

THE PETROLEUM INDUSTRY: OIL ON TROUBLED WATERS

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A Thesis Submitted to the School of Government and
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University in Partial Fulfillment of the
Requirements for the Degree of
Master of Business Administration

May, 1972

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T146766

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ACKNOWLEDGMENTS

The author wishes to express his appreciation to Miss Schuermann, librarian of the American Petroleum Institute, for her gracious and helpful assistance in locating material used in this paper, and to Mr. R. E. Hess, Chief, Operations Branch, Division of Oil and Hazardous Materials, U.S. Environmental Protection Agency, for pointing the author towards the light at the end of the tunnel of Federal laws dealing with water pollution.

CHAPTER I

INTRODUCTION

We do not say that a man who takes no interest in public affairs is a man who minds his own business. We say he has no business being here at all.
--Pericles¹

Man has known about oil since the dawn of history.² The "sacred fires" worshiped by primitive peoples are believed to have been fueled by natural seepage of oil and natural gas. Oil pitch was used to lubricate the wheels on the chariots of the Egyptian Pharaohs. In this country, Indians in New York and Pennsylvania skimmed oil from springs and streams and used it for medicinal purposes. However, until the second half of the nineteenth century, oil was generally thought of as a polluting nuisance. Brine well operators often found petroleum with the salt water they were seeking and were forced to abandon productive wells.³

In 1859, the first successful oil well in the United States was drilled in Pennsylvania by the Pennsylvania Rock Oil

¹Pericles, cited by M. A. Wright, The Business of Business: Private Enterprise and Public Affairs (New York: McGraw-Hill Book Company, Inc., 1967), p. 3.

²American Petroleum Institute, Facts About Oil (Washington, D.C.: American Petroleum Institute, 1971), pp. 1-2.

³Ibid.

Company.¹ From this beginning, the industry has grown to become the third largest in the United States, employing approximately 1.5 million people, in more than 40,000 companies.² The Petroleum Industry, which controls \$71 billion worth of assets, locates, mines, transports, refines and markets over 10 million barrels of oil a day.³ As a result of these activities, an estimated 7,500 oil spills occur each year in the waters of the United States.⁴

This paper seeks to answer the question: "Is the Petroleum Industry meeting its social responsibility in regard to the prevention of harmful water pollution by oil in the continental United States and the contiguous zone?" In order to answer this question, three subsidiary questions must first be answered.

1. What is the Petroleum Industry's water pollution problem?
2. What are the external pressures for control and prevention of water pollution?
3. What has the Petroleum Industry done to meet its responsibilities?

¹Ibid.

²National Petroleum Council, Environmental Conservation: The Oil and Gas Industries, Vol. II, W. W. Keeler, chairman (Washington, D.C.: National Petroleum Council, 1972), pp. 67-82.

³Ibid.

⁴Marvin Zeldin, "Audubon Black Paper Number One: Oil Pollution," Audubon, May, 1971, p. 100.

Because of the vast size and complexity of the industry, this investigation is limited to those companies operating in the continental United States and the contiguous zone. Additionally, the study focuses on only part of the Industry's pollution problem--that of water pollution resulting from mining, waterborne transportation, and refining of oil. No attempt was made, for example, to consider the problems generated by the necessity to dispose of 450 million gallons of used oil each year in the United States,¹ or the spill potential found in pipe lines, tank trucks and railway tank cars. All of these, however, would be fruitful research areas.

The purpose of this study is an attempt to clarify some of the issues involved in the environmental controversy which is currently a topic of concern both in this country and, to a varying extent, in the world; and to determine if the Petroleum Industry is taking positive steps to alleviate the problem. This industry was chosen because of the economic importance of the product it produces and because that product, when mishandled, results in highly visible and noxious pollution.

The information gathered in this study came primarily from secondary sources found in The George Washington University Library and Law Library, the American Petroleum Institute library (ecology section), the U.S. Environmental Protection Agency library, and the National Wildlife Federation library. Extensive use was also made of U.S. Government publications

¹Ibid., p. 110.

obtained through the Government Printing Office and various House and Senate committees. Two primary sources were interviewed and are quoted in the paper. The analysis used in the paper is primarily deductive.

Chapter II reviews current and projected requirements for oil. Surveys indicate that the demand for oil will double by 1985. In order to meet this demand, current domestic sources will have to be utilized to the fullest, new sources found and developed, and increasing amounts of oil will have to be imported. As the amount of oil moving through our waterways increases both in total tonnage and in the size of individual shipments, the pollution potential will also increase. The ecological effects of this pollution are also discussed, and studies presenting conflicting findings are reviewed.

The external pressures to protect the environment generated by a growing awareness of industrial social responsibility, by new and stricter Federal and state legislation, and by the activities of environmental groups are discussed in Chapter III. It is pointed out that the interest in social responsibility evidenced today by many industries results from internal as well as external pressures. Industry is not run by a faceless "they" but rather by people who belong to our human society and have to live with the results of their companies' activities in the same way the rest of us do. Legislative and rule making powers of government are seen as an attempt to establish standards by which to measure responsibility but,

inevitably, conflicts will occur between governing bodies and between government and industry.

Chapter IV surveys the Industry's response to the problem of oil pollution. Expenditures for water pollution control equipment in 1970 are investigated. Research concerning the effects of oil pollution on the environment and methods of cleaning up oil spills are discussed, along with a review of the various efforts being made to prevent oil spills. This chapter also discusses the efforts of the oil companies to meet their financial obligations for oil spill cleanup. Recognizing that even when the best preventive measures are employed spills will occur, the Industry has established three funds to cover, within certain limits, the costs of oil spill cleanup. While basically these funds are insurance plans, they do have a positive value in that companies responsible for spills are encouraged to take prompt cleanup action, knowing they will be reimbursed.

Chapter V summarizes the facts pertinent to the basic question posed by this paper and details the conclusions drawn from these facts.

CHAPTER II

THE PETROLEUM INDUSTRY'S POLLUTION PROBLEM

Until recently, oil pollution was looked upon largely as a marine problem. Accidents at sea had been the prime cause of significant oil pollution.

--American Petroleum Institute¹ .

The public's concern with oil pollution in past years is aptly summed up in the above statement. Oil pollution was looked upon as a minor irritant which, when washed up on the shore, might cover the bottom of an unwary swimmers feet with a thick black sticky substance. The problem of oil pollution had been recognized by the Federal Government with the enactment of the Oil Pollution Act of 1924, and by the Petroleum Industry with the implementation of various programs which will be discussed later. In general, however, the public and Federal attitude toward oil pollution was one of complacency. In 1967, this complacency was shattered by the stranding of the TORREY CANYON off the English Coast. As the extent of the resulting oil pollution became known, the question arose, "Can it happen here?"

In the case of the United States, the answer to this question was provided in 1968 with the grounding of the tanker

¹American Petroleum Institute, Oil and Water Don't Mix (New York: American Petroleum Institute, 1970), p. 1.

OCEAN EAGLE off Puerto Rico.¹ Although this incident received considerable publicity, it was not until early the following year that the problem of oil pollution was more forcefully brought to the attention of the American public. On January 28, 1969, a Union Oil Company well located in the Santa Barbara Channel, approximately six miles off the California Coast, suffered a blowout, spewing some 7,000,000 gallons of oil into the water and spreading an oil slick which extended as far as thirty miles.² The resulting publicity thrust oil pollution into the consciousness of the American public.

In order to place oil and its pollution potential in perspective, a review of current and prospective requirements for oil is necessary. That oil plays a significant role in the economy of the United States cannot be denied. In a report prepared by the U.S. Department of State and other Federal agencies for presentation at the U.N. Conference on Human Environment scheduled for June 1972, it is pointed out that:

. . . oil supplies a fourth of the industrial energy, nearly half of household and commercial heating needs, and virtually all of that employed in moving goods and people. Oil contributes some forty-four percent of the total U.S. energy supply. We consume it in enormous volumes: the current rate is 15 million barrels a day.³

¹J. Clarence Davies III, The Politics of Pollution (New York: Western Publishing Company, Inc., 1970), p. 30.

²U.S., Department of the Interior, Federal Water Pollution Control Administration, Spreading and Movement of Oil Spills, by H. G. Schwartzberg, Water Pollution Control Research Series, Program No. 150 80 (Washington, D.C.: U.S. Department of the Interior, 1970), p. 5.

³U.S., Department of State, Bureau of International Scientific and Technological Affairs, U.S. National Report on Human Environment, Pubn. 8588 (Washington, D.C.: Government Printing Office, 1971), p. 13.

By the year 1980 it is estimated that the U.S. will be consuming 25 million barrels a day.¹ Industry sources estimate that by 1985, the domestic demand for oil will have doubled and they also point out that current U.S. reserves total only 39 billion barrels, located primarily in Alaska, Louisiana and Texas.² In view of the projected increases in use and the limited amount of power reserves, production of oil in the United States is expected to ". . . peak out in 1973 or 1974 . . . [and] . . . we will have to step up our imports from the current 25% of consumption to 30%, 35%, even 40%. By 1980 over half the oil used in the U.S. will be imported."³ Even today, the East Coast imports about 94 per cent of the oil it needs to feed its industries and power stations.⁴

Given these figures, and the fact that more and more power companies are switching to imported low-sulphur oil to reduce air pollution, it can be anticipated that the amount of oil shipped to this country by sea will increase substantially. In order to meet this demand, oil companies and shippers are building more and larger tankers. It does not take a very vivid imagination to foresee the potential pollution problems resulting from collisions and groundings of these huge carriers. The

¹Bernard D. Nossiter, "New Oil Talks Could Reshape World Economic, Political Map," Washington Post, Jan. 29, 1972, p. A12.

²"The Battle of the Atlantic," Time, January 3, 1972, p. 62.

³"Raw Materials: You Get What You Pay For," Forbes, August 1, 1971, p. 20.

⁴Ibid., p. 21.

Standard Oil Company places the number of tankers in the world's fleet at 3,450 with an average size of 40,000 dead weight tons.¹ The latter figure, however, is somewhat misleading when the size of the new tankers is considered. Most new tankers under construction are in the range of 200,000 to 300,000 dead weight tons;² although one supertanker will be 550,000 dead weight tons, almost five times the size of the TORREY CANYON (120,000-tons), or the SS MANHATTAN.³ Equally impressive are the statistics indicating the number of these giants currently under construction. During 1971, 191 tankers of the 200,000-ton class were being built while eleven of the 300,000-ton class were also under construction. It is also interesting to note that at present, the U.S. has only four ports that can handle a sixty-foot-draft 200,000-ton tanker.⁴

While the above picture indicates that more and more oil will arrive in this country by sea, recent events in the Middle East could close the circle and cause an increase in exploration and production of oil in the U.S. as prices of foreign oil rise. It is also argued that a dangerous dependency on foreign sources

¹American Petroleum Institute and U.S. Department of the Interior. Proceedings: Industry Government Seminar: Oil Spill Treating Agents (Washington, D.C.: 1970), p. 149.

²Malcolm F. Baldwin, Public Policy on Oil: An Ecological Perspective (Washington, D.C.: The Conservation Foundation, 1971), p. 25.

³Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 101.

⁴Wesley Marx, "Oil, Be Seeing You In All The Old Familiar Places," Sierra Club Bulletin, September, 1971, pp. 20-21.

could well develop, putting the United States at a severe economic disadvantage.¹

Domestic offshore production of oil is, of course, also a potential source of water pollution as the Santa Barbara blow-out and other offshore well mishaps ably testify. At the present time there are some 16,000 oil wells off the coast of the United States, located primarily in the Gulf of Mexico. The National Council on Marine Resources and Engineering Development estimates that the number of offshore wells will increase in increments of 3,000 to 5,000 wells per year so that by 1980, the total number of offshore wells will have increased threefold.²

A serious but not well known pollution problem connected with oil production is that of brine disposal at the well head. This is an especially critical problem at wells which are drilled on land. For every barrel of oil brought up out of the ground, two to three barrels of brine are brought up also.³ Oil well brine contains about 50,000 ppm of dissolved solids. These solids are mostly salt but may also contain other chemicals such as potassium, iodine, bromine, lithium and sulphur.⁴

¹U.S., Congress, Senate, Committee on Public Works, Some Environmental Implications of National Fuel Policies, by Walter G. Planet, Committee Print (Washington, D.C.: Government Printing Office, 1970), p. 23.

²Marx, "Oil, Be Seeing You In All The Old Familiar Places," p. 20.

³American Petroleum Institute, Conservatism Practices At Oil Installations (New York: American Petroleum Institute, 1970), p. 1.

⁴John Pierson, "An Antipollution Plan Contains a Big Loophole Favoring Oil Companies," Wall Street Journal, Jan. 7, 1972, p. 1.

Early disposal methods consisted of storing the brine in holding pits and releasing it into nearby waterways during flood periods. This technique was followed by the use of evaporation pits but this allowed some brine to seep back into the earth where it polluted underground water. At the present time, the industry practice is to pump the brine back down into dry wells, a safe practice if the brine does not leak into the underground water table which supplies water for about 20 per cent of the country.¹

During the refining process, approximately 0.23 billion gallons of water² are used for steam distillation and various other processes that result in condensates which pick up some of the chemical compounds of oil. Unless properly treated, this now contaminated water will cause pollution as it flows back into the waterway.

Having obtained the oil, either through import or domestic production, the Petroleum Industry must dispose of oil well brine, transport the oil to refineries, dispose of refinery wastes and transport the refined oil to its customers. In addition to pipeline and truck transport, oil moves within the United States by small vessels and barges throughout a 25,000-mile network of inland waterways. "In 1964, these waterways were used to move an estimated 188 million tons of petroleum

¹Ibid.

²U.S., Congress, Senate, Committee on Public Works, Water Pollution Control Programs, Hearings, before the Subcommittee on Air and Water Pollution of the Committee on Public Works, United States Senate, 92d Cong., 1st sess., 1971, p. 449.

products and hazardous substances One recent movement of petroleum on the Mississippi-Ohio River routes involved 277,000 barrels . . . in a single tow" ¹ In a more recent study, it was pointed out that petroleum products make up the largest share of barge transportation. ² This same study stated that where 5,000-ton tows were the usual size, an increasing number are in the 10,000-ton range and that 15,000-ton tows are not unusual. ³ The capacity of some of the newly built barges ranges up to 17,000 tons for a single barge. ⁴

In summary, the Petroleum Industry faces potential pollution problems through waste disposal operations, transfer accidents, tanker or barge collisions or groundings and well blowouts as the producers and shippers work to meet our demand for 5 billion barrels of oil a year.

