two specific estimates made by other entities and of the magnitude of the above figures were utilized.

(c) There are, for financial calculations, two sets of charts reflecting and comparing alternatives for two different circumstances: The first for a facility life of twenty (20) years, and the second for a thirty (30) year facility.

(d) For the various alternatives, principal payments vary but interest is calculated on the declining principal balance.

(e) The charge or tariff per barrel moved through the facility is equal to:

$$\frac{\text{(Operation \& Maintenance) + (Principal \& Interest)}}{\text{Estimated Number of Barrels per Year}}$$

(Additionally, several variations of the alternatives add a profit factor to the numerator.)

(f) Future dollars are converted to present value to establish comparable figures for all alternatives. A 10% discount rate was utilized for this conversion. A change in the discount rate used does not affect the relative dollar positions of the alternatives.

C. Specific Alternatives

The three most viable alternatives, and appropriate variations of each, are presented in this section. They are:

ALTERNATIVE	PROBABLE INTEREST RATE	FINANCING METHOD	SECURITY
A	8%	Taxable corporate bonds	"take or pay" contracts, oil companies with a corporate entity
B	6%	Tax-exempt revenue bonds	"take or pay" contracts, oil companies with State
C	7%	"	Revenues

1. Alternative A

Alternative A is the basic corporate financing plan. Chart A_1 reflects the cash flow of that plan. The main points of Alternative A are:

a. The companies which would be the prime users of the facility would make an initial cash investment of 10% of the construction costs; the remaining 90% debt would be financed by these companies over twenty (20) years at approximately eight percent (8%) interest.

b. The oil companies would execute "take or pay" throughput contracts, with the corporate entity established by them to develop, operate, and own the facility. In these contracts, each

company would guarantee to pay for the throughput of a minimum number of barrels per year, even if the company did not actually import that number of barrels during the year. The sum of these "take or pay" contracts would be sufficient to cover all costs, including debt service of the facility for that year.

c. Book depreciation is straight line, and equal to principal reduction; tax depreciation would be on the basis of accelerated or declining balance methods.

d. The tariff per barrel would be sufficient to cover operations and maintenance (O&M) + Principal and Interest (P&I) + Return on Base (ROB). Return (ROB) is the Interstate Commerce Commission allowed seven precent (7%) of rate base. The rate base is calculated, per ICC, as capital investment less straight line depreciation at 1.5% of capital investment per year.

Under Alternative A, the estimated average present value tariff for a twenty year operation would be 4.58¢ per barrel. With Alternative A the corporate entity would own the facility. With the companies assuming such a liability for signing take or pay contracts, their present value interest for such obligation would come to approximately $188 million which is comprised of:

Book income after tax:	$190 million (Present Value)
Plus The	
Depreciated asset:	$ 38 million (Present Value of ICC rate base with future value, after 20 years depreciation, of $260 million)
Less	$ 40 million initial cash investment.

2. Alternative B

Alternative B represents traditional governmental financing of a revenue producing facility: the use of tax-exempt revenue bonds which fund construction. Tax-exempt bonds are bonds issued by State and local

governments for constructing public purpose facilities. As such, the interest paid to purchasers of these bonds is not taxable income to them. Because of this tax-exempt factor, these bonds would probably be salable at a lower interest rate than corporate bonds.

Costs to users of the facility are set at the level necessary to generate sufficient revenues to repay the bonds plus pay operational and maintenance costs. Security for the bonds are "take or pay" contracts between the oil companies and the governmental entity issuing the bonds.

This alternative would provide the lowest tariffs--an estimated average present value of 2.91¢ per barrel over the twenty years--due to the lower interest rate (tax-exempt and secured) and exclusion of the seven percent (7%) Return on Base (ROB) of Alternative A.

Chart B_3 reflects the cash flow of this plan. The facility would be owned by the governmental entity.

The other main points of Alternative B are:

a. No "up front" cash would be necessary. The 100% debt would be financed for twenty (20) years at an assumed 6% interest.

b. Contracts would be prepared in a form in which the oil companies could receive depreciation and investment tax credit, in addition to expensing the tariffs paid.

3. Alternative C

This alternative is the same as Alternative B, but without the security of the "take or pay" contracts. Without this security, it is probable that the interest rate on the bonds would be higher than the six percent (6%) of Alternative B, but lower than the taxable interest of eight percent (8%) of Alternative A.

For the development of cash flow charts, a seven percent (7%) rate is therefore shown as probable. Chart C_2 reflects that cash flow. The present value

estimated average tariff, over twenty (20) years, would be 3.01¢ per barrel.

More so than the other alternatives, Alternative C would require a particularly strong financial feasibility report which would have to be fully acceptable by potential purchasers of bonds. The source of such a report must be a nationally recognized authority, with oil, transportation, and financial expertise.

Absent such a feasibility report a low interest rate could be enhanced and a successful bond sale could be assured if the Texas Legislature resolved that the State had a "moral obligation" to ensure bond repayment. If deemed appropriate by the Legislature, this statement would be in the form of a concurrent resolution that the Legislature would exercise its powers as necessary to ensure payment of debt service and operation and maintenance costs, should some unpredictable action temporarily reduce revenues below those necessary to meet costs of the facility.

As there are no contracts with the users in this alternative, the oil companies would not have the tax advantages of depreciation and investment tax credits. Concurrently, they would not have the contractual liabilities of Alternatives A and B, nor would they be required to provide the $40 million "up front" cash of Alternative A. Ownership of the facility would reside in the government entity issuing the bonds.

D. Comparisons of Alternatives

Selected overall observations of the alternatives, additional comparisons, and conclusions are contained in this section of the report. The Commission is persuaded that three separate but related interests must be equated in this summary of conclusions.

The first: The citizens of Texas have a strong interest as consumers. This interest, stated simply, is that the lower the tariff for using the facility, the lower the cost passed on to the consumer.

The second: The government of the State of Texas,

representing its citizens, has two interests in the facility in addition to consumer advocacy. Therefore, the Commission finds:

> *That the facility must be constructed because of its necessity to the State's economy, and to the general economic well-being of a large segment of the U. S. economy and;*
>
> *That the construction and operation of the facility must meet the highest environmental requirements. (It is presumed that the more involved the State is in financing, the more flexibility and control the State may exercise in preserving its interest.)*

The third: The oil companies must be in general agreement with the recommendation if an unscathed conversion of the Commission's recommendations into legislation is to occur. For the oil companies to be in agreement, the recommendation must therefore serve at least some interests of the oil companies.

