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TEXAS PORTS AND NATURAL ENVIRONMENTAL ISSUES

As uniquely located exchange points between rich natural resources and their markets and between land-based and water-based transportation systems, Texas ports have greatly enhanced the economic viability of the state of Texas. Indeed, these ports possess economic importance not only to Texas but to the nation.

Ports provide the hinterlands, or land-locked areas of Texas, with an economic tie to the states that border the Gulf of Mexico, the Mississippi River, the Intercoastal Waterway, the Atlantic, and the Caribbean. The commercial importance of the ports leads to economic development at the ports themselves, at points of interchange, plus in the hinterlands. Beaumont, Port Arthur, Galveston, Houston, Freeport, Victoria, Corpus Christi and Brownsville benefit from ports and accompanying development.

Just as they are generators of economic activity, ports also generate environmental issues. Direct and secondary environmental effects are realities of port development as with other development.

James B. Blackburn, Jr., attorney, has reviewed these issues for Rice Center and the Texas Coastal and Marine Council. Better understanding of environmental issues at Texas ports should allow cooperative efforts, avoid conflict and insure future economic development of the Texas Coast.

DIRECT ENVIRONMENTAL EFFECTS

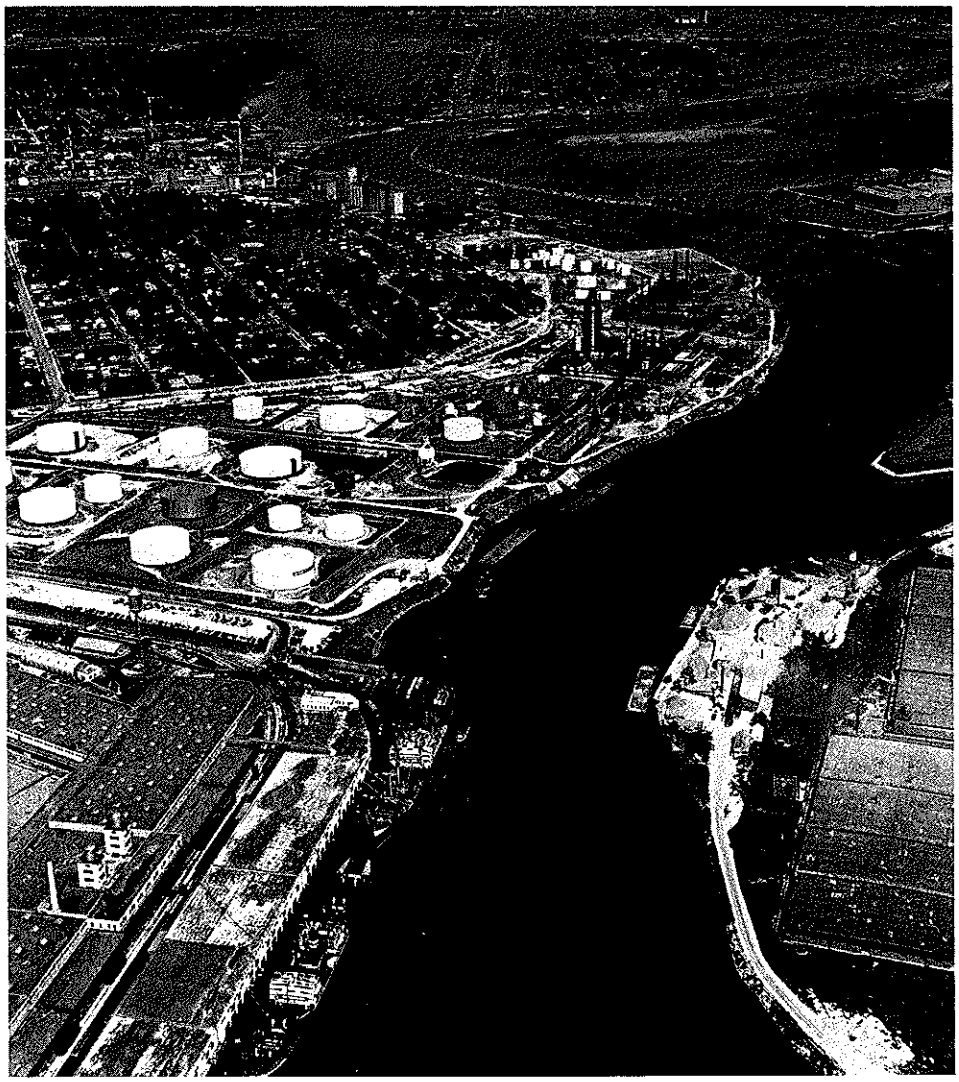
Direct environmental effects refer to disruptions of natural environmental systems resulting from the operation and maintenance of ports. Such disruptions may result from oil and hazardous material spills, dredging, dredge spoil disposal, tanker and barge movement to and from ports, waste generation by vessels, disposal of tanker wastes and barge washings, and air emissions from loading and unloading activities.

