OIL IN WASHINGTON WATERS:
BOON OR BANE?

Edited by

James W. Scott

Donald K. Alper

&

Manfred C. Vernon

Occasional Paper #11

Center for Pacific Northwest Studies

Western Washington University

1978

OIL IN WASHINGTON WATERS:

BOON OR BANE?

edited by

James W. Scott

Donald K. Alper

&

Manfred C. Vernon

Occasional Paper #11

Center for Pacific Northwest Studies

Western Washington University

1978

PREFACE

A great deal has happened concerning the topic of OIL IN WASHINGTON WATERS since the three conferences, on which the present publication is based, took place in Bellingham and Port Angeles in April and in Tacoma in May 1977. Yet it is no exaggeration to say that the discussions and comments made then and contained herein retain a topicality that is disconcerting, and an importance to the state that is still critical.

Oil has begun to flow south on a regular basis from the Alyeska Pipeline at Valdez, and to date no final decision has been made on the question of a Washington transshipment terminal, albeit the recent and much-discussed "sleight-of-hand" of Senator Warren G. Magnuson in the Congress has resulted, for the time being at least, in the banning of any such facility within the interior waters of Puget Sound and the Strait of Georgia. Consequently, Port Angeles remains the most likely site, although public sentiment appears to be hardening against the locating of any oil transshipment terminal there, or anywhere else in the state.

The three conferences, held in three different locales, had much the same format and each addressed many, if not all, of the major issues in question. Most participants, including many of the main speakers, discussants and chairmen of sessions, attended only one of the conferences, but a small group of them, including Murray Morgan, Captain Malm of the United States Coast Guard Service, William Ross of the University of Victoria, and Mrs. Norma Turner of No Oil Port, Inc., Port Angeles, became a small band of "regulars," who came to know one another well by the time we left Tacoma. For the organizers of the conferences, the problems were many but the fine contributions and the thoughtful suggestions of various of the participants made this "road show" venture a constant pleasure rather than a long-drawn out, wearisome chore.

Included in the volume are the speeches delivered by the principal speakers at the three conferences, and a selection of shortened, edited comments taken from the transcripts of the audio tapes. Unfortunately, because of the

poor quality of those recorded in Tacoma, it has not been possible to include any made at the University of Puget Sound.

For many readers the commentaries delivered at each of the conferences by Murray Morgan, prize-winning historian and Pacific Northwest author extra-ordinaire, will provide an excellent introduction to both conference and controversy. These are printed in their entirety near the end of the volume.

Preparing such a publication has entailed my calling on the help of many persons. I am particularly indebted to the following:

-- to Dr. Manfred Vernon, Conference Director, and Dr. Don Alper of the Political Science Department and member of the Organizing Committee, who aided me in the editing of some of the transcripts.

-- to Mrs. Jane Clark, Director of the Bureau for Faculty Research, and her ever-helpful assistants, Geri Walker and Pam Hamilton, for most of the problem-solving.

-- to Florence Preder of the Center for Higher Education who typed various drafts and the final version of the manuscript.

-- to Dr. Werner Quast of Peninsula College, who joined the Organizing Committee at the start and who added such verve and enthusiasm throughout.

-- to Dr. Phyllis Bultmann, Research Associate, Department of History and member of the Organizing Committee, for the Official Report of the conference.