The chart on the succeeding page 66 presents a brief comparison of the financing alternatives.

COMPARISON OF FINANCING ALTERNATIVES

ALTERNATIVE	VARIATION	INTEREST RATE	AVERAGE TARIFF*	CONSUMER INTEREST**	STATE INTEREST	OIL COMPANIES INTEREST
A--Corporate Proposal	A	8	4.58	$973 million	least involvement	$188 million (PV) for liability
B--Tax-Exempt Financing w/take or pay contracts	B***	6	2.91	$620 million	average involvement	0 Return for Liability
C--Tax-Exempt Financing w/o take or pay contracts	C	7	3.01	$641 million	highest involvement	no liability

* In ¢/barrel, the estimated average, in present value, for twenty years of operation.

** Present value of cost of facility ((principal and interest) + (operation and maintenance) +, in Alternative A, (Return on Base)) The higher this amount, the higher the cost-of-goods passed on to the consumer. These amounts provide a quantified measure of those costs which may be passed on.

*** In this alternative, the companies assume the liability of take or pay contracts. For this liability, the companies have the use of the facility, and can receive the advantages of tax depreciation and investment tax credit. However, they do not receive the 7% return on base described on p. 62. Two cash flow charts--B_1 on p.75 and B_2 on p. 76 -- reflect the costs of providing this return in Alternative B at the rates of 7% and 3.5%, respectively. In these cases, the estimated average, present value of the tariff over twenty years operation would be 3.67¢/barrel and 3.22¢/barrel, respectively; and the consumer interest figure would be $825 million and $722 million respectively.

The chart on the previous page indicates that, in an overall sense, Alternative C is the most attractive. However, the Commission is cognizant that there are conditions and variables which may detract from Alternative C and/or which may cause Alternatives A or B to be compromisingly attractive. The most significant of these matters are described in the following paragraphs.

The question of bond marketability exists in all alternatives, particularly Alternative C. If the economic feasibility document assigns a high probability of frequent interruption of the flow of imported crude petroleum due to unstable international conditions, and/or if the Legislature believes a resolution of moral obligation not appropriate, then the bonds may not be marketable. In that case, Alternative C becomes impossible to implement.

The oil industry has specific financial inducements in the development of an oil importation facility in addition to the industry's prime interest of continued feed for refineries for the purpose of providing petroleum products. The facility may represent, if financed through Alternative A, a very attractive return to those companies who assume the liability in that corporate financing method. Additionally, those companies may view the deepwater facility as but one component in the production and transportation system from oil well to consumer. In that case, the companies may believe that ownership of this component should be private. Since there can be a significant return to be realized by the companies from the facility, and/or if the companies are strongly of the opinion that the facility would not be an integral part of the industry's system if publicly owned, then the oil industry would strongly resist implementation of any alternative other than Alternative A. On the other hand, it must be remembered that it is still to the primary interest of the oil companies that the product of their industry be marketable at the lowest cost at the retail level. There would be no profit or loss to the oil companies in this segment of the production chain if publicly financed. Thus, this segment should be of no consequence to the companies so long as they can still sell and make a profit at retail. Public financing will aid in providing lowest cost at the final destination of the product.

The development of any large facility carries with

it a certain degree of risk. This risk may take several forms: delays in construction, uneconomic operation, acts of God, significant interruptions of oil flow into the facility, a severe oil spill, and other similar possibilities.

If these risks become realities to the worst extent possible, the facility's cost per time period would exceed its revenues for the same time period. And should this worst situation eventuate, the owner of the facility must initiate actions to pay the difference of costs less revenue during those adverse time periods. The question exists of whether the oil industry is of such importance to the State of Texas as to cause it to be mandatory that the State assume this risk. Concurrently, regarding some of these risks, the question exists whether the State would be better able to prevent or rectify the results of these risks. It should be understood that the oil and chemical companies who have or may join SEADOCK as proposed participants have repeatedly expressed their readiness to assume the risks inherent in the financing and operation of an offshore facility of the magnitude suggested by this plan. For assuming such risks they would be fully entitled to a fair return on their investment.

There is the question of the extent of State desirability to become involved in the facility. If the State is of the opinion that its interests can be sufficiently protected without there being public ownership, or if the State is of the opinion that it does not have sufficient interest in the facility and its function to warrant public ownership, then public ownership becomes an unnecessary requirement.

In the public ownership alternatives, the total costs of the facility are reduced due to lower bond interest rates and due to exclusion of profit. Costs are covered by the tariffs paid by the companies importing oil through the facility. These costs thus become a component of the cost-of-goods-sold of the resulting petroleum products and are ultimately paid by the consumers of these products. Although in the total price of a gallon of gasoline, costs for this segment of the production of that petroleum unit are of a very small magnitude, the cummulative total amount paid by consumers could be nearly one billion dollars during a projected 30 year facility life. The consumer benefit is thus best served by keeping the unit segment costs as low as possible.

There are several additional matters, hereinafter

discussed, which have been considered in the Commission's deliberations. However, they are not believed to have significant impact upon the facility's financing.

"Control," as applied to the facility, has been a term often utilized but without clear definition. There may be concern in the oil industry that if the facility is financed by the State, control of the setting of tariffs would be out of the hands of the known and established tariff setting provisions of the ICC, and that tariffs would be set at extremely high levels. However, for the State to do so would be contrary to its interest. If necessary, this concern may be assuaged by appropriate provisions in bond documents, if the facility is to be publicly owned.

Another possible definition of control of the facility has been that it would be analogous to the "State controlling" to the same extent as has been threatened by the oil producing and exporting countries. In this context, "control" is the capability of shutting off the flow of oil through the facility. This control, even if possible, would also be contrary to the State's interest. This concern may also be rectified, if necessary, in the bond documents.

The oil industry has emphasized the financial liability the oil companies would assume if the facility is privately owned. It should be noted that this liability would be spread, albeit unevenly, among a number of companies, each of some magnitude. However, due to the industry's emphasis upon the liability, this "spread" aspect has not been included in the considerations upon which the Commission's plan is based.

Considerable discussion and difference of opinion exists regarding whether the liability of the "take or pay" contracts, in tax-exempt or taxable bond financing, can be treated on-or off-balance sheet. The Commission is of the opinion that if Alternative C is implemented, which is without "take or pay" contracts, the matter becomes moot. Conversely, if "take or pay" contracts are utilized, it is highly probable that they can be treated off-balance sheet in any alternative if the bond documents are properly formulated.

