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Public Policy on Oil—An Ecological Perspective

Malcolm F. Baldwin*

Recent oil spills in the Santa Barbara Channel, the Gulf of Mexico, San Francisco Bay, and the Hudson River have made the entire country aware of the problem of oil pollution. Laws have been passed, agencies created, and numerous hearings held in a national attempt to halt destructive oil accidents, but the crisis continues as the nation’s demand for petroleum accelerates. In this article, Malcolm Baldwin of the Conservation Foundation, attempts to show that environmental problems caused by petroleum and its ultimate scarcity are far more complex than most of us realize. The oil policy of the United States has not reflected the ecological ramifications of oil production and consumption. Furthermore, the governmental decision-makers do not presently have sufficient information to make sound environmental policies concerning oil. In analyzing several of the most important ecological effects of oil, and the present legal response, the author raises some of the most difficult issues of the future. His recommendations for change represent an important first step in meeting the challenge these issues present.

To a large extent, petroleum forms the energy basis of our industrial society. The ecological effects of our dependency on oil as a source of energy boggle the mind. The current energy shortage,

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2. Symptomatic of the energy crisis, as it affects electric utilities especially, is the shortage of coal and railroad coal cars, residual fuel—particularly low sulphur—and natural gas. Reasons commonly given for the shortage are: (a) a rupture on May 3,
in forcing our attention on some of those effects, may produce a salu-
tary result; however, danger lies in the possibility that energy policy
will continue to be formulated in terms of traditional economic theory,
with greater regard for corporate interests than for environmental con-
siderations. Unfortunately, ecological perceptions are notably weak in
the governmental and industrial circles that decide whether to ration
our fuels, retain our import quota program, stimulate the oil industry or
let it alone—though the ecological implications of these decisions are
profound.

There are at least three major areas of oil policy in which eco-
logical problems may result from subsidy to oil production. First,
when consumption of fuels causes air pollution for which neither the
oil industry nor the consumer is held responsible, a subsidy occurs be-
cause environmental costs are incurred by society and are not reflected
in the price of oil. Second, when oil is spilled in lakes, rivers, and
oceans, due either to transport or production, the result is once again
a subsidy to the extent that oil interests do not have to pay for all
the damage, including subtle long-range effects. Finally, when oil in-
terests are allowed to use choice coastal lands for production and trans-
port facilities, the loss of aesthetic enjoyment of such lands by the pub-
lic may represent another form of subsidy. These hidden subsidies,
along with those that are intentional, such as import restrictions and
depletion allowances, all act to encourage increasing production of
petroleum resources. Such an effect is inconsistent with a goal of
long-range sustained environmental quality because it increases our
dependence on energy resources. By accelerating the consumption of
a finite energy source, these policies leave less time in which workable
substitutes can be found for fossil fuel.

Our energy policy should assure minimal detriment to the envi-
ronmental values we believe important. That this assurance should be

1970 of the Trans-Arabian pipeline in Syria, resulting in the need to send 500,000
more barrels a day around Africa, (b) Libya's reduction of crude oil production which
levelled off at 500,000 barrels per day of low-sulphur oil as of the end of September 1970,
(c) a tanker shortage and rate increase as oil takes the longer route around Africa from
the Persian Gulf, (d) strict air pollution control regulations effective before industry
expectations, (e) inability of the National Air Pollution Control Administration to fi-
nance construction of sulphur oxide stack gas removal processes, thus holding up
needed technological development, and (f) promotion by the Atomic Energy Commissi-
on of nuclear fueled electric power and a rush by utilities to build them, after which
strikes, technical problems and conservationists delayed completion.

3. See text accompanying notes 17-40 infra.
4. See note 18 infra.
5. See generally Mills, Johnson, & Perry, Fuels Management in an Environ-
mental Age, 5 Envir. Sci. & Tech. 30 (1971). The point of this eloquent article is that
with fuels management, "no matter how you play it, the environment never wins." Only
decreased dependence on fossil fuel can ultimately ease all the problems they cause.
the governing consideration in regulation of the oil and gas industry is a logical first step in preserving the environment; yet that step has not been taken. In order to begin rationally toward taking this step, we need to answer the following questions: what are the present and projected environmental costs of our oil dependency; how are these costs built into the market mechanism and what effect do they have on local, national, and international policy; what less damaging alternative sources of energy are available and what policies should be developed to promote them? This Article considers these questions by assessing the ecological effects of oil production and transport and by comparing them with the impact of existing laws and regulations on present and future oil production and consumption, and outlines the basic oil import policy of the United States in order to show the lack of environmental consideration given this area so far. Following this preliminary perspective, separate sections of the Article discuss the relevance of our concern about sulphur dioxide pollution to the production of low sulphur oil and natural gas, the relationship between oil tanker and offshore drilling policy to ocean pollution, and the impact of oil trade and production on our scarce shoreline resource. The final section presents some recommendations for future policy changes and further study. The reader will find the Article comprehensive but not complete. Experts in every field are invited to criticize and supplement this effort.

I

OIL AND GAS CONSUMPTION AND PRODUCTION

The time remaining for adequate petroleum supplies is short. As estimated by M. King Hubbert of the U.S. Geological Survey, 80 percent of cumulative world petroleum production will occur between 1968 and 2032 or, at a lower quantity estimate, between 1961 and 2019; the peak of production will occur from 1990 to 2000.1

The United States alone now consumes more than 14 million barrels of oil per day—one third of world consumption.8 Forecasts for 1980 vary from 18 to 21 million barrels of oil per day, about one quarter of world consumption.9 By that date, about 75 percent of

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6. The petroleum group of fossil fuels includes components that are gaseous (principally methane or commercial natural gas), liquid (crude oil, ranging from natural gasolines to heavy, viscous oil), and solid or pseudo solid (tars from tar sands, and the truly solid Kerogen from oil shales). M. K. Hubbert, Energy Resources, in RESOURCES AND MAN 168 (1969) (a study and recommendations by the Committee on Resources and Man of the Division of Earth Sciences, National Academy of Sciences—National Research Council).

7. Id.


9. Id.
United States energy production will be from oil and gas. There is no agreement about the amount of crude oil that could ultimately be produced within the United States and its continental shelf. Hubbert estimates that, based on declining rates of discovery and present recovery factor of about 40 percent, there are about 190 billion barrels still available—25 billion barrels from Alaska and 165 billion barrels from the rest of the United States. The world's total proved and probable ultimately recoverable crude oil has been estimated at 665.3 billion barrels. When estimates of future discoveries and past production are added to this, the estimate of ultimate world production of crude oil varies from about 1,350 billion to 2,100 billion barrels.

On the basis of these projections Hubbert has theorized that fossil fuel supplies limit future industrial growth.

If our ability to rely on oil is limited by time, and if the need to develop other sources of energy is pressing, our public policy ought to avoid irrevocable environmental commitments in the interim to insure that there are in fact "no insuperable physical or biological difficulties" during this period of transition.

Continuation of present oil policies will result in increasing oil trade and production, and it is unclear whether the rapid consumption of petroleum will cause widespread ecological dislocation. This lack of knowledge suggests that the appropriate environmental policy is one of buying time to assess the possible effects and to assure that we

10. Id. at 163.
11. For an extensive analysis of these and other crude oil estimates see M.K. Hubbert, supra note 6, at 194-96. See also H. Landsberg & S. Schurr, Energy in the United States: Sources, Uses, and Policy Issues, Resources for the Future (1968).
13. These estimates of total world oil supply include: first, an estimate of the quantity already produced; second, an estimate of proved reserves; third, an estimate of probable reserves; and finally, an estimate of future discoveries. Id. at 195.
find needed energy substitutes before petroleum supplies are exhausted. In recent years environmental litigation has become, in many respects, a means to buy time. Similarly, bills passed at the state and national levels promote better planning and understanding of proposed future actions. In the field of oil, however, because it is so large, ecological perspective has been lacking. Our public policy has not consciously sought to buy time for adequate study of the problems we face. Therefore, we risk a lasting hangover after the oil binge.

II

THE OIL IMPORT POLICY

Since 1948 the United States has imported more oil than it has exported; approximately 20 percent of U.S. consumption is now met by oil imports. Whether the United States can meet its projected petroleum demands in the next decade without increasing its import proportion depends on domestic reserves and the rate of their exploration. Exploration rates appear to depend on the price of oil, and consequently, the import quota, depletion allowance, and other factors affecting oil investment. The President's Cabinet Task Force on Import Controls reported that, notwithstanding these incentive subsidies, in early 1970, even at the base price of $3.30 per barrel of crude—the Southern Louisiana wellhead price for crude of 30 degree gravity—domestic production could not keep up with demand and that the amount of imports would have to increase. The average

18. The depletion allowance is the percentage share of income from oil production deductible for purposes of taxation from gross income of oil producing property. The rate was recently lowered from 27 1/2 percent to 22 percent by the Tax Reform Act of 1969, 26 U.S.C. § 613 (Supp. V, 1970), which retains the additional provision that the deduction may not exceed 50 percent of the new income before depletion of the property. With the depletion allowance, petroleum operators may recover far more than their original capital investment over the lifetime of a producing well since, unlike other capital depletion schemes, percentage depletion is computed without regard for the original amount invested. The same deduction at less percentages is permitted for coal—ten percent—and oil shale—twelve percent—as well as for other minerals. These tax breaks are not designed in any way to protect environmental values but rather, they simply encourage mineral extraction. Percentage depletion is considered essential by oil producers to insure exploration and development.
19. The Task Force estimated for 1980 an increase in the proportion of imports to consumption of 27 percent at $3.30 per barrel and up to 51 percent imports at $2.00 per barrel. THE OIL IMPORT QUESTION, supra note 17, at 41.
oil company projection of domestic production in 1980, at that price, came to about twelve million barrels per day.20

A. The Mandatory Oil Import Program

Since 1959 oil imports have been subject to the Mandatory Oil Import Program.21 The institution of the Program by President Eisenhower followed two years of unsuccessful experience with voluntary control. The only comprehensive executive review of the program came a decade later when the President's Cabinet Task Force on Oil Import Control recommended a tariff system. The idea was rejected by President Nixon in August 1970.22

The Mandatory Oil Import Program, managed by Interior's Oil Import Administration,23 allocates and restricts oil imports. Imports are regulated according to product and geographical district: District V on the West Coast, District I on the East Coast, and Districts II through IV lying in between. Products are classified as crude oil, unfinished oil—such as naptha and other products used as feedstock for petrochemical companies—finished products—gasoline, jet fuel, asphalt, heating oil—and residual oil, often known as No. 6 Oil, "Bunker Fuel Oil," or "Bunker C," used by utilities, industrial plants and other large facilities.24

Allocation of the various products among the petroleum interests in various districts is complex. Residual oil for fuel use, however, is virtually exempt from the quota system in District I,25 where access to water makes transport of this low-profit item economical. Otherwise Districts I-IV are similarly treated, and crude and product imports are set at 12.2 percent of estimated domestic production.26 Crude

20. Id. at 229.
23. The Oil Import Administration is supervised by the Assistant Secretary of Interior for Mineral Resources and headed by an administrator with the help of a deputy and three assistants. An Oil Import Appeals Board judges hardship claims while the Bureau of Customs enforces import quotas. For a review of this aspect of import controls see HOUSE COMM. ON GOVERNMENT OPERATIONS, CUSTOMS CONTROL OVER PETROLEUM IMPORTS, H.R. Doc. No. 91-729, 91st Cong., 1st Sess. (1969).
24. For a discussion of the significance of residual fuel, particularly emphasizing the problem of sulfur content see text accompanying notes 49-64 infra.
25. Oil Import Regulations, § 12, 32A C.F.R. 152 (1970). The Oil Import Question points out that the administrative requirements "retain the form, though not the substance, of an allocation system." THE OIL IMPORT QUESTION, supra note 17, at 10.
26. THE OIL IMPORT QUESTION, supra note 17, at 10. It should be noted that the 12.2 percent formula may now be "adjusted to reflect other national security determinations . . . ." Presidential Proc. No. 4025, 35 Fed. Reg. 19391 (1970).
imports in these districts came to 9.9 percent of crude demand in 1968.\textsuperscript{27} For District V the crude product quota is the difference between annual demand and United States and Canadian supply. The difference in district treatment is due to the fact that the Rocky Mountains are deemed a barrier to oil trade, and District V is considered a crude deficit area—a situation likely to be affected when oil starts to flow from the Alaskan North Slope. In 1968 District V imported 18.5 percent of its crude demand.\textsuperscript{28} District V refiners can receive a barrel of imported crude for every barrel of low-sulphur residual fuel they produce to meet air pollution requirements,\textsuperscript{29} indicating one way in which the quota system has been used to further environmental objectives.

Import rights are allocated by means of import tickets awarded to refiners as a percentage of a refinery’s input. The tickets, granting a right to import a stated quantity of oil, are themselves valuable items, and are traded among the oil companies. A sliding scale is used to award a higher proportion of tickets to smaller refineries than to large, with different scales used for District V. A historical minimum assures that no refiner gets fewer tickets than he did before 1959.\textsuperscript{30} Because of the Oil Import Administration’s policy to encourage domestic refining, product imports are not favored in the quotas. Unfinished oils may be imported under crude tickets up to a set limit. Petrochemical companies, the only nonrefinery interests to receive import allocations, benefit especially from these “feed stock” imports consisting primarily of naptha or natural gas liquids.

\textbf{B. Policy Basis}

The policy basis for the Mandatory Oil Import Quota Program is purportedly national security.\textsuperscript{31} The supporting argument is that domestic production and refining capabilities need protection and that the country cannot rely on an oil supply subject to interruption by external events. Recognizing that import irregularities would threaten essential civilian uses and defense production, rather than emergency military needs, the 1970 Cabinet Task Force Report concluded that the national security argument for import quotas was weak for the following reasons: one, there are now eleven major exporting countries while in 1956 there were only four, and it is unlikely that they will

\begin{itemize}
\item\textsuperscript{27} The Oil Import Question, supra note 17, at 71.
\item\textsuperscript{28} Id. The Cabinet Task Force pointed out that because of the formula used for District V, producers receive an unique subsidy in that they are guaranteed a market for their entire production, unlike those used in other districts. Id.
\item\textsuperscript{29} Id. at 14.
\item\textsuperscript{30} Id. at 12.
\item\textsuperscript{31} Id. at 2-4.
\end{itemize}
combine to deny oil to the United States; two, Middle Eastern countries need hard currency from the United States; three, with respect to imports from Canada, the usual national security arguments are inappropriate because the U.S.-Canadian economic ties are close; four, in a nuclear war, oil supply problems are not significant, and afterward, there would be less need for oil; five, risks of submarine attack are no greater for ships travelling from Venezuela to the United States than those voyaging from the Gulf Coast to the East Coast; and six, synthetic fuel development, increased storage capabilities and government exploration and production from its own spare sources can take care of needs in the unlikely event of a protracted war.\footnote{32} Rejecting the Task Force's conclusions, presumably on grounds of national security, President Nixon decided not to change the present import quota program in favor of a tariff system. A letter to the President from George Lincoln, Director of the Office of Emergency Preparedness and head of the Oil Policy Committee, explained that recent oil supply interruptions from the Middle East and the uncertainty about when Alaskan oil could be available were reasons against a policy change.\footnote{33}

In assessing the costs and benefits of the present quota system, the Task Force emphasized the effects on the consumer but rarely mentioned the environment. Assuming that without a quota, oil would be cheaper—approximately nearer the $2.00 a barrel world price in contrast to the domestic price of $3.30 a barrel—the Report concluded that the consumer was paying into the coffers of the oil companies $5 billion more than he would were there no controls.\footnote{34} State market-demand prorationing schemes, which also boosted prices, were perpetuated by the import quota.\footnote{35} Moreover, consumers of oil suf-

\footnote{32. \textit{See id.}, at 30-37 for a discussion on risks to security. Secretary of Defense Melvin Laird was a member of the Cabinet Task Force on Oil Import Control majority endorsing these conclusions. In March 1970, the Assistant Secretary of Defense for Installations and Logistics added his approval. \textit{N.Y. Times}, Mar. 10, 1970, at 57, col. 3.}

\footnote{33. \textit{N.Y. Times}, Aug. 18, 1970, at 1, col. 5.}

\footnote{34. \textit{THE OIL IMPORT QUESTION, supra note 17, at 22.}}

\footnote{35. The import quota system allows Texas and Louisiana, the two primary United States oil producing states, to play a key role in controlling domestic oil production. Pursuant to the Interstate Compact to Conserve Oil and Gas of 1935, which set up a purely fact-finding, advisory body, 29 producing states have enacted petroleum conservation laws. \textit{See The Bank of New York, Petroleum Conservation—How America Is Making the Most of Its Oil and Gas, 3 NAT. RES. LAW. 272 (1970).} Such measures were dictated by overdrilling, waste of natural underground pressure and, consequently, of oil, extensive stream pollution from oil reservoirs and, of course, low oil prices. State reform, therefore, concentrated on control of waste and the institution of Maximum Efficient Rates—"the peak rate at which oil can be produced without impairing ultimate recovery." \textit{Id.}, at 277. Based on that principle, Texas and Louisiana have regulated oil by allocating production among the various state pools and wells. These so-
fered to the benefit of consumers of gas since, by boosting oil prices, import controls stimulated domestic oil and, therefore, gas production. Gas was made available at prices lower than if there were no import controls, and consumers of this low-pollution fuel were subsidized between $500 million to $1 billion.