At present, the Oil Industry finds itself heavily under fire from ecology groups because of its offshore drilling operations. Deep offshore well drilling has been carried on in this country since 1948 when the first well was drilled off the Louisiana coast, the initial step in what has become an

¹Secretary of the Interior and the Secretary of Transportation, A Report on Pollution of the Nation's Waters by Oil and Other Hazardous Substances (Washington, D.C.: Government Printing Office, 1968), p. 5.

²U.S., Department of the Interior, Federal Water Quality Administration, Control of Spillage of Hazardous Polluting Substances, by G. W. Dawson, A. J. Shuckrow, and W. H. Swift, Water Pollution Control Research Series 15090 FOZ 10/70 (Washington, D.C.: Government Printing Office, 1970), p. 32.

³Ibid.

⁴Sun Oil Company, 1970 Annual Report, pp. 9-10.

approximately \$7 billion investment by the industry. Despite the increasing tempo of drilling operations, it was not until 1969 that a major pollution problem occurred.¹ The blowout of the Union Oil Company well in the Santa Barbara Channel occurred as the crew was routinely bringing the drill up out of the well to replace the drilling bit. As the drill was withdrawn, gas pressure began to force drilling mud out of the well. Although the well was equipped with a blowout preventer, it failed to work and the heavy drill was dropped back into the well to ram the preventer home, shutting off the well. Unfortunately, this was an area of geological faults and the gas pressure forced oil through the side of the well and up through cracks in the sea bed where it floated to the surface.²

Aside from the possible long term biological damages, and the loss to the company of spilled oil, monetary costs of this one incident are still not settled. As Time recently reported, civil suits totaling some \$6 million have been paid by Union Oil, Mobil, Texaco and Gulf, and beach cleanup costs of \$10.5 million have been paid by Union Oil. However, a \$500 million claim brought by the State of California and the country and city of Santa Barbara are still outstanding.³

On January 18, 1971, California waters suffered another major polluting blow when two 17,000-ton tankers belonging to

¹American Petroleum Institute, Conservation Practices at Oil Installations, p. 2.

²Ibid., p. 3.

³"Cost of an Oil Spill," Time, January 31, 1972, p. 46.

the Chevron Shipping Company collided underneath the Golden Gate Bridge in San Francisco Bay.¹ While there were no personnel injuries, a large oil spill of over 1 million gallons resulted. Efforts of 1,000 Standard Oil Company and contractors' personnel plus numerous volunteers were involved in the \$4 million cleanup operation.² As a result of the Coast Guard investigation, the two Captains of these ships were charged with negligence.³

While these two incidents are dramatic and rated front page headlines in newspapers across the country, it is estimated that 90 per cent of the oil which enters the earth's waters on a worldwide basis results from normal ". . . routine activities of oil tankers, refineries, and gasoline filling stations."⁴ The American Petroleum Institute reports that ". . . about two-thirds of all oil spill incidents are in port and harbor areas and are generated in routine petroleum transfer operations."⁵

¹U.S., Congress, House, Committee on Merchant Marine and Fisheries, The Tanker Collision of January 18, 1971 in San Francisco Bay Between the Arizona Standard and the Oregon Standard and the Effects of the Resulting Massive Oil Spill, Hearings, before a special committee of the Committee on Merchant Marine and Fisheries, House of Representatives, 92d Cong., 1st sess., 1971, p. 205.

²Ibid., p. 238.

³Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 102.

⁴Council on Environmental Quality, Environmental Quality: The Second Annual Report of the Council on Environmental Quality, Russell E. Train, chairman (Washington, D.C.: Government Printing Office, 1971), p. 221.

⁵American Petroleum Institute, Oil and Water Don't Mix, p. 7.

A study of major oil spills covering the period 1956 to 1959 found that:

- (1) 75 percent were associated with vessels of which 90 percent involved tankers and half involved groundings.¹
- (2) 50 percent of the offshore spills occurred less than one mile from shore and 80 percent were within ten miles of the shore line.²

In 1970, 3,711 polluting spills were reported to the U.S. Coast Guard. Of this total, 3,335 of the spills were oil and they accounted for 98 per cent of the 15,252,992 gallons of pollutants spilled.³ Miscellaneous personnel errors accounted for the largest number of spills covered in this study.⁴ In 1970, the primary source of the polluting oil spills of over 10,000 gallons was barges.⁵ The Environmental Protection Agency stated that 88 per cent of the spills reported to that agency were caused by personnel error.⁶

An attempt to draw a positive conclusion from the above figures is fraught with peril since the studies do not have a

¹American Petroleum Institute and U.S., Department of the Interior, Proceedings: Industry Government Seminar: Oil Spill Treating Agents, p. 16.

²Ibid., p. 19.

³Commandant (WEP) U.S., Coast Guard, Polluting Spills in U.S. Waters - 1970 (Washington, D.C.: Commandant (WEP) U.S. Coast Guard, 1971), p. 3.

⁴Ibid., p. 5.

⁵Ibid., pp. 8-11.

⁶American Petroleum Institute, U.S., Environmental Protection Agency and U.S., Coast Guard, Proceedings: Prevention and Control of Oil Spills (Washington, D.C., 1971), p. 14.

common base nor are the definitions of spills (i.e., major, minor, large, small) known to be consistent. However, it would seem that the primary source of water pollution by oil in the near future will be barges and the primary cause will be human error during transfer operations, although the two are not necessarily tied together in the same pollution incident. While tankers cannot be discounted as a contributing source of pollution, especially in view of their quantum increase in size with the attendant decrease in maneuverability, an argument can be made that as the larger tankers enter the fleet, smaller tankers will be retired and thus the total number of tankers will decline. At the same time, the total number of barges will probably increase since the bigger tankers will be unable to navigate in the shallower waterways and ports the smaller tankers once served. The potential of pollution from offshore wells will also rise as we increase the number of wells. Senator Gaylord Nelson, in an interview with a reporter from Environmental Quality Magazine pointed out that if the projected expansion of 3,000 to 5,000 offshore wells per year takes place as predicted, then ". . . we can expect a Santa Barbara-scale disaster once a year."¹

In summary, the rising demand for oil will result in increasing domestic production and/or importation, and as this growing supply is refined and transferred from point to point, the potential for pollution will increase. What will the costs

¹Mary Sanderson, "Interview: Senator Gaylord Nelson," Environmental Quality Magazine, November, 1971, p. 61.

of this pollution be? The economic losses from oil pollution are readily calculable. Oil spewing uncontrolled from a well, the side of a tanker, barge or refinery has a market price and the calculation of value involves the arithmetic of so many gallons of oil times the market price (plus fines if applicable). Clean-up costs are also relatively easy to calculate. The problem area is the calculation of possible biological costs of oil pollution. In addition to dead birds and blackened shorelines, are there any further ecological damages?

Before investigating this question, the pollutant itself should first be examined. Crude oil, which is the base from which other petroleum products are refined, is a complex mixture of organic compounds. The chief components are compounds of hydrogen and oxygen which are called hydrocarbons. Other compounds containing sulphur, nitrogen and oxygen are also present in varying degrees.¹ Hydrocarbons may be divided into four classes according to the way in which the hydrogen and carbon molecules are linked together. These are the aliphatic compounds which form the main components of gasoline; the alicyclic compounds; the aromatic compounds, some of which have been shown to be highly carcinogenic; and olefinic compounds which result from various refining processes.² While different crude oils contain different proportions of these four groups of hydrocarbons, ". . . all are similar in chemical, biological and

¹Blumer, et al. "A Small Oil Spill," Environment, March, 1971, p. 10.

²Ibid.

toxicological properties: crude oil and all except some pure oil fractions, . . . are toxic to marine life."¹ This, then, is what is spilled into the water.

Although the vastness of the oceans would lead one to think that this oil could quickly be dispersed without too much damage to marine life, unfortunately most of the spills occur in inland and coastal waterways where the heaviest concentration of shipping, transfer, refining and usage is found. The importance of coastal areas to the entire food chain of the ocean is stressed by Donald J. Zinn who points out that:

. . . most of the sea is biologically a desert. Its fertile areas are found where runoff from the land or the upwelling of nutrient-rich deep water fertilizes the surface water and stimulates the growth of marine plants, the photosynthetic organisms on which all other marine life depends.²

In the biological sense, the coastal area is where we find our greatest amount of marine resources. Almost the entire shell fish crop of shrimp, crabs, lobsters, clams, oysters, and scallops, as well as almost half of our commercially valuable finfish catch are directly dependent on coastal waters during part or all of their life cycle.³

How are these marine species affected by oil pollution? The results of some of the biological and chemical studies

¹Baldwin, Public Policy on Oil, p. 23.

²James B. Trefethen, ed., Transactions of the Thirty-Six North American Wildlife and Natural Resources Conference (Washington, D.C.: Wildlife Management Institute, 1971), p. 188.

³Blumer, et al. "A Small Oil Spill," p. 3.

conducted in the area of the Santa Barbara oil spill ". . . indicate minimal acute effects have been experienced thus far by sea life, planktonic and intertidal plants, and invertebrate animals have maintained their variety and abundance."¹ Dr. Molly Spooner of Great Britain's Marine Biological Association points out that spilled oil is partially degraded by micro-organisms as part of their natural growth processes.² Additional studies and literature reviews have pointed in the direction of limited short-term biological damage of marine plant and animal life due to oil pollution.³

Lyle S. St. Amant differentiates between the effects of accidental oil pollution and chronic pollution. He claims that while accidental pollution can be disastrous and does cause short-term damage to the environment, the evidence so far tends to disprove any permanent effect. He points out that intensive oil production and frequent pollution have occurred in the Gulf of Mexico over the past thirty years ". . . without evidence of a serious reduction in the production of living resources."⁴ He does admit, however, that coastal and marshy areas along the

¹The George Washington University, Legal, Economic, and Technological Aspects of Liability and Financial Responsibility As Related to Oil Pollution, Program of Policy Studies in Science and Technology (Washington, D.C.: The George Washington University, 1970), pp. 9-11.

²"Oil Spills Conference Draws 1100," American Petroleum Institute Air/Water Research Briefs, Winter, 1970, p. 4.

³Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 108.

⁴Trefethen, ed., Transactions of the Thirty-Six North American Wildlife and Natural Resources Conference, p. 214.

Louisiana Coast which have been subjected to intensive oil production and chronic pollution have turned into a "biological desert" or have become unfit for any further use or development.¹

Among those disputing these findings of minimal pollution damage is University of California, Santa Barbara, scientist Dr. Michael Neushul, who conducted an investigation of the Santa Barbara oil spill under a contract with the Federal Water Pollution Control Administration. In his report he cited as "overoptimistic" those investigations which found no important ecological damage. "' . . . conclusions obtained a few months after a pollution incident of this sort should not be held as proof that there will not be long-term effects and gradual erosion of natural resources which have been seen in other locations.'"² Hearings held before the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works elicited the information that oil pollution produces unfavorable effects on reproduction and other behavioral aspects of marine animals and that cancerous growths have been found in fish which have been caught in waters polluted by oil and refinery wastes.³

Probably the most definitive study on the biological effects of oil pollution was conducted by Dr. Max Blumer and his associates at the Woods Hole Oceanographic Institution, Woods

¹Ibid., pp. 214-215.

²Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 108.

³U.S., Congress, Senate, Committee on Public Works, Oil Sludge Dumping Off the Florida Coast, Hearings, before the Subcommittee on Air and Water Pollution of the Committee on Public Works, Senate, 91st Cong., 2d sess., 1970, p. 24.

Hole, Massachusetts. This study was started in September, 1969, when a barge carrying a cargo of number two fuel oil for a power plant on Cape Cod grounded off Fassets Point, West Falmouth, Massachusetts, and spilled between 650 and 700 tons of oil into Buzzards Bay.¹ Earlier studies on pollution damage had concentrated on measuring the size of adult fish catches or on inspecting organisms living at the margins of the spill area which possessed to some degree a tolerance to oil. Blumer's contention is that ". . . statistical and observational data on adult fishes will not reveal damage to the often much more sensitive juvenile forms or to intermediate members in the marine food chain."²

The spill in Buzzards Bay offered an excellent opportunity for an intensive study of pollution effects because so much was already known about the ecology of the native organisms. Using a variety of chemical and biological techniques, Blumer and his colleagues have studied the area over a period of eighteen months and will continue to observe the persistence of the oil and watch for the eventual return of the normal marine balance.³

As expected, there was immediate destruction of marine organisms in the area of the spill, but within a few days the dead animals had decayed, most visible traces of the oil had disappeared and the area appeared to be back to normal. However,

¹Blumer, et al., "A Small Oil Spill," p. 4.

²Ibid., p. 3.

³The study was still in progress as of March, 1971.

the continued studies by the Woods Hole group indicated that the effects of the oil were much more long-lasting and destructive than earlier studies had indicated. Months after the original spill, the oil continued to spread via the movement of contaminated sediments. Heavy destruction of organisms resulted as it reached a previously unpolluted area. It was noted that bacterial decomposition of oil is not as effective as previously thought, and has very little destructive effect on the most poisonous compounds.

After eighteen months only pollution-resistant organisms have returned to the heavily affected areas; the normal population has not yet been re-established. It was also noted that immature blue mussels exposed to the spill were sexually sterile the following season. Even more serious is the observation that marine animals take up the hydrocarbons of the oil and these poisonous compounds become more heavily concentrated in the fatty tissues of the animals as they are passed from prey to predator along the food chain. This may present a serious hazard for man when he becomes a link in the food chain by dining on a contaminated species.¹

The immediate reaction of the oil industry was an attempt to refute the findings of Dr. Blumer and his associates. Said one official: "Oh God, Dear Dr. Blumer! He can hold opinions and that's all he has. He has no scientific facts to back them

¹Blumer, et al., "A Small Oil Spill," pp. 5-11.

up."¹ However, experiments currently being conducted by the Water Quality Office of the Environmental Protection Agency are expected to confirm the West Falmouth oil spill findings.³

¹Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 107.

²Ibid., p. 109.

CHAPTER III

EXTERNAL PRESSURES FOR CONTROL AND PREVENTION OF WATER POLLUTION

As Al Capone put it: "You can get so much farther with a kind word and a gun than with a kind word alone."
--Walter Heller¹

In this chapter we will investigate the social and governmental pressures being brought to bear on oil companies; while the industry is being asked to produce more oil to meet the growing demands of our industrial and private consumption, at the same time it is expected to drastically curb the damage that may occur to the environment in the mining, refining and transfer of this product.