An observation has been made that financing by the State will probably be unacceptable and crude importation will be via Bahamas transshipment or by importation of crude supplies through another state(s). These are, of course, possible alternatives. It has, however, been conservatively calculated that there is a transportation

savings of 20 to 30 cents per barrel through a Texas deepwater terminal versus the transshipment alternative. A State proposed financing and ownership plan would have to be extremely unacceptable to the oil companies to forego such savings. More importantly, any unacceptable financing proposed by the State would not be in the State's interest. Additionally, all states have common interests in deepwater facilities which would strongly resist one state being placed in opposition to or in competition with another. In fact, all the Gulf Coast states favor federal deepwater port legislation which contains language making State consent a necessary prerequisite to the granting of a license before facilities are built off the State's coast.

E. Conclusions

From the previous information, Alternative C (tax-exempt financing without "take or pay" contacts) is the most attractive in the sum of the interests of all parties.

More so than Alternatives A and B, achieving a low interest rate in this alternative would be a function of the strength of the economic feasibility report. Efforts to achieve the lowest rate would be greatly enhanced by the legislative statement of moral obligation. Acceptance of this alternative by the oil companies depends on whether they can achieve a present value (based upon a twenty year period) in excess of $188 million for incurring the same liability through some other investment, an example being perhaps the building or expansion of refineries.

In contrast with the possible risks, this financing alternative is the one which is most in the public interest and in balance with the probability of implementation of this alternative. Accordingly, it is the Commission's finding that the facility should be publicly owned. Additionally, the Commission finds that such ends should be accomplished through government revenue bonds whose repayment will rest entirely upon the revenues generated by the deepwater port facility. The Commission further finds that the public would be most benefited by these revenue bonds being secured by minimum throughput ("take or pay") contracts between the companies who will use the facility and the State (Alternative B). If that alternative cannot be

implemented, the Commission finds that the public would still receive larger scale benefits if the security for these bonds is restricted to the revenues of the facility (Alternative C).

However, the Commission recognizes that each of these alternatives may become more attractive because of changed circumstances. Therefore, the Commission recommends that legislation be enacted that would permit any alternative, including private ownership, if such an alternative can be shown to be more attractive.

F. Cash Flow Charts

The following pages (73 to 85) are the cash flow charts referenced on Page 59 of the Commission's plan. These charts are:

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
*A_1	Taxable	Private	8%	Take or Pay	7%	20 years
A_2	Taxable	Private	8%	Take or Pay	7%	30 years
B_1	Exempt	Public	6%	Take or Pay	7%	20 years
B_2	Exempt	Public	6%	Take or Pay	3.5%	20 years
*B_3	Exempt	Public	6%	Take or Pay	0%	20 years
C_1	Exempt	Public	6%	Revenue	0%	20 years
*C_2	Exempt	Public	7%	Revenue	0%	20 years
C_3	Exempt	Public	8%	Revenue	0%	20 years
D_1	Exempt	Public	7%	Revenue	0%	30 years
D_2	Exempt	Public	7%	Revenue	0%	30 years

(All figures on the charts, except volume and tariff, are X$1,000. Volume is barrels X1,000 per day. Tariff is $ per barrel.)

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*These charts present the cash flows of the three basic alternatives, respectively, of Alternatives A, B, and C, described in the text of the plan.

Charts A_2, D_1, and D_2 reflect slightly different cost figures than those of the other charts and present a thirty (30) year facility life.

Charts D_1 and D_2 are bond amortization schedules which include, in addition to the factors of the other charts, three years capitalized interest and a 15% reserve (.15 X (capitalized interest + capital expenditures)).

In Chart D_1 it is assumed that bonds are held to a maturity of 30 years and then redeemed.

In Chart D_2 it is assumed that the bonds contain a 15-year call provision, which is exercised, after which the lowered costs are reflected in lowered tariffs.

These reductions are reflected in columns (19) and (20) of (Page 3) of Chart D_2, showing Net Tariff and Adjusted Gross Revenues.

A_1

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 8% INTEREST	(6) BOOK DEPCN.	(7) AFTER TAX DIVDS.	(8) PV DIVIDENDS	(9) GROSS REVENUE	(10) PRESENT VALUE REVENUES	(11) CUMM. PV REVENUES	(12) TARIFF
1975	-0-	276495	-0-									
1976	1731	105910	26703	12442	19907	12442	18615	16922	81351	73956	73956	.1287
1977	2152		28327	17459	26537	17459	26062	21537	107059	88473	162429	.1362
1978	2346		29724	17459	25141	17459	24702	18558	108175	81271	243700	.1263
1979	2558	12850	31214	17459	23744	17459	23561	16092	109397	74718	318418	.1171
1980	2867		33051	18182	23272	18182	24300	15087	115312	71597	390015	.1101
1981	2991		34546	18182	21818	18182	23473	13250	116554	65794	455809	.1067
1982	3104		36089	18182	20363	18182	22809	11705	117856	60483	516292	.1040
1983	3198		37659	18182	18909	18182	22291	10398	119200	55606	571898	.1021
1984	3300		39309	18182	17454	18182	21905	9289	120638	51162	623060	.1001
1985	3391		41005	18182	16000	18182	21635	8340	122133	47082	670142	.0986
1986	3391		43055	18182	14545	18182	21063	7382	123179	43174	713316	.0995
1987	3391		45208	18182	13090	18182	20563	6551	124298	39601	752917	.1004
1988	3391		47468	18182	11636	18182	20126	5830	125494	36355	789272	.1013
1989	3391		49841	18182	10181	18182	19740	5197	126765	33377	822649	.1024
1990	3391		52333	18182	8727	18182	19396	4643	128117	30671	853320	.1035
1991	3391		54950	18182	7272	18182	19088	4153	129554	28190	881510	.1046
1992	3391		57698	18182	5818	18182	18807	3720	131078	25927	907437	.1059
1993	3391		60583	18182	4363	18182	18545	3336	132690	23870	931307	.1072
1994	3391		63612	18182	2909	18182	18300	2992	134403	21974	953281	.1085
1995	3391		66792	18180	1454	18180	18064	2684	136213	20241	973522	.1100
									2409466	973522		

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
A_1	Taxable	Private	8%	Take or Pay	7%	20 years