Even though the Task Force may have exaggerated the unfairness to consumers resulting from the quota system, the irrational privileges of the system rival those of the rotten boroughs without their Burkean redemption. Unfortunately the Task Force's tariff proposal was also irrational ecologically. The environmental effects of oil and gas use, transportation and production were neither understood nor recognized as paramount. Because the environmental effects of the oil import quota system have not systematically been studied, and because there are so many variables to consider, they can-
called "allowables" set by means of market-demand proration factors, establish the percentage of oil which may be extracted from a well based on its production capacity. An immediate domestic response to the recent demand for oil was that both Texas, [OIL & GAS J., Aug. 24, 1970, at 32] and Louisiana, [OIL & GAS J., Aug. 17, 1970, at 33] raised their market-demand factors to allow more crude production. Consumer criticism of the proration system results from the extent to which it encourages production from high-cost wells without encouraging exploration for new, larger reserves, especially those offshore. Because of adverse environmental effects of offshore drilling, that criticism may be unsound.

Equally unrelated to environmental considerations was the conclusion of the Cabinet Task Force on Oil Import Control that its suggested tariff system would diminish state control over the nation's oil policy. Under the tariff system, it said, "a state effort to curtail efficient production in order to maintain or raise prices would call forth greater imports rather than higher prices. It follows that tariffs are more likely to call forth more domestic production with lower cost to the economy than would be available under the quota system." THE OIL IMPORT QUESTION, supra note 17, at 88.

On December 4, 1970, President Nixon announced that state prorationing schemes would no longer apply to undisputed areas of the outer continental shelf that were leased for oil and gas. An order of the acting Secretary of the Interior, Fred J. Russell, declared that the Secretary had "exclusive conservation jurisdiction" over such areas and that any state conservation regulations were rescinded. OIL & GAS J., Dec. 14, 1970, at 46. The new order was intended to inhibit oil price rises by supplying additional oil from United States leases in the Gulf of Mexico.

36. "[B]etween 25-30 [percent] of the additions to gas reserves each year probably can be attributed to oil exploration and production." THE OIL IMPORT QUESTION, supra note 17, at 25.

37. Id. Evaluation of the environmental impact of this subsidy is difficult because although it encouraged use of a low pollution fuel, it did not necessarily promote the most effective use of a very scarce resource. See text accompanying notes 66-69 infra.

38. Studies such as that conducted by the Cabinet Task Force on Oil Import Control, although they are rigorous in analysis, make recommendations based on limited policy assumptions and are no longer adequate. The Report and its recommendations were quickly outdated by the development of the energy "crisis" and concern for environmental values. Had its analysis included these considerations, the laborious research would have been vastly more valuable in formulating tariff alternatives. The tariff proposal must now be evaluated anew from an environmental perspective.
not at this point be clearly stated. On the one hand, the system encourages offshore leasing in the U.S. continental shelf because such oil would be protected by the quota, but on the other hand it inhibits shipping to the U.S. market from foreign ports and, therefore, may limit ocean pollution. While it encourages exploration of Alaskan oil, it may have curbed exploration activity elsewhere that might have posed equally serious environmental questions. These are matters that deserve intensive analysis.

III

SULPHUR DIOXIDE POLLUTION—THE DEMAND FOR LOW-SULPHUR FUEL

When many fossil fuels are burned, pollution in the form of sulphur dioxide occurs. Sulphur dioxide is an incombustible irritant gas with a suffocating odor at concentrations of over 0.5 parts per million (p.p.m.). At concentrations of 0.3 p.p.m. to 1 p.p.m. in the air we breathe, it can be tasted. Combined with moisture it may eventually convert to sulphuric acid. Ill effects of sulphur dioxide on the human respiratory system, as well as on plants, buildings and visibility, make it a notorious pollutant.

The largest sulphur dioxide polluters are fossil fuel burning electric utilities. They accounted for 18 million of the 31.2 million tons of sulphur oxide, mostly sulphur dioxide, emitted into the air in 1967. Other large industrial plants accounted for much of the remainder. By 1980, when electric power production is expected to double, the Department of Health, Education and Welfare estimates that utilities will emit about 43 million tons of sulphur oxides if pollution controls are not increased. The outlook for diminishing this figure is not encouraging. The government has pointed out that partly because of insufficient federal investment in research and development, "[t]here is a widening gap between the rising trend of sulphur oxide emissions and the nation's technological capability for bringing the problem under control . . . ." Moreover, the demands of the electric utility industry for fossil fuels are growing despite an increase in the proportion of power expected from nuclear sources. Since desul-

39. See text accompanying notes 159-204 infra.
40. See text accompanying note 115 infra.
42. SECRETARY OF HEALTH, EDUCATION AND WELFARE, THIRD REPORT TO THE CONGRESS OF THE UNITED STATES ON PROGRESS AND CONTROL OF AIR POLLUTION, S. DOC. NO. 91-64, 91st Cong., 2d Sess. 26 (1970) [hereinafter cited as HEW REPORT].
43. Id.
44. Id.
45. Use of coal by electric utilities is estimated at 305 million tons in 1970—56
phurization of gas in the stack is still in the developmental stage,\textsuperscript{46} desulphurization of coal is limited or not perfected,\textsuperscript{47} and low-sulphur coal\textsuperscript{48} is in short supply on the market, residual fuel oil and natural gas are frequently the only desirable fossil-fuel alternatives for utilities. It is ironic that when petroleum interests have an opportunity to serve a compelling public need and, simultaneously, to fulfill their faith in private enterprise by producing these low-sulphur fuels, they should fail. The opportunity presented is the need to develop low-sulphur fuel; the opportunity missed has become the impending fuel shortage.

\textbf{A. Low-sulphur Residual Fuel}

Residual fuel oil is what is left over after refining crude to highly profitable items such as gasoline, jet fuel and other light distillates. It is attractive to utilities because it can be desuphurized and because its cost is low, until recently, lower than crude itself. The utilities' demand for residual, particularly the low-sulphur variety, has helped boost its domestic consumption markedly since the early 1960's. From 1966 to 1968 residual demand went up about 7.1 percent each year.\textsuperscript{49} In 1969, the demand increased by 15 percent.\textsuperscript{50} In 1970, apparently due to increased tanker rates, the cost per barrel rose from $2.50 to $3.60.\textsuperscript{51}


\textsuperscript{46} HEW Report, supra note 42.

\textsuperscript{47} Id. at 28. The process of taking sulphur out of coal requires liquefaction—the same process as gasifying coal, which is itself a possible fuel alternative for the future.

\textsuperscript{48} For a discussion of the reluctance of coal companies and utilities to encourage use and development of low-sulphur coal see J. Esposito, \textit{Vanishing Air} 101 (1970). That report concludes that even if half of the ten percent of the low-sulphur fuel lying east of the Mississippi could be mined economically "there is enough [one percent] sulphur coal in the Eastern part of the U.S. to supply the entire country's needs for the next forty or fifty years." Id. at 109. Much of this eastern low-sulphur coal, however, is in eastern Kentucky and southeast West Virginia, where slopes are steep and the most profitable mining technique, strip mining, is extremely damaging to the environment.


\textsuperscript{51} Id. (figures up to Aug. 1970).
average of 450 million barrels of residual were produced in the United States each year, but by 1964, because refiners left only nine percent of the barrel in residual, the total had slipped to 270 million. The figure, now six percent, will reach three percent by 1980. The reason for the decline in production is simple: There is more profit in making as much light fuel as possible out of each barrel of crude. Oil imports must, therefore, satisfy much of the domestic demand for residual. In 1968 District I, largely exempt from residual import restrictions, received 99.6 percent of the U.S. imports. The President's Cabinet Task Force on Oil Import Control critically assessed the principal reasons for the exemption of residual—that domestic supply was insufficient—by questioning the issue of national security, the basic policy behind import control. Domestic scarcity occurs, the Task Force pointed out, "only because domestic refiners have found ways to reduce the proportion of their output that goes into low-profit residual. One may wonder whether the security test should be different when imports do not threaten the profits of the domestic industry than when they do."

The sulphur content of residual depends on the quality of crude, which varies greatly. In the refining process the sulphur is "backed down" to the residual, so a one percent sulphur content in crude may leave a higher percentage of sulphur in the residual. Because there is an economic limit to the desulphurization that residual can undergo, it is less costly to start with a low-sulphur crude. Offshore Nigerian, North African and Indonesian crude are particularly low in sulphur, but Venezuela, having a relatively high sulphur content, has historically supplied approximately two-fifths of our residual fuel.

To meet new state air pollution standards specifying that fuels must contain no more than a set percentage of sulphur content by

54. See text accompanying notes 23-25 supra.
55. The Oil Import Question, supra note 17, at 11. Residual imports to Districts II-IV are still restricted despite exemptions such as that given to Chicago's Commonwealth Edison to use 4.5 million barrels of low-sulphur residual. WALL STREET J., July 31, 1970, at 1.
56. See text accompanying note 32 supra.
57. The Oil Import Question, supra note 17, at 75.
60. FORTUNE, June 1969, at 107. The article points out that Venezuela is as close to Philadelphia Harbor by tanker as is Texas City, Texas. Id.
weight, Venezuelan residual is often blended with North African residual. When sulphur dioxide emission standards require cleaner fuels, this blending will no longer be possible, and use of high-sulphur Venezuelan crude will become unprofitable.\textsuperscript{61} Venezuela, however, is depending on increased demand for her blend of residual, and oil companies have invested heavily in large desulphurization plants.\textsuperscript{62}

A major supply question for the immediate future is how we should meet the increased need for residual. Though air pollution standards are not the cause of the present fuel shortage, projected demands of higher air pollution requirements may intensify the supply problem. The U.S. oil industry has not been eager to meet residual demand from domestic refining.\textsuperscript{63} For example, Mobil Oil's new light fuels refinery in Joliet, Illinois, designed especially for "extra large yield of high octane gasolines, . . . will produce no residual fuel. And it undoubtedly will be the biggest single U.S. investment in new refinery capacity of all time."\textsuperscript{64} The new, comparably large refineries of Atlantic Richfield at Cherry Point, Washington, and those of Gulf Oil near New Orleans, will also be light-fuel producers. Such investment preferences caused one group of energy experts to note that "[t]he oil of the Alaskan North Slope is, incidentally, low in sulphur, but this is all but irrelevant. Since it will be refined in United States refineries, it will add little or nothing to the supply of residual fuel oil."\textsuperscript{65} Of course, the demand for low-sulphur residual may stimulate refining changes if the price is right.

\textbf{B. Natural Gas}

In the fall of 1969 domestic natural gas producers were predicting a serious shortage of natural gas supply.\textsuperscript{66} By the following spring, the Interagency Power and Energy Committee of the Office of Emergency Preparedness reported that along with coal and residual fuel oil, natural gas for electric utilities was in short supply and that

\begin{itemize}
  \item \textsuperscript{61} Present costs of the desulphurization process to the consumer depend on the crude used. The Office of Science and Technology has estimated desulphurization costs at from 25 cents to 50 cents per barrel, with capital investment in desulphurization plant at about $260 per barrel of daily capacity. Background Study, \textit{supra} note 1, at 106.
  \item \textsuperscript{62} \textit{The Oil Import Question, supra} note 17, at 75.
  \item \textsuperscript{63} See, e.g., Stormont, \textit{U.S. Refiners Will Continue To Add Light Fuels Capacity}, \textit{Oil & Gas J.}, Apr. 6, 1970, at 112.
  \item \textsuperscript{64} \textit{Id.}, Aug. 24, 1970, at 39.
  \item \textsuperscript{65} B. Netschert, A. Gerber & I. Stelzer, \textit{supra} note 49, at 9.
  \item \textsuperscript{66} \textit{Hearings on Supplies of Natural Gas Before the Subcomm. on Minerals, Materials and Fuels of the Senate Comm. on Interior and Insular Affairs, 91st Cong., 1st Sess. 1 (1969)} [hereinafter cited as \textit{Hearings on Supplies of Natural Gas}]. See text accompanying notes 70-84 \textit{infra}.
\end{itemize}
natural gas companies had already drawn heavily on winter storage that badly needed replenishment.\textsuperscript{67}

Hopes for air pollution control are now closely connected to the use of natural gas, which is the cleanest fossil fuel. Partly for that reason, its use by utilities doubled from 1959 to 1968. The advantages of natural gas for utilities concerned about air pollution are reflected by testimony in a recent dispute between the Air Pollution Control District of the County of Los Angeles and the Department of Water and Power, over the construction of a new 460 megawatt steam electricity-generating unit.\textsuperscript{68} It was estimated that if it were to use natural gas, the new unit would emit no sulphur dioxide, while use of low-sulphur residual would produce 15 tons and use of high-sulphur residual, 93 tons per day. As for particulate matter, the unit would emit one-tenth of a ton per day using natural gas, 2 tons per day using low-sulphur residual and 6 tons per day using high-sulphur fuel. Similar units emitted twice the amount of nitrogen oxides with low-sulphur fuels as they did with natural gas.\textsuperscript{69}

1. The Economic Shortage

The oil and gas industries have said for some time that natural gas demand was increasing faster than its domestic supply, and that natural gas reserves were showing an alarming decline.\textsuperscript{70} The reason

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\textsuperscript{67} J. Nassikas, supra note 45, at 7-8.

\textsuperscript{68} Department of Water & Power v. Hearing Bd. of the Air Pollution Control Dist., Civil No. 971, 991 (L.A. Super. Ct. July 9, 1970), 1 BNA ENVIRONMENT REP.-CASES 1580 (1970). The Department of Water and Power asked the court to set aside the decision of the Hearing Board prohibiting construction of the generating unit. In upholding the decision of the Hearing Board, the court declared that a regulation passed by the County prohibiting any new steam power plant within the Los Angeles basin, excepting jet power units, was a valid exercise of the County's police power:

It is reasonable to hold, therefore, that the public interest in preventing any increase in the levels of air pollution and in seeking a diminution in the current levels of air pollution in the Los Angeles Basin, is an overriding public interest which must stand paramount and supreme when contrasted with the public interest of the residents of Los Angeles in obtaining all the electrical power they may desire. No substantial evidence has been presented to prove that the residents of Los Angeles are in any real danger in the foreseeable future of having an insufficient amount of electrical power to supply their basic needs. They may not have sufficient electrical power to supply all of their peripheral needs or demands created by good and effective advertising copy put out by the Department of Water and Power.

Id. at 1625.

\textsuperscript{69} Id. at 1598.

\textsuperscript{70} Proved natural gas reserves are reported to have declined over 12 trillion cubic feet in 1969, twice the amount of the previous year, leaving a known reserve supply estimated sufficient for 12 to 15 years, as opposed to a 20 year projected reserve contemplated in 1969. N.Y. Times, July 26, 1970, § 3, at 13, col. 1. Industry reports show that U.S. consumption rose to 21.5 trillion cubic feet in 1968 compared to 10 trillion in 1955. Bybee, \textit{Petroleum Exploration and Production on the Nation's Con-}
for this decline, the industry has suggested, is that there is no economic incentive for more exploration. Consequently, petroleum interests asked the Federal Power Commission (FPC) to raise the price ceiling at least 50 percent on interstate natural gas sold by gas producers to the pipeline at the wellhead. The FPC responded by holding new nation-wide proceedings and public hearings after it had issued a report by its Bureau of Natural Gas.