In discussing the pressures which force an industry to moderate its possibly damaging effect upon society and the environment, the term "social responsibility" comes to mind. The term has long been used in regard to business, and many different authors offer as many different definitions. According to Peter Drucker, the old attitude toward the social responsibility was that ". . . concerns that cannot be encompassed within an economic calculus, are restraints and limitations

¹Donald M. Morrison, "The Future of Free Enterprise," Time, February 14, 1972, p. 51.

imposed on management rather than management objectives and tasks."¹

However, the modern concept of social responsibility recognizes that the business corporation ". . . can no longer hungrily pursue the single goal of profits to the complete neglect of its table manners."² Indeed, some writers feel that: "The corporation today must take an interest in politics, in the welfare of the community, in education, in the 'happiness' of its employees--in fact, in the whole social world about it."³ Furthermore, in the decision-making process, the manager must consider ". . . the widest possible effects of his decision on the public interest."⁴

Other modern writers do not agree with this picture of the corporation as a ". . . benevolent rich uncle who will use his power and wealth to help right the wrongs of the world."⁵ They hold that it is ethically wrong for business to do other than maximize profits. Economist Milton Friedman of the University of Chicago points out that money spent by corporations on

¹Peter F. Drucker, Technology, Management and Society (New York: Harper & Row, Publishers, 1970), p. 26.

²Joseph W. McGuire, Business and Society (New York: McGraw-Hill Book Company, Inc., 1963), p. 144.

³Ibid.

⁴Keith Davis and Robert L. Blomstrom, Business, Society and Environment: Social Power and Social Response, McGraw-Hill Series in Management, 2d ed. (New York: McGraw-Hill Book Company, 1971), p. 85.

⁵"The American Corporation Under Fire," Newsweek, May 24, 1971, p. 74.

social activities must be paid for either by stockholders in the form of lesser profits or by the purchaser who finds a higher price tag on the commodity. Either way, it would be "taxation without representation" because the businessmen would be making decisions in areas outside their authority, and they do not necessarily know what the best interests of society may be.¹

That Friedman's views may have moderated somewhat is indicated in an article by Phillip I. Blumberg in the Conference Board Record where he states that while Friedman still regards maximization of profits as the only real objective of business, still, ". . . corporate action in social sphere when performed as a result of hardheaded business judgment in order to advance business objectives is, of course, permissible--indeed, desirable. . . ." ² Friedman, however, insists that to apply the term "social responsibility" to this type of decision making is misleading.

Peter Drucker is also careful to define the limits within which a corporation must be socially responsible. Corporations act socially responsible ". . . when they satisfy society's needs through concentration on their own specific job."³ Any industry has an impact on its environment, on the local community, and on society. Because of this, it is the

¹"The American Corporation Under Fire," p. 78.

²Phillip I. Blumberg, "Corporate Responsibility and the Environment," The Conference Board Record, April, 1971, p. 43.

³Peter F. Drucker, The Age of Discontinuity (New York: Harper & Row, Publishers, 1969), p. 206.

duty of the corporation to anticipate and prevent any undesirable impacts within their own sphere of competence and influence.¹

How does the concept of social responsibility affect the policy decisions of the oil industry? Businessmen are more and more coming to realize that it is no longer enough to produce a good product and show a good profit. The public is becoming more aware of the damage being done to the environment by uncontrolled exploitation. The cost of pollution control must be added as a cost of doing business because, as Peter Drucker points out:

The great new fact is that a society of organizations holds institutions and their executives not only accountable for quantities. . . . It holds its institutions collectively accountable for the quality of life.²

One indication of the increasing public pressure on business to accept responsibility for the maintenance of our environment is the results of a 1970 survey showing that 60 per cent of those interviewed considered control of pollution to be a major responsibility of business. Furthermore, 49 per cent of the respondents did not believe that corporations were doing enough in this area. A very large majority, 80 per cent, advocated the shutting down of plants which violate pollution standards.³ (Of course, the response might be quite different if a local plant and local jobs were involved.)

¹Ibid., pp. 201-203.

²Ibid., p. 207.

³Committee for Economic Development, Social Responsibilities of Business Corporations (New York: Committee For Economic Development, 1971), pp. 14-15.

Two more important factors compel the oil executives to face up to their responsibility to the environment. First, they too are a part of our society, and environmental despoilment affects everyone within the system. Polluted water is just as undrinkable to the stockholder as it is to the ghetto dweller. Secondly, in performing its economic function of supplying oil to society, the industry has produced pollution, and it cannot escape from the necessity to solve problems which it has created.¹

When the concept of social responsibility does not provide enough motivation to the Petroleum Industry to control and prevent pollution, the Federal Government can apply strong external pressure with a growing list of anti-pollution legislation. Involvement by the Government in the affairs of private enterprise has not always been the case, however.² At the time of the founding of the United States the philosophy of laissez-faire as expounded by Adam Smith and others was the dominant economic philosophy, and thus government was seen to be in a supportive vice controlling role in its relationship with business. This philosophy continued generally until 1887 when the Interstate Commerce Act was passed, initiating a new role for Government as a regulator of business.³ (The passage of this act was given strong impetus due to an oil company using

¹Blumberg, "Corporate Responsibility and the Environment," p. 44.

²Davis and Blomstrom, Business, Society and Environment, p. 113.

³Ibid., p. 125.

its economic power to demand preferential shipping rates from the railroads.)¹

Although businessmen have since that time decried the increasing role of government regulation in business, we often find them requesting further regulation either as a protective measure or as a standard setter. The latter is particularly true in the field of pollution control. As Peter Drucker points out: "Whatever can be done only if everyone does it requires law."² In the Petroleum Industry, indeed in all industries, as long as a few companies continue dumping pollutants into the water rather than installing expensive equipment and procedures to prevent pollution, the pollution abatement expenditures of those companies who are trying to meet their social responsibilities places them in an unfair economic position. The unfortunate result of looking to the government as a standard setter, however, is that the standards may turn out to be more stringent than what the regulatees think is reasonable.

The basic philosophy followed by Congress in the field of water pollution legislation has been that ". . . : The States shall lead the national effort to prevent, control and abate water pollution. As a corollary, the Federal role has been limited to support of, and assistance to the States."³

¹Robert W. Austin, "Who Has the Responsibility for Social Change - Business or Government?" Philosophy of Business Series [Part I], Harvard Business Review, 1956, p. 143.

²Drucker, The Age of Discontinuity, p. 204.

³U.S., Congress, Senate, Federal Water Pollution Control Act Amendments of 1971, S. Rept. 441 To Accompany S.2770, 92d Cong., 1st sess., 1971, p. 1.

Several laws on water pollution had been passed by Congress such as the Refuse Act of 1899, the Public Health Service Act of 1912, and the Oil Pollution Act of 1924, but it was not until 1948 that the first comprehensive Federal water pollution act was passed: Public Law 80-845.¹ Following the philosophy stated above, the law assigned enforcement powers to the governors of the various states while the Federal role was limited to supporting water pollution research and new technology and limited financial assistance for construction of treatment plants.²

The Refuse Act of 1899, although ignored for years, has been resurrected by the Federal Government in its recent effort to clean up the country's waterways. As originally passed, this Act (also known as the River and Harbor Act of 1899) provided for ". . . appropriations for the construction, repair and preservation of certain public works on rivers and harbors, and for other purposes."³ Section 13 of the Act made it unlawful to dispose of any refuse material of any kind (other than liquid runoff from streets and sewers) into any navigable water or tributary or to place such material on the bank of any such navigable water or tributary where it can subsequently be washed into these waters by any means. This section also

¹U.S., Congress, House, Laws of the United States Relating to Water Pollution Control and Environmental Quality, Committee on Public Works, Committee Print 91-33 (Washington, D.C.: Government Printing Office, 1970), p. 1.

²Ibid.

³Ibid., p. 137.

provided for the issuance of permits for such disposal, in navigable waters, under specific conditions.¹

The Refuse Act was brought to bear on the pollution problem in 1970 when, by Executive Order, the President implemented a permit program under section 13 of the Act to prevent the discharge of industrial pollutants into the navigable waters without a permit issued by the Secretary of the Army (Corps of Engineers) in consultation with the Administrator of the Environmental Protection Agency.² Before a permit can be issued, certification from the state in which the discharge will occur is required to the fact that the discharge will not violate state water quality standards. The EPA must also concur that water quality standards are met.

The use of this Act for pollution control had some disadvantages, the primary one being the division of responsibility among several government agencies. However, it had the advantage of permitting swifter action to stop harmful pollution than is allowed under the Federal Water Pollution Control Act.³ It also encouraged some companies to rush plans for completion of pollution treatment facilities, or to build connections to municipal waste treatment systems rather than become involved with the paper work and red tape of getting a permit.⁴

¹Ibid., pp. 138-139.

²Council on Environmental Quality, The Second Annual Report, p. 280.

³Ibid., p. 12.

⁴Burt Schorr, "U.S. Pressure on Firms to Clean Up Waterways Begins to Have Impact," Wall Street Journal, Nov. 4, 1971, p. 19.

The 1899 Act applies to the Petroleum Industry in several respects:

- (1) Statute and related case law apply to both chronic and accidental oil spills.
- (2) In U.S. v. Standard Oil Co., (384 U.S. 224(1966)) the court extended the meaning of the term "refuse" to include valuable products.
- (3) Case law has determined liquid sewage to mean municipal rather than industrial sewage.
- (4) The regulations under which permits are issued prohibit the issuance of a permit for harmful quantities of oil as defined by the Federal Water Pollution Control Act.
- (5) Permits may not be issued covering discharges from ships and other watercraft.¹

Approximately one year after the permit program was initiated, a U.S. District Court Judge in Washington ruled that the Federal Government had no right under the Refuse Act to issue permits allowing the dumping of pollutants in non-navigable waters, and, further, permits could be issued for navigable waters only after the requirements of section 102 of the National Environmental Policy Act of 1969 were satisfied. This decision effectively stymied the operation of the permit program.²

¹American Petroleum Institute, Proceedings: Prevention and Control of Oil Spills, 1971, pp. 5-6.

²Elsie Carper, "Challenging the River Dumpers," Washington Post, Feb. 7, 1972, pp. A1, A12.

Section 102 of the National Environmental Policy Act of 1969 requires that all agencies of the Federal Government,

. . . include in every recommendation or report on proposals for legislation and other major Federal actions [i.e., issuance of permits] significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.¹

The Act further provides that before the responsible Federal Official submits this statement, he shall ". . . consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved."² Copies of these statements along with the views of the various interested Federal, state and local environmental agencies are to be made available to the President, the Council on Environmental Quality and the public.³

As a consequence of this ruling, and unless the Refuse Act is repealed, every industry that pollutes a waterway without a permit is violating the law and is subject to prosecution. As pointed out above, an attempt to continue the permit program

¹National Environmental Policy Act of 1969, U.S. Code, Vol. IX, sec. 4332(2)(c)(1970).

²Ibid.

³Ibid.

under the guidelines set up by the judge would become an administrative nightmare because of the environmental impact investigations which must be completed by the government before each permit is issued.

The first major piece of legislation dealing directly with oil pollution was the Oil Pollution Act of 1924 which prohibited the discharge of oil into the coastal navigable waters of the United States except as permitted by the Secretary of War under conditions not harmful to health or sea food, or a menace to navigation, or dangerous to persons or property engaged in commerce.¹ The Act was subsequently amended by the Clean Water Restoration Act of 1966² which defined discharge to mean ". . . any grossly negligent, or willful spilling, leaking, pumping, pouring, emitting, or emptying of oil; . . ." ³ and defined Secretary as the Secretary of Interior.⁴ This redefinition of the word discharge effectively emasculated the 1924 Act due to the difficulty of proving gross negligence or willful spilling, etc., and it was subsequently repealed by the Water Quality Improvement Act of 1970.⁵

¹U.S., Congress, House, Laws of the United States Relating to Water Pollution Control, p. 125.

²Clean Water Restoration Act of 1966, Statutes at Large, LXXX, 1246-1254 (1966).

³Ibid., sec. 211, 1253.

⁴Ibid.

⁵Water Quality Improvement Act of 1970, Statutes at Large, LXXXIV, sec. 108, 113 (1970).

The current Federal program dealing with water pollution had its beginnings in 1956 with the enactment of the Water Pollution Control Act Amendments of 1956.¹ This Act as amended by the following legislation is known as the Federal Water Pollution Control Act, as amended:

- (1) The Federal Water Pollution Control Act of 1961 placed the water-pollution program under the Secretary of Health, Education and Welfare, permitted the Secretary of HEW to bring suit to stop pollution in interstate waters without the requirement of obtaining the permission of the state, and extended pollution control procedures to navigable intrastate waters.²
- (2) The Water Quality Act of 1965 established the Federal Water Pollution Control Administration under the Secretary of HEW and provided impetus for the states to adopt water quality standards for their interstate waters.³
- (3) The Clean Water Restoration Act of 1966 provided for grants to assist in the formulation of river basin agencies and plans.⁴

¹Water Pollution Control Act Amendments of 1956, Statutes at Large, LXX, 498-507 (1956).

²Federal Water Pollution Control Act of 1961, Statutes at Large, LXXV, 204-210 (1961).

³Water Quality Act of 1965, Statutes at Large, LXXIX, 903-910 (1965).

⁴Clean Water Restoration Act of 1966, Statutes at Large, LXXX, 1246-1254 (1966).

- (4) The Water Quality Improvement Act of 1970 added sections on oil pollution from vessels and on-shore and off-shore facilities.¹

Prior to looking in detail at the Federal Water Pollution Control Act, as amended, and certain other acts relating to the problem of oil pollution, two reorganization plans should be mentioned to complete the basic history of water pollution legislation. Under Reorganization Plan No. 2 of 1966 the functions assigned to the Secretary of HEW under the Federal Water Pollution Control Act, as amended, were transferred to the Secretary of the Interior effective May 10, 1966.² Reorganization Plan No. 3 of 1970 established the Environmental Protection Agency and placed therein responsibility and authority for ". . . the major Federal programs dealing with air pollution, water pollution, solid waste disposal, pesticide regulation, and environmental radiation."³

That part of the Federal Water Pollution Control Act which deals most directly with pollution by oil is section 1161. This section defines a number of terms, among which the most important for our purposes are:

- (1) "oil" means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil

¹Water Quality Improvement Act of 1970, Statutes at Large, LXXXIV, 91-115 (1970).