A_2

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 8% INTEREST	(6) BOOK DEPCN.	(7) AFTER TAX DIVDS.	(8) PV DIVIDENDS	(9) GROSS REVENUE	(10) PV REVENUES	(11) CUMM. PV REVENUES	(12) TARIFF
1975	-0-	274755				-0-						-0-
1976	1731	123210	27213	8900	19782	9891	19233	17484	81351	73956	73956	12.9
1977	2152		28843	12900	27942	14327	27570	22783	107059	88473	162429	13.6
1978	2346		30246	12900	26910	14327	27156	20402	108175	81271	243700	12.6
1979	2558	19300	31743	12900	25878	14327	26748	18268	109397	74718	318418	11.7
1980	2867		34114	13500	26235	15022	27699	17198	115312	71597	390015	11.0
1981	2991		35618	13500	25155	15022	27283	15401	116554	65794	455809	10.7
1982	3104		37172	13500	24075	15022	26873	13791	117856	60483	516292	10.4
1983	3198		38752	13500	22995	15022	26470	12348	119200	55606	571898	10.2
1984	3300		40413	13500	21815	15022	26074	11057	120638	51162	623060	10.0
1985	3391		42121	13500	20835	15022	25683	9900	122133	47082	670142	9.9
1986	3391		43370	13500	19755	15022	25297	8866	123179	43174	713316	10.0
1987	3391		44679	13500	18675	15022	24917	7938	124298	39601	752917	10.0
1988	3391		46052	13500	17595	15022	24544	7110	125494	36355	789272	10.1
1989	3391		47492	13500	16515	15022	24175	6365	126765	33377	822649	10.2
1990	3391		49000	13500	15435	15022	23812	5700	128117	30671	853320	10.4
1991	3391		50580	13500	14355	15022	23456	5104	129554	28190	881510	10.5
1992	3391		52238	13500	13275	15022	23104	4569	131078	25927	907437	10.6
1993	3391		53976	13500	12195	15022	22757	4093	132690	23870	931307	10.7
1994	3391		55801	13500	11115	15022	22416	3665	134403	21974	953281	10.9
1995	3391		57714	13500	10035	15022	22080	3281	136213	20241	973522	11.0
1996	3391		59636	13500	8955	15022	21749	2938	138044	18649	992171	11.2
1997	3391		61622	13500	7875	15022	21423	2630	139946	17185	1009356	11.3
1998	3391		63675	13500	6795	15022	21101	2356	141924	15852	1025208	11.5
1999	3391		65797	13500	5715	15022	20785	2109	142897	14504	1039712	11.5
2000	3391		67990	13500	4635	15022	20473	1889	143462	13241	1052953	11.6
2001	3391		70258	13500	3555	15022	20166	1691	144113	12091	1065044	11.6
2002	3391		72602	13500	2475	15022	19864	1515	144849	11051	1076095	11.7
2003	3391		75025	13500	1395	15022	19565	1355	145594	10089	1086184	11.8
2004	3391		77528	3939	315	3865	19272	1214	124117	7819	1094003	10.0
2005	3391		80117				18983	1087	118083	6766	1100769	9.5
								294107	3792495	1100769		

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
A_2	Taxable	Private	8%	Take or Pay	7%	30 years

B_1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	VOLUME	CAPITAL	O & M	PRINCIPAL	6% INTEREST	TOTAL COST	COST TARIFF	SECURITY FEE	SECURITY FEE (PV)	PRESENT VALUE REVENUES	TOTAL TARIFF
1975	-0-	276495	-0-								
1976	1731	105910	26703	19763	16589	63055	.0997	19354	17594	57323	.1304
1977	2152		28327	19763	21758	69248	.0889	27058	22360	57722	.1233
1978	2346		29724	19763	20572	70059	.0818	26657	20027	52635	.1129
1979	2558	12850	31214	19763	19386	70363	.0753	26255	17932	48057	.1034
1980	2867		33051	19763	18972	71786	.0685	26753	16610	44571	.0941
1981	2991		34546	19763	17786	72095	.0660	26338	14867	40697	.0901
1982	3104		36089	19763	16600	72452	.0639	25923	13303	37182	.0868
1983	3198		37659	19763	15414	72836	.0623	25508	11899	33977	.0842
1984	3300		39309	19763	14229	73301	.0608	25093	10641	31086	.0816
1985	3391		41005	19763	13043	73811	.0596	24678	9513	28454	.0795
1986	3391		43055	19763	11857	74675	.0603	24263	8504	26173	.0799
1987	3391		45208	19763	10671	75642	.0611	23848	7597	24099	.0803
1988	3391		47468	19763	9485	76716	.0619	23433	6788	22224	.0809
1989	3391		49841	19763	8300	77904	.0629	23018	6060	20512	.0815
1990	3391		52333	19763	7114	79210	.0639	22603	5411	18962	.0822
1991	3391		54950	19763	5928	80641	.0651	22188	4828	17547	.0830
1992	3391		57698	19763	4743	82204	.0664	21773	4306	16259	.0840
1993	3391		60583	19763	3557	83903	.0677	21358	3842	15094	.0850
1994	3391		63612	19763	2371	85746	.0692	20943	3424	14019	.0861
1995	3391		66792	19761	1185	87738	.0708	20528	3050	13037	.0874
			879167	395258	239560	1513985			205556	619630	
									825186		

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
B_1	Exempt	Public	6%	Take or Pay	7%	20 years

B_2

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 6% INTEREST	(6) TOTAL COST	(7) COST TARIFF	(8) SECURITY FEE	(9) SECURITY FEE (PV)	(10) PRESENT VALUE REVENUES	(11) TOTAL TARIFF
1975	-0-	276495	-0-								
1976	1731	105910	26703	19763	16589	63055	.0997	9677	8797	57323	.1151
1977	2152		28327	19763	21758	69848	.0889	13529	1118	57722	.1061
1978	2346		29724	19763	20572	70059	.0818	13328	1090	52635	.0973
1979	2558	12850	31214	19763	19386	70363	.0753	13127	8965	48057	.0894
1980	2867		33051	19763	18972	71786	.0685	13376	8305	44571	.0813
1981	2991		34546	19763	17786	72095	.0660	13169	7433	40697	.0781
1982	3104		36089	19763	16600	72452	.0639	12961	6651	37182	.0753
1983	3198		37659	19763	15414	72836	.0623	12754	5949	33977	.0733
1984	3300		39309	19763	14229	73301	.0608	12546	5320	31086	.0712
1985	3391		41005	19763	13043	73811	.0596	12339	4756	28454	.0696
1986	3391		43055	19763	11857	74675	.0603	12131	4251	26173	.0701
1987	3391		45208	19763	10671	75642	.0611	11924	3798	24099	.0707
1988	3391		47468	19763	9485	76716	.0619	11716	3394	22224	.0714
1989	3391		49841	19763	8300	77904	.0629	11509	3030	20512	.0722
1990	3391		52333	19763	7114	79210	.0639	11301	2705	18962	.0731
1991	3391		54950	19763	5928	80641	.0651	11094	2414	17547	.0741
1992	3391		57698	19763	4743	82204	.0664	10886	2153	16259	.0752
1993	3391		60583	19763	3557	83903	.0677	10679	1921	15094	.0764
1994	3391		63612	19763	2371	85746	.0692	10471	1712	14019	.0777
1995	3391		66792	19761	1185	87738	.0708	10264	1525	13037	.0791
			879167	395258	239560	1513985			102778	619630	
									722408		