The situation, not unlike the residual supply problem, presents a regulatory problem. As a report by the National Economic Research Associates noted:

this developing crisis is artificial in the sense that, as the gas producers themselves agree, there is plenty of gas left in the ground. It is simply not being developed and made available at an adequate rate ... [T]he gas producers—which is to say, the oil companies—expect that their point of view will prevail with the Federal Power Commission and so have everything to gain by holding off on gas finding and development until they get the price they ask. In making this point we do not accuse the industry of overt agreement. Clearly each producer has a parallel expectation and behaves accordingly.

Questions raised by the request of the oil and gas companies for higher prices and the resulting rate hearings get to the heart of the regulatory problem. First, the Commission has relied primarily on the pleas, schedule and data of the regulated industry rather than on its own initiative, information and analysis. For example, testimony presented to the Commission indicated that the industry's statistics on which the Commission relied might not adequately reflect natural gas reserves intentionally withheld from production. Furthermore, al-


74. Edward Berlin, General Counsel for the Consumers Federation of America, criticized the Commission for its new rule-making procedures that did not allow the more lengthy data gathering characteristic of previous area rate proceedings. "As noted at the outset, it is glaringly apparent that the instant proceeding was instituted not in response to alleged increased producer costs, but in an attempt to bribe the producers to make more gas available on the interstate market. ... The willingness of the Commission to dance to the producer's tune provides a classic example of the (industry) tail wagging the (regulatory) dog." Comments of Edward Berlin, General Counsel for the Consumers Federation of America, before the FPC in the matter of Initial Rates for Future Sales of Natural Gas for All Areas, Doc. No. R-389 A, 1970.

75. Albert Bass, testifying at the FPC area rate hearings, cited the producer practice of plugging producible wells and the subsequent delay in reporting such data to the
though the Commission has control over gas imports,\textsuperscript{76} which can now be shipped to the United States in liquid form,\textsuperscript{77} and while it has control over the export of Alaskan natural gas, it still confronts the problem of the Jones Act prohibitions against use of foreign ships for domestic trade.\textsuperscript{78} Most important, however, is the fact that the Commission, already limited to regulation over one particular fuel, exercises no control over the disposition of the new revenues it is asked to grant the petroleum companies. The 25 major oil companies that produce 68 percent of interstate natural gas\textsuperscript{79} may, if they so desire, employ the new revenues for domestic diversification or foreign oil investment rather than for potentially less lucrative natural gas exploration and production. This would not occur, of course, if the price of gas was allowed to rise to its natural level.

The effects of the natural gas shortage, artificial or real, have already affected air pollution control. New York City, having decided, against the advice of the municipal Environmental Protection Administration, to permit construction of an 800,000 kilowatt fossil fuel generating plant in


\textsuperscript{77} 46 U.S.C. § 883 (1964). For various reasons including higher labor costs, higher taxes, and more stringent regulation, the United States has slipped to fifth place among nations in the number of registered vessels, behind Liberia, Great Britain, Norway, and Japan. \textit{OIL & GAS J.}, Apr. 6, 1970, at 72. Consequently U.S. vessels are at a premium for the Alaskan trade. The adverse effects of the Jones Act on U.S. consumption of Alaskan oil, as well as liquified gas, were noted by the Cabinet Task Force on Oil Import Control, whose report cautiously suggested consideration of Jones Act suspension or amendment. \textit{The Oil Import Question, supra} note 17, at 40. For an analysis of current and potential prospects of Jones Act revision see Center for Political Research—Research Services Division, Opposition to the United States Cabotage Laws (Jones Act), 1970 (research memorandum).

\textsuperscript{78} The effects of the natural gas shortage, artificial or real, have already affected air pollution control. New York City, having decided, against the advice of the municipal Environmental Protection Administration, to permit construction of an 800,000 kilowatt fossil fuel generating plant in

\textsuperscript{79} See also Hearings on Supplies of Natural Gas, supra note 66, at 78.
Astoria, Queens, was unable to exact a guarantee from Consolidated Edison that natural gas would be used as fuel. In Maryland one of the nation's top state air pollution administrators had to eliminate proposed new emission standards that required all new fuel burning installations to be designed for gaseous fuels. In these and other cases the shortage of natural gas on the market was a critical factor and for that reason state agencies and the FPC pressed hard for more gas production from offshore reserves and urged new oil and gas leasing by the Department of the Interior. The potentially unfortunate acquiescence of Interior in deciding to lease again in the Gulf of Mexico, and the issues it avoided in the name of air pollution control, are examined further on in the section on offshore oil production.

2. Evidence of an Actual Shortage

The economic shortage of natural gas may not present the most imposing threat to natural gas use for pollution abatement. There is also, unfortunately, a limit to the amount of gas recoverable at any price. According to the Potential Gas Committee of the oil and gas industry, the United States has an ultimate supply of 1,290 trillion cubic feet of natural gas, including 314 trillion cubic feet of cumulative past production. Using the Committee's higher figures, Hubbert determined that peak U.S. production would occur around 1980, with 80 percent of total historic production occurring between 1950 and 2015.

The implications of a natural gas shortage are not presently reflected in our consumption patterns. Yet the most rational use of this clean fuel might emerge from policies to preserve natural gas for home heating purposes. Large industrial and power plant facilities would be required to use other fuels, such as low-sulphur residual oil, under the conditions of maximum heat and pollution control efficiency that only large operations can afford to develop and use. Because such rationing schemes have not yet evolved, natural gas is demanded for a variety of purposes without regard for its scarcity and value as a vital clean fuel for domestic heating in the future.

83. J. Nassikas, supra note 45, at 22.
84. See text accompanying notes 159-204 infra.
85. M. K. Hubbert, supra note 6, at 188-89.
86. Id. at 189. This estimate of natural gas supply is based on the same kind of extrapolations as were undergone for crude oil. See note 13 supra.
IV

OIL IN THE OCEAN—GENERAL ECOLOGICAL EFFECTS

The clamor for more oil imports and offshore sites may be shortsighted in terms of the ecological consequences of oil transport, production and spills in the ocean. The effects of these spills and their threat to marine life and aesthetics are only beginning to be understood, despite the Santa Barbara and Torrey Canyon experiences.\(^7\) Generally, however, oil pollution is continuous and less spectacular than these events. Of the 10,000 pollution incidents occurring in U.S. waters, some 7,500 are from oil.\(^8\) Max Blumer, a marine chemist at Woods Hole Oceanographic Institute estimates that the total oil influx into the ocean is at least four to five million metric tons a year and may amount to ten million metric tons.\(^9\) This influx occurs primarily in the ecologically highly productive coastal and estuarine regions of the seas.\(^10\)

The most obvious immediate effect of these spills is bird destruction—over 25,000 after Torrey Canyon,\(^11\) 20,000 following a single spill off the Dutch coast,\(^12\) 10,000 after an unidentified spill off Alaska's Kodiak islands.\(^13\) Thousands of dead birds were counted onshore after spills at Santa Barbara,\(^14\) off Cape Province, South

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\(^8\) M. Blumer, Oil Contamination and the Living Resources of the Sea, presented at the Food and Agriculture Org. Technical Conf. on Marine Pollution and its Effects on Living Resources and Fishing, Rome, Italy, Dec. 9-18, 1970, on file the Ecology Law Quarterly.

\(^9\) Id.

\(^10\) While the coastal regions, and the increasing pressures to develop them, have been extensively studied, they are not protected by the federal government. Each study tells the tale of a resource fast disappearing. See U.S. Dep't of the Interior, Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries, The National Estuary Study, Jan. 1970 (7 vols); U.S. Dep't of the Interior, Federal Water Pollution Control Administration, The National Estuarine Pollution Study, Nov. 1969 (3 vols); Panel Reports of the Commission on Marine Science, Engineering and Resources, 1969 (3 vols).


\(^12\) Nature, July 18, 1970, at 218.


Africaootnote{R. Warner, Environmental Effects of Oil Pollution in Canada—An Evaluation of Problems and Research Needs, Aug. 1969, at 6 (an unpublished brief prepared for the Canadian Wildlife Service), on file with the Ecology Law Quarterly.} and at Midway Estuary, United Kingdom.\footnote{Id. at 3.} One study estimates that "for every oiled bird, which reaches shore and subsequently perishes in the normal course of events, between eight and eleven perish and are lost at sea."\footnote{Id. at 6, citing J. Tanis and M. Morzer-Bruijns, Investigations on Sea-birds Killed by Oil Pollution 1958-62, 1962.} The effects of these constant diminutions of bird populations by oil cannot be dismissed as limited in duration, as damage from oil spills often is.\footnote{Much post oil spill analysis is short term, as was that following the Santa Barbara incident. For a description of the short-range studies on environmental effects of the Santa Barbara spill see M. Baldwin, supra note 94, at 16-23; Young, supra note 91.} Sea birds occupy an important ecological niche and they directly benefit man by feeding on carrion and cleaning up shorelines.\footnote{See J. C. Weltz, THE LIFE OF BIRDS (1962).} We simply know very little about the long-term ecological effects of bird losses from oil.

Although complex and varied, all crude oil is similar in chemical, biological and toxicological properties: crude oil and all except some pure oil fractions, including the low-boiling, saturated hydrocarbons until recently considered harmless, are toxic to marine organisms.\footnote{M. Blumer, supra note 88, at 6.} Petroleum hydrocarbons that are stable in the marine environment are ingested by marine organisms and become part of body lipides where they may remain for the animal’s life.\footnote{Id. at 8.} Unstable hydrocarbons may also be preserved there, protected from bacterial attacks. The hydrocarbons pass through the food chain much in the same way as other persistent chemicals, such as DDT, presenting, among other dangers, a threat of cancer. Says Blumer, “crude oils and all oil products containing hydrocarbons boiling between 300 and 500 [degrees centigrade] should be viewed as potential cancer inducers.”\footnote{The persistence of oil in shellfish was documented in Blumer, Souza & Sass, Hydrocarbon Pollution of Edible Shellfish by an Oil Spill, 5 Marine Biology 3:195-202 (1970) (a study of a 600-700 ton spill in September 1969, of No. 2 diesel fuel oil in Buzzards Bay, West Falmouth, Massachusetts which resulted in drastic fish and shellfish kills). Only limited amounts of detergents were used for a short time period. The lasting effects of the oil, which remained in the lipides of shellfish eight months afterward, and as unaltered fuel oil in the bottom sediments, continues to be studied. See M. Blumer, J. Sass, G. Souza, H. L. Sanders, J.F. Graselle & G.R. Hampson, The West Falmouth Oil Spill—Persistence of the Pollution Eight Months After the Accident, Woods Hole Oceanographic Institution Reference No. 70-44, Sept. 1970 (unpublished manuscript available upon request).} Shellfish or other fish that have built up hydrocarbons in their body fat as a result of...
oil spills could be hazardous to eat. These and other harmful compounds of oil are preserved in the floating masses of crude oil found throughout the ocean\textsuperscript{103} as witnessed by Thor Heyerdahl during his Atlantic crossing.\textsuperscript{104}

Despite some technological solutions to the severe aesthetic degradation from oil spills, Blumer concludes that:

there is no reason to be hopeful that existing or planned countermeasures will reduce the biological impact of oil pollution. The most immediately toxic fractions of oil and oil products are soluble in seawater; therefore, biological damage will occur at the very moment of the accident.\textsuperscript{105}

\ldots From the point of view of avoiding the immediate biological effect of oil spills, countermeasures are completely effective only if \textit{all the oil is recovered immediately after the spill}. The technology to achieve this goal does not exist.\textsuperscript{106}

\section{V

\textbf{OIL POLLUTION FROM VESSELS}}

\textbf{A. The Problem}

An increasing majority of oil spills of 100 barrels or more come from vessels. In 1968, 347 of a total of 714 incidents in U.S. waters were from vessels; in 1969, 532 out of 1,007.\textsuperscript{107} Around the world the story is similar since 60 percent or one billion metric tons}

\begin{footnotesize}
\textsuperscript{103} Id. at 8.
\textsuperscript{104} N.Y. Times, July 15, 1970, at 2, col. 4.
\textsuperscript{105} M. Blumer, \textit{supra} note 88, at 9-10. The potentially serious climatic effects of oil films on the ocean surface were recently underscored by the Council on Environmental Quality:

\textquote{With their vast stores of thermal energy, the oceans act as balance wheels to climate. The atmosphere exchanges energy with the ocean through radiation and mechanical processes. The strength of the mechanical interaction associated with air moving over a wave-roughened surface depends on the surface roughness of the water and the velocity and regularity of the wind. Very thin oil films can alter this interchange by reducing turbulence, evaporation, and the radiation emission of the surface.}


\textsuperscript{106} M. Blumer, \textit{supra} note 88, at 10. Blumer examines the existing techniques of detergents and dispersants, physical sinking, combustion, mechanical containment and removal and biological degradation, each of which has serious biological drawbacks. He recommends rigorous enforcement through aerial spectroscopic surveys, and the relatively simply techniques of tagging of oil based on its unique \textquote{fingerprint} to aid enforcement officials. For a useful compendium of papers on oil spills, see \textit{American Petroleum Institute—Federal Water Pollution Control Admin., Proceedings—Joint Convention on Prevention and Control of Oil Spills (1969)}.

\textsuperscript{107} \textit{Environmental Quality, supra} note 105, at 38. In 1969, shore facilities accounted for 331 incidents; the remaining 144 from various unidentified sources. \textit{Id}.}
\end{footnotesize}
of the world's annual oil production is transported by sea,\textsuperscript{108} compared to only 85 million metric tons shipped in 1938 when most oil refining occurred before, rather than after, shipment.\textsuperscript{109} The bulk of this petroleum is crude oil, cheaper to carry by tankers than refined products, which are more corrosive and do not move in such large volume.\textsuperscript{110} Unfortunately, crude may be a more lasting pollutant.

Oil tankers continue to grow in number and size. In 1969 there were 125 new tankers in the world fleet, a net gain of 27 vessels, representing since 1968, a 12.1 percent tonnage increase, to a grand total of 132,137,444 dead weight tons (dwts).\textsuperscript{111} The average tanker size was 41,816 dwts, up 12.2 percent from 1968.\textsuperscript{112} Orders for tankers in the 200,000 to 300,000 dwt class are also up.\textsuperscript{113} Gulf Oil has six 325,000-ton vessels, and five other companies have ordered more of this size.\textsuperscript{114} The largest vessel under construction, 370,000 dwts, is more than three times the size of the Torrey Canyon or the SS. Manhattan. Despite this increase of vessel size and numbers, world oil trade would require 10 percent more tanker volume by 1980 if import quotas were not retained,\textsuperscript{115} a fact that, because of its ecological implications, should not be neglected by critics of the import quota system.

Oil pollution from vessels results from collisions,\textsuperscript{116} mechanical failures, pumping accidents and, most importantly, from deballasting and cleaning operations. Tankers and nontankers, which regularly take in sea water for ballast, later discharge it into the ocean along with the oil cargo or fuel tank residues. The result is considerable, steady pollution of the ocean.\textsuperscript{117} Tank cleaning procedures add to the problem. About 0.4 percent of oil cargo is left clinging after unloading,


\textsuperscript{110} The Oil Import Question, supra note 17, at 311.

\textsuperscript{111} OIL & GAS J., Apr. 6, 1970, at 72 (reviewing JOHN I. JACOBS AND CO., LTD., 1969 WORLD TANKER FLEET REVIEW.)

\textsuperscript{112} Id.

\textsuperscript{113} Id.

\textsuperscript{114} Id. The article reported 36 recent orders for tankers between 200,000 and 300,000 dwts.

\textsuperscript{115} The Oil Import Question, supra note 17, at 32.