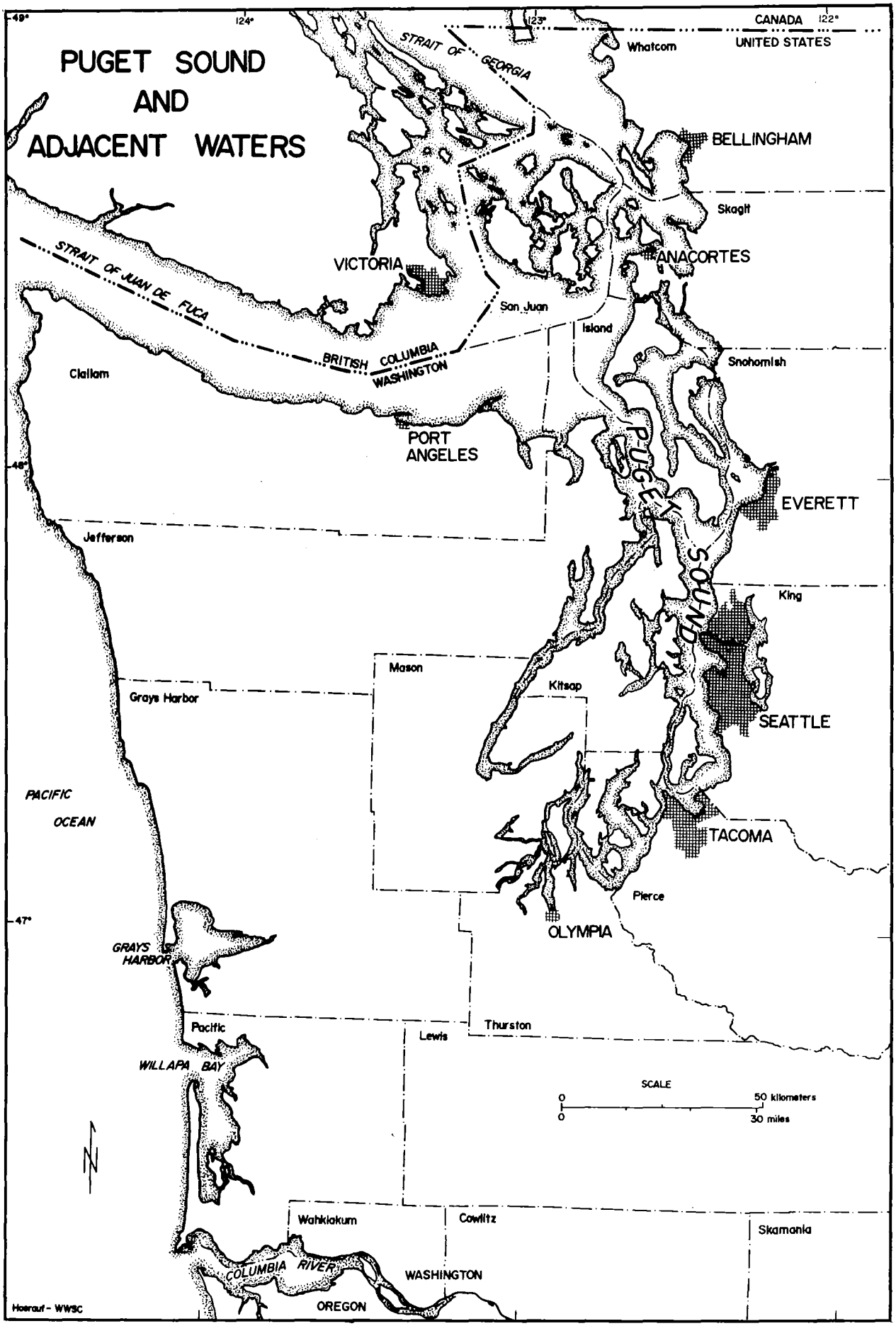
-- to Dr. Robert Monahan, Director of the Center for Canadian American Studies, and Dan Turbeville, former Map Curator, Department of Geography and Regional Planning, for help whenever it was needed most.

-- to the many persons, including mayors, university presidents, county commissioners, deans and the department chairmen, who cheerfully joined us as chairmen of sessions and discussion leaders.

-- and especially to the Washington Commission for the Humanities, which with its matching grant--the third awarded to us in three years--made possible the series of conferences and the subsequent publication of the proceedings.