Oil and Hazardous Material Spills

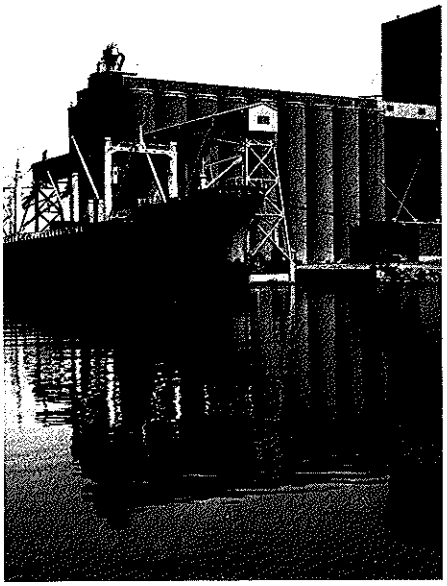
Some 75 percent of the total tons shipped from Texas ports are either raw crude, petroleum or petrochemical products, compared to the nationwide average of slightly over 40 percent. Therefore, the probability that a collision involving marine vessels on the Texas Coast will involve the spillage of petroleum or petroleum-related products is proportionately higher than for the nation generally.

The effects of such spills are related to the type of product spilled, the amount spilled, the characteristics of the region where the spill occurs and the type of treatment given to the spill. The low tidal range (one foot) along the Texas Gulf Coast helps to mitigate the impact of spills, as do quick and efficient clean-up techniques. At this time, sufficient technology exists to clean up spills in five to six foot seas, but efficiency is minimal beyond these levels. Operational contingency plans for clean-up are critical, as the opportunity to minimize environmental effects of spills depends upon affirmative action commenced immediately. Because the timing of the response is crucial, each port must have sufficient equipment and workable plans.

Intergovernmental and interindustry cooperation is equally important in minimizing environmental effects. The U.S. Coast Guard, the U.S. Environmental



Deepwater ports generate industrial and other growth that in turn produces environmental issues related to ports. Houston, although 50 miles inland, is among the nation's top three deepwater ports and one of thirteen deepwater ports along the Texas Coast. (Texas Highway Department photo)



Emissions from agricultural loading operations can be significant in areas attempting to reduce particulate emissions. (Texas Highway Department photo, Corpus Christi)

Protection Agency, the Texas Water Quality Board, the Texas Highway Department and the Texas Railroad Commission all have responsibilities with regard to spills of oil and hazardous materials. The Federal Water Pollution Control Act Amendments of 1972 and the Texas Oil and Hazardous Materials Act of 1975 contain provisions for oil spill contingency planning. The combination of coverage by these two acts makes Texas better covered legislatively than many other states. The current contingency plan, published by the Texas Water Quality Board in 1975, includes a compilation of names, addresses, persons to call, plus statutory authorization. However, the absence of a major spill along the Texas Coast has left this plan untested.

Dredge Spoil Disposal

Because most bays along the Texas Coast are shallow, dredging is necessary to insure safe navigation. The disposal of spoil from dredging raises two natural environmental issues. First, wastes that have previously settled to the bottom in major industrial areas are resuspended by dredging. For example, the discharge of mercury from industries has been reduced substantially in recent years because of the awareness by industry and government of the hazard represented by this heavy metal. However, substantial amounts of mercury, other heavy metals and oxygen-demanding materials may be present in the sediments of industrialized waterways. Dredging activities can resuspend these contaminants.

Land spoil disposal is often put forth as the preferred alternative to disposal in water. Although certain water quality issues are avoided by land disposal, other issues are raised. Frequently the least expensive land, in a market sense, is chosen as the place for disposal. For example, marshland areas are not characterized by high marketplace values, yet the value of the marsh has been estimated by marine productivity researchers to be from $50,000 to $80,000 per acre. This estimate is based upon the contribution of the marsh to fish production and upon the marsh's function as a remover of wastes from water. However, these values are not generally represented in the sale price of marshland areas and as a result these lands are often chosen for dredge spoil disposal.