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
B_2	Exempt	Public	6%	Take or Pay	3.5%	20 years

B_3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	VOLUME	CAPITAL	O & M	PRINCIPAL	6% INTEREST	TOTAL COST	COST TARIFF	SECURITY FEE	SECURITY FEE (PV)	PRESENT VALUE REVENUES	TOTAL TARIFF
1975	-0-	276495	-0-					-0-	-0-		
1976	1731	105910	26703	19763	16589	63055	.0997			57323	.0997
1977	2152		28327	19763	21758	69848	.0889			57722	.0889
1978	2346		29724	19763	20572	70059	.0818			52635	.0818
1979	2558	12850	31214	19763	19386	70363	.0753			48057	.0753
1980	2867		33051	19763	18972	71786	.0685			44571	.0685
1981	2991		34546	19763	17786	72095	.0660			40697	.0660
1982	3104		36089	19763	16600	72452	.0639			37182	.0639
1983	3198		37659	19763	15414	72836	.0623			33977	.0623
1984	3300		39309	19763	14229	73301	.0608			31086	.0608
1985	3391		41005	19763	13043	73811	.0596			28454	.0596
1986	3391		43055	19763	11857	74675	.0603			26173	.0603
1987	3391		45208	19763	10671	75642	.0611			24099	.0611
1988	3391		47468	19763	9485	76716	.0619			22224	.0619
1989	3391		49841	19763	8300	77904	.0629			20512	.0629
1990	3391		52333	19763	7114	79210	.0639			18962	.0639
1991	3391		54950	19763	5928	80641	.0651			17547	.0651
1992	3391		57698	19763	4743	82204	.0664			16259	.0664
1993	3391		60583	19763	3557	83903	.0677			15094	.0677
1994	3391		63612	19763	2371	85746	.0692			14019	.0692
1995	3391		66792	19761	1185	87738	.0708			13037	.0708
			879167	395258	239560	1513985				619630	

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
B3	Exempt	Public	6%	Take or Pay	0%	20 years

C_1

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 6% INTEREST	(6) TOTAL COST	(7) PRESENT VALUE REVENUES	(8) TOTAL TARIFF
1975	-0-	276495	-0-					
1976	1731	105910	26703	19763	16589	63055	57323	.0997
1977	2152		28327	19763	21758	69848	57722	.0889
1978	2346		29724	19763	20572	70059	52635	.0818
1979	2558	12850	31214	19763	19386	70363	48057	.0753
1980	2867		33051	19763	18972	71786	44571	.0685
1981	2991		34546	19763	17786	72095	40697	.0660
1982	3104		36089	19763	16600	72452	37182	.0639
1983	3198		37659	19763	15414	72836	33977	.0623
1984	3300		39309	19763	14229	73301	31086	.0608
1985	3391		41005	19763	13043	73811	28454	.0596
1986	3391		43055	19763	11857	74675	26173	.0603
1987	3391		45208	19763	10671	75642	24099	.0611
1988	3391		47468	19763	9485	76716	22224	.0619
1989	3391		49841	19763	8300	77904	20512	.0629
1990	3391		52333	19763	7114	79210	18962	.0639
1991	3391		54950	19763	5928	80641	17547	.0651
1992	3391		57698	19763	4743	82204	16259	.0664
1993	3391		60583	19763	3557	83903	15094	.0677
1994	3391		63612	19763	2371	85746	14019	.0692
1995	3391		66792	19761	1185	87738	13037	.0708
			879167	395258	239560	1513985	619630	

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
C_1	Exempt	Public	6%	Revenue	0%	20 years

C_2

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 7% INTEREST	(6) TOTAL COST	(7) PRESENT VALUE REVENUES	(8) TOTAL TARIFF
1975	-0-	276495	-0-					
1976	1731	105910	26703	19763	19354	65820	59846	.1041
1977	2152		28327	19763	25384	73474	60718	.0935
1978	2346		29724	19763	24001	73488	55211	.0858
1979	2558	12850	31214	19763	22618	73595	50265	.0788
1980	2867		33051	19763	22134	74948	46535	.0716
1981	2991		34546	19763	20750	75059	42370	.0687
1982	3104		36089	19763	19367	75219	38602	.0663
1983	3198		37659	19763	17983	75405	35176	.0645
1984	3300		39309	19763	16600	75672	32092	.0628
1985	3391		41005	19763	15217	75985	29292	.0613
1986	3391		43055	19763	13833	76651	26866	.0619
1987	3391		45208	19763	12450	77421	24666	.0625
1988	3391		47468	19763	11066	78297	22682	.0632
1989	3391		49841	19763	9683	79287	20876	.0640
1990	3391		52333	19763	8300	80396	19246	.0649
1991	3391		54950	19763	6916	81629	17762	.0659
1992	3391		57698	19763	5533	82994	16416	.0670
1993	3391		60583	19763	4149	84495	15200	.0682
1994	3391		63612	19763	2766	86141	14084	.0695
1995	3391		66792	19763	1383	87938	13067	.0710
			879167	395260	279487	1553914	640972	

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
C_2	Exempt	Public	7%	Revenue	0%	20 years