\textsuperscript{116} An article entitled Mishaps Worsen World Tanker Shortage, reported three recent accidents in the Persian Gulf: collision of a 216,000 dwt tanker with another ship, collision of a 225,000 dwt tanker with submerged rocks, and the running aground of the 115,000 dwt SS. Manhattan. \textit{OIL & GAS J.}, Sept. 28, 1970, at 52.

and although cleaning only takes place about every fifth voyage, it is estimated that 2.85 million metric tons of oil entered the sea by this process alone in 1967. Since 1960 the major oil companies have instituted, under a “Clean Seas Code,” new load-on-top procedures whereby oily water from ballast and tank washing is kept in a separate tank and allowed to separate. The sea water is then pumped out, along with some oil, and the oily mixture above is retained for ultimate refining. New crude is loaded on top. Although some commercial difficulties remain, and the load-on-top scheme is not universally popular, the system is widely used by major oil companies; neither refining problems nor extensive tanker modifications are necessary.

B. Regulation

1. Treaty Amendments on Routine Pollution

The 1954 International Convention for the Prevention of Pollution of the Sea by Oil restricts oil discharge from tankers and other ships. Zones in which oil discharge is prohibited are established for all tankers over 150 tons gross tonnage. These zones must extend at least 50 miles from land, but Article III of the Convention specifically exempts from the prohibitions the discharge of oily mixtures, such as those from bilge pumping, cleaning or deballasting, of 100 parts per million or less. This exemption allows unlimited amounts of oil discharge so long as sea water dilution occurs first. Beyond the prohibited zones the Convention imposes no oil spill limits.

Major oil companies, now using expensive load-on-top procedures in the open ocean, have supported new treaty proposals designed to require others to adopt similar practices. As a result, the Intergovernmental Maritime Consultative Organization (IMCO) agreed on new discharge amendments which were subsequently recommended by President Nixon for Senate ratification. Oil discharge

118. Id. at 319.
119. Boyl, supra note 109, at 319.
120. Comment, supra note 117, at 351-52.
122. 1954 Convention, supra note 121, art. III.
123. Message from the President of the United States Transmitting Two
would, under the amendments, be limited to 60 litres per mile for any ship or tanker proceeding en route. In addition, tankers would be restricted to total discharge on a ballast voyage of 1/15,000 of total cargo capacity occurring at least 50 miles from shore. The discharge from nontankers would have to be at the 60 litre rate with the discharge itself less than 100 ppm and "as far as practicable from land."124

Immediate questions about ecological effects of these new proposals are the usual ones, so well expressed by Garrett Hardin in The Tragedy of the Commons.125 Since numbers and sizes of ships increase as each enterprise adds to its fleet, international regulations do not anticipate the total ecological impact on a finite resource. Also, since little is presently known regarding the time required for natural processes to render oil ecologically harmless, we should be very cautious before allowing more oil discharge into the ocean. Another objection is the difference between the 60 litre proposal and the new prohibitions on oil spills in U.S. waters issued under the Water Quality Improvement Act of 1970126 by former Secretary of the Interior Hickel.127 Under these domestic regulations violations may occur when discharges of oil in navigable waters or the contiguous zone "cause a film or sheen" on the water. Recent, unpublished tests by the U.S. Coast Guard have provided graphic proof that the discharge of only 2.2 litres of heavy crude oil per mile results in a visible slick on relatively calm seas, while the 60 litre discharge evidenced appreciably greater pollution and a persistent oil slick.128


128. The unpublished experiments with oil discharge were conducted by the U.S. Coast Guard during April 1970. Several types of oils were discharged (no. 2 fuel oil, lubricating oil, light crude, heavy crude and no. 6 fuel oil) at various rates, from 0.82 to 67 litres per nautical mile. The study concluded that present treaty regulations, allowing up to 100 ppm of oil of water mixture, was equivalent to lineal discharge of 2.2 litres of oil per mile of heavy crude. Photographs, examined by the author, of heavy crude discharge at 1.3, 2.2 and 60 litres per mile showed that the proposed treaty amendments would allow appreciably more pollution than is now permitted in the contiguous zone or navigable domestic waters by new Interior regulations.
One of the arguments oil companies have made in favor of the new treaty proposals is the need for a specific and enforceable standard rather than complete prohibition. But whatever the international discharge regulation, enforcement is difficult. A glaring weakness of the 1954 Convention on International Pollution of the Sea by Oil, untouched by amendments, is the provision that enforcement is the sole obligation of the country in which the ship is registered, thus compounding abuses of "flags-of-convenience" practices. The coastal state, therefore, has no treaty devices to ensure prosecution of a polluting vessel by the flag state.

2. The Canadian Arctic Waters Pollution Prevention Act

International neglect and the special environmental conditions of the Arctic led to passage in the spring of 1970 of Canada's comprehensive Arctic Waters Pollution Prevention Act. With this Act, Canada asserted pollution-control jurisdiction over Arctic waters between the 60th parallel and the meridian between Canada and Greenland, over waters along "a line measured seaward from the nearest Canadian land a distance of 100 nautical miles," as well as over all waters above the Canadian continental shelf. To prevent water degrading "waste" from being deposited from ships and from onshore and offshore facilities, the Act authorizes the establishment of a "shipping safety control zone," within which ships may be banned unless they meet certain regulations. Persons violating the waste-disposal prohi-

129. 1954 Convention, supra note 121, art. III(3).
130. Much of the world tanker fleet is registered in Liberia and Panama. (The Torrey Canyon had Liberian registry.) Pollution control exerted by these nations is not noteworthy, although both have signed the 1954 Convention. See Comment, supra note 117, at 330-32.
131. After the Torrey Canyon spill, IMCO did propose to remedy the international law barriers to coastal state action related to major casualties on the high seas. The proposed Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties now before the Senate provides that parties "may take such measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from pollution or threat of pollution of the sea by oil, following upon a maritime casualty or acts related to such a casualty which may reasonably be expected to result in major harmful consequences." MESSAGE, supra note 123, art. I.
134. Id. § 3(2).
bitions may be fined up to $5,000 and ships may be fined up to $100,000 for each daily offense. Anyone violating reporting regulations, or shipping standards or regulations, is liable for fines of up to $25,000. Pollution Prevention Officers have authority to board for inspection purposes, and there is provision for seizure of ships and cargo in Arctic waters to prevent violations of the Act. Liability for costs of cleanup and for private losses or damages is absolute, but regulations for liability limits are authorized.

Despite opposition from the U.S. State Department, the Canadian action has ecological, if not international legal, justification. The special conditions of the Arctic, its increased oil activity, and the proliferation of oil incidents gives special weight to arguments that, having failed to obtain far-reaching international control measures, Canada had no other recourse. Bacterial decay of crude oil is drastically retarded at Arctic ocean temperatures, which are 32° F. or lower. On the even more frigid shoreline and on ice flows, "biochemical decay would be virtually nonexistent, and the oil would persist for decades, perhaps centuries." Slower evaporation of the highly toxic lighter fractions of crude oil might be especially dangerous because "the net effect is to significantly prolong the time during which sensitive marine organisms are exposed to the toxic influences of the lighter hydrocarbons." Particularly susceptible to surface oil films is the hyponeuston marine community, which contains the early stages of pelagic and bottom-dwelling life that are commercially valuable and critical to the productivity of the world's oceans. The proposed 60 liter discharge amendments to the 1954 Convention neglect these factors and the uncertainties they create.

Apparentlly, no studies have been conducted on the effects of the amendments' new oil dumping limits in the Arctic. Professor Warner

135. Id. § 2(3).
136. The Department statement indicated concern with the "domino" effect of such a novel unilateral action. "Other countries could assert the right to exercise jurisdiction for other purposes. . . ." It proposed an International Arctic Conference in the fall of 1970 to discuss pollution problems. U.S. State Dep't, Press Release No. 121, Apr. 15, 1970. No such conference was scheduled.
138. R. Warner, supra note 95, at 8.
139. Id.
of the University of Newfoundland concludes that:

[T]he proposed oil dumping scheme, by advocating the mixing of waste oils with seawater immediately upon their release into the environment, effectively eliminates their detoxification by the previously described surface evaporation of the highly toxic "lighter fractions." Waste oils introduced into the ocean under these circumstances may well prove to be many thousands of times more toxic to hyponeuston organisms than if left as surface films.\textsuperscript{140}

The recent discoveries of oil in the Arctic, recurring oil pollution incidents in Cook Inlet,\textsuperscript{141} and the journey of the \textit{SS. Manhattan} through the Northwest Passage have made these concerns political issues.

It has been suggested that by basing its pollution jurisdiction on the controversial right of the coastal state to take unilateral measures to protect its contiguous zone, rather than on expanded territorial or archipelagic claims, Canada may have laid the grounds for later acts regulating shipping procedures and offshore development near Newfoundland or elsewhere.\textsuperscript{142} A series of damaging oil spills and shipping disasters in the heavily used lands of Newfoundland and in the Gulf of St. Lawrence support this argument.

Despite the biological expertise at its disposal, and the attempts to regulate oil pollution of the contiguous zone through domestic legislation,\textsuperscript{143} United States' leadership in fostering effective international control of oil pollution has been sadly deficient. Neither environmental sophistication nor a sense of urgency was evident in the negative response of the State Department to the Canadian initiative or to

\begin{footnotes}
\item[140] Id. at 11.

\item[141] These incidents now average 1-2 every fortnight; their severity ranges from modest to extremely destructive. Tens of thousands of sea birds and water fowl have been killed by this pollution, and even the commercial species of fish and bottom dwelling crabs have been affected. Concern is growing for the welfare of the mammal populations of the region, including the Beluga Whale, seals, sea otters, bears and furbearers, . . . .

\item[142] Bilder, supra note 132, at 23-30.

\item[143] Interior regulations pursuant to section 11(b) of the Water Quality Improvement Act of 1970 [Pub. L. No. 91-224, 84 Stat. 91 (to be codified as 33 U.S.C. §§ 1161 (b))] prohibit discharge of oil into navigable waters of the United States, adjoining shorelines, and waters of the contiguous zone so as to "(a) violate applicable water quality standards in navigable waters of the United States, or (b) cause a film or sheen upon or discoloration of the surface of the water of adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines, . . . ." 35 Fed. Reg. 12180 (1970) (emphasis added). Discharges allowed by the International Convention for the Prevention of Pollution of the Sea by Oil are permitted, however, and to this extent are inconsistent with the attempt to prohibit the creation of harmful water and oil emulsion beneath the ocean surface.
\end{footnotes}
the inadequacies of the oil pollution treaty amendments. Unfortunately, between Canada's unilateral action and the lack of understanding on the part of the United States and other countries, there is scant reason to hope for early success of schemes for an international Arctic pollution treaty.

3. The Question of Civil Liability

One of the most effective ways to control oil discharge would be to force the oil companies to bear all the risks attendant to oil shipping. If this were possible, many of the problems involved in oil transport by sea would be greatly diminished since oil companies and their insurers would have financial incentive to take every precaution against potential damage. These precautions would undoubtedly include a self-imposed limit on the size of tankers at the point where the potential damage of a spill, such as the Torrey Canyon, becomes so great that the increased profit would no longer compensate the loss even over a long period of time. Unfortunately, the full measure of such a method of control is limited by the difficulty in determining all the damage caused by any particular accidental or intentional spill. This is particularly true of the subtle ecological impacts which may not be translated into monetary losses for several years. Still, a system of absolute liability for all provable damage would go far to force the industry to calculate many social costs which it would probably prefer to ignore. As scientific knowledge of the effects of oil in the ocean increases, such a system would become more and more effective in forcing oil companies to minimize ecological impacts of oil spillage.

Neither the Water Quality Improvement Act of 1970144 nor the newly proposed Convention on Civil Liability for Oil Pollution Damage,145 which relates only to oil tankers, imposes absolute and unlimited civil liability on oil shippers. Consequently, the incentive to protect the oceans from possible irreparable damage is presently so limited as to be lost in the competitive struggle for bigger tankers and more profits. The Water Quality Improvement Act of 1970 requires that all vessels over 300 gross tons using U.S. navigable waters establish evidence of financial responsibility of $100 per gross ton or $14,000,000 whichever is less.146 This figure is then set as the

145. See MESSAGE, supra note 102. Senator Muskie's Air and Water Pollution Subcommittee has examined in detail the potential conflicts between the Act and the Convention. Hearings on the Relationship of Brussels Convention on Civil Liabilities for Oil Pollution and Public Law 91-224 Before the Air and Water Pollution Subcomm. of the Senate Comm. on Public Works, 91st Cong., 2d Sess. (1970) [hereinafter cited as Hearings on Brussels Convention and Public Law 91-224].
limit of liability to the U.S. government for oil pollution cleanup necessitated by any one incident not involving negligent or intentional harm occurring in U.S. waters, or in the contiguous zone. The Act sets no limit on liability to private parties. The Convention on Civil Liability stipulates that owners of vessels carrying over 2,000 tons of oil might restrict liability by financial certificates to $134 per ton or $14,000,000, whichever is less. However, the Convention limits must cover claims by all injured parties, not simply government claims. Both the Water Quality Improvement Act and the Convention adhere to the concept of strict liability although there are potentially significant differences in approach. Liability would be imposed, up to certain limits, on the shipowner or operator unless he can prove damage was caused by act of war, act of God or act of a third party. These strict liability defenses would not be available under an absolute liability doctrine. However, the Act requires a showing that damage was caused solely by such actions. Neither the Act nor the Convention impose monetary limits with respect to pollution caused by negligence.

The Convention has been strongly criticized, and a favorable Senate Public Works Committee report is uncertain for several reasons. First, the need to divide the limited amount provided under the Convention among all claimants, private as well as governmental, might severely restrict the rights of recovery now available to Americans. Present domestic law at least permits the claimant to remove liability limits by proving the shipowner had "privity or knowledge" of the cause of damage. Second, and perhaps more important,

147. Id. § 11(f). The Act defines the contiguous zone as that established by the United States under Article 24 of the Geneva Convention on the Territorial Sea and Contiguous Zone. Id. § 11(a)(9). Regulation of oil pollution in the contiguous zone was adopted pursuant to authority granted to coastal states under the Geneva Convention. April 29, 1958, [1964] 15 U.S.T. 1606, T.I.A.S. 5639. Article 24(1)(a) of the Convention empowers the coastal state to prohibit activities in the contiguous zone that infringe "its customs, fiscal, immigration or sanitary regulations within its territory or territorial sea .... " Id. (emphasis added). See Comment, supra note 117.


150. 46 U.S.C. § 183(a) (1964). One lawyer has concluded that in the event of a major spill causing extensive damage to coastal property in this country, any competent American trial lawyer would probably be prepared to take the case on a contingent fee simply because the limit in 46 U.S.C. Sec. 183 is so easily breakable. In view of this state of the law, I submit that to buy the argument that the treaty should be ratified because it provides a remedy to private parties which might not be available is really to buy a 'pig in a poke.' Testimony of A. Mendelsohn, Hearings on Brussels Convention and Public Law 91-224, supra note 145, at 41.
strict liability, with its defenses, may be too liberal for effective international pollution control. Although the concept has a basis acceptable to both common and civil law countries. it was adopted by the Convention against the original recommendations of the United States, which favored absolute liability of the carrier because of the ultra-hazardous nature of the enterprise. The U.S. position is justified by experience with airline liability. In 1966 the United States successfully urged a change in the Warsaw Convention's provisions for presumption of an airline's negligence to a standard of absolute liability. The analogy is clear.

[A]ppropriate as that rule is in international air transportation, it is even more appropriate in oil pollution cases. For in air transportation one might always argue that by agreeing to board the airline, the passenger assumes a certain risk and hence should himself bear losses resulting from Acts of God, War or Third Party. But in oil pollution cases, the victim never boarded the tanker.

In terms of ecological risk, however, the issue is not simply one of determining the just resolution of a dispute between a private party and the tanker owner. Neither the strict liability provisions of the Water Quality Improvement Act nor those of the Convention of Civil Liability provide impetus to the oil industry and their insurers to assess the total risks of and damage from spills. They are not called on to adjust their costs to provide for complete recompense in situations of ecological disaster; hence, the sanctions do not force preventive measures.

Similarly, were there no $14-million ceiling on liability for cleanup, insurance companies would be required to establish the premiums for large ships based on the actual cost of the damage they might cause. The point at which insurance becomes unprofitable would be the point at which larger ships would cease to be built. The insurance market, reflecting the most sophisticated data on oil pollution damage and the long-term ecological damage that claimants might consider, could thus dictate a more rational limit on vessel dimension.