On the other hand, spoil disposal, if properly managed, can augment the environment of an area. For example, spoil islands have become favored bird nesting areas that aid certain bird species. Knowledgably handled, an environmental problem can become an environmental amenity.

Disposal of Wastes

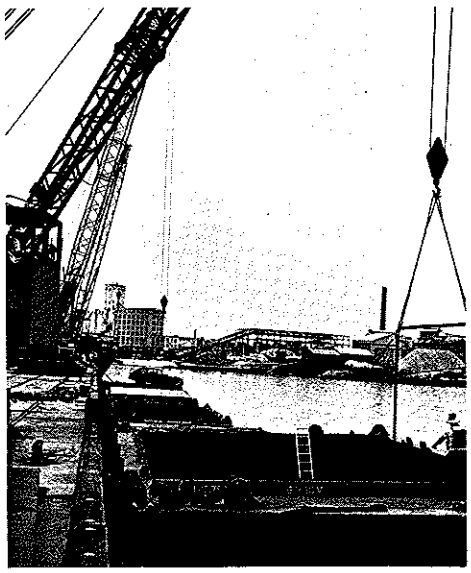
A third direct environmental issue is the disposal of wastes from tankers and barges. At this time, the general practice is to discharge ballast waters from tankers in open waters. While one discharge may not cause a large amount of oil to enter the marine system, the number of dischargers is large. Similarly, barge washings from commercial barge cleaning operations contain substantial amounts of oil and potentially hazardous materials. This wastewater is often discharged directly into the waters of bays and estuaries. The use of suitable wastewater treatment facilities could solve this problem if the cost can be absorbed equitably.

The availability—or lack—of sewage and waste treatment plants and tanker ballast receiving facilities along the Texas Gulf Coast poses an important question. Industries and municipalities throughout the state are being required to construct sewage treatment plants to bring water quality to acceptable levels, yet many ports lack these necessary facilities. Texas ports have to date issued bonds in excess of $100 million to finance pollution control projects for industrial clients. For their own facilities, Texas ports have expended a total of $3.9 million.

Air Pollution

Another direct impact of ports upon the natural environmental system pertains to atmospheric emissions from loading and unloading operations. Two types of atmospheric emissions are of concern—hydrocarbon and particulate matter.

Hydrocarbons are emitted in the evaporation of petroleum-related products. These emissions are an issue in the upper Texas Coast. Since hydrocarbons are precursors to the formation of photochemical oxidants, the strategy adopted to control oxidant formation currently involves controlling hydrocarbon releases. Documentation for Air Quality Control Region 7 (Houston-Galveston area) indicates that the imposition of ship and barge controls



Three potential environmental issues can be raised by barge transport: atmospheric emissions from loading and unloading, disposal of waste materials, and the hazard of collision-caused spills.

would reduce reactive hydrocarbon emission by 2.7 percent. At this time the imposition of ship and barge controls in the Houston area is pending an investigation of safety questions.

It is significant to note here that the loading method recommended to contribute the least hydrocarbon emissions is bottom loading, whereas the method of loading recommended to produce the least water pollution is top loading. Thus a conflict arises: two solutions to a problem lead to opposite recommendations for action. This does not seem to be an uncommon occurrence in public policy. Those attempting good faith compliance with agency rules and regulations find such dilemmas difficult to resolve.

Violation of particulate matter standards is a more widespread issue than that of photochemical oxidants. Four air quality maintenance areas along the coast have been designated for particulate matter, including the Beaumont, Houston, Galveston and Corpus Christi areas. Because of the large number of small sources contributing to the particulate problem, all sources are being considered for reduction. Emissions from elevators are significant sources of particulates. New particulate control technology will probably enable elevators to increase the tons of products handled and lower the particulate volume at the same time.

The maintenance of water quality and the production of nursery areas are important factors for the continuation of fishing and shrimping, major industries along the coastline of Texas. Shrimp boats are shown at Aransas Pass. (Texas Highway Department photo)

SECONDARY ENVIRONMENTAL EFFECTS

In addition to the direct effects of port operations on the environment, substantial issues may actually be raised by the secondary effects of port development—the industrial, commercial and residential development accompanying port development.

Water Quality Impact

Water quality impacts due to port-related industrial development are important issues. Of twenty-nine stream segments along the coast which violate state water quality standards, eight are directly associated with ports. However, other ports have no significant water quality problems. The absence of water quality problems at some ports may result from either the type of industry using the port or to the natural flushing action to be found in the port's waterways.