C_3

YEAR	(1) VOLUME	(2) CAPITAL	(3) O & M	(4) PRINCIPAL	(5) 8% INTEREST	(6) TOTAL COST	(7) PRESENT VALUE REVENUES	(8) TOTAL TARIFF
1975	-0-	276495	-0-					
1976	1731	105910	26703	19763	22119	68585	62350	.1085
1977	2152		28327	19763	29011	77101	63716	.0981
1978	2346		29724	19763	27430	76917	57787	.0898
1979	2558	12850	31214	19763	25849	76826	52472	.0822
1980	2867		33051	19763	25296	78110	48498	.0746
1981	2991		34546	19763	23715	78024	44044	.0714
1982	3104		36089	19763	22134	77986	40022	.0688
1983	3198		37659	19763	20553	77975	36375	.0668
1984	3300		39309	19763	18972	78044	33098	.0647
1985	3391		41005	19763	17391	78159	30130	.0631
1986	3391		43055	19763	15810	78628	27559	.0635
1987	3391		45208	19763	14228	79199	25232	.0639
1988	3391		47468	19763	12647	79878	23140	.0645
1989	3391		49841	19763	11066	80670	21240	.0651
1990	3391		52333	19763	9485	81581	19530	.0659
1991	3391		54950	19763	7904	82617	17977	.0667
1992	3391		57698	19763	6323	83784	16572	.0676
1993	3391		60583	19763	4742	85088	15307	.0687
1994	3391		63612	19763	3161	86536	14148	.0699
1995	3391		66792	19761	1580	88133	13096	.0712
			879167	395258	319416	1593841	662293	

CHART	TAX STATUS	OWNERSHIP	INTEREST RATE	SECURITY	RETURN OR SECURITY FEE	TIME SPAN
C_3	Exempt	Public	8%	Revenue	0%	20 years

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YEAR	(1) BOND PROCEEDS	(2) CAPITAL EXPENDITURES	(3) VOLUME	(4) TARIFF	(5) GROSS REVENUES	(6) O & M	(7) NET REVENUES
1975	612144	274755	-0-	-0-	-0-	-0-	-0-
1976		123210	1731	.129	81351	27213	54138
1977			2152	.136	107059	28843	78216
1978			2346	.126	108175	30246	77929
1979		19300	2558	.117	109397	31743	77654
1980			2867	.110	115312	34114	81198
1981			2991	.107	116554	35618	80936
1982			3104	.104	117856	37172	80684
1983			3198	.102	119200	38752	80448
1984			3300	.100	120638	40413	80225
1985			3391	.099	122133	42121	80012
1986			3391	.100	123179	43370	79809
1987			3391	.100	124298	44679	79619
1988			3391	.101	125494	46052	79442
1989			3391	.102	126765	47492	79273
1990			3391	.104	128117	49000	79117
1991			3391	.105	129554	50580	78974
1992			3391	.106	131078	52238	78840
1993			3391	.107	132690	53976	78714
1994			3391	.109	134403	55801	78602
1995			3391	.110	136213	57714	78499
1996			3391	.112	138044	59636	78408
1997			3391	.113	139946	61622	78324
1998			3391	.115	141924	63675	78249
1999			3391	.115	142897	65797	77100
2000			3391	.116	143462	67990	75472
2001			3391	.116	144113	70258	73855
2002			3391	.117	144849	72602	72247
2003			3391	.118	145594	75025	70569
2004			3391	.100	124117	77528	46589
2005			3391	.095	118083	80117	37966
	612144	417265			3792495	1541387	2251108

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(7) NET REVENUES	(8) 7% DEBT SERVICE INTEREST	(9) AFTER INTEREST BALANCE	(10) RESERVE	(11) 6% INTEREST ON RESERVE	(12) NON-RESERVE BALANCE	(13) 4% INT. ON NON-RESERVE	(14) IN-VESTMENT INCOME	(15) TOTAL NON-RESERVE	(16) PRINCIPAL PAYMENT	(17) ENDING SURPLUS
-0-	42850	294539	91821	5509	202717	8108	13617	216334		
54138	42850	182617	91821	5509	90796	3631	9140	99936		
78216	42850	217983	91821	5509	126162	5046	10555	136717		
77929	42850	253062	91821	5509	161241	6449	11958	173199		
77654	42850	268566	91821	5509	176745	7069	12578	189323		
81198	42850	306914	91821	5509	215093	8603	14112	229205		
80936	42850	345000	91821	5509	253179	10127	15636	268815		
80684	42850	382834	91821	5509	291013	11640	17149	308162		
80448	42850	420432	91821	5509	328611	13144	18653	347264		
80225	42850	457807	91821	5509	365986	14639	20148	386134		
80012	42850	494969	91821	5509	403148	16125	21634	424782		
79809	42850	531928	91821	5509	440107	17604	23113	463220		
79619	42850	568697	91821	5509	476876	19075	24584	501460		
79442	42850	605289	91821	5509	513468	20538	26047	539515		
79273	42850	641712	91821	5509	549891	21995	27504	577395		
79117	42850	677974	91821	5509	586158	23446	28955	615113		
78974	42850	714103	91821	5509	622282	24891	30400	652682		
78840	42850	750093	91821	5509	658272	26330	31839	690111		
78714	42850	785957	91821	5509	694136	27765	33274	727410		
78602	42850	821709	91821	5509	729888	29195	34704	764592		
78499	42850	857358	91821	5509	765537	30621	36130	801667		
78408	42850	892916	91821	5509	801095	32043	37552	838647		
78324	42850	928390	91821	5509	836569	33462	38971	875540		
78249	42850	963789	91821	5509	871968	34878	40387	912355		
77100	42850	998039	91821	5509	906218	36248	41757	947975		
75472	42850	1030661	91821	5509	938840	37553	43062	981902		
73855	42850	1061666	91821	5509	969845	38793	44302	1014147		
72247	42850	1091063	91821	5509	999242	39969	45478	1044720		
70569	42850	1118782	91821	5509	1026961	41078	46587	1073548		
46589	42850	1122521	91821	5509	1030700	41228	46737	1077437		
37966	42850	1117637	91821	5509	1025816	41032	46541	1072357	612144	460213
2251108	1328350	2846451		170779		722325	893104			