By the terms of the Act and the Convention the incentive to evaluate ecological risks from shipping catastrophes is now gone. If the

151. Sweeney, supra note 121, at 196.
152. Id. at 197-98.
155. In notable contrast to both the Act and the Convention, off shore leasing regulations of the Department of the Interior, issued after the Santa Barbara spill, make lessees absolutely liable, without limit, for the control and cleanup of spills. See note 171 infra.
Torrey Canyon settlement is any guide, and the relatively small size of the ship—121,890 dwts—makes it a good one, Union Oil was fortunate to settle French and British claims for $7.2 million, since total government claims were over $14 million.\(^\text{156}\) One can only speculate what the property, let alone long-term ecological, damage would be if a similar disaster were to involve an oil-laden 370,000-ton tanker.\(^\text{157}\)

Arguments to the effect that the oil industry would be incapable of bearing the burden of unlimited absolute liability or that the maritime insurance industry would be unable to adjust to such a standard are ill-founded. Undoubtedly the cost of insurance as well as the cost of precautions against accidents would rise, perhaps greatly. But the increased expenditure would be borne ultimately by the consumers of oil products, a fact which is appropriate in an economic system in which the value of a product to society is measured in terms of consumer demand. If the increase in price caused by forcing pollution control decreases demand for oil products, then these products are not as valuable to society as they seemed when oil companies were, in fact, being subsidized by the limitations in civil liability. Also, in light of the aviation industry's success in utilizing insurance when the new aviation rules of absolute liability up to $75,000 per person became a reality,\(^\text{158}\) it would be strange if the insurance industry were unable


\(^{157}\) Out of court settlement of the West Falmouth oil spill of some 650 tons, studied by Max Blumer, \textit{supra} note 88, came to $100,000 to the town and $200,000 to the state for fishery damage. Letter from Max Blumer to the author Oct. 8, 1970, on file with the Ecology Law Quarterly. But the American Institute of Merchant Shipping in endorsing Convention ratification, blandly stated that "we are confident on the basis of the record of vessel spills in recent years in most instances claims would not exceed the Convention limits." \textit{Hearings on Brussels Convention and Public Law 91-224, supra} note 145, at 34.

\(^{158}\) "If American airlines can enlist, for the first time, the aid of American life insurance companies, why cannot American shipowners do the same?" Testimony of A. Mendelsohn. \textit{Hearings on Brussels Convention and Public Law 91-224, supra} note 122, at 45. For an extensive discussion of the aviation analogy and development of the absolute liability agreements see Mendelsohn, \textit{supra} note 153.
to accommodate the oil trade under similar or more stringent circumstances. The question is not can a free enterprise insurance industry meet the demand for no ceiling insurance, but rather what will it cost? When this question is answered, the amount of the present subsidy to oil products will be known. The basic policy decision then is whether that subsidy should continue to provide cheaper oil at the expense of the intricately balanced life systems of the ocean.

VI
OFFSHORE OIL

"No facet of the oil industry offers as much room for action as the offshore arena."159 World offshore production, now about 6.5 million barrels per day, may well quadruple in the next decade, while its proportion of the free world's production, 16 percent, may double.160 Offshore production is already world-wide,161 and as the oil companies perfect new drilling and production technology, offshore production will reach farther out on the continental shelves.162 These developments pose dangers of marine pollution that are not met by existing international agreements. Pollution and production controls are domestic only.

Approximately ten percent of the United States' favorable offshore oil regions are reported to have been explored, compared with 90 percent of its favorable land regions.163 Beyond the state three-mile

161. Offshore wells have been drilled in 75 countries with 28 nations participating. OIL & GAS J., Mar. 16, 1970, at 127. Offshore oil or gas has been produced or discovered off the coasts of Venezuela, Nigeria, Gabon, Congo, Italy, Indonesia, Australia, as well as in the Persian Gulf and Red Sea. Id. at 124-26. In the North Sea, a giant oil field was recently discovered by Phillips Petroleum between Scotland and Norway. OIL & GAS J., Aug. 31, 1970, at 33.
162. Offshore production is currently limited to 340 feet of water [Marine Science Affairs, supra note 108, at 68] but there is exploratory drilling in the Santa Barbara Channel at 1,600 feet. OIL & GAS J., Mar. 16, 1970, at 127. Humble Oil Co. plans a new permanent platform in the Santa Barbara Channel in 700 feet of water. OIL & GAS J., Dec. 7, 1970, at 30. Production at depths of 6,000 feet are predicted by 1980. Nat'l Petroleum Council, Petroleum Resources Under the Ocean Floor, Mar. 1969, at 46. A recent technological breakthrough was achieved by the Glomar Challenger, operated by the Scripps Institute of Oceanography and supported in part by grants from the National Science Foundation. The Challenger relocated by sonar a test hole beneath the ocean floor, permitting drill bits to be changed and the hole drilled at full oceanic depths. N.Y. Times, June 18, 1970, at 36, col. 1. Offshore oil storage technology is also changing whereas most oil from offshore platforms is piped to shore, underwater storage may be possible. The Phillips Petroleum Company may store North Sea production in underwater caverns blasted in salt deposits. OIL & GAS J., Aug. 31, 1970, at 33.
limit, and excluding offshore Alaska, there are proved reserves of some 4.3 billion barrels of oil and 34.2 trillion cubic feet of gas on the U.S. outer continental shelf.\footnote{164} An additional ten billion barrels might come from Prudhoe Bay, Alaska.\footnote{165} Oil companies are optimistic about potentially large fields off the Atlantic Coast that may equal or surpass those in the Gulf of Mexico.\footnote{166} Substantial investment in offshore exploration and development,\footnote{167} spurred by the subsidy to domestic production provided by the import quota, and preliminary surveys by the U.S. Geological Survey in such regions as the Chukchi Sea off Alaska\footnote{168} indicate the broad national and international environmental implications of plans for offshore production.

\textbf{A. Federal Regulation}

Under leasing authority given by the Outer Continental Shelf Lands Act,\footnote{169} regulation by the United States of offshore drilling and production was reformed in several procedural and technical respects after the Santa Barbara spill\footnote{170} to provide better environmental protection.\footnote{171} Another piece of legislation, the Water Quality Improve-
ment Act of 1970, includes the regulation of all offshore platforms inside territorial waters. After the second major offshore spill from the Chevron platform in the Gulf of Mexico and the Interior Department's prosecution of production violations, the Director of the Bureau of Land Management ordered public hearings in Louisiana over the question of new offshore leasing there. Hence, with each new spill the federal government has elaborated its environmental response.

The major questions of policy for the federal government, beyond an overriding concern about the risk of spills and effective cleanup techniques, relate to the extent of federal control over outer-shelf oil production and use, where the most significant ecological policy issues concern federal-industry and federal-international relationships. Despite the federal government's regulatory revisions, the petroleum companies are still at a distinct informational advantage concerning the

172. Pub. L. No. 91-224, § 11, 84 Stat. 91 (to be codified as 33 U.S.C. § 1161). The Act does not cover offshore platforms located outside of United States' navigable waters (generally the 3-mile limit), leaving these to the regulations of the Secretary of the Interior under the Outer Continental Shelf Lands Act. For other offshore platforms that polluted shorelines, navigable waters and the contiguous zone beyond, it establishes notice requirements for oil discharge and civil penalties [§ 11(b)], federal cleanup authority [§ 11(c)], and strict liability for owners or operators for the cost of cleanup to $8 million, with no limit in the case of their negligence [§ 11(f)(3)].

Section 11(c) calls for the President to set up a National Contingency Plan for spill cleanup. The President authorized the Council on Environmental Quality to prepare and publish such a plan [35 Fed. Reg. 8423 (1970)], which was then issued by the Council [35 Fed. Reg. 8508 (1970)].

173. The Chevron Oil Company spill, at Platform C off the Louisiana coast, lasted eight weeks beginning on February 10, 1970. The spill was estimated at from 600 to 1000 barrels per day for 21 days. The National Observer, May 4, 1970, at 8, col. 1. The danger of making estimates, however, was illustrated after Santa Barbara, when U.S. Geological Survey and oil company estimates were 1/3 of that which the author believes to be the more probable—the 3 million gallon estimate of an independent research corporation. For an analysis of spill estimates see Baldwin, supra note 94. The Chevron spill was caused by the absence of required automatic storm chokes at the base of the polluting wells. For these violations and for failure to install or maintain storm chokes on 90 wells in the Gulf, Chevron was prosecuted and fined $1 million by a grand jury, $2,000 for each of the 500 violations of the Section 5(a)(2) of the Outer Continental Shelf Act. Air & Water News, Aug. 31, 1970, at 6-7.


175. The risks of more offshore spills are serious, despite the propensity of industry proponents to ridicule admonitions to go slow on offshore drilling. See Oil & Gas J., Sept. 7, 1970, at 59. Analysis of the Santa Barbara spill shows that since the geology of the area was unique the disaster might have been contained more quickly had a drill casing variance not been issued, but carelessness on the part of the drillers themselves probably touched off the incident. Baldwin, supra note 94, at 8-9. In the Chevron incident, company violations simply emphasized the difficulty of assuring safe operations in every case. Statistical records of pollution-free drilling in the past are belied by what we know about human error. The risks are magnified immensely by planned offshore production growth.
value of the resource the government controls, thereby limiting its planning capacity. Under the Outer Continental Shelf Lands Act, the Secretary of the Interior is given broad authority to conserve outer shelf resources. But, while Interior receives all the geological information that the oil companies get from their exploration permits, it does not receive geophysical interpretive data from the oil companies. Although it has access to raw geophysical information, the data is valueless without the complex computers and the trained staff that the oil companies have. Thus, even though Interior has purchased geophysical information on western Louisiana offshore fields, the industry knows more than Interior about the nature and value of that field before it is leased. The same was true before the Santa Barbara Channel leasing—U.S. Geological Survey did not demand the kind of data from oil companies that might have prevented the sale of some of the tracts, and the granting of the well casing variance to Union Oil.

For these reasons, the Public Land Law Review Commission has recommended an expanded federal program requiring public expenditure to gather more information—some of it already compiled by industry. But, while admitting that the industry's exploration information should be "fully disclosed" to the government before leasing, the Commission stated that "the interpretation of geophysical data is in the nature of a prime trade secret of the company gathering the data, and its release to the government, even on a confidential basis, would create competitive problems." It is difficult to understand why such problems would result if disclosure is handled on a confidential basis. Even more alarming is the assumption that before the sale of such valuable public resources it should be necessary for the government to duplicate information on which it must make broad policy decisions. But failure to obtain geophysical interpretive data makes virtually meaningless the requirements for the Director of the Bureau of Land Management to evaluate "the potential effect of the leasing program on the total environment, aquatic resources, aesthetics, recreation, and other resources in the entire area during exploration, development and operational phases." So, in the case of new leasing plans in the Gulf of Mexico, the government had been obliged to purchase its data.

Another important aspect of the government's lack of information, particularly crucial to offshore Louisiana leasing, regards how much

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177. See Harlow, supra note 87, at 729, who rightly suggests that failure to supply such information should preclude participation in a lease sale.
178. ONE THIRD OF THE NATION'S LAND, supra note 164, at 194.
of the resource to be sold is natural gas or oil.\textsuperscript{180} Oil companies can determine whether there is oil or gas in a given field before drilling after they have assessed geophysical interpretive and reservoir data coming from records of nearby wells. Before leasing, such reservoir information is not available to Interior. It will only become available after the oil companies’ wildcat drilling under their leases.

Interior could itself develop such information by drilling test holes through producing formations before leasing. It would then be in a good position to calculate the values of the resource to be sold and the relative dangers to the environment from accidents. Unfortunately, Interior lacks the budget to make this kind of independent evaluation.

The National Environmental Policy Act of 1969 (NEPA),\textsuperscript{181} particularly section 102, has important implications for the Department of the Interior’s offshore leasing procedures. Section 102 requires that every federal agency analyze and submit a public statement on the major environmental effects of its legislative proposals and “other major federal actions,” such as offshore leasing.\textsuperscript{182} Specifically, agencies must examine the unavoidable environmental effects, the alternatives available, the short-term benefits versus long-term environmental costs and any irrevocable commitments of resources involved. Recently the Department of the Interior sought to comply with the NEPA by filing a section 102 statement on proposed offshore leasing of 593,000 acres off western Louisiana in the Gulf of Mexico. On October 9, 1970, it filed a draft statement, which was sent to other affected agencies but was not made public. One week later it filed the final public statement and the same day announced that a lease sale would be held in December.\textsuperscript{183} The lack of opportunity for public evaluation of the impact of the proposal highlights one major flaw in the NEPA; the other is its substantive inadequacy.

Much of the support and impetus for the proposed offshore leas-

\textsuperscript{180} Natural gas supply is intricately associated with oil supply since much of it is found with oil underground. \textit{The Oil Import Question} states that “some 8 to 10% of the gas supply now being developed is associated and dissolved gas in reservoirs that contain oil predominantly, [and that] between 25-30\% of the additions to gas reserves each year probably can be attributed to oil exploration and production.” \textit{The Oil Import Question}, supra note 17, at 24-25.

The Cabinet Oil Import Task Force had different opinions as to the extent to which natural gas supplies could be ensured by price-induced directional drilling for gas only. \textit{See id.} at 376-80 (separate report of the Chairman, Federal Power Commission). But the oil industry has admitted that it does have the ability to determine whether it is going after gas or oil before production drilling. Testimony before the FPC in the matter of Area Rate Proceeding, Offshore Southern Louisiana Federal Domain and Disputed Areas, Doc. No. AR-69, 1969.


\textsuperscript{182} \textit{Id.} § 4332.

ing involves the demand for more low-polluting fuels, especially natural gas, necessary for air pollution control. The FPC has reported that “the western portion of the Louisiana offshore area [that proposed to be leased] tends to be more prone to natural gas than to crude oil accumulations,” and that up to 80 percent of the gas is found separately from oil. According to Interior’s statement, 80 of the 100 tracts to be offered are primarily natural gas fields, which would be available for production by 1972. And as that statement notes, there are substantially fewer environmental risks from offshore natural gas operations than from oil operations.

In view of these facts, two questions remain unanswered by Interior’s statement. First, to what extent could Interior insure that natural gas alone be produced from the western Louisiana offshore fields and second, if low-sulphur crude oil is produced, what incentive is possible to induce devotion of this oil to production of low-sulphur residual. Discussion of the first question involves the kind of information Interior receives or develops before leasing, and as noted above, this is deficient. The second question involves consideration of the fact that most U.S. crude oil is refined into gasoline. The existence of low-sulphur crude in the western Louisiana offshore fields is not in itself a guarantee that it will be used for needed low-sulphur residual. The relationship between use of this crude for residual and the opportunities available to get low-sulphur residual from abroad should be examined by Interior before buttressing plans for leasing with anti-air pollution needs. Furthermore, if reliance on the market mechanism or industry goodwill does not appear to sufficiently guarantee the appropriate use of the offshore crude, then Interior should consider lease stipulations that would do so.

Unfortunately, Interior did not discuss these matters in its section 102 statement, despite its value as a policy tool for the technological assessment so important to offshore production and oil spill control. It also failed to evaluate the effect of unusual and potentially disastrous occurrences. Thus hurricane hazards were simply mentioned while the possibility of ship collisions was ignored. Yet the potential value of the section 102 statement makes it a requirement in the law that citizens cannot afford to have agencies neglect.

185. Dep’t of the Interior, Environmental Statement in Connection with a Possible General Oil & Gas Lease Sale Off the Coast of Western Louisiana under the Outer Continental Shelf Lands Act, on file with the Ecology Law Quarterly.
186. Id.
187. Id.
At present, once leasing takes place, the government does not exercise its potential authority for regulating general pollution effects of offshore production and the connected enterprises of the lessee. Under section 5 of the Outer Continental Shelf Act, the Secretary of Interior grants rights of way for oil and gas pipelines from outer-shelf platforms. Bureau of Land Management regulations authorize the leasing supervisor "to approve any reasonable offshore or onshore location as the central or delivery point." Federal authority therefore exists to specify the lessee's compliance with specified onshore land-use criteria for facilities at the pipeline terminal.