Part of the effort of the Federal Water Pollution Control Act Amendments of 1972 was to determine the amount of waste which can be assimilated by a water body without that water body being unfit for fish life. This amount, when quantified, may be considered a "pollution budget." There is some possibility that this budget represents a limit to the amount of pollutants which may be discharged into a specified stream segment. In the past, industrial and residential development adjacent to ports has been a point of pride with port managers and directors. If, however, attention is not directed to the type of industry, the type of controls to be used by industry and to an understanding of accompanying pollution, industrial development adjacent to ports may be curtailed or stalled by the attempted enforcement of this "pollution budget" concept. In the future, even industrial clients may be asking questions about the ports' resolution of government environmental standards before locating their facilities.

Air Quality Considerations

The same may be said of air quality considerations. Four areas along the coast have been identified as Air Quality Maintenance Areas (AQMA's) under Section 110 of the Federal Clean Air Act Amendments of 1970. These are the Beaumont-Pt. Arthur area, the Houston Area, the Galveston area and the Corpus Christi area. To date, the air quality problems of the Texas Coast have been related primarily to photochemical oxidants and particulate matter, but the conversion of boilers from natural gas to higher sulfur fuels promises to add substantially to sulfur dioxide emissions along the Gulf Coast. For example, increased sulfur dioxide levels have been projected by the Texas Air Control Board for two industrial sectors, petrochemicals and petroleum refining. In the Corpus Christi area, sulfur dioxide emissions are expected to increase by 2600 percent; in Houston, by 550 percent; and in Beaumont, by 364 percent. While all this increase in sulfur dioxide cannot be attributed to industrial development adjacent to ports, such contribution is significant.

Similarly, the Federal Clean Air Act Amendments of 1970 will require projections of future pollutant concentrations and will attempt to attain the ambient air quality standards. A major

control strategy outlined by the E.P.A. under the mandate of the 1970 legislation is to restrict industrial development in areas currently violating these national standards.

Resource Consumption

Another secondary environmental effect of port development involves resource consumption. For example, water supply questions are raised. The subsidence along the Houston Ship Channel is well known, yet overuse of ground water remains a very real possibility in other areas of the coast. Similarly, surface water supplies are limited in most areas south of the Victoria region. Other resource consumption issues include energy consumption, the utilization of marshland and highly productive agricultural lands—all possible future issues.

Implications of Secondary Effects

Two important considerations are vital to understanding the future of the secondary effects of port development. First, ports in the past have prided themselves on the industrial development which they have generated. In many respects, Texas ports are real estate developers. However, the pending enforcement of the federal air and water quality laws as well as resource consumption issues may curtail these activities in certain areas and aid these activities in other areas. In other words, certain areas may gain a competitive advantage because of the issues surrounding environmental quality.

For example, if the current air quality laws and standards were enforced in areas such as Houston, Galveston and Beaumont, industrial growth would be curtailed, but in areas such as Victoria, Brownsville and perhaps Bay City current air quality regulations would not be a constraint to growth. Industrial development may not cease if air quality considerations are seriously enforced, but the locus of the development may change. The implications of such shifts of future jobs, dollars and capital expenditures need to be fully understood.

Another significant consideration is that secondary environmental effects of ports seem to have been neglected to date. This neglect may have to change if ports are to continue to generate economic growth and development as they have in the past. In particular, better information and understanding of the relationship between the natural environmental systems and port-related development is necessary if port managers and directors are to continue to add to the economic futures of their respective communities. Inventories concerning water quality, air quality, resource availability and other information related to community services should be gathered and understood by port managers. Cooperation among ports in the preparation of common environmental analyses to aid industries and government would be a strong asset.

SUMMARY

Ports exhibit direct and secondary effects upon the natural environmental system. Although public attention is often focused upon the direct effects, such as sensational oil spills, these direct effects can be controlled through thorough planning and immediate action. By contrast, secondary effects are much more elusive. Secondary effects involve air quality, water quality, water supply and other resource consumption resulting from growth that accompanies port development. If Texas is to continue to realize the benefits of port development, more attention must be directed toward planning and understanding the relationship between secondary effects and port development. If this planning is done jointly by the ports, dollars will be saved, efficiency increased, and development continued.

Through consideration of the characteristics of ports and understanding of the dynamics of port-related industrial development in conjunction with the natural environmental systems of the Texas Coast, both increased development and environmental quality may be realized. Lack of attention to environmental views in concert with port development will, at a minimum, bring about delays in the progress of each port. Texas should prepare itself for a future in which it can keep the initiative with respect to the wise development of its ports.

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