²U.S., President, "Reorganization Plan No. 2 of 1966," Federal Register, XXXI, No. 90, May 10, 1966, 6857-6858.

³U.S., President, "Reorganization Plan No. 3 of 1970," Federal Register, XXXV, No. 194, Oct. 6, 1970, 15623-15626.

refuse, and oil mixed with wastes other than dredged spoil;

- (2) "discharge" includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping;
 - (3) "vessel" means every description of water craft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel.
-
- (9) "contiguous zone" means the entire zone established or to be established by the United States under article 24 of the Convention on the Territorial Sea and the Contiguous Zone;
 - (10) "onshore facility" means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under, any land within the United States other than submerged land;
 - (11) "offshore facility" means any facility of any kind located in, on, or under, any of the navigable waters of the United States other than a vessel or a public vessel; . . .¹

The Act goes on to state ". . . that it is the policy of the United States that there should be no discharge of oil into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone."² The Act empowers the President to make a determination of what constitutes harmful quantities of oil, and allows him to determine exceptions to the above. In 1970, the President, through the Secretary of the Interior published the regulations required by the Act. These were subsequently republished by the Environmental Protection Agency under Chapter I of Title 40 - Protection of the Environment in the Code of Federal Regulations.³

¹Federal Water Pollution Control Act, U.S. Code, Vol. VIII, sec. 1161(a) (1970).

²Ibid., sec. 1161(b)(1).

³U.S., Environmental Protection Agency, "Title 40 - Protection of the Environment," Federal Register, XXXVI, No. 228, Nov. 25, 1971, 22369-22573.

As of November 4, 1971, "harmful quantities" of oil were defined as discharges which violate applicable water quality standards or ". . . cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines."¹ "Applicable water standards" are those standards for interstate waters adopted under the provisions of section 10(c) of the Federal Act and state standards adopted for their waters not defined as interstate by the Act.² The exceptions permitted are those granted by Article IV of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended, and discharges of oil from vessel engines.³

Other provisions of the Federal Water Pollution Control Act establish penalties of not more than \$10,000 or imprisonment for not more than one year or both for failure of a responsible person to notify the appropriate U.S. Agency (U.S. Coast Guard) of any harmful discharge, and a civil penalty of not more than \$10,000 for knowingly discharging harmful quantities of oil into waters covered by the law.⁴ Unless owners or operators, or third parties can show that the prohibited discharge was caused by an act of God, an act of war, negligence on the part of the U.S.

¹Ibid., secs. 110.3-110.4, p. 22487.

²Ibid., sec. 110.1 (j), p. 22487.

³Ibid., secs. 110.5-110.6, p. 22487.

⁴Federal Water Pollution Control Act, U.S. Code, Vol. VIII, sec. 1161(b)(5) (1970).

Government or an act or omission on the part of a third party, they are liable for actual clean up costs incurred subject to limitations shown:¹

TABLE 1
CLEANUP COST LIABILITY

Type of Facility	Discharges Oil in Harmful Quantities ^a	Discharges Harmful Quantities Through Willful Negligence or Willful Misconduct
Vessels ^b	Actual cost up to the lesser of \$100/gross ton or \$14 million	Full amount
Onshore facilities	Actual costs up to \$8 million	do
Offshore facilities	do	do
Third party		
1. Vessels causing the spill ^b	Same as for vessels above	do
2. Other	Limits which would have been applicable to the owner or operator of the facility or vessel if he were liable	do

^aIf oil is knowingly discharged the owner or operator shall be assessed a civil penalty of not more than \$10,000 for each offense (sec. 1161(b)(5)).

^bVessels over 300 gross tons using U.S. Ports must establish and maintain evidence of financial responsibility for the lesser of \$100/gross ton or \$14 million to cover cleanup costs (sec. 1161(p)(1)).

¹Ibid., secs. 1161(f)-(g).

The Act also requires the President to issue regulations concerning requirements for equipment to prevent leaks and discharges from vessels and onshore and offshore facilities; and to establish inspection procedures for oil-carrying vessels.¹ In response to this requirement the U.S. Coast Guard (U.S. Department of Transportation) has issued proposed rules which, if and when approved, will become part of Title 33, Code of Federal Regulations.² Briefly, the more important rules are that:

- (1) After April 3, 1973, permits will be required to conduct oil transfer operations to or from vessels.
- (2) Design of transfer equipment is specified and a means of positive containment of small discharges must be available.
- (3) Barges of 100 gross tons or larger, built after December 31, 1972, will be required to be of double wall construction on the sides and ends while all vessels operating on navigable or contiguous waters must, prior to January 1, 1975, have a means to retain oily bilge water on board.³

Additionally, the Coast Guard has proposed modification of existing regulations by requiring that Merchant Marine officers and seamen be required to display greater knowledge of the laws

¹Ibid., sec. 1161(j).

²U.S., Department of Transportation, U.S., Coast Guard, "Pollution Prevention: Vessel and Oil Transfer Facilities," Federal Register, XXXVI, No. 248, Dec. 24, 1971, 24960-24970.

³Ibid., 24960-24961.

and regulations concerning oil pollution and the means to prevent or clean it up; that vessels be required to have certain anti-pollution equipment as a condition for licensing; and that the period between drydockings of vessels operating on inland waters be shortened.¹

The reaction of the Petroleum Industry to the Coast Guard proposals will not be known for some time. However, there are two points in the Federal Water Pollution Control Act that the Industry dislikes. The first concerns the "sheen" standard which defines a harmful quantity of oil. Several major producing companies have filed petitions requesting that the standard be modified since, in their opinion, it is impracticable and unworkable as a standard. As little as fifty gallons of oil per square mile would produce a sheen.² These companies also argued that where the regulations prohibit all discharges of oil they were ". . . in conflict with the legislative history of the Act which contemplated that certain controlled discharges would be permitted if they were consistent with applicable water quality standards, rules and regulations."³

The second point which has provided some discomfort to the Petroleum Industry as well as to the Merchant Shipping Industry is found in section 1151(0)(2) of the basic Act which

¹U.S., Department of Transportation, U.S. Coast Guard, "Pollution Prevention: Inspection of Vessels and Deck and Engineer Officers Licenses," Federal Register, XXXVI, No. 248, Dec. 24, 1971, 24970.

²American Petroleum Institute, Proceedings: Prevention and Control of Oil Spills, p. 13.

³Ibid., p. 5.

states: "Nothing in this Act shall be construed as preempting any State or political subdivision thereof from imposing any requirement or liability with respect to the discharge of oil into any waters within such State."¹ There are two reasons for their concern. First, there are twenty-seven states which can accommodate interstate and foreign shipping and if each of these states were to pass its own laws with differing but more stringent requirements than the Federal law imposes, the burden on interstate and foreign water-borne commerce would be disruptive.²

The second point of concern deals with the degree of financial liability embodied in the law. The Federal Water Pollution Control Act allows four defenses which would excuse the owner of a vessel, onshore facility or offshore facility from liability if he could prove that the spill was caused solely by: an act of God, an act of war, negligence on the part of the United States Government, or an act or omission of a third party without regard to whether any such action or omission was or was not negligent.³

If these defenses are not judged to stand, the owner is then liable for costs of cleanup to the limits set forth in the Act, unless the United States can prove that the spill was the result of willful misconduct or willful negligence within the privity and knowledge of the owner. In this latter case, the owner is

¹Federal Water Pollution Control Act, U.S. Code, Vol. VII, sec. 1151(0)(2), (1970).

²The George Washington University, Legal, Economic, and Technical Aspects, p. 4-47.

³Federal Water Pollution Control Act, U.S. Code, Vol. VIII, sec. 1161(f)(1), (2), (3).

then liable for the full costs of cleanup.¹ Thus, under the Federal law, the owner can, through reasonable precautions, limit his liability. The problem arises in the case of those state laws which provide either no defense and/or no liability limits. The recent legislation passed by the State of Florida is an example of this. Under the Florida law, the polluter is absolutely liable and bears unlimited financial responsibility for all of the consequences of his pollution of water with oil. This is true regardless of whether or not he was negligent and whether or not the act was caused by forces beyond his control.²

Another law which pertains to the operations of the Oil Industry is the Outer Continental Shelf Lands Act of 1953.³ This Act covers the offshore oil wells located outside the territorial waters of the United States. The Continental Shelf is defined as ". . . all submerged lands lying seaward and outside of the area of lands beneath navigable waters . . . which . . . appertain to the United States and are subject to its jurisdiction and control; . . ."⁴ The Act directs the Secretary of the Interior to prescribe rules and regulations to carry out the provisions of the Act, to include

. . . the prevention of waste and conservation of natural resources . . ., and the protection of correlative

¹Ibid.

²The George Washington University, Legal, Economic, and Technological Aspects, pp. 2-1, 4-2.

³Outer Continental Shelf Lands Act of 1953, U.S. Code Vol. X, secs. 1331-1343 (1970).

⁴Ibid., sec. 1331 (a).

rights therein In the enforcement of conservation laws, rules and regulations the Secretary is authorized to cooperate with the conservation agencies of adjacent States.¹

Under these provisions, the Secretary of the Interior has issued regulations requiring the lessee to

. . . keep all wells under control at all times, . . . utilize and maintain materials and high-pressure fittings and equipment necessary to insure the safety of operating conditions and procedures Prevent release of fluids from any stratum through the well bore (directly or indirectly) into the sea; . . . prevent communication . . . between hydrocarbon and water bearing strata; . . .
.....
. . . install, use, and test blowout preventors . . . [which] shall be activated frequently to test for proper functioning . . . maintain in operating condition storm chokes . . . and periodically test or inspect such devices

.....
The lessee shall not pollute land or water or damage the aquatic life of the sea or allow extraneous matter to enter and damage any mineral- or water-bearing formation . . . the control and total removal of the pollutant, wheresoever found, proximately resulting . . . [from drilling or production operations] shall be at the expense of the lessee.²

Willful and knowing violation of these regulations subject the violator to a fine of not more than \$2,000 or imprisonment for up to six months or both.³

Two international conventions have a bearing on the oil pollution problem from the outer limits of the contiguous zone shoreward. The first of these is the International Convention

¹Ibid., sec. 1334(1).

²U.S., Department of the Interior, "Title 30 - Mineral Resources," Code of Federal Regulations, secs. 250.41-250.43 (1971).

³Outer Continental Shelf Lands Act, U.S. Code, Vol. X, sec. 1335(a)(2) (1970).

for the Prevention of Pollution of the Sea by Oil, 1954.¹ This treaty was implemented by the United States through the Oil Pollution Act, 1961.² The basic Convention was amended in 1962 and the United States passed enabling legislation in 1966.³ The Convention, as amended, prohibits the discharge of oil by tankers over 150 tons gross tonnage within fifty miles of the coast of the United States (prohibited zone). Other ships over 500 tons gross tonnage are similarly prohibited from discharging oil in the prohibited zone unless they are enroute to a port in which there is no facility to offload the oil or oily mixture. In this case, the discharge is to be made as far from land as possible.⁴ Enforcement of the provisions of the Convention outside of territorial waters is the responsibility of the country in which the ship is registered. Under this condition, it appears that the civil and criminal penalties of the Federal Water Pollution Control Act are not enforceable against ships registered in foreign countries which are parties to this convention.⁵

¹U.S., Department of State, United States Treaties and Other International Agreements, Vol. XII, pt. 3. "International Convention for the Prevention of Pollution of the Sea by Oil, 1954," TIAS No. 4900, May 12, 1954, pp. 2990-3027.

²Oil Pollution Act, 1961, Statutes at Large, LXXXV, 402-407 (1961).

³Oil Pollution Act, 1961, as amended, U.S. Code. Vol. VIII, secs. 1001-1015 (1970).

⁴U.S., Department of State, United States Treaties and Other International Agreements, Vol. XVII, pt. 2. "Prevention of Pollution of the Sea by Oil," TIAS No. 6109, April 4-11, 1962, pp. 1523-1551.

⁵The George Washington University, Legal, Economic, and Technological Aspects, p. 7-6.

The United States is also a signatory to the Convention on the Territorial Sea and the Contiguous Zone.¹ This convention provides for the right of innocent passage through the territorial sea² and empowers the coastal State within the contiguous zone to ". . . exercise the control necessary to: (a) Prevent infringement of its customs, fiscal, immigration or sanitary regulations within its territory or territorial sea; . . ." ³ The Federal Water Pollution Control Act requires that ". . . any vessel over three hundred gross tons, . . . using any port or place . . . or the navigable waters of the United States for any purpose shall establish and maintain . . . , evidence of financial responsibility of \$100 per gross ton, or \$14,000,000 which ever is the lesser, . . ." ⁴ This is in conflict with article 14 of the Convention in that, under this article, ships have the right of innocent passage through the United States' territorial seas (navigable waters).

The fact that, under the international conventions cited above, the United States is unable to prosecute foreign flag ships for violations of the laws concerning oil discharge and financial responsibility means that U.S. ships are placed at an economic disadvantage.

¹U.S., Department of State, United States Treaties and Other International Agreements, Vol. XV, pt. 2. "Convention on the Territorial Sea and the Contiguous Zone," TIAS No. 5639, April 29, 1958, pp. 1607-1614.

²Ibid., p. 1610.

³Ibid., p. 1612.

⁴Federal Water Pollution Control Act, U.S. Code, Vol. VIII, sec. 1161(p)(1) (1970).

Besides the legislation currently in force, the Federal Government has additional means to encourage social responsibility in the Petroleum Industry. The Department of Defense recently announced that, starting in 1976, it will not purchase fuel from any refinery that does not provide proper facilities for accepting oily ballast from ships.¹ As an added inducement to responsible behavior the Internal Revenue Service has proposed regulations (directed toward all industry as well as the Petroleum Companies) prohibiting tax deductions for fines paid as a result of civil penalties for, among other infractions, violation of pollution laws.² More along the lines of a carrot rather than the stick are the new IRS rules on tax write-off for anti-pollution facilities. In general, these rules allow business to amortize the cost of a certified treatment facility over a period of sixty months.³

As pointed out above, it has been Federal policy to allow the states to take the initiative in the field of water pollution, and much of this authority was further delegated to the local government level.⁴ For many years the primary concern of

¹"Taking Aim at 'Do-Good' Federal Contracts," Business Week, February 5, 1972, pp. 46-48.