The principle of exerting comprehensive federal leverage over adverse environmental effects, based on federal control over the use of public lands and the outer continental shelf, was endorsed by the Public Land Law Review Commission. It recommended that "Congress should authorize and require the public land agencies to condition the granting of rights or privileges to the public lands or their resources on compliance with applicable environmental control measures governing operations off public lands which are closely related to the right or privilege granted." The Commission suggested that firms violating federal, state or local environmental standards on nonpublic lands be ineligible "for obtaining public land resources for use in the plant where violations occur." The application of this recommendation to refineries, port facilities and tankers used to service production of oil from offshore platforms is consistent with the Commission's recommendation.

**B. International Regulation**

Among international lawyers, a great legal dispute of recent years revolves around the extent and definition of the continental shelf, whose resources, since the Truman Proclamation of 1945, have been considered property of the coastal states. The outer limits of the shelf were defined by the Geneva Convention on the Continental Shelf as referring "(a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine
areas adjacent to the coasts of islands." Now, as exploitation of oil is contemplated beyond the 200-meter mark, the oil industry and coastal states would like to have the ambiguous definition of the continental shelf clarified, or at least not resolved against their interests.

The less developed countries, however, see ocean resources and resulting revenues as international property, and any continental shelf exploitation under present circumstances, unconscionable. In the United Nations General Assembly these nations have passed Resolution D, which declares that, pending the establishment of an international regime having jurisdiction over the seabed and ocean floor to supervise resource exploitation for the benefit of all mankind, "(a) States and persons, physical or judicial, are bound to refrain from all activities of exploitation of the resources of the area of the seabed and ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction; (b) No claim to any part of that area or its resources shall be recognized."

When a special Subcommittee on the Outer Continental Shelf was formed by the Senate Interior Committee in August 1969, its primary concern was examination of the legal implications of Resolution D and development of a policy position on U.S. rights to continental shelf resources. Pursuing these objectives in its first public hearings, the committee received the policy positions of the Natural Resources Section of the American Bar Association, the American branch of the International Law Association, several law professors, a few economists, the National Petroleum Council and the American Mining Congress. The legal and industrial associations, urging extension of United States jurisdiction to its farthest plausible limit, argued that the Continental Shelf Treaty permitted a shelf definition that included the continental slope. The petroleum industry had a special interest in an expanded continental shelf. A "short" shelf, without the price-protecting import quota, could substantially inhibit offshore investment beyond the national limit, since oil acquired beyond the limit would be foreign. An extended, or "long" shelf with an import quota would stimulate investment in offshore production and presumably would outweigh any advantages of having no royalty requirements or other jurisdictional controls by the United States. Domestic oil companies prefer both a long shelf and the import quota.

The reader of the testimony at the Continental Shelf Subcommittee hearings is struck by the limited role played by ecological considerations, which neither the group representing the bar, which saw the issue as political, nor industrial witnesses were skilled in treating. As a buttress against pervasive testimony favoring maximum exploitation, reminiscent of early federal public land policy, only existing off-shore legal title uncertainty and uneconomical extractive technology emerge as the environmental protectors.

Against this background, President Nixon has proposed a new ocean treaty differing substantially from that endorsed by most at the subcommittee hearings. Declaring that "the law of the sea is inadequate to meet the needs of modern technology and the concerns of the international community," the President proposed that all nations "renounce all national claims over the natural resources of the seabed beyond the point where the high seas reach a depth of 200 meters" and "agree to regard these resources as the common heritage of mankind." He further suggested that coastal nations hold the resources in the continental margin beyond the 200-meter line in trust for the world community, receiving in return an unspecified portion of the international revenues and, moreover, that an international regime regulate use of seabed resources beyond the continental margins.

Based on the Nixon proposal, the State Department presented the Draft United Nations Convention on the International Seabed Area to the U.S. Seabed Committee on August 3, 1970. It outlines a comprehensive petroleum and mining arrangement for two distinct areas comprising the International Seabed Area: First, the International Trusteeship Area between the 200-meter depth and some still undetermined gradient at the base of the continental slope, and second, the seabed beyond, which would be under complete jurisdiction of the International Seabed Resource Authority.

The spirit of the Draft convention is stated clearly in Article 5. The International Seabed Resource Authority shall use revenues it derives from the exploration and exploitation of the mineral resources of

197. For example, Professor Carl A. Auerbach testified as follows:
I think it is to be regretted that the resolution was passed, because unless mineral resources exploration and exploitation are encouraged and take place, the mineral resources will benefit no one. Congress has also declared in legislation that it is our national policy to encourage technological advances in this area so ultimately these marine resources can benefit all mankind. Id. at 150.

199. Id.
the International Seabed Area for the benefit of all mankind, particularly to promote the economic advancement of developing States Parties to this Convention, irrespective of their geographic location. Payments to the Authority shall be established at levels designed to ensure that they make a continuing and substantial contribution to such economic advancement, bearing in mind the need to encourage investment in exploration and exploitation and to foster efficient development of mineral resources.\textsuperscript{201}

The Article goes on to state that environmental protection is an interest designated to receive a portion of the revenues, along with technological and other research assistance.

Since the Nixon proposal and Draft recognize the legitimacy of the "world heritage" concept and the need for economic and legal certainty for offshore investment, it could satisfy both internationalist and extractive, but not the world's environmental, interests. Despite the opposition of the American Petroleum Institute, which fears the stifling of U.S. offshore investment,\textsuperscript{202} the Draft is primarily an instrument to foster ocean exploitation, though not necessarily by American companies, and to encourage the division of marine mineral wealth. It creates no agency capable of assessing ecological costs of exploitation, resolving conflicts with other environmental values—those of obscure economic value and those of long-term economic value such as fishery resources, neither of which would help fund operations of the International Seabed Authority nor satisfy revenue desires of less developed nations. Without a competent, powerful body to prohibit exploitation and to establish and enforce production criteria from an ecological perspective, ratification of the United Nations draft treaty presented by the United States would be a tragic mistake. The danger is that in seeking an instrument of certainty, we create another level of chaos.\textsuperscript{203} Recent evidence that there may be oil and gas beneath the seabed\textsuperscript{204} has added a new element of urgency to this problem.

VII

THE ONSHORE PROBLEM

Shoreline property is becoming an increasingly scarce natural re-

\textsuperscript{201} Id.


\textsuperscript{203} The United States failed to realize hopes that the draft might spur the development of seabed principles to be submitted to the General Assembly by the United Nations Seabed Committee. The Committee reached no agreement at its August 1970, meeting. \textit{37 Petroleum Press Service} 360 (1970).

\textsuperscript{204} \textit{Oil & Gas J.}, Nov. 2, 1970, at 120.
source in the United States.\textsuperscript{205} This is the result of two basic facts: Shoreline property has aesthetic appeal and is thus an attractive recreational site, while at the same time, these sites are attractive to industrial users who depend upon water for transport, for use in an industrial process, or for disposal of wastes. Increasing demand for energy is a significant part of this problem.

Both offshore petroleum production and increased ocean transport will augment demand for valuable shoreline regions of the United States and will exert progressively more serious pressures on the coastal region in the future. Coastal and riverside sites are attractive to oil companies primarily because refineries require large amounts of water for crude oil transport, supporting port facilities, and refining operations.\textsuperscript{206} Utilities are similarly anxious to obtain shoreline sites for nuclear power plants which require large quantities of water to dissipate waste heat. The fuel-related petrochemical industry in the United States has added another important contender for shoreline property.\textsuperscript{207}

Approximately 90 percent of U.S. crude consumption is domestically refined,\textsuperscript{208} amounting to about 12 million barrels per day (b/d) in 1969. Half again as much domestic refinery capacity is required if U.S. consumption is to reach the high estimate of 21 million b/d in 1980.\textsuperscript{209} While most of this increase in capacity will occur by expansion of existing facilities, grass root facilities will be increasingly important, primarily along the Gulf Coast but also along the East Coast, Puget Sound and on the Great Lakes. These new refineries will be increasingly larger, with capacities of from 100,000 to 160,000 b/d. With them will come equally large desulphurization plants to meet East Coast demands for low-sulphur residual,\textsuperscript{210} although not all such plants will be located in the United States,\textsuperscript{211} despite defense con-

\textsuperscript{205} See note 90 supra.
\textsuperscript{206} See The Oil Import Question, supra note 17, at 311-12.
\textsuperscript{207} An example is the Badische Analin and Soda Fabrik (BASF) plan for a dye and plastics plant in the tidal region near Hilton Head Island, South Carolina. The company requested an import license of 40,000 barrels per day of naptha to be used as the basic petrochemical feed stock. Like other domestic chemical companies BASF projected a rise in the cost of the alternative feed stock, domestic natural gas liquids, relative to the world price of naptha. See note 242 infra and accompanying text. See also The Oil Import Question, supra note 17, at 77.
\textsuperscript{208} See Oil & Gas J., Nov. 10, 1969, at 167.
\textsuperscript{209} Id.
\textsuperscript{210} Maine Clean Fuels, Inc. has an import license from the Oil Import Administration for a 100,000 barrel high sulphur fuel from Western Hemisphere sources to be located in South Portland, Maine. ENVIR. REP.—CURRENT, supra note 157, at 360.
\textsuperscript{211} Creole Petroleum plans a 100,000 barrel per day plant at Amuay, Venezuela to desulphurize two percent sulphur Venezuelan crude, [Oil & Gas J., Aug. 24, 1970, at 80-83] and Texaco, a 90,000 barrel per day desulphurization plant in Trinidad, also for the U.S. market. Texaco Press Release, July 1, 1970.
cerns that refining capacities not be exported.\textsuperscript{212}

Although the petroleum industry finds the use of shoreline property beneficial because it allows reductions in production and transportation costs, some of these costs are in fact being exported to society in the form of environmental degradation. Common environmental costs include water pollution\textsuperscript{213} by discharge of chemical wastes, heat, and, of course, oil; air pollution, principally sulphur dioxide, nitrogen oxides, and carbon monoxide; noise pollution; and many adverse aesthetic effects. Since society's interests are best served by taking all of these factors into consideration before allowing industrial use of coastal lands, it is appropriate that government exercise control over the decisions concerning siting of petroleum industry facilities.

\textbf{A. Federal Control}

Federal control over the location of petroleum complexes is diffuse, eclectic and often indirect. Still, there are at least five possible ways in which federal authorities can influence siting decisions: first, by control over applications for free trade zones; second, by control over oil import quotas; third, through the application of federal water pollution control legislation; fourth, by appropriate denial of permits under Corps of Engineers permit authority; and fifth, through application of federal air pollution control legislation.

1. \textit{Foreign Trade Zones Board}

Direct federal control over both refinery location and the port facilities on which they depend can be exercised by the Foreign Trade Zones Board. Under the Foreign Trade Zones Act\textsuperscript{214} manufacturing and processing areas may be established in the United States where raw materials are received duty free. The resulting free trade zone is treated like a foreign port for purposes of customs, and any resulting manufacturing must, on entry into U.S. customs territory, be taxed accordingly.\textsuperscript{215} The Foreign Trade Zones Board approves the establishment of such zones in the United States after receiving detailed plans and specifications from the applicant.\textsuperscript{216}

The importance of the free trade zone to petroleum and environmental interests was illustrated when, at the state legislature's

\textsuperscript{212} \textit{The Oil Import Question, supra} note 17, at 75.
\textsuperscript{213} With respect to water pollution, several refineries have been singled out for good practices that other industries might imitate. \textit{See} Hines, \textit{Controlling Industrial Water Pollution: Color the Problem Green}, 9 B.C. IND. & COM. L. REV. 553, n.71 (1969).
\textsuperscript{215} Id. § 81(c).
\textsuperscript{216} Id. § 81(f).
request,\textsuperscript{217} the Maine Port Authority, in August 1968, applied to the Board for permission to make Portland a free trade zone and the undeveloped harbor and region around Machiasport, a free trade sub-zone.\textsuperscript{218} The Occidental Petroleum Corporation had agreed to build a refinery—one of the country's largest—and the necessary docking and harboring facilities at Machiasport, on property leased from the Port Authority. Portland was already a large port appropriate for the general facilities required by a primary free trade zone. The attraction of Machiasport was the deep harbor, capable of handling tankers up to 300,000 dwt whose draft may nearly double that of tankers going into New York Harbor.\textsuperscript{219} A 1500-foot-long T jetty was proposed at Machiasport for supertankers and smaller vessels, as well as for pipeline facilities.\textsuperscript{220} Occidental planned to import 300,000 b/d of crude, of which 75,000 b/d would be low-sulphur residual oil—a blend of Venezuelan and Lybian—for high-priced New England fuel markets and to re-export 125,000 b/d for foreign and Defense Department use overseas.\textsuperscript{221} The remaining 100,000 b/d would require an import quota from the Oil Import Administration.\textsuperscript{222}

In this situation the federal government retained two controls over the construction of the port and refinery thereby controlling the development of Machiasport as a new industrial center. Under the National Environmental Policy Act of 1969\textsuperscript{223} both the Foreign Trade Zones Board and the Oil Import Administration must exercise their licensing authority in accordance with the environmental analyses and coordination established by the Act.\textsuperscript{224} When, as in the case of Machiasport, the state backs the plan, such federal environmental concern can be an important guarantee that the project's ecological costs are nationally desirable. This national role is assisted by congressional committee hearings, such as the one held by Senator Muskie's Air and Water Pollution Subcommittee at Machiasport,\textsuperscript{225} which solicit information and provide the agencies with a record of the technical and

\textsuperscript{217.} Ch. 178, [1963] ME. PRIVATE & SPECIAL LAWS.
\textsuperscript{218.} Application by the Maine Port Authority to the Secretary of Commerce for a grant of a primary Foreign Trade Zone at Portland, Maine and a Foreign Trade Sub-Zone at Machiasport, Maine, Aug. 20, 1968, on file with the Ecology Law Quarterly.
\textsuperscript{219.} Id.
\textsuperscript{220.} Id.
\textsuperscript{221.} A. Hammer, Chairman of the Board, Occidental Petroleum Corp., Let's Keep the Record Straight on Machiasport, Apr. 21, 1969, at 5-6.
\textsuperscript{222.} Id. at 6.
\textsuperscript{225.} Hearings Before the Subcomm. on Air and Water Pollution of the Senate Public Works Comm., 91st Cong., 2d Sess. (1970) [hereinafter cited as Machiasport Hearings] (held on Sept. 9-10).
environmental facts necessary to their response. Such information, while required under NEPA, is rarely gathered by government agencies.

2. **Oil Import Quotas**

Free trade zone applications are relatively rare, however, and Interior's authority to issue import quotas under its oil import regulations may provide especially useful environmental leverage. This potential was illustrated when the Stuart Petroleum Company sought to expand its oil terminal facilities at Piney Point, Maryland, on Chesapeake Bay. In June 1968 it applied to the Maryland Port Authority for a permit to establish a free trade zone and oil refinery at Piney Point. The Port Authority turned down the request after receiving strong objections to the project by the St. Mary's County Commissioners. Thereafter Stuart applied to Interior for a general allocation to import 100,000 b/d of residual fuel oil for desulphurization to serve the Washington area. The company proposed a desulphurization plant on the 265-acre tract where it already had oil storage facilities. This request was also energetically opposed by the county and by local and state conservation groups, which were primarily concerned about the proposed plant's adverse effects on tourism, recreation and the seafood industry. In response to a letter from Maryland's Senator Mathias, Secretary Hickel carefully alluded to the relevance of these effects to Interior's licensing role.

We have become keenly aware of the importance of site selection for installations of this sort in terms of overall impact on the environment. While this Department has no authority for land-use zoning, we are concerned that economic activities of this nature which are likely to have far-reaching effects on the environment receive broader consideration in terms of location as well as operation.

Not long after this letter was sent, Stuart Petroleum withdrew its application for residual imports.

3. **Federal Water Pollution Control Act Leverage**

Whatever its impact, and it appears to have been substantial, In-

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226. A subsequent economic study of the refinery's costs and benefits concluded that its advantages were trivial and its disadvantages were great due to its potential adverse effect on income from tourism and the seafood industry. See N. Dodge & J. Cumberland, Some Environmental Externalities in Regional Development: A Refinery Case Study, June 1969, at 6-8 (Working Paper Series, Bureau of Business and Economic Research, University of Maryland), on file with Ecology Law Quarterly.