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YEAR	(1) BOND PROCEEDS	(2) RESERVE FUND (15%)	(3) CAPITAL REQUIREMENTS	(4) VOLUME	(5) GROSS TARIFF	(6) GROSS REVENUES	(7) O & M	(8) AVAILABLE REVENUES
1975	575334	75044	275000	-0-	-0-	-0-	-0-	-0-
1976			125000	1731	.129	81351	27213	54138
1977				2152	.136	107059	28843	78216
1978				2346	.126	108175	30246	77929
1979				2558	.117	109397	31743	77654
1980				2867	.110	115312	34114	88198
1981				2991	.107	116554	35618	80936
1982				3104	.104	117856	37172	80684
1983				3198	.102	119200	38752	80448
1984				3300	.100	120638	40413	80225
1985				3391	.099	122133	42121	80012
1986				3391	.100	123179	43370	79809
1987				3391	.100	124298	44679	79619
1988				3391	.101	125494	46052	79442
1989				3391	.102	126765	47492	79273
1990				3391	.104	128117	49000	79117
1991				3391	.105	129554	50580	78974
1992				3391	.106	131078	52238	78840
1993				3391	.107	132690	53976	78714
1994				3391	.109	134403	55801	78602
1995				3391	.110	136213	57714	78499
1996				3391	.112	138044	59636	78408
1997				3391	.113	139946	61622	78324
1998				3391	.115	141924	63675	78249
1999				3391	.115	142897	65797	77100
2000				3391	.116	143462	67990	75472
2001				3391	.116	144113	70258	73855
2002				3391	.117	144849	72602	72247
2003				3391	.118	145594	75025	70569
2004				3391	.100	124117	77528	46589
2005				3391	.095	118083	80117	37966

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(8) AVAILABLE REVENUES	(9) 7% DEBT SERVICE INTEREST	(10) AFTER INTEREST BALANCE	(11) 4% INTEREST ON BALANCE	(12) 6% INTEREST ON RESERVE	(13) INVESTMENT INCOME	(14) ENDING BALANCE	(15) PRINCIPAL PAYMENT	(16) SURPLUS BALANCE (AT 6%)
-0-	40273	185017	7400	4502	11902	196919		
54138	40273	85784	7876	4502	12378	98162		
78216	40273	136105	3926	4502	8428	144533		
77929	40273	182189	5781	4502	10283	192472		
77654	40273	229853	7698	4502	12200	242053		
88198	40273	289978	9682	4502	14184	304162		
80936	40273	344825	12166	4502	16668	361493		
80684	40273	401904	14459	4502	18961	420865		
80448	40273	461040	16834	4502	21336	482376		
80225	40273	522328	19295	4502	23797	546125	575334	45835
80012	-0-	-0-	-0-	-0-	-0-	-0-		48585
79809								51500
79619								54590
79442								57865
79273								61337
79117								65017
78974								68918
78840								73054
78714								77437
78602								82083
78499								87008
78408								92229
78324								97762
78249								103628
77100								109846
75472								116437
73855								123423
72247								130828
70569								138678
46589								146999
37966								155818

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(8) AVAILABLE REVENUES	(14) ENDING BALANCE	(15) PRINCIPAL PAYMENT	(16) SURPLUS BALANCE (AT 6%)	(17) TARIFF REDUCTION $/BBL	(18) NET TARIFF	(19) ADJUSTED GROSS REVENUES	(20) DISCOUNTED ADJUSTED GROSS REVENUES
-0-	196919				-0-	-0-	-0-
54138	98162				.129	81351	73956
78216	144533				.136	107059	88473
77929	192472				.126	108175	81271
77654	242053				.117	109397	74718
88198	304162				.110	115312	71597
80936	361493				.107	116554	65794
80684	420865				.104	117856	60483
80448	482376				.102	119200	55606
80225	546125	575334	45835		.100	120638	51162
80012	-0-		48585	.064	.035	42121	16237
79809			51500	.064	.036	43370	15201
79619			54590	.064	.036	44679	14234
79442			57865	.064	.037	46052	13341
79273			61337	.064	.038	47492	12504
79117			65017	.063	.041	49000	11730
78974			68918	.063	.042	50580	11006
78840			73054	.063	.043	52238	10332
78714			77437	.063	.044	53976	9710
78602			82083	.063	.046	55801	9123
78499			87008	.063	.047	57714	8576
78408			92229	.063	.049	59636	8056
78324			97762	.063	.050	61622	7567
78249			103628	.063	.052	63675	7112
77100			109846	.062	.053	65797	6678
75472			116437	.060	.056	67990	6275
73855			123423	.059	.057	70258	5894
72247			130828	.058	.059	72602	5539
70569			138678	.057	.061	75025	5199
46589			146999	.037	.063	77528	4884
37966			155818	.030	.065	80117	4590
							816848

VIII. LEGAL

A. International Law

The United States now has full rights to build deepwater ports on high seas according to current international law. This law is set forth by the convention on the high seas:

> *"The high seas being open to all nations, no state may validly purport to subject any part of them to its sovereignty. Freedom of the high seas is exercised under the conditions laid down by these articles and by the other rules of international law. It comprises, inter alia, both for coastal and non-coastal states:*
>
> *1. Freedom of navigation;*
>
> *2. Freedom of fishing;*
>
> *3. Freedom to lay submarine pipelines, cables and pipelines;*
>
> *4. Freedom to fly over the high seas.*
>
> *These freedoms, and others which are recognized by the general principles of international law, shall be exercised by all states with reasonable regard to the interest of other states in their exercise of the freedom of the High Seas."*

The National Security Council's Interagency Task Force on the Law of the Sea considers the statement above to mean that nations are entitled "reasonable" use of the high seas and that a deepwater port would be a "reasonable" use.

The United States could not and has not claimed sovereignty to a high seas area in which a deepwater port facility may be located. To do so would be a territorial appropriation of a high seas area specifically prohibited by international law.

Under international law, the United States would have the right to regulate and protect

deepwater ports in international waters. This right is based on the general right of each nation to regulate and protect its activities which are in international waters. The situation is somewhat analogous to that of a nation having the right to protect its ships on the high seas.

In conclusion, the Commission finds that although there has been substantial discussion which is continuing, about the exact nature of international law in this area, it seems clear that current international law is sufficient, both under the Convention on the High Seas and current custom and usage, to permit a deepwater port to be built under federal sponsorship in international waters more than three (3) miles from the coast.

B. Federal Legislation

It seems clear that current federal law is sufficient to prohibit the construction of a deepwater port on the coast of the United States. It is, unfortunately, not equally clear that the federal government has sufficient enabling legislation to permit the construction of such a port. There may be sufficient existing authority to permit the construction of a dredged channel into international waters, but this is also not clear.

In an attempt to remedy that situation, several pieces of proposed legislation have been introduced in the United States Congress.