²"IRS Gets Tough on Deductions," Business Week, September 4, 1971, p. 27.

³U.S., Environmental Protection Agency, Office of Public Affairs, "EPA Sets Rules on Tax Write-Off for Anti-Pollution Facilities," EPA Citizen's Bulletins, September, 1971, pp. 8-9.

⁴Davies, The Politics of Oil Pollution, pp. 120-125.

state and local anti-pollution laws was the prevention of nuisances and hazards to waterborne commerce. The inadequacy of local control and a growing knowledge of a cause and effect relationship between polluted water and certain diseases brought about a shift in the locus of power back to the state level and, by 1948, these pollution programs were generally housed in the state public health departments. As interest in water pollution increased, there was a shift of control of water pollution programs from the health departments to state agencies specifically chartered to deal with water pollution, especially in the South and New England.¹ However, not too much initiative in pollution control was shown by many of the states until the passage of the Water Quality Act of 1965 provided the impetus or clout for state establishment of water quality standards. Under the provisions of this Act, the states are required to determine the desired use of the body of water such as industrial use or swimming, and then set water quality standards consistent with the intended use.²

At the joint American Petroleum Institute, Environmental Protection Agency, and U.S. Coast Guard conference on oil spills held in 1971, it was reported that while all states have adopted water quality standards which have been approved in whole or in part by the Environmental Protection Agency, the standards

¹Ibid.

²Water Quality Act of 1965, Statutes at Large, LXXIX, sec. 5, 907 (1965).

normally do not specify a definite allowable limit of oil pollution.¹ Typically, the standards read that ". . . There shall be no slicks or free or floating oil present in sufficient quantities to interfere with the designated uses, nor shall emulsified oils be present in sufficient [sic] quantities to interfere with designated uses."²

Action against water polluters by the states has been slow because of the complicated procedures required under the 1965 Act. These procedures provide for conferences between the polluter and the appropriate governing body; and judicial review of the conference recommendations which can be enforced only if the court finds compliance to be feasible.³

Because of the complicated enforcement procedures, and because it is difficult to set a level of effluent each polluter can be permitted to dump into the river or stream in order that the designated level of water quality be maintained, enforcement efforts vary widely from state to state.⁴ In general, the degree of state prohibitions and enforcement activities can be related to the amount of political power held by those who expect to profit from economic growth. This concentration of political and economic power is found more in the Deep South than in the rest

¹American Petroleum Institute, Proceedings: Prevention and Control of Oil Spills, pp. 3-4.

²Ibid., p. 4.

³U.S., Congress, Senate, Federal Water Pollution Control Amendments of 1971, p. 2.

⁴Ibid., p. 8.

of the country. Added to this is the urgent need for economic development in these poor Southern States, which leads to the official attitude that the jobs provided by an industry outweigh any possible damage that might be caused to the environment. That anti-pollution laws may not be vigorously enforced was suggested by a member of the Alabama Governor's staff who said that Alabama "' . . . will not be at a competitive disadvantage with her sister states. We will abide by these new federal water standards but we aren't going to be more extreme than the other states.'"¹

This spotty pattern of pollution law enforcement by the states may also be found in the regulation of brine disposal. As pointed out earlier, the Petroleum Industry faces the problem of disposing of some 9 million gallons of brine a day and the current practice is to pump the brine into non-producing wells. Regulation of this activity is under the supervision of the various states, and when properly carried out, it is a safe procedure. However, Wilson Land, the director of the American Petroleum Institute's committee on exploration admits that regulation in some of the thirty-three oil producing states "' . . . is probably not as stringent as in some of the other states.'"²

On the other side of the coin, some states have adopted strong oil pollution measures. Florida, Maine, Massachusetts and

¹Ibid., p. 29.

²Pierson, "Big Loophole Favoring Oil Companies," p. 17.

Washington have passed laws covering oil spills within their jurisdictions which

. . . provide for strict liability, without proof of negligence, . . . [and] contain no defense from strict liability, except for Washington, which provides relief from strict liability if it can be established that the discharge was caused by an act of war or by negligence on the part of the federal or state government . . . [otherwise] such liability is unlimited in amount.¹

As a result of the strict provisions of the Florida law, some insurers have decided not to insure ships which call at ports in that state.²

Some states have decided to cut down on the possibility of oil pollution by limiting the introduction of oil facilities into their territory. In 1970, Maine turned down an application to build a \$150 million oil refinery on Sears Island because of the possible undesirable effects it would have on the environment.³ Delaware recently turned down a \$360 million oil, coal and steel development on Delaware Bay. Shell Oil Company had planned to build a \$200 million refinery there to refine oil imported by supertankers. Shell argued that in order to realize the economies of these new ships, refineries will have to be built in coastal areas that can receive the ships. Governor Peterson's answer is "If there are no ports for big vessels,

¹American Petroleum Institute, Proceedings: Prevention and Control of Oil Spills, p. 6.

²The George Washington University, Legal, Economic, and Technological Aspects, p. 4-3.

³Council on Environmental Quality, The Second Annual Report, p. 66.

then big vessels are not economic, are they?"¹ Delaware's refusal was based on a new state law which prohibits heavy industrial development and regulates light industrial development along the state's bay and ocean coasts. The law specifically prohibits oil refineries, offshore bulk facilities and petrochemical plants.²

The states are making their voices heard in other ways, too. Fearful that drilling operations on the Atlantic Outer Continental Shelf will result in pollution incidents similar to the Santa Barbara oil spill, Governors Mandel of Maryland, and Sargent of Massachusetts, along with representatives of other Eastern seaboard governors, recently met with Interior Secretary Morton concerning the proposed leasing of drilling rights.³ Although the potential well sites are outside the contiguous waters of the states, an oil spill in this area could very easily drift into the state's waters, spreading pollution to the local fishing industries in its wake. While the final decision will be made in the White House, Secretary Morton has agreed to consider the views of the governors before presenting his suggestions to the President.⁴

¹"Fellow Americans Keep Out," p. 30.

²Council on Environmental Quality, The Second Annual Report, p. 63.

³Elsie Carper, "Morton Promises to Consult States on Off-Shore Oil," Washington Post, Jan. 12, 1972, p. A3.

⁴Ibid.

To close this discussion of the anti-pollution pressures being brought to bear on the oil industry, we shall look at the activities of the environmental groups. Probably the most significant occurrence of the past several years has been the gradual awakening of the people in the United States to the fact that we do have serious pollution problems, and that concern about these problems transcends the traditional differences in our society. Everyone agrees that a clean environment is a worthy aspiration and that drinkable water and breathable air are birthrights we wish to be able to pass on to our children.

The approaches taken by ecology-minded citizens in their fight against pollution are many and varied, but, in general, they may be grouped under four types.¹ The Idealists believe that in order to solve the problems of the environment, people must be educated to understand the importance of the inter-relationship between themselves and the environment. The Realists, on the other hand, believe that the solution to the problem lies in the carrot and the stick. It is their contention that we cannot expect people or industry to stop polluting until we make it worth their while on a uniform basis through either incentives or penalties or both. The Technocrats favor the proper regulation of technological innovation coupled with the realization that technological innovation has provided benefits over and above the problems it has caused, and that through the proper application of technology, we will be able to both clean up the

¹U.S., Congress, House, Committee on Government Operations, The Environmental Decade (Action Proposals for the 1970's), H. Rept. 1082, 91st Cong., 2d sess., 1970, pp. 2-3.

environment and maintain our standard of living. The Legalists agree that pollution will not cease just because everyone feels it should. They claim that the only solution is through stronger enforcement of the laws, stronger laws where necessary and court action through law suits.¹

Realizing the relative powerlessness of the individual in our pluralistic society, people in increasing numbers are forming and joining groups to lobby for the repair and conservation of the environment. Estimates and "counts" of conservation and environmental groups vary, but as an indication of the size of this movement, there are approximately 250 national and regional groups and 400 state groups listed in the National Wildlife Federation's 1971 Conservation Directory, and approximately 2,500 local groups have been identified.² To gauge their power, one need only look at the size of the membership rolls of just a sample of the national organizations: Sierra Club, 130,000 members; Audubon Society, 38,000 members; Nature Conservancy, 26,000 members; and Friends of the Earth, 22,000 members.³

The national, regional and local groups are using this power to influence the direction and shape our laws are taking. Many of these organizations maintain offices in Washington, D.C., staffed by willing witnesses for Congressional Hearings on subjects of interest to them; and Congress listens. What these

¹Ibid.

²Council on Environmental Quality, The Second Annual Report, p. 90.

³"Fellow Americans Keep Out," p. 22.

organizations are saying is represented by this quote from a recent hearing held before the House Committee on Government Operations:

I am Thomas L. Kimball, executive director of the National Wildlife Federation We have approximately two and a half million members and affiliates in 50 states.

.
 The National Wildlife Federation believes that the quality of life, indeed the continuation of life, . . . depends on man's stewardship of the environment--particularly those vital components essential to life, air, water, and soil.¹

In addition to testifying before Congressional Committees, these organizations keep a steady stream of information about the environment flowing to their members through such media as the Sierra Club Bulletin, the Izaak Walton League's Outdoor America, and the Conservation Foundation's CF Letter. These regular publications plus special publications and pamphlets all serve to keep the anti-pollution cause before their members.

Local organizations are active in the fight against water pollution too. Groups such as BAG (Beach Alliance Group), SODA (Stop Ocean Dumping),² and GOO which stands for Get Oil Out--of the Santa Barbara Channel³ are springing up across the country. A California group, the People's Lobby, is attempting to push

¹U.S., Congress, House, Committee on Government Operations, The Environmental Decade (Action Proposals for the 1970's), Hearings, before a subcommittee of the Committee on Government Operations, House of Representatives, 91st Cong., 2d sess., 1970, p. 10.

²"Fellow Americans Keep Out," p. 22.

³Jeremy Main, "Conservationists at the Barricades," The Environment: A National Mission for the Seventies, ed. by the Editors of Fortune, Perennial Library (New York: Harper & Row, Publishers, 1970), p. 167.

through a Clean Environment Act by referendum in their state's Presidential primary. This Act, if passed, would bar any new offshore drilling in California waters. The group already has 325,000 signatures on its petition which are sufficient to place the measure on the ballot.¹

Conservation groups, anti-pollutionists and individual citizens are also using the courts in their battle to preserve the environment. The Council on Environmental Quality states that: "Perhaps the most striking recent legal development has been the step-up in citizen 'public interest' litigation to halt degradation of the environment."² Three Federal Acts and subsequent court interpretations have assisted in this increased activity: The Freedom of Information Act, the Administrative Procedures Act and the National Environmental Policy Act of 1969. The effect of these Acts and various court interpretations has been to open the formerly closed doors of the Federal bureaucracy and allow citizens access to agency data and studies concerning the environmental impacts of proposed legislation and rules making.³ The delay in construction of the Alaska pipeline,⁴ the recent cancellation of offshore oil leases in the Gulf of Mexico,⁵ and

¹"A Cleanup Battle Jolts California," Business Week, December 25, 1971, p. 35.

²Council on Environmental Quality, The Second Annual Report, p. 155.

³Ibid., p. 115-163.

⁴Ibid., p. 157.

⁵Jim Mann, "Interior Cancels Sale of Off-Shore Oil Leases," Washington Post, Jan. 21, 1972, p. A3.

and the overturning of the Refuse Act of 1899 permit program,¹ are examples of this type of action to protect the environment.

While all this activity is going on, one is forced to wonder if some of the people concerned with stopping pollution of the environment are not creating or sustaining as many problems as they correct. The fight to save the environment appears to be led by the white, educated, middle and upper classes of society--and their children, ". . . the successful, well-adjusted young people who are beneficiaries of this high-pressure and high-education society of ours. . . ." ² Indeed, somewhat of a backlash already appears to be forming, especially among the "blue-collar" classes. Even though national labor union leaders have taken strong positions in favor of clean air and water, many local union officials are joining the anti-anti-pollution fight to preserve the jobs of their members.³ The Maine State Federated Labor Council has fought the ecologists, so far unsuccessfully, over new oil refineries in that state. A. F. Grospiron, who heads up the Oil, Chemical and Atomic Workers says that: "'We will oppose those theoretical environmentalists who would make air and water pure without regard to whether or not people have food on their tables.'" ⁴

¹"Court Challenges License to Pollute," Business Week, January 1, 1972, p. 21.

²Peter F. Drucker, "American Directions: A Forecast," quoted in U.S., Congress, House, The Environmental Decade, p. 25.

³Byron E. Colome, "Changing Times: Fearing Loss of Jobs, Unions Battle Efforts to Clean Environment," Wall Street Journal, Nov. 19, 1971, pp. 1, 21.

⁴Ibid., p. 1.

In considering the actions and reactions of these opposing forces, it is well to remember the First Law of Ecology, as handed down to us by Dr. Barry Commoner: "Everything is Connected to Everything Else."¹

¹Barry Commoner, The Closing Circle: Nature, Man, and Technology (New York: Alfred A. Knopf, 1971), p. 33.

CHAPTER IV

THE PETROLEUM INDUSTRY'S RESPONSE

No group opposes pollution control per se. Clean air and clean water have joined the ranks of motherhood and apple pie in the American political pantheon.

--J. Clarence Davies III¹

Previous chapters of this paper have been concerned with the oil pollution problem of the Petroleum Industry, and the external forces being brought to bear on the industry to prevent and clean up oil spills and related wastes. This chapter will review some of the efforts of the industry to meet its responsibility to protect the environment by developing safer methods to mine, refine, and transport its product. Obviously, not every company in the industry can be examined to determine what it, individually, is doing about pollution. Rather, this will be an industry-wide assessment of the efforts being made to prevent water pollution, and a review of some of the current research aimed at producing better methods of accident prevention and spill clean-up.