227. *Id.* at 13-14.

228. 115 Cong. Rec. 32162 (1969) (letter from Secretary of the Interior Walter Hickel to Senator Charles Mathias, Jr., Oct. 15, 1969). The Secretary's authority to issue import licenses under Oil Import Regulations, section 16, was suspended at this time pending the review of the Cabinet Task Force.

229. *See id.* at 32161-62.
terior concern over the broad environmental effects of the Piney Point desulphurization plant would have been precluded had the import quota system been abandoned. Interior would, however, have had a continuing responsibility to examine potential water quality violations of the plant. Under the Federal Water Pollution Control Act, the Secretary of the Interior, whose powers under the Act have been transferred to the new Environmental Protection Agency, must call an abatement conference if he believes there is interstate pollution or substantial economic injury being done to shellfish resources. He may also issue notices of abatement within 6 months if he believes that interstate waters are being polluted in violation of state water quality standards.

These powers give the federal government the authority to issue strong warnings to the state of potential violations of the Federal Water Pollution Control Act, and federal intervention is possible, should a new refinery be built.

4. Permit Authority of the Corps of Engineers

The only remaining source of direct federal control is the Corps of Engineers. Permits from the Corps are required before any "refuse" may be dumped into U.S. navigable waters or their tributaries or before these waters can be obstructed, dredged, filled or excavated. The environmental breadth of Corps powers was recently vindicated by the Fifth Circuit Court of Appeals. The Corps' permit mechanism, requiring coordination with the Secretary of the Interior

230. See text accompanying notes 21-22 supra.
233. 33 U.S.C. § 466g(d)(1) (Supp. V, 1970), as amended Water Quality Improvement Act of 1970, Pub. L. No. 91-224, 84 Stat. 91 (to be codified as 33 U.S.C. § 1160(d)(1)). Interstate pollution is defined as pollution of waters, which is "endangering the health or welfare of persons in a State other than that in which the discharge or discharges . . . originate . . . ." Id.
234. Id. § 466g(c)(5).
238. Zabel v. Tabb, 430 F.2d 199 (5th Cir. 1970). The court upheld the authority of the Corps to refuse a dredge and fill permit on environmental grounds despite the fact that navigation would not have been impaired. A rousing decision by the Chief Judge.
and, in all but routine matters, the filing of an environmental statement by the District Engineer,\(^{240}\) provides the federal government with its most ubiquitous and effective control over the location of refineries and many other developments along U.S. navigable waters.\(^{241}\) Announced federal intentions to refuse permits can be effective in discouraging plant locations, as in the case of the Badische Analin and Soda Fabrik plant proposal in South Carolina.\(^{242}\)

Despite the intriguing breadth of the Corps' permit authority, the mechanism is hampered by administrative reluctance to provide funds and staff necessary for its aggressive implementation to protect broad environmental values. When it is not so used and where advance advertising is lacking, the Corps’ permit is more formal than real to those investing heavily in enterprises requiring permits. Its utility may be tested at Machiasport where Atlantic Richfield and World Port plan to construct port facilities and a refinery without requesting either new import quotas or a free trade sub-zone.\(^{243}\)

Section 21 (b) of the Water Quality Improvement Act of 1970\(^{244}\) has given new impetus to use and enforcement of the Corps' permit authority. It requires that any applicants for a federal license or permit, “which may result in any discharge into the navigable waters of the United States,”\(^{245}\) must provide the federal licensing or permitting agency with a certification from the applicable state or interstate water pollution agency that there is a reasonable assurance “that such activity will be conducted in a manner which will not violate applicable water quality standards.”\(^{246}\) The certification must come after a public hearing. If certification is refused, then no federal license or permit may be issued.\(^{247}\) Upon the state or interstate


\(^{242}\) See note 207 supra. In a letter to the Secretary of the Army, Secretary Hickel voiced strong opposition to the dredging and channelization required for the petrochemical complex in the South Carolina estuary until satisfied with environmental protection measures of BASF. Dept’ of Interior, News Release, Mar. 26, 1970.

\(^{243}\) Machiasport Hearings, supra note 225.

\(^{244}\) Pub. L. No. 91-224, § 21(b)(1) 84 Stat. 91 (to be codified as 33 U.S.C. § 1171(b)(1)).

\(^{245}\) Id.

\(^{246}\) Id.

\(^{247}\) Id.
agency's failure to act on application for a certificate within one year, a license or permit may be granted.\textsuperscript{248}

Unless Corps permits are rigorously required, especially under the Refuse Act, section 21(b) cannot be widely applied. But if such permits are required by the Corps, they must, at minimum, include provisions for the pollution controls or abatement schedules called for by the certificate. Thus Refuse Act permits, for example, and the renewal of such permits, could be employed to enforce water quality standards of the states, who, under section 21(b), could veto the issuance of Refuse Act permits.\textsuperscript{249} In addition, however, the federal government, by rigorously requiring applications for Refuse Act permits under section 21(b) procedures, would still retain authority to deny permits even if state certificates were issued. Furthermore, the federal government could seek criminal and injunctive remedies\textsuperscript{250} for permit violations occurring on those intrastate waters that are now virtually exempt from federal authority under the Federal Water Pollution Control Act.\textsuperscript{251} Such federal action, required under the terms of the Refuse Act, would necessarily rely on federal environmental policies dictated by NEPA,\textsuperscript{252} the Fish and Wildlife Coordination Act,\textsuperscript{253} and the Water Quality Improvement Act of 1970.\textsuperscript{254}

\textsuperscript{248} Id.

\textsuperscript{249} See Barry, supra note 235, at 1139.

\textsuperscript{250} 33 U.S.C. § 411 (1964). Injunctions are not expressly authorized by the statutes but may be deemed authorized by necessary implication. See United States v. Republic Steel Corp., 362 U.S. 482 (1960); Wyandotte Transportation Co. v. United States, 389 U.S. 191 (1967).

\textsuperscript{251} Although charged in 33 U.S.C. § 413 with the duty of vigorous prosecution of Corps permit violations, when presented with this new federal enforcement opportunity under § 21(b), the Department of Justice was less than enthusiastic. See full text of exchange of correspondence on this matter between Assistant Attorney General Shiro Kashiwa and the Conservation Foundation, \textit{Envir. Rep.---Current, supra} note 157, at 434-36.

It might be noted here that one potentially useful, if limited, federal remedy against the environmental effects of refineries and port facilities along the coast or elsewhere involves the authority of the Attorney General to bring public nuisance actions to protect federal property. A recent example of such action is \textit{United States v. Florida Power and Light} in which the federal government alleged the violation of the Refuse Act and a public nuisance, in the form of thermal pollution harmful to the waters of the Biscayne National Monument. 311 F. Supp. 1391 (S.D. Fla. 1970) (injunction denied). Similar public action might be brought to protect the integrity of national seashores or other federal property from oil or air pollution resulting from petroleum development and trade, and may offer possibilities of effective judicial remedy where no citizen action is likely to succeed.


\textsuperscript{253} 16 U.S.C. § 662(a) (1964).

A new source of federal control over the location of new refineries and other industrial plants is made possible under the National Air Quality Standards Act of 1970.\footnote{5} Section 111 of the Act directs the Administrator of the Environmental Protection Agency to publish 90 days after enactment a list of categories for all stationary sources, meaning "any building, structure, facility or installation which emits or may emit any air pollutant,"\footnote{6} if he believes that it "may contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare."\footnote{7} Within 120 days thereafter, the Administrator must propose federal standards of performance for any new sources that have been listed.\footnote{8} A new source is defined as any stationary source "the construction or modification of which is commenced after the publication of regulations (or, if earlier, proposed regulations) prescribing a standard of performance . . . ."\footnote{9}

The federal standards of performance are required to reflect "the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Ad-
ministrator determines has been adequately demonstrated.\textsuperscript{260} Within 90 days after proposed regulations, the Administrator shall promulgate the final standards, which may thus come as late as 300 days after enactment of the statute. Each state may implement these standards if their procedures are approved by the Administrator; otherwise he enforces them himself.\textsuperscript{261}

Existing stationary sources would be regulated under the Act by the states, in accordance with procedures prescribed by the Administrator, if they are not covered by air quality criteria issued by the Administrator under other parts of the Act and if standards of performance would apply if they were new sources.\textsuperscript{262}

Federal authority is somewhat greater if the stationary source emits what the Act calls a “hazardous air pollutant,” described as a pollutant for which no ambient air quality standard applies and which the Administrator believes “may cause, or contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.”\textsuperscript{263} Here, the Administrator must first publish a list of hazardous air pollutants for which emission standards will be established, then, 180 days thereafter, he must publish proposed emission standards for such pollutants, and 180 days after that and after notice of a public hearing, he must promulgate the final emission standards.\textsuperscript{264} After the effective date of these standards no new person may construct a new source or modify an existing source if the Administrator believes that it will violate standards of hazardous air pollutants. But there are certain exceptions: (a) No such standard will apply to existing sources until 90 days after its promulgation,\textsuperscript{265} (b) Existing sources may receive a waiver from the Administrator for up to two years if he finds that such time is needed to institute the necessary controls,\textsuperscript{266} and (c) The President may exempt any stationary source from compliance with hazardous air pollutant standards for up to two years, and for additional periods of two years if necessary, whenever “he finds that the technology to implement such standards is not available and the operation of such sources is required for reasons of national security.”\textsuperscript{267}

Unfortunately the National Air Quality Standards Act is somewhat less stringent with respect to federal regulations of station-

\begin{footnotesize}
\textsuperscript{260} Id. § 111(a)(1).
\textsuperscript{261} Id. § 111(c)(1).
\textsuperscript{262} Id. § 111(d)(1).
\textsuperscript{263} Id. § 112(a)(1).
\textsuperscript{264} Id. § 112(b)(1)(B).
\textsuperscript{265} Id. § 112(c)(1)(B)(i).
\textsuperscript{266} Id. § 112(c)(1)(B)(ii).
\textsuperscript{267} Id. § 112(c)(2).
\end{footnotesize}
ary sources than the original Senate-passed version.\textsuperscript{268} The exceptions noted above were added and standards are to be developed after taking cost into account rather than simply considering available technology.\textsuperscript{269} The Act also reduced, from the Senate version, federal control of state implementation of emission standards for new sources, and made more rigid the process of setting new standards whenever new technology made possible and new sources made necessary more rigorous control.\textsuperscript{270} Such flexibility is especially important when higher pollution levels result simply from greater numbers of pollution sources.

Oil refineries, whether new or expanded, will eventually fall within the new act. It is unclear at this point whether any will be regulated under the provisions for hazardous air pollutants. The impact of the new act clearly depends on the rigor of federal regulations and state implementation procedures.

B. A Model for State Regulation

A comprehensive state industrial site regulation now fills the federal planning vacuum. The State of Maine, while inviting the development at Machiasport, has taken unusual steps to protect its land, air and water, particularly along the coast, by adequate enforcement of statewide site planning. A ten-man Maine Environmental Improvement Commission appointed by the governor must approve land development that may "substantially affect the environment."\textsuperscript{271} "Development" includes commercial or industrial development "which occupies a land area in excess of 20 acres, or which contemplates drilling for or excavating natural resources . . . or which occupies on a single parcel a structure or structures in excess of a ground area of 60,000 square feet."\textsuperscript{272} Criteria considered by the Commission in-


\textsuperscript{269} The Senate bill required that federal emission standards for new sources "reflect the greatest degree of emission control which the Secretary determines to be achievable through application of the latest available control technology." S. 4358, 91st Cong., 2d Sess. § 113 (1970); \textit{Air Quality Report}, at 91.

\textsuperscript{270} The Act omits the specific procedures in the Senate bill by which emission standards for new sources are to be effected. The Senate version required federal regulations for the issuance of state certificates of compliance with the emission standards, including preconstruction review of location and design, and performance tests soon after construction. \textit{Air Quality Report}, at 92. The Senate had also required that any new source not violate national ambient air quality standards in the course of operations even if abiding by the terms of its original certification; new performance standards could still be imposed as the demands on the air increased.


\textsuperscript{272} \textit{Id.} § 482.
clude whether "[t]he proposed development has made adequate provision for fitting itself harmoniously into the existing natural environment and will not adversely affect existing uses, scenic character, natural resources or property values in the municipality or in adjoining municipalities." 278

Oil operations in the state receive special attention from the Environmental Improvement Commission. An oil terminal facility, broadly defined by the Act, 274 must be specially licensed by and in accordance with regulations of the commission, with daily violations subject to fines from $100 to $5,000. 275 The commission is armed with a revolving fund of up to $4 million 276 to cover administrative expenses, third-party damages from oil pollution and pollution cleanup costs. Fees must be paid into this fund by licensees on the basis of "1/2 cent per barrel of oil, petroleum products or their by-products transferred by the applicant during the licensing period . . ." 277 with reductions to cover simply administrative and research costs when the fund reaches $4 million.

Since the beginning of its operation in May 1970, the commission has been under attack from petroleum interests alarmed at its authority. Ten major oil companies are challenging the constitutionality of the license tax on terminal facilities 278 and King Resources is disputing the commission's right to deny a permit to build a transshipment pier and oil storage facilities in Casco Bay in Portland Harbor. 279

The state land use regulations are a vital test of a new planning scheme. The cases brought against the state are a mark of the ex-

273. Id. § 484.

274. "Oil terminal facility means any facility of any kind and related appurtenances, located in, on or under the surface of any land or water, including submerged lands, which is used or capable of being used for the purpose of transferring, processing or refining oil, petroleum products and their by-products or for the purpose of storing the same, but does not include any facility used or capable of being used to store no more than 500 barrels, nor any facility not engaged in the transfer of oil, petroleum products or their by-products to or from tidal waters of the State. A vessel shall be considered an oil terminal facility only in the event of a ship to ship transfer of oil, petroleum products and their by-products, and only that vessel going to or coming from the place of transfer and the oil terminal facility.

275. Id. § 550.

276. Id. § 551.

277. Id.


tent to which oil companies are unwilling to accept the plan for fear of imitation elsewhere. No amount of hiding behind police power, commerce power and other constitutional arguments should obscure the policy decision behind the contest of oil interests with the state; the state regulations threaten the traditional prerogatives of the industry and fly in the face of the precept that industry, unregulated, looks after the public interest. The decision to challenge the state buttresses the simple point that industry, guided by the profit motive, cannot be the arbiter of social welfare.

CONCLUSION

A. Recommendations

From drilling to ultimate consumption, the pervasive environmental effects of oil have been reflected but marginally in its marketplace and by federal policies. Massive oil spills marked the first change in this tradition, and popular demand for clean fuel and air may provide the next. In the face of attempts at backlash, such as the National Petroleum Council's proposition that sulphur oxide standards be waived to ease low-sulphur residual and natural gas demand, the daily reminders of pollution are the conservationists' best defense. The most frequent of these reminders is automobile air pollution resulting from high consumption of gasoline which is the end product of much of the U.S. crude oil consumption. We can expect periodic large spills to highlight other costs. Inevitably, the public will become increasingly aware of the ecological consequences of spiraling oil use.

Offshore production, larger tankers, terminals and refineries are heavily subsidized but hardly controlled by the public. The oil import quota and depletion allowances have become policy fixtures. Otherwise direct federal regulation of the oil industry exists only over interstate gas sales, and the Federal Power Commission with its limited jurisdiction is charged with regulating, not controlling, but one part of a monstrous, integrated, international industry. Neither the FPC nor the Interior Department, responsible for leasing and regulating oil and gas in the outer continental shelf and public lands, has complete information from, or informational resources equal to those of the industry it—in effect—serves.

The enterprise of the oil industry is checked by the federal government only after a problem develops. Federal regulation of spills, tankers, offshore platforms and port and refinery construction are after the fact—after investment and after social choices have been made for us in terms of what the industry and government believe to be the public interests.

Such traditional regulation is changing. The theory behind the National Environmental Policy Act (NEPA) is to assess each major increment of federal action for its total environmental impact before the fact—to buy more time before the federal government promotes further environmental change.