Chief among these pieces of proposed legislation, and an example which may be considered typical, is the Administration sponsored bill (S. 1751, H.R. 7501) entitled Deepwater Port Facilities Act of 1973. This bill would include the following major provisions:

1. All facilities, except pipelines, beyond three (3) nautical miles from the coast are included.

2. A license for construction, operation, or addition is required.

3. The facility must be so constructed and operated as to minimize adverse environmental effects.

4. The number of licenses to be granted is not to be

limited because of economic effects on other ports or commodity and transportation markets.

5. Licenses are issued for 30 years with preferential rights of renewal in the original licensee.

6. The Act requires consultation with the Governor of any State off whose coast the facility is to be built to insure consistency with State land-use planning.

7. The Secretary of the Interior is to consult with all interested or affected federal agencies.

8. An application filed under the Act is the only application required, but the application must be certified by all federal agencies as conforming to the laws and regulations to which they administer.

9. The Secretary of the Interior is to prepare a single Environmental Impact Statement (EIS) pursuant to the National Environmental Protection Act.

10. There is a requirement for notice of public hearing before the issuance of any public licenses.

11. There is a provision for judicial review in the United States federal courts.

12. State law is made applicable to pipelines on State lands if such laws are not inconsistent with federal law.

13. The State may require more stringent regulations.

One of the major weaknesses of this legislation is the lack of a single agency with sufficient authority to require expeditious handling and processing of the application. For example, the present procedures for obtaining a work permit from the Corps of Engineers under the Rivers and Harbors Act for dredging or construction require the coordination of twenty one (21) different federal agencies and six (6) other groups to which each permit application must go; many of the steps may have to be done several times before final approval is obtained.

The Commission, therefore, believes that federal legislation is necessary, and any such legislation should

contain several provisions which the Commission believes are absolutely necessary to the expeditious and environmentally sound development of a deepwater terminal on the Texas Gulf Coast.

The first of these requirements is that the federal government must provide a single agency to provide precise and expeditious handling of applications made for a permit to construct or operate a deepwater facility. That agency should be given the necessary authority in the enabling legislation to insist that expeditious handling be accorded each application by all agencies involved in the permitting and licensing process.

Another major weakness which the Commission foresees in current legislation, specifically in the Administration Bill, is the lack of adequate consultation with the coastal State off whose coast the facility is to be built. It is the Commission's finding that such legislation must require that the licensing agency obtain approval of the State off whose coast the facility is to be built for the type of facility, the location of the facility, and, in general, all matters pertaining to the application which will affect the State.

This need is especially great because of the relatively large economic and environmental impact that such a facility could potentially have on the State and its citizens. Merely to require "consultation" is an inadequate means of insuring that the State's interest and that of its citizens will be adequately protected.

The Commission finds that legislation containing these two provisions, each of which it considers absolutely necessary, would be at least adequate to provide sufficient federal legislation to enable the construction of a Texas deepwater port. The Commission also finds that in the absence of such provisions construction of a deepwater port may be long delayed or never constructed, thus aggravating the current energy crisis. Likewise, the absence of consent involvement on the part of the State would raise a large risk that the best interest of the State of Texas may be sacrificed to private interests or partisan politics.

C. State Law

1. Civil Statutes

Current State legislation is not adequate to permit development of a Texas deepwater port in accordance with the Commission's Plan. The Commission will cause to be prepared such suggested legislation as would, in the Commission's judgment, be necessary to permit such construction in the most economically sound, environmentally secure and expeditious way possible. Texas law is sufficient to permit the construction of facilities connected with offshore terminals on State-owned submerged lands.

The State-owned submerged lands, extending, in the case of Texas, three marine leagues (about 10 1/2 miles) from the shore, would need to be utilized for pipelines connecting an offshore terminal located on the federal outer continental shelf with shore installations. The Submerged Lands Act grants to the State title and ownership of such lands and their natural resources, as well as the power to manage, administer, lease, develop and use such lands, in accordance with applicable State law.

Pipeline easements across unsold public free school land, islands, saltwater lands, bays, inlets, marshes, and reef owned by the State within tidewater limits and that portion of the Gulf within the jurisdiction of Texas are under the Commissioner of the General Land Office. Pipeline right-of-way easements may be granted by the Commissioner of the General Land Office on terms fixed by him, but for no more than ten (10) years, renewable at his discretion. The fee for the easement is no less than 2 1/2¢ per lineal rod (16 1/2 feet) per annum, but a higher fee may be fixed by contract.

Additionally, the Land Commissioner is permitted to adopt regulations for the operations on leases of surface rights in public lands.

2. Penal Code

There is a provision in the Texas Penal Code (Article 1631 (a)) which makes it a misdemeanor, punishable by a fine of $1,000 for each day of violation, to build "any pipeline leading into the waters of the Gulf of Mexico, which pipeline is used....for transporting, handling, loading or discharging oil, gas, or any derivative of oil or gas....into tanks, ships, vessels, barges or watercraft, or any agency for loading any of the oil products as described in this section, into tanks, ships, vessels, watercraft, or any agency for loading watercraft, whenever an emergency arises by the destruction through storm of the loading facilities within any harbor."

This provision was the result of a suit in 1928 between the State of Texas and the Humble Pipeline Company to enjoin the laying of pipelines from a point on the mainlands at Corpus Christi to two deep sea loading points within the three-mile territorial jurisdiction of Texas. The Austin Court of Civil Appeals held that the statute granting pipeline companies the right to use public lands included "necessary implication of a grant of power and authority" to the corporation to lay its pipelines across and under the beds and bottoms of public bays, inlets, canals, or channels belonging to this State or the part of the Gulf of Mexico within the jurisdiction of this State.

The Legislature took due notice of the judicial declaration that construction of these pipelines could only be enjoined if legislative act prohibited them and on March 19, 1929, passed an emergency measure to protect the ports of Texas.

The legislative history of the Act indicates that Article 1631 (a) was aimed at pipelines carrying oil from land into watercraft or a loading facility for watercraft.

In view of the changed circumstances since the Penal Code provision was passed and the availability of other State regulatory mechanisms, the Commission recommends that Penal Code Section 1631 (a) be repealed.

D. Conclusions and Recommendations

The Commission concludes that current international law is sufficient to permit construction of deepwater oil terminals off the Texas Gulf Coast in international waters, under federal aegis.

The Commission also concludes that federal legislation is necessary to permit the construction of such facilities and that any such legislation should contain provision for a single federal agency with complete authority over the application and require consent involvement by the State in any terminal to be built off its coast.

The Commission finds that if current State law is insufficient to permit the best development of a Texas deepwater port it will cause to be prepared such suggested legislation as may be necessary and desirable for the implementation of this plan.

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