The American Petroleum Institute which represents the majority of the petroleum companies in this country has issued a publication stating the policy in their industry concerning

¹Davies, The Politics of Pollution, p. 90.

water pollution resulting from the production, transportation, or use of oil. This policy (adopted in 1965) states that:

The Institute endorses the principle that producers of contaminating wastes, whether individual, industry or principality, have a social responsibility to avoid the pollution of waters. . . . [it] also advocates measures to avoid contamination of surrounding ocean or nearby recreational beaches with wastes from offshore drilling and producing operations. . . . [and the] . . . careful avoidance of the discharge of wastes from ships, such as through the cleaning of bilges and tanks, or the spillage of cargo which could contaminate water or beach areas.¹

The Petroleum Industry has, through the Institute, been interested in pollution problems for quite some time.² In 1927 a committee was formed to deal with the problem of disposal of refinery wastes. One result of a study conducted by this committee was the publication of the Manual on Disposal of Refinery Wastes which has since grown into six volumes, reflecting the results of current research in the fields of water pollution control, air pollution control, and chemical and solid waste treatment.³ In 1965, with a growing awareness of the problems of pollution, the American Petroleum Institute formed a permanent Committee for Air and Water Conservation. Since 1969, this committee has been budgeted at over \$3 million a year for

¹American Petroleum Institute, Statement of Policy on Conservation of Natural Resources and Wildlife (New York: American Petroleum Institute, 1965), pp. 5-6.

²American Petroleum Institute, Environmental Research: A Status Report (Washington, D.C.: American Petroleum Institute, 1972), p. I-1.

³American Petroleum Institute, Conservation Practices at Oil Installations, p. 5.

research on pollution problems.¹ In 1969, following the Santa Barbara oil spill, a permanent Subcommittee on Oil Spills Cleanup was formed under the Air and Water Conservation Committee, and has been funded with \$1.2 million for research through 1970.²

Research and manual writing is performed by the API and also contracted out to various universities, companies and individuals. A brief sample of these projects gives some idea of the scope of its research programs. Completed projects include: Industrial Oily Waste Control, A Primer on Oil Spill Cleanup, Systems Study of Oil Spill Cleanup (2 Vols.), and Oil Spill Treating Agents.³ Studies or projects currently underway include: Mathematical Modeling and Environmental Testing of Containment Booms, Development and Demonstration of New Devices for Removal and Separation of Spilled Oil, Oiled Waterfowl Rehabilitation, Training Film (coping with oil spills), Effects and Fate of Oil in the Marine Environment, and a Manual on Prevention of Oil Spills.⁴ A brief description of these projects may be found in APPENDIX I.

Research is also being conducted by individual petroleum companies on an equally broad spectrum of problems. American Oil Company has recently developed an oil recovery system which

¹American Petroleum Institute, Environmental Research, p. I-2.

²American Petroleum Institute, Oil and Water Don't Mix, p. 3.

³American Petroleum Institute, Environmental Research, pp. III-12 - III-15.

⁴Ibid., pp. II-21 - II-34.

uses polyurethane foam attached to a revolving drum to absorb spilled oil. As the exposed part of the drum revolves into the boat, the oil is squeezed out of the foam into a collection tank.¹ The foam drum will collect up to 300 tons of oil an hour.²

The Cities Service Tankers Corporation has conducted research on oil separators. These are devices to separate oil from the water used in washing fuel and cargo tanks. The corporation installed SEREP/Butterworth gravity type separators on three of their tankers and as a result of a three-year study have determined that during a typical sailing as much as 1,200-1,500 barrels of oil slop can be recovered and burned as fuel.³

Shell Oil Company has developed tank overflow alarms to be used during fuel transfer operations between the shore and ships/barges. A brief description of the development process of these alarms is illustrative of some of the difficulties encountered in the search for new ways to handle old problems. Shell started with the concept that the alarm device had to fit into various types of tank openings; be portable; withstand various climatic influences; possess sufficient ruggedness to withstand handling by waterfront personnel; and sound an alarm loud enough to alert the transfer crews to an impending spill.

¹American Petroleum Institute and U.S., Department of the Interior, Proceedings: Industry Government Seminar, pp. 119-120.

²Standard Oil Company (Indiana), 1970 Annual Report, p. 18.

³American Petroleum Institute, U.S., Environmental Protection Agency and United States Coast Guard, Proceedings: Prevention and Control of Oil Spills, pp. 109-117.

Requests for proposals were sent to 170 companies of which 111 responded. Thirty-four submitted proposals but only sixteen of these were judged reasonable by Shell. Of the sixteen plans accepted, only seven were resubmitted as working prototypes by their developers for testing. The system finally chosen is working well. In answer to fears that transfer crews will rely on the alarm to warn them as a tank reaches a topped-off condition, rather than keeping a check on the progress of the job themselves, Shell reports that the sound of the alarm is sufficiently loud enough to alert everyone in the vicinity.¹

Gulf Oil Corporation has been looking for methods to handle oil spills in open water. The company has developed a new wicking agent consisting of asphalt-coated expanded vermiculite.² This wicking agent is used to burn oil floating on the water and turn it into a clean residue which may then be collected for disposal. Gulf has also reported the development of a new process for cleaning oil cargo and fuel tanks. This method, called "Skinclean," reduces the possibility of tank explosions during cleanings; permits the cleaning to be done in less time than it formally took using conventional procedures; and reduces chances for pollution.³

Although pollution control and research expenditures have been a part of the industry's budget for quite some time,

¹Ibid., pp. 103-108.

²Gulf Oil Corporation, 1970 Annual Report, p. 11.

³Ibid.

the new Federal and State laws are compelling additional expenditures to meet the standards established by these laws. Thus, the freedom of the industry to spend or not to spend money on water pollution control is more restricted than formerly; and this item is demanding a larger share of every oil company budget. A McGraw-Hill survey of capital investment for water pollution control in 1970 shows that the Petroleum Industry spent \$185 million for pollution control equipment and facilities that year.¹ To meet 1974 water quality standards it is estimated that the Petroleum Industry will have to spend \$110.2 million annually for water treatment alone.² A survey of the industry conducted by the API over the period of 1966 to 1970 shows that total expenditures of forty-five companies for water conservation increased from \$145.7 million in 1966 to \$288 million in 1970 (estimated).³ The apparent discrepancy between the McGraw-Hill figure and the API figure results from the fact that the latter contains expenditures for capital equipment (\$184.7 million), operation and maintenance (\$77.3 million), administrative expenses (\$21.2 million), and research and development (\$4.9 million).⁴ It should be noted that these expenditures account for only half of the \$559.5 million spent on both air and water

¹Council on Environmental Quality, The Second Annual Report, p. 147.

²Ibid., p. 148.

³American Petroleum Institute, Report on Air and Water Conservation Expenditures of the Petroleum Industry in the United States 1966-1970 (New York: American Petroleum Institute, 1971), p. 3.

⁴Ibid., pp. 4-7.

pollution. The major areas of capital investment for pollution control equipment in the 1970 estimates were in crude oil production (\$45,454 thousand) and refinery operations (\$76,857 thousand). Attendant operating and maintenance expenses in these two areas were estimated at \$27,631 and \$26,910 thousand, respectively.¹ A more detailed breakdown of water pollution expenditures may be found in APPENDIX II.

In terms of investment in water pollution control equipment, the Petroleum Industry ranked first in the identifiable industry groups in 1970.² These expenditures represent significant portions of the capital budgets in the industry. Union Oil estimates that 18.5 per cent of the cost of its new refinery was budgeted for pollution control equipment (both air and water); while Sun Oil Company figures that about 10 per cent of the cost of one of its new refineries will be spent on pollution control equipment.³ In one Mobile Oil Company refinery, six separate sewer systems were constructed to handle ". . . oil process waste, sanitary waste, phenolic process waste, normal storm drainage, emergency storm drainage and ship's ballast discharge."⁴

¹Ibid., pp. 13, 16.

²Council on Environmental Quality, The Second Annual Report, p. 147.

³Blumberg, "Corporate Responsibility and the Environment," p. 45.

⁴Davis and Blomstrom, Business, Society and Environment, p. 344, quoting Mobil World, February, 1965, p. 7.

Modern refinery design has cut the usage of water from 1,500 gallons to about 300 gallons per barrel of crude oil through recirculation of cooling water. Where cooling water formerly passed once through heat exchangers and returned directly to its original source, the water itself is now re-cooled and recirculated through the system five to thirty times.¹ As a further water conservation measure, refinery condensate is purified in a series of steps, usually starting with preliminary treatment at the source. The water is then sent to central waste treatment plants where it is further purified by biological conversion, chemical flocculation, aeration and separation.² Atlantic Richfield recently completed a 100,000 barrel refinery at Cherry Point, Washington which ". . . may well draw world wide attention as a model of water-pollution control. . . ." ³ Oily water from process operations and ballast water will be processed through a gravity separator, two stages of biological treatment, and two stages of clarification to meet the strict standards that have been imposed by the Federal Government.⁴

In a reverse of the usual procedure, the Kern River California production field of the Getty Oil Company actually adds to the local fresh water resources. About 300,000 barrels

¹American Petroleum Institute, Conservation Practices at Oil Installations, p. 6.

²U.S., Congress, Senate, Committee on Public Works, Water Pollution Control Programs, pp. 449-450.

³"Cherry Point Refinery--A Story of Air, Water, and Fuel," Oil & Gas Journal, January 24, 1972, p. 84.

⁴Ibid., p. 86.

of water are produced from oil bearing formations. After purification, about 200,000 barrels are used to feed boilers located at the Kern River site. The remaining 100,000 barrels of water are sold to area farmers for irrigation of their crops.¹

Some of the methods used by the oil companies to prevent pollution by offshore wells include: installing pans and steel skirts on the well platforms to catch oil drippings; hauling debris ashore for disposal; and installing blowout preventers and storm chokes in the well. There is some evidence, however, that the preventers and chokes used in wells are not adequate accident deterrents: this problem is currently being investigated by a group from the National Academy of Engineering and a group from the National Aeronautics and Space Administration.² A new device recently patented by the Atomic Energy Commission may be an answer to this problem. The AEC has announced that the device will close off a well almost instantly.³

Efforts are also being made to cut down on the pollution of the sea resulting from the activities of tankers. The Petroleum Industry, in conjunction with the Maritime Industry, is refitting U.S. tankers to comply with new rulings by the American Bureau of Shipping. These standards require that fuel oil overflows, and drains from oil pans and tanks be piped

¹Getty Oil Company, 1970 Annual Report, p. 31.

²"Offshore Fire Singes Oil's Safety Rules," Business Week, October 23, 1971, p. 48.

³"Emergency Device of AEC to Seal Oil Well Patented," Wall Street Journal, Feb. 17, 1972, p. 7.

into a closed cofferdam and held there until the oil can be properly disposed of.¹ New tankers are being designed with double bottoms to prevent the spillage of oil as a result of groundings such as occurred in the Torrey Canyon incident. A double bottomed tanker has, as the name implies, two bottoms separated by a watertight void so that if the hull is ruptured, the cargo will not spill out through the hole. Mobil Oil Corporation took delivery of two such tankers in 1970--the S.S. MOBIL PINNACLE and the S.S. MOBIL PEGASUS. Both tankers are 211,666 dead weight tons and are to be followed by four more of the same class by 1974.²

As part of a "Clean Seas Code" the major oil and shipping companies retain oily waters on board and load new shipments of oil on top of this mixture until they can offload the waste water in ports equipped to handle it. Called the load-on-top method, this procedure has aided greatly in reducing the amount of oil purposely pumped into the water.³ The success of this program is dependent on the ability of the receiving refinery to either process the oily mixture or to receive and store it until it can be properly disposed of. New refineries are generally able to handle the mixture as a consequence of their

¹United Nations, United Nations Secretariat, Pollution of the Sea by Oil (ST/ECA/41), August, 1956, p. 162.

²Mobil Oil Corporation, 1970 Annual Report, p. 8.

³Baldwin, Public Policy on Oil, p. 26.

designed capabilities, while some older refineries are being modified for this purpose.¹

As a further effort to prevent water pollution by tankers, some companies have stepped up training programs for tanker crews. One such program, developed by Marine Advisory and Associated Services, is called the "Shipboard Pollution Control Indoctrination and Training Program."² The course of instruction runs for a seven-to-eight-day period during a normal sailing. Six to eight hours of formal sessions are held for all deck and engineer officers and consist of lectures, movies, slides, and question and answer periods. Two hours of formal sessions are also devoted to crew training. An additional fifteen hours are spent in informal sessions with both officers and crew.³ A list of the subjects covered in this program is shown in APPENDIX III.

Borrowing an idea from the airline industry, Shell Oil Company is using an electronic simulator to train crews for well drilling operations. The simulator is able to realistically produce the symptoms of drilling problems that a drilling crew may have to face on the job, including appropriate sounds. All activities and conditions that can be encountered in drilling to a depth of 15,000 feet can be programmed into the simulator, providing realistic training in a short period of time.

¹American Petroleum Institute, U.S., Environmental Protection Agency and United States Coast Guard, Proceedings: Prevention and Control of Oil Spills, p. 35.

²Ibid., pp. 98-99.

³Ibid.

Approximately 200 Shell and contractor personnel have been trained so far and the idea has attracted interest from several other oil companies.¹ The American Association of Oilwell Drilling Contractors has also conducted training programs for its members' drilling personnel during the past several years.²

Despite all these training sessions and precautions, spills will occur, and the industry has taken steps to minimize their effects as much as possible. This is done through voluntary oil spill cleanup cooperatives.³ The first such organization came into being in New Haven, Connecticut in 1964. Oil companies in the immediate area pooled their resources and purchased equipment to cope with oil spills in the harbor area; developed an emergency plan for combating oil spills; and set up the necessary communications network to activate the plan. This idea has spread throughout the country. In addition to oil companies, various local, state and Federal agencies have joined the cooperatives. At the present time there are sixty-seven of these cooperatives in operation and twenty-two more are being organized.⁴ While this effort may be viewed as locking the barn door after the horse is stolen, not even the most optimistic ecologist or oil company public relations man can believe that oil spills can be

¹"Shell Pushes Well-Control Training Program," Oil & Gas Journal, January 24, 1972, p. 24.

²National Petroleum Council, Environmental Conservation, p. 146.

³American Petroleum Institute, Oil Spills Cleanup Cooperatives (Washington, D.C.: American Petroleum Institute, 1972), pp. 1-3.

⁴Ibid.

completely stopped--short of ceasing oil production, shipment and usage of oil. The ability of these cooperatives to rapidly deploy men and equipment to contain and clean up oil spills represents the best chance of reducing their severe effects.

In order to help meet the cost of cleaning up spills, oil companies owning tankers and independent tanker owners have formed an association called Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution, or TOVALOP.¹ This voluntary insurance scheme has been in operation since October, 1969. Under this plan, if a tanker owner does not immediately clean up an oil spill, TOVALOP will reimburse the Federal Government for cleanup costs up to a maximum payment of the smaller of \$100 per gross registered ton or \$10 million. If the tanker owner cleans up the spill himself or assists the Government in cleaning up the spill, he can recover his reasonable cleanup costs, or share of the costs in the latter case.² Ninety-six per cent of the tonnage of the Free World's tanker fleet is participating in this plan.³

Complementing TOVALOP is a plan called Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution, or CRISTAL.⁴ This insurance plan, which became effective in April

¹The George Washington University, Legal, Economic, and Technological Aspects, pp. 8-9.