The environmental assessment required by NEPA must take place within the program agency, among other federal and state agencies, and by the Council on Environmental Quality. Furthermore, there must be opportunity for public analysis. Were the Department of the Interior, the FPC, the Corps, the new Environmental Protection Agency and the Foreign Trade Zones Board to use these provisions to formulate environmentally sound policy, the effect on the oil industry could be considerable. But improved procedures will be developed only if the Council employs broader supervisory powers over the Act than it currently has. It has taken the position that under section 102 of the Act it has authority neither to require a particular environmental impact statement from the federal agencies nor to veto one for inadequacy. Yet a strong case can be made that under Title II of NEPA, the Council has sufficient authority to do so. Of course a strong Council will require a far larger staff and budget.

An even greater force for such change, and for implementation of the NEPA, is citizen litigation by private parties. This need was illustrated when Interior filed the dissembling, masterfully superficial environmental statement on the Alaska pipeline proposals. This

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281. Section 204 of the Act states:

it is the duty and function of the Council . . . (2) to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in Title I of this Act, and to comply and submit to the President studies relating to such conditions and trends; (3) to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in Title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;


282. Throughout the first half of fiscal year 1971, the Council operated without a budget, since the Council funds were a part of the vetoed HEW appropriations bill. (The administration had asked for $1.5 million for the Council as opposed to the $1 million in the bill.) The Council has operated solely on month-to-month continuing resolution funds and has been compelled to examine incoming environmental impact statements, of which there were 300 in draft and final forms by November 27, 1970. These are reviewed by a Council staff of 10.

283. The Trans Alaska Pipeline System (TAPS), a consortium of oil and pipeline companies, applied to Interior for permission to construct an 800 mile, 48-inch oil pipeline, and a shorter haul road requiring 12 million cubic yards of gravel from public land across federal land in Alaska. After issuing environmental stipulations for pipeline con-
abuse was promptly checked by litigation—a policing action in defense of procedures and values that the public, if not the federal agencies, is learning to appreciate. Citizen action in the energy field is a new experience for many industries and agencies. It is especially necessary in this time of environmental rhetoric when government may simply dress its oil policies in ecological garb.

But neither the NEPA nor its private enforcement will remove the reluctance of the oil industry to consider the most basic long-range ecological costs. The problem is emphasized by the administration's attempt to remove lead from gasoline by imposing a tax on leaded gasoline. The theory, as stated by former Treasury Secretary Kennedy, was that since removal of lead would require higher concentrations of more expensive blending of gasoline components "there is at present a clear economic disincentive to remove the lead additives from gasoline." The lead tax would simply remove the disincentive.

Industry objections were severe and the scheme was bound to fail. In a modest way, failure of the administration proposal emphasizes the apparent impotence of the government to protect the environment from abuse by oil interests. The industry talks in terms of increased subsidies for the necessarily sizeable investments in offshore and synthetic oil development, deemed necessary to ease the pressure

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284. Wilderness Society, Inc. v. Hickel, — F. Supp. — (D.D.C., 1970); 1 ELI ENVIRONMENTAL LAW REP. 20042 (1971). The District Court issued a preliminary injunction restraining Interior from issuing road or gravel permits or any section of the pipeline without giving plaintiffs 14 days notice and opportunity to challenge the permit.

285. An example is the administration's proposal to terminate 20 oil and gas leases in the Santa Barbara Channel in return for revenue from the Elk Hills Naval Petroleum Reserve in California. In this case legislation was necessary (S. 4017) and in endorsing it President Nixon declared, "This proposal for Santa Barbara illustrates our strong commitment to use offshore lands in a balanced and responsible manner. It recognizes the earlier decision made by the people of California to set aside a part of their coastline as a sanctuary, and it extends the protected area across the Channel to Santa Cruz Island." The White House, Press Release, June 11, 1970. The leases to be terminated are located outside the oil-rich Rincon Trend that underlies the infamous Union Oil Lease and are not productive. See Baldwin, supra note 94; see also Yerkes, Wagner, & Yenne, Petroleum Development in the Region of the Santa Barbara Channel, Geology, Petroleum Development and Seismicity of the Santa Barbara Channel Region, California, Geological Survey Professional Paper 679, 1963, at 21, and accompanying map; BUSINESS WEEK, June 20, 1970, at 34. Unproductive leases lapse after five years. 43 U.S.C. § 1337(b) (1964).

286. ENVIR. REP.—CURRENT, supra note 157, at 402.
of the fuel "crisis," and consequently there is reluctance to remove the disincentives for more residual production, or the incentives for more gasoline consumption. Government, faced with the fuel "crisis," relies on the performance of the protected, supported market mechanism that brought us into the consumption spiral and the fuel "crisis" itself. The same mechanism is hardly capable of getting us out.

In addition to those called for by the NEPA, there are several immediate steps available to the government to make the oil industry move in the environment's favor. First, the Bureau of Land Management should require that a certain amount of residual oil be produced from outer shelf crude rather than refined into gasoline, the royalty rates to be adjusted accordingly. The action would be consistent with the theory that new regulation of the petroleum industry is necessary for environmental reasons often in conflict with the market constraints and traditional management prerogatives of the petroleum industry. Second, the leasing of oil beneath public lands and the outer continental shelf should be tied to compliance with applicable state air and water quality standards, and land use regulations of state and local governments. Third, a more direct federal tool, the federal purchasing power, can provide a potent means of insuring that certain environmental criteria are met before entering into any bulk purchases of oil or gas. The National Air Quality Standards Act of 1970 endorses this concept by providing that any person or corporation convicted of violation of the Act is ineligible for federal contracts for work done in the polluting facility. Finally, we must construct and upgrade oil and water receptor facilities for tankers and other ships at U.S. oil terminals. A new survey of existing domestic receptors was completed in mid-1970 by the Coast Guard, but, unfortunately, despite the Coast Guard's expertise and port enforcement duties, the evaluation and supervision of new receptor requirements was transferred by the President to the Commerce Department.

These policies are likely to counteract some disincentives in the oil industry, but they will not arrest the incremental environmental costs of increased consumption and production of oil "planned" for the next

287. This tie-in concept is found in the Resource Recovery Act of 1970, Pub. L. No. 91-512, 84 Stat. 1227. Under Section 211, federal agencies must now ensure that contractees for the operation of any federal property or facility who are involved in solid waste disposal activities must comply with federal guidelines for solid waste recovery, collection, separation and disposal systems.


289. See ENVIR. REP.—CURRENT, supra note 157, at 75, on the proposals sent by the President to Congress on Oil Pollution, May 20, 1970.
few decades. To accomplish that it is necessary under present circum-
stances to stop government attempts to attain what the FPC Chairman
described as "the national goal of dynamic energy growth in an ex-
panding economy . . . ."\textsuperscript{290}

The restraint required would mean revolutionary changes in atti-
tudes of the oil industry. When the American Petroleum Institute
(API) endorsed the concept of a National Energy Commission to co-
ordinate governmental energy policies and relate them to other public
goals, it emphasized the need for "continuity and stability of pol-
icy."

\textsuperscript{291} It accurately noted that "to function effectively we must
know under what rules we will be expected to operate."\textsuperscript{292} But
the most basic rules that API prefers are curiously open-ended. "This
country," it said, "has developed a seemingly insatiable appetite for
energy. We are confident that the demand can be supplied, pro-
vided that the energy industries are able to make sound long-range
plans."\textsuperscript{293}

The clear and the uncertain ecological effects of present and pro-
jected oil demands amply justify new rules and new long-range plans
for stability in world petroleum use. So too does the sensed erosion of
aesthetic and cultural values for the sake of the higher gross consump-
tion on which petroleum expansion plans depend. Many oil men, in
quiet moments, knowing that future petroleum and natural gas use
cannot continue to rise without higher environmental costs, recognize
the logic of efforts to curb the trend. But these are individual feelings
not easily reflected in the collective corporate world. It is apparent
that only federal pressure and modified consumer preferences will force
a shift in the plans of petroleum companies.

At the consumer level, we can reduce our need for highly re-
fined gasoline and jet fuel by changing or eliminating the consuming
products. Radical alteration of automobile engine design, for exam-
ple, can be accomplished within this decade.\textsuperscript{294} We might also
eliminate the SST, whose annul tonnage demands for crude oil pro-
duction and refining by 1980 have been estimated in the millions.\textsuperscript{295}

\textsuperscript{290} J. Nassikas, \textit{supra} note 45, at 27.
\textsuperscript{291} Letter from Frank N. Ikard, President, American Petroleum Institute, to Sen-
ator Frank E. Moss, Sept. 14, 1970, on file with the \textit{Ecology Law Quarterly}.
\textsuperscript{292} \textit{Id}.
\textsuperscript{293} \textit{Id}.
\textsuperscript{294} "And why must oil companies promote more travel by auto just to burn up
more gasoline? Aren't the streets and highways jammed enough now? Won't increased
travel negate much of the gains from pollution controls on fuels and autos?" \textit{Editorial},
\textsuperscript{295} It has been estimated that the fleet of 380 Super Sonic Transports planned for
1980 would require 46 million tons (1 million b/d) of kerosene each year demanding
the annual refining of 322 million tons (6.4 million b/d) of crude oil. The London
Other items, such as the rash of new off-road vehicles\textsuperscript{296} also will consume increasing quantities of refined fuels. All of these items should be assessed in terms of their impact on oil consumption as well as any other social costs. Meanwhile, the recycling of oil products is another necessary but largely neglected possibility that can ease crude oil production needs while reducing water pollution.\textsuperscript{297}

The feeding of growing energy wants is no longer the single goal of oil companies; the need for pollution abatement has added another. Industry must now employ existing fuels, or develop new energy sources,\textsuperscript{298} within ever stronger environmental strictures that, with federal planning, will promote competition\textsuperscript{299} and the kind of stability and sense of direction that investors can appreciate in advance.

\textbf{B. The World Perspective}

Although environmental abuses from oil use are worldwide, the United States is in the fortunate position of having the most ubiquitous control over oil production and trade. But although it is the ma-

\begin{itemize}
\item Observer, Aug. 30, 1970. It has been pointed out that from this same crude would come 3.2 million b/d of gasoline and several million b/d of light and heavy fuel oil so that total SST consumption would amount to one percent of the expected world oil demand by 1980, or two percent by 1985. \textit{See} Fiction and Fact, \textit{Oil & Gas J.}, Nov. 16, 1970.
\item \textsuperscript{296} See M. Baldwin, The Off-Road Vehicle and Environmental Quality, 1970.
\item \textsuperscript{297} There has been little investigation of the disposal practices by gasoline stations of their used oil products. Most of this waste oil is currently sent through the sewer system, whereas a decade ago much of it was recycled. A few companies still buy such waste oil for resale and refining. Ironically, one of the few such companies in the east, which buys up and resells waste oil, Berks Associates, was the cause of a massive oil spill in the Schuylkill River—thousands of gallons of waste oil from a holding lagoon polluted the river and caused a massive fish kill. \textit{N.Y. Times}, Nov. 15, 1970, at 59, col. 1.
\item \textsuperscript{298} There are, of course, new energy schemes presently considered. They range from the magneto hydrodynamics (MHD) device and the fuel cell designed to use existing fuels more efficiently, to the breeder reactor which has its own possible environmental problems, to controlled fusion and solar power. For analysis of and a proposal to develop solar energy see P. Glaser, Beyond Nuclear Power—The Large-Scale Use of Solar Energy, 1970 (Transactions of the New York Academy of Sciences), on file with the Ecology Law Quarterly. The first of these is years away and the last far from certain. Lessing, \textit{New Ways to More Power With Less Pollution}, \textit{FORTUNE}, Nov. 1970, at 78. Large scale research in ecologically attractive energy sources, possibly funded by private energy taxes, is needed. \textit{See} Statement by S.D. Freeman, \textit{The People's Stake in the New Technology}, presented at the 12th Annual Meeting, Mid-West Electric Consumers Assoc., Denver, Colo., Dec. 9, 1969, on file with the Ecology Law Quarterly.
\item \textsuperscript{299} Of the top 25 oil companies, 18 “have uranium investments and 11 hold coal interests. Petroleum companies reportedly control 23 percent of coal production and at least 14 percent of uranium output.” \textit{Oil & Gas J.}, Sept. 28, 1970, at 27. Vigorous antitrust action against such industries will stimulate competition for the growing clean fuels market, more attempted environmental solutions and far less coordinated and powerful political pressures and lobbying against effective legislation.
\end{itemize}
jor national market for the world's oil and so many tankers and refineries everywhere are strongly tied to its interests, the United States has not been aggressive in controlling the global environmental abuses of its own oil companies.

Despite the frequent "flags of convenience" registry of tankers used or owned by U.S. oil companies, the United States might require rigorous pollution control practices, such as load-on-top procedures, by any tanker using U.S. ports. Already such tankers must receive certificates of financial responsibility for pollution cleanup from the Federal Maritime Commission before they can operate in U.S. waters. Moreover, trade restrictions can be instituted to affect the operations of oil companies importing oil into the United States. For example, since we know little about foreign environmental protection regulations for offshore oil production or oil refining, each company importing oil into the United States might be required to disclose publicly the environmental regulations and practices under which it operates abroad. Such information would be a first step toward requiring compliance with minimum environmental standards for oil production and refining abroad before the oil products are imported into the United States. Because of enforcement difficulties, a corresponding effort would be required via domestic or international foreign assistance programs to see that other nations upgrade their environmental standards. These possibilities for obtaining immediate environmental action affecting the world community are perhaps more promising than current prospects for reaching agreement through public international treaties. Surely this is meat for thorough study and another law review article.

Yet the need for an international environmental guardian, forcefully expressed by George Kennan in *To Prevent a World Wasteland*, is nowhere more apparent than in the field of oil. The inability of national governments to deal with the abuses of "flags of convenience," the lack of international standards for offshore drilling, the inadequate monitoring of oil pollution around the world, the total lack of international enforcement capabilities, and the inherent conflict between development aspirations and conservation in most international agencies dictate the need for a new international instrument. Conservation in the high seas should not, Kennan suggests, be simply built into existing international agencies.

This is an area in which exploitive motives cannot usefully be mingled with conservational ones. What is needed here is a watchdog; and the conscience and sense of duty of the watchdog must not be con-

fused by contrary duties and undertakings. It may be boldly as-
serted that of the two purposes in question, conservation should come
first. The principle should be that one exploits what a careful regard
for the needs of conservation leaves to be exploited, not that one
conserves what a liberal indulgence of the impulse to development
leaves to be conserved.302

To create such an International Environmental Agency, Kennan con-
cludes that “the interest and initiative will have to proceed from a rela-
tively small group of governments; and logic suggests that these
should be those of the leading industrial and maritime nations.”303

Protection of the oceans and development of energy alternatives
should be immediate international objectives. The United States has
a superb opportunity to develop the Kennan proposal around that re-
source. As if he had read the Kennan proposal, Secretary of
Transportation Volpe appealed to the NATO nations, which control
three fourths of the world's tanker tonnage and receive 70 percent
of the world's annual oil production, to halt all international oil dis-
charge into the oceans by 1975.304 The suggested measure, while
extremely limited, is intriguing because of the role that NATO might
play in developing the Kennan proposal.

The larger international mandate with respect to oil and the en-
vIRONMENT is to devise a world instrument for enforcement, monitoring,
standard setting and research. Plans of the United States for such
an entity should now be devised and vigorously presented at the
United Nations Conference on Man and the Environment to be held in
Sweden in 1972. We shall be well on our way toward wasting the
decade and discouraging hopes thereafter if this opportunity is missed.

To control our future environment effectively, and we need speak
only in terms of the next few generations, the public must first know
more about the oil industry and the social, economic and environ-
mental alternatives to our present dependence on its product. Op-
tions exist for radical domestic and international policy changes, but
lack of perspective inhibits their employment. Lawyers, newly
aware of their public obligation, must work with scientists and econo-
mists on the various pieces of the petroleum environmental puzzle with
an eye toward the goals of social and ecological balance and diversity.
Rather than waiting to respond, lawyers might anticipate the probable
rapid change in the public's understanding of the ecological costs of oil
and the public's will to eliminate them.

302. Id. at 408.
303. Id. at 410.
304. Speech by Secretary of Transportation Volpe before the Oil Spills Conference
Committee on the Challenges of Modern Society, Nov. 2, 1970, on file with the Ecology
Law Quarterly.