²Ibid.

³National Petroleum Council, Environmental Conservation: The Oil and Gas Industries, Vol. II, W. W. Keeler, chairman (Washington, D.C.: National Petroleum Council, 1972), p. 29.

⁴"New Tanker-Spill Liability Group Organized," Oil & Gas Journal, January 25, 1971, p. 87.

of 1971, provides an additional \$20 million to cover oil spill cleanup costs that run higher than the \$10 million maximum limit of TOVALOP. Membership consists of thirty-eight major oil companies which ship 80 per cent of the oil moved by tanker.¹ Thus, for the full \$30 million maximum to apply, the owner of the oil must be a member of CRISTAL and be shipping his oil in a tanker participating in TOVALOP. CRISTAL will also pay compensation to third parties who suffer damage from an oil spill.²

A third insurance scheme to help pay the cost of oil spill cleanup is Oil Insurance Limited or OIL.³ This plan covers production facilities, onshore and offshore, up to a maximum of \$100 million per member per year. Costs connected with incidents such as catastrophies, property damage, and blowouts are covered under this plan.⁴

In summary, it is through improved refinery and tanker design, increased spending for pollution control equipment, crew training programs, and continuing research that the Petroleum Industry seeks to fulfill its responsibilities as a law-abiding corporate citizen. The industry also feels that it has a further responsibility to work closely with the government in the shaping

¹National Petroleum Council, Environmental Conservation, p. 29.

²"New Tanker-Spill Liability Group Organized," p. 87.

³The original plan was liquidated and reconstituted as of January 1, 1972. The major change in the new plan is that the participating companies are committed for a five year period vice the one year period under the old plan. (J.A. Edwards, Gulf Oil Corporation, telephone interview, March, 1972).

⁴The George Washington University, Legal, Economic, and Technological Aspects, p. 8-11.

of the standards which oil companies are expected to meet.

While the term "lobbying" may have unsavory connotations, many business leaders feel that:

. . . business not only has the right but the responsibility to be a full partner in our political way of life. Our expanding social responsibilities are becoming far too great to permit us to be otherwise

 This grand old practice, popularly known as lobbying, . . . is a legitimate and necessary part of law making.¹

It is a policy of the American Petroleum Institute to work with government legislators in an attempt to develop ". . . regulations which provide the most benefit for the least cost to the public; reflect the time required to develop and implement technology; and treat competing products or equipment equitably."²

In line with this policy, industry representatives have testified at hearings before committees of Congress, and have worked closely with Federal agencies in the preparation of rules and regulation governing their operations. For example, in 1969, the Petroleum Industry participated in revising and updating the rules which regulate drilling operations on the Outer Continental Shelf.³

As a result of its cooperation with government legislators, the Petroleum Industry hopes to see the establishment,

¹J. W. Hull, "The Public Concerns of Private Enterprise," Vital Speeches of the Day, XXXVII (April, 1971), 369.

²American Petroleum Institute, Statement of Policy: Air and Water Conservation (New York: American Petroleum Institute, 1969), p. 2.

³National Petroleum Council, Environmental Conservation, p. XVII.

by the government, of workable air and water quality standards, with the methods by which these standards are to be met left up to the initiative of the individual companies.¹ Workable standards are defined as those which are within the capability of present technology, or permit time for the necessary technology to be developed. The ratio of cost to benefit must also be considered in establishing standards. For example, it has been estimated that for a hypothetical 100,000 barrel-per-stream-day refinery to submit waste water to a high degree of treatment would involve a capital outlay almost six times as great as that needed for a low degree of treatment (\$1,126,000 vs \$219,000).²

At the present time the Petroleum Industry feels it is being forced to deal with water pollution standards which have not been clearly defined, and which may soon be changed as a result of a water pollution bill (S.2770) written by the Senate Public Works Committee. (The bill has been passed by the Senate but is still awaiting final action in the House.)³ As a result of this uncertainty, almost no refineries are scheduled to be built this year. While many companies are planning new refineries, they are waiting for clarification of the regulations regarding allowable pollution levels, and for the new specifications for fuels. Although refineries are operating today at about 87 per cent of capacity, demand for finished products is

¹Ibid.

²Ibid., p. 93.

³Elsie Carper, "Assault Grows on Clean Water Bill," Washington Post, Dec. 11, 1971, p. A17.

expected to increase about 5 per cent a year. Considering that the normal time period from commencement of building a refinery to completion is three years, it appears that the United States will outrun its refinery capacity in the mid-seventies.¹

Hence, close cooperation between the government and the Petroleum Industry is needed so that the countries' fuel needs can be met with the minimum cost to the environment.

Industry needs to know what the government wants, and what government is about to ask it to do; government needs to know what industry can do, what it is trying to do, and how much time and money it is going to take.²

¹"Oil Spending in U.S. to Move Up Slightly in 1972," Oil & Gas Journal, January 31, 1972, pp. 49-50.

²National Petroleum Council, Environmental Conservation, p. 39.

CHAPTER V

SUMMARY AND CONCLUSIONS

There is grave danger in portraying the issue of the environment as the polluters vs. the people or the nuts vs. the defenders of the American System, depending on your point of view.

--William D. Ruckelshaus¹

This paper has attempted to assess whether or not the Petroleum Industry is meeting its responsibilities to eliminate and prevent pollution of the waterways in the continental United States and the contiguous zone. In the course of analysing the efforts of the Petroleum Industry to protect the environment, the role played by this industry in the economy of the United States was first investigated.

The Petroleum Industry is the third largest industrial group in the United States, exceeded in asset value only by agriculture and the combined public utilities.² The industry as a whole controls \$71 billion of assets and employs 1.5 million people. The extent of activities carried out by these companies ranges from participation in production, refining, marketing, and transportation (integrated companies) to those involved in

¹William D. Ruckelshaus, "Environment 1971," An address given at the National Press Club, Washington, D.C., Dec. 16, 1971, EPA Citizens' Bulletin, December, 1971, p. 2.

²National Petroleum Council, Environmental Conservation, pp. 67-82.

two or three activities (semi-integrated) to those involved in just one of the activities (non-integrated). Their operations (excluding wholesaling and retailing) are spread throughout thirty of the contiguous forty-eight states. In supplying nearly half of the energy consumed in the United States, the industry operates more than 500 thousand oil wells; refines over 10 million barrels of crude oil a day at 250 refineries; and transports, in 6,000 tankers and barges, about 16 per cent of domestic crude, a quarter of the refined products, and all of the oil imported from overseas.¹

While the Petroleum Industry is carrying out its function of keeping our economy well oiled, an estimated 7,500 oil spills per year occur, directly or indirectly, as a result of its activities.² The major cause of these spills has been found to be human error during transfer operations, while the source of most of the largest spills was barges.

Aside from aesthetics, a difference of opinion exists about the effects of these spills on the environment, especially over the long term. The split is more or less divided along the lines of those responsible for the pollution and those wishing to stop it. To date, the most comprehensive study of the effect of oil spills on marine life is that carried out by Dr. Max Blumer and his associates at the Woods Hole Oceanographic Institute. The results of his study show that long-term damage

¹Ibid.

²Zeldin, "Audubon Black Paper Number One," p. 100.

is done to the biological systems found in the coastal waters-- the waters which receive the greatest amount of spilled oil. Additional studies, especially one being conducted by the Environmental Protection Agency, are expected to confirm these results.

If no effort is made to check this pollution, the number of spills will undoubtedly increase, as the industry expands its operations to meet an expected doubling of demand for oil by 1985. Oil spills, however, are not to be left unchecked. As pointed out in this paper, several pressures are being brought to bear which are providing the incentives and direction needed to encourage the industry to attempt to minimize the impact of its activities on the environment. These pressures include those exerted by the government, conservation groups and the industry's own sense of social responsibility.

While the term "social responsibility" has many definitions, ranging from the idea that business should be all things to all people to the idea that business' social responsibility is to maximize profits, the definition chosen by this writer is the one expounded by Peter Drucker and others which claims that businesses are socially responsible when they fulfill ". . . society's needs through concentration on their own specific job."¹ In carrying out its "own specific job," the Petroleum Industry has the responsibility to prevent harmful

¹Drucker, The Age of Discontinuity, p. 206.

pollution of the waters of the United States by its products and processes.

It should be noted that it is not strictly a sense of altruism which is prompting industry to become more aware of its responsibilities to society. A well-publicized advertising campaign stressing "corporate involvement" can do much to deflect the criticism of pressure groups and stay the growing threat of increased governmental control. That a commitment to social involvement may also save a company time and money is pointed out by John R. Bunting, president of First Pennsylvania Corporation:

I can think of few more foolish expenditures of salary dollars than having the corporate secretary and public relations officers, not to mention the chairman of the board, spending hours debating a second-year law student who owns three shares.¹

Corporations are also feeling an internal pressure to become more responsible citizens. This pressure is generated by the executives and workers who are themselves members of society and have to live with the results of their companies' environmental policies. The effects of oil pollution are felt to a far greater extent by the people involved in the industry than by a farmer in North Dakota. In other words, the pollution is, relatively speaking, localized in the area where the people in the Petroleum Industry live and work. It is their beaches and drinking water which are affected.

Federal and state governments are increasingly providing the standards for pollution control which will insure that all

¹Charles N. Stabler, "Changing Times: For Many Corporations, Social Responsibility Is Now a Major Concern," Wall Street Journal, Oct. 26, 1971, p. 22.

members of the Petroleum Industry will be equally responsible citizens. Federal laws concerning water pollution have multiplied significantly since the Refuse Act of 1899 and the Oil Pollution Act of 1924 were passed. The basis of the current Federal program is the Federal Water Pollution Control Act, as amended. The various laws which make up this legislation were reviewed in Chapter III. That the Federal Government has become the standard setter in the pollution field is due in great part to the urging of business in general and the Petroleum Industry in particular. Petroleum companies operate in thirty states, and a lack of uniform standards combined in certain instances with lax enforcement will work towards the economic disadvantage of those companies that are trying to meet their responsibilities. There are 40,000 petroleum-connected companies, and only a naive optimist would expect to find one and all with the same degree of awareness of responsibilities regarding pollution.

While the problem of lax state laws is generally being corrected, the problem of a lack of uniform standards is raising many questions. In line with Congressional policy that the states have the primary right and responsibility to control the pollution of their waters, the Water Quality Act of 1965 gave the states the right to establish water quality standards, subject to approval by the appropriate Federal agency (currently the Environmental Protection Agency). Hence, no uniform national standards were established. As pointed out in Chapter III, some conflicts have arisen between state and Federal regulations.

Should the Supreme Court determine that a uniform standard is required or that statutes ". . . pose a positive and direct conflict with the general maritime law . . ." such statutes would be declared invalid.¹

The problem of international agreements and their conflicts with the Federal Water Pollution Control Act was also discussed. Under the 1954 convention's practicality standard for discharge of oily wastes, ships registered in countries other than the United States, which are parties to the convention, could determine that the most practical area to discharge such waste is within twelve miles of the coast line. Additionally, enforcement of the discharge provisions rests with the country of registry. The second problem discussed concerns the requirement, under Federal law, for ships over 300 gross tons using the navigable waters of the United States to establish and maintain proof of financial responsibility to cover the cost of oil spill clean-up. This conflicts with the right of innocent passage as guaranteed by Article 14 of the Convention on the Territorial Sea and the Contiguous Zone in that, under the provisions of the convention, ships merely transiting through the territorial waters of the United States can not be required to show proof of financial responsibility. Aside from the unequal financial burden on U.S. ships and those foreign ships entering U.S. ports which results from this situation, it appears that unilateral

¹The George Washington University, Legal, Economic, and Technological Aspects, p. 4-1.

action is not the best method of solving the problem of sea pollution.

To close the discussion of pressures on the Petroleum Industry to clean up its operations, the paper surveyed the activities of environmental and conservation groups. While they have played an important role in alerting the public and the government to the dangers of pollution, there is the risk that in their zeal to solve one problem, they may well cause several others. As an example, the worker back-lash was discussed. While the national leaders of the major unions have expressed their support of the anti-pollution legislation, local unions have fought strict enforcement of these laws where loss of jobs was involved. A study of the economic impact of current pollution abatement laws was recently released by the Council on Environmental Quality.¹ It indicated that about 1,000 of the 12,000 plants included in the study would close between 1972 and 1976. Of this number, approximately 800 would have closed in any case, with an additional 200 to 300 being forced to close because of anti-pollution requirements. During the same period, from 50,000 to 125,000 jobs would be lost due to enforcement of environmental protection regulations. As far as the Petroleum Industry is concerned, the study estimates that about 12 small refineries employing about 1,000 workers would be forced to

¹Council on Environmental Quality, U.S., Department of Commerce, and U.S., Environmental Protection Agency, The Economic Impact of Pollution Control: A Summary of Recent Studies (Washington, D.C.: Council on Environmental Quality, 1972), pp. 10-11, 39.

close. While the over-all job loss totals represent only about 1 per cent to 4 per cent of the work force in the industries under study, local impact resulting from the closing of what might be the town's principal employer could be severe.¹

The industry's response to the pollution problem has been a wide-ranging attack consisting of research, education and training, and expenditures on pollution control equipment. Research projects covering a broad variety of oil-related problems are being funded by the industry through the American Petroleum Institute, and further research is being carried out by individual companies. Projects include the study of the effects of oil pollution on marine life, the search for methods of oil spill clean-up, and the development of safety devices to prevent accidental spills. It is important to note that while considerable work has been done in the area of oil spill recovery, a satisfactory method of reclaiming oil in open water with waves over two foot high or currents of over one knot is lacking as of this date.²

The Petroleum Industry has also been spending heavily on water treatment equipment and facilities to meet Federal and state water quality standards. The Economic Impact of Pollution Control survey indicates that by 1976, the costs of refinery pollution treatment (air and water) alone will average about \$0.06 per barrel which will result in an increase in price per

¹Ibid.

²American Petroleum Institute and U.S. Department of the Interior, Proceedings: Industry Government Seminar: Oil Spill Treating Agents, pp. 35-36.

barrel of \$0.08.¹ This latter figure includes the return necessary to attract the capital required to purchase pollution-control equipment.

These estimates were based on the costs involved in meeting current water-quality standards. Costs could increase considerably if the new Federal Water Pollution Control Act, S.2770, which has already been approved by the Senate, is passed substantially unchanged by the House. Rather than allowing the states to set water-quality standards for rivers and lakes consistent with their designated uses, the bill sets zero discharge as a national goal by 1985.² During the first phase of the bill which runs to 1976, industry must apply the "best practicable" technology to control water pollution. By 1981, all companies are expected to achieve zero discharge unless they can show that available technology does not allow this to be done at a reasonable cost. After 1981, all companies must use the "best available" anti-pollution technology, with the aim of achieving zero discharge by 1985.³ The Environmental Protection Agency is required to report to Congress on the cost/feasibility of zero discharge; if the cost appears to outweigh the benefit, Congress can reset the national goal to a target more in line with economic realities.⁴

¹Council on Environmental Quality, U.S., Department of Commerce, and U.S., Environmental Protection Agency, The Economic Impact of Pollution Control, p. 39.

²U.S., Congress, Senate, Federal Water Pollution Control Act Amendments of 1971, p. 7.

³Ibid., p. 8.

⁴"The Stormy Debate Over 'Zero Discharge'," Business Week, February 5, 1972, p. 70.

The Petroleum Industry, along with the Nixon Administration and most business groups, opposes the concept of zero discharge arguing that it would be beyond the ability of the economy to support these costs. The American Petroleum Institute estimates that water treatment using the "best available" technology would cost the refinery segment of the industry about \$2 billion; total industry expenditures would be about \$5 billion.¹

The administration also argues that it would be economically unfeasible to require every body of water in the U.S. to be totally free of pollutants. Studies by the Council on Environmental Quality indicate that removal of the last 1 per cent of pollutants from waste water costs 1.5 times as much as removal of the first 95-99 per cent.² New technology could reduce these costs, but some administration spokesmen warn that the time table set by the bill may not allow enough time for needed research. Counseling a "slow-down" policy, Commerce Secretary Stans asks: "Isn't it time to say 'Wait a minute'? If we try to solve our environmental problems more quickly than our technology permits, not only will we raise costs sharply and suddenly, but we will also increase the number of false steps that we take along the way."³

¹A. E. Gubrud, Deputy Director, Committee for Air and Water Conservation, American Petroleum Institute, telephone interview, Washington, D.C., March, 1972.

²Burt Schorr, "New Federal Requirements for Power Plants Spur Debate About Cost and Pace of Pollution Laws," Wall Street Journal, Jan. 10, 1972, p. 24.

³Ibid.

In conclusion, what can be said about the activities of the Petroleum Industry vis-a-vis its obligations to protect the earth from which it draws the source of its wealth? A number of facts may be marshaled by the industry to prove its case that, in the main, the oil companies are attempting to meet their responsibilities to avoid pollution of U.S. waters by their products and processes.

First on the list of credits is the industry's record of pollution abatement spending. As pointed out in Chapter IV, the Petroleum Industry, in terms of investment in pollution control equipment, ranked first among the identifiable industry groups in 1970. Expenditures for capital equipment amounted to \$184.7 million, while total expenditures for water pollution abatement, including maintenance of equipment and research and development, amounted to \$288 million. The industry also points out that a large portion of the costs of new refineries is devoted to pollution control equipment. However, while these are impressive figures, it must be remembered that the Petroleum Industry is the third largest industry group in the United States. The \$288 million spent on water pollution represents only 0.4 per cent of the 1969 income of \$65.3 billion.¹

Government officials are generally favorable in their assessment of the pollution control efforts of the majority of oil companies. A paper presented by K. E. Biglane and R. H. Wyer, Division of Oil and Hazardous Materials, Environmental Protection

¹Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 119.

Agency, at the 1971 Conference on the Prevention and Control of Oil Spills stated that:

. Most of the petroleum industry is responding to the provisions of the Act and, at present is demonstrating a willingness to protect the environment against the unnecessary discharge of oil.¹

As noted in the summary above, the Petroleum Industry is also budgeting money for research in the areas of waste treatment, oil spills prevention and cleanup, and the biological effects of oil spills. As a very public-relations conscious industry, the petroleum companies, through their advertising and annual reports, are making sure that the public is aware of its anti-pollution efforts. The annual reports are particularly indicative of the pattern of social awareness among the individual oil companies. A brief survey of a representative number of 1970 annual reports showed that the major petroleum companies were concerned with establishing a posture of social responsibility. While prominent mention was made in their reports of company activities in the field of pollution control, this type of information was notably lacking in the annual reports of the small lesser known companies.

The industry may also be commended for its efforts to prevent oil spills resulting from tanker activity: new tankers are being built with double bottoms to prevent massive spills as the result of groundings; old tankers are being refitted so oily wastes can be retained on board until it can be safely unloaded; crews are being trained in oil spill prevention, and

¹American Petroleum Institute, Environmental Protection Agency and United States Coast Guard, Proceedings: Prevention and Control of Oil Spills, p. 14.

cleanup; and devices are being developed to make oil transfers fail-proof.

While all these pollution abatement efforts are commendable, the Petroleum Industry still has an oily record, due in part to its size. Of the 40,000 petroleum-related companies, many are small operations operating at the limits of what poorly enforced laws will allow. As was previously pointed out, the enforcement of water-quality standards under the 1965 Water Quality Act has been almost non-existent. A major problem has been the difficulty of relating the effect of the pollutants dumped by an individual company to the overall water quality in a way which can be demonstrated in court.¹ A further block to strict enforcement has been the presence of industry representatives on state pollution-control boards.² Furthermore, under the 1965 Act, states were allowed to set their own standards, subject to Federal approval, for interstate waters passing through their boundaries. This has led to a lack of uniform standards.

Other difficulties have arisen as a result of those portions of the Federal Water Pollution Control Act which deal directly with oil pollution. Under the provisions of this Act, regulations were published which described "harmful quantities" of oil as those discharges which violate applicable state water quality standards or cause a sheen upon the water. The Act

¹U.S., Congress, Senate, Federal Water Pollution Control Act Amendments of 1971, p. 8.

²Zeldin, "Audubon Black Paper Number One: Oil Pollution," p. 110.

further declares that none of its provisions should be interpreted as preventing the right of a state to establish its own requirements or liability with respect to oil pollution. As indicated in Chapter II, the Petroleum Industry feels the sheen standard to be impracticable, because almost any amount of oil will cause a sheen on the surface of the water. Also, the fact that states may impose their own perhaps more stringent regulations concerning oil spills could cause serious complications, especially for those companies engaged in interstate transport of oil.

As a result of this pollution law muddle, conscientious companies are put at an economic disadvantage. Should Company A spend heavily for pollution control equipment when Company B down river is getting away with only minimal waste treatment? Thus, managers are faced with a dilemma because, as pointed out by Lawrence Moss, a director of the Sierra Club, ". . . they work within a system where their performance is judged by the corporate profit-and-loss statement which doesn't allow for social considerations."¹

While industry in general, and the Petroleum Industry in particular, objects to the Senate bill S.2770, especially in regards to the concept of zero discharge, these opponents should be reminded that the major result of the bill would be the establishment of uniform national water quality standards based on effluent limits. This would oblige all competing companies

¹Frederick Andrews, "Changing Times: Puzzled Businessmen Ponder New Methods of Measuring Success." Wall Street Journal, Dec. 9, 1971, p. 1.

within an industry to make similar cleanup effort and remove the economic penalties incurred when just a few companies attempt to meet their obligations.

The writer feels that the following conclusions are supported by the facts presented in this paper:

1. That the Petroleum Industry, for the most part, recognizes that it has a social responsibility to avoid harmful pollution of the Nation's waters by oil.
2. That the industry, in the main, is making an attempt to meet its responsibilities.
3. That disagreement as to what constitutes harmful pollution does exist between the industry and the Federal and some State governments.
4. That uniform, workable standards, enforced with equality will speed up the attainment of a mutually satisfactory goal.

APPENDIX I

RESEARCH BRIEFS

Completed Projects¹

Industrial Oil Waste Control, July, 1970 (API Pub. 4041).

A series of articles dealing with the problem of oily wastes in industry, including standards for control, methods of treatment, and disposal of these wastes.

A Primer on Oil Spill Cleanup, December, 1968 (API Pub. 4012).

Explains methods and procedures for cleaning up oil spills, taking into account various factors such as type of material spilled, amount, climatic conditions, sea conditions, and proximity to critical areas.

Systems Study of Oil Spill Cleanup Procedures, 2 Vols., February, 1970 (API Pubs. 4024, 4025).

A more recent update of Pub. 4041.

Oil Spill Treating Agents . . . A Compendium, May, 1970 (API Pub. 4042).

Contains information on various products with application in the control and removal of oil spills. The study covers dispersants, sinking agents, sorbents, combustion promoters,

¹American Petroleum Institute, Environmental Research, pp. III-12 - III-15.

biological degrading agents, gelling agents, beach cleaners, and miscellaneous agents.

Current Projects¹

Mathematical Modeling and Environmental Testing of Containment Booms, (Project OS-2 and OS-3).

This project consists of developing mathematical models to explain the spread of uncontrolled oil on water, the forces acting on containment booms, and validation of models and tests in the open sea.

Development and Demonstration of New Devices for Removal and Separation of Spilled Oil, (Project OS-5A).

This project is concerned with testing a skimmer and voraxial separator used to remove and separate spilled oil under high-sea conditions. The model is being developed by Reynolds Submarine Services Corporation.

Oiled Waterfowl Rehabilitation, (Project OS-12).

This study is concerned with surveying the methods of cleaning oil soaked birds and getting them back on their wings. A Manual, entitled The Rehabilitation of Oil-soaked Birds, is expected to be issued in 1972.

Training Film, (Project OS-19).

The object of this project is to produce a film to train personnel of the Petroleum Industry in the methods of handling oil spill emergencies, especially in quiet waters.

¹Ibid., pp. II-21 - II-34.

Effects and Fate of Oil in the Marine Environment, (Project OS-20A).

This study is concerned with both the short-term and long-term biological effects of oil on marine life. Originally commissioned by Esso Research and Engineering Company at a cost of \$380,000, the study has been extended under the sponsorship of the American Petroleum Institute.

Manual on Prevention of Oil Spills, (Project OS-22).

This manual on the prevention of oil spills is being prepared by the API.

APPENDIX II

Selected Water Pollution Control Expenditures
By The Petroleum Industry

TABLE 2
CAPITAL EXPENDITURES 1970 (Est.)
(Thousands of Dollars)

PRODUCTION		
Crude oil	45,454	
Gas	15,272	
Other	3,423	
Total Production		73,452 ^a
TRANSPORTATION		
Tankers and barges	1,824	
Railroad	50	
Pipeline	3,464	
Trucks	5	
Other	609	
Total Transportation		5,991 ^a
MARKETING		
Bulk terminals	4,147	
Loading	166	
Service stations	5,623	
Other	144	
Total Marketing		11,712 ^a
MANUFACTURING		
Refineries	76,857	
Chemical plants	12,227	
Other	4,514	
Total Manufacturing		93,598
TOTAL		184,753

^aThe total exceeds the sum of the individual parts because one or two companies only reported a total figure.

Source: American Petroleum Institute, Air and Water Conservation Expenditures, Table IV, p. 13.

TABLE 3

OPERATING AND MAINTENANCE EXPENDITURES 1970 (Est.)
(Thousands of Dollars)

PRODUCTION		
Crude Oil	27,631	
Gas	3,873	
Other	1,177	
Total Production		37,186 ^a
TRANSPORTATION		
Tankers and barges	842	
Pipeline	2,441	
Trucks	278	
Other	509	
Total Transportation		4,115 ^a
MARKETING		
Bulk terminals	1,164	
Loading	123	
Service stations	639	
Other	15	
Total Marketing		3,553 ^a
MANUFACTURING		
Refineries	26,910	
Chemical plants	4,868	
Other	675	
Total Manufacturing		32,453
TOTAL		77,316 ^a

^aThe total exceeds the sum of individual parts because one or two companies only reported a total figure.

Source: American Petroleum Institute, Air and Water Conservation Expenditures, Table VII, p. 16.

APPENDIX III

SHIPBOARD POLLUTION CONTROL TRAINING PROGRAM¹

Subject Coverage Outline

Orientation to the Objectives of the Program
The Program Content and Approaches to Presentation
History of Pollution Control Activities Within the Federal Government
History of Pollution Control Activities Within the Shipping Industry
History of Pollution Control Activities at the International Level
Review of Pertinent Domestic Laws and Regulations
Review of Pertinent International Conventions
The Process of Development of Domestic Requirements
The Process of Development of International Requirements
Domestic Agencies, their Jurisdictions and Activities
International Agencies, their Jurisdictions and Activities
Legal and Financial Liabilities of the Officers and Crew
Responsibilities of Vessel Personnel to Management
Responsibilities of the Terminal Operator
Effects of Various Pollutants on Marine Environments
The Complex Relationships Between Pollution and Safety
Refinery Operations Related to Crude Processing
Physical and Chemical Aspects of Oil and Other Pollutants On and In Water
The Potential for Pollution from Routine Ship Operation
Potential Pollution Problems During Cargo Transfer
Potential Pollution Problems During Bunkering Operations
Operating Practices for Pollution Prevention
Maintenance as a Pollution Control Practice
Tank Cleaning Procedures from the Viewpoint of Pollution Control
Ballast Handling from the Viewpoint of Pollution Control
Shoreside Ballast/Slop Handling Facilities
Bilge Waste Handling Procedures
The Load-on-Top Approach to Crude Carriage
The Tanker Owners Voluntary Agreement on Liability for Oil Pollution (TOVALOP) and Vessel Personnel Responsibilities Thereunder
Priority of Actions in Minor Spill Situations

¹American Petroleum Institute, U.S., Environmental Protection Agency and United States Coast Guard, Proceedings: Prevention and Control of Oil Spills, p. 101.

Priority of Actions in Gross Spill Situations
Evaluation of the Seriousness of an Incident
Operation of the Federal Oil Spill Contingency Plan
On-Board Spill Handling Techniques
Over-The-Side Spill Handling Techniques
The Lessons of History on Repeated Spill Causes
Current Status of Technological Development Projects
Continuing Sources of Pollution Control Information
The Future Plans of Management Relative to Pollution Control
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