James W. Scott,
Co-Director of the conferences
&
Director, Center for Pacific Northwest Studies

TABLE OF CONTENTS


PUGET SOUND
AND
ADJACENT WATERS
49°
124°
123°
122°
CANADA
UNITED STATES
Whatcom
STRAIT OF GEORGIA
BELLINGHAM
Skagit
ANACORTES
VICTORIA
STRAIT OF JUAN DE FUCA
San Juan
Island
BRITISH COLUMBIA
WASHINGTON
Snohomish
Clallam
PORT
ANGELES
PUGET SOUND
EVERETT
48°
Jefferson
King
Mason
Kitsap
Grays Harbor
SEATTLE
PACIFIC
OCEAN
TACOMA
Pierce
47°
OLYMPIA
GRAYS
HARBOR
Pacific
Thurston
Lewis
WILLAPA BAY
SCALE
0
50 kilometers
0
30 miles
N
Wahkiakum
Cowlitz
Skamania
COLUMBIA RIVER
WASHINGTON
OREGON
Hoerauf - WWSC

I. THE CONFERENCE OUTLINED

Manfred C. Vernon

We are approaching this conference and in local meetings with concern, enthusiasm, and human involvement, because the plans that we have developed, while being ambitious, should be approached with an attitude of fairness and detachment. Thus it should make possible the free exchange of thoughts. I thank you for coming to join us and listen to things which we would like to listen to ourselves. We feel that we are not only organizers, but that we are also public and audience. We are eager to hear from the many experts who have been so kind as to accept our invitation to speak and engage in panel discussions. But before doing so I would like to thank particularly the representatives of the media who have made it, I think, a special task not only to announce the meeting, but to comment on the content of the meeting, and while I should mention all of them--radio, newspaper and television--both here and in Canada, I must not omit the name at least of the Bellingham Herald which has been most generous, most considerate and thoughtful in helping us make this conference known to so many.

Modern man has become increasingly involved in finding ways and means to improve his own life and lifestyle. Our steadily improving standard of living seems to demand that everything is done to quickly produce what we desire. Thus we ask to move fast and, besides, to have all this happen as a matter of fact and to be taken for granted. The need for energy is obvious, but it has been a startling discovery for the average person that there is a limit to most of our energy resources. Indeed, there is a plenitude of statistics, reports and thoughts that some of our energy resources are rapidly depleting and disappearing. For instance, regardless of some recent statements coming from United Nations quarters, it certainly seems doubtful that those following us in time--in all probability within the next two generations--will not have a chance to rely on oil for transportation or heating. Yet in the meantime while oil is still with us, and we continue to ask for more and more of it, challenges of an economic, political or ecological nature occur that make many of us wonder how much of a blessing oil really is. We need not go into unnecessary details but, to begin with, we are all aware that the use of oil entails a number of significant problems which can bring about

social, economic, political, and ecological upheaval, contribute to divisiveness in our society, and pose a deep seated concern for our future. We talk about oil supertankers, we wonder about oil terminals, refineries, and petrochemical industrial activities. The words "oil spill" bring back memories of the "Torrey Canyon," of Santa Barbara, and more recent occurrences in the Atlantic Ocean and the North Sea. A short time ago we were witnesses of a number of oil tanker accidents on the high seas and in our off-shore waters. Society has become divided into antagonistic camps while dealing with such questions as "Should we continue with the indiscriminate use of oil?" "Should we have better tankers, or better mooring facilities?" "How should we deal with oil spills?" And what about oil terminals and the question of transshipment of oil to places far away from us through pipelines?

This conference, made possible by a matching grant from the Washington Commission for the Humanities, hopes to do justice to the time-honored approach of presenting--different though they may be--all viewpoints. This should help us to ponder what we should do, and what we would like our political and economic leaders to do. Are we interested in ending the flow of oil, period? Or do we believe we should take all the oil we can get--though preferably under totally safe conditions, through secure tankers, with properly trained crews, in well-handled terminals, and with those responsible ever on the alert lest spills might occur? Would we like to see the oil delivered to ports close to us, or preferably far away from us? Indeed, should it be Cherry Point or Port Angeles or, for better or worse, even further away, perhaps California? There is also the question of our Canadian neighbor, the Canadian oil that is to be denied us in the near future, and Canada's and our own reaction to the flow of Alaskan oil, beginning this summer, through Washington and Canadian waters.

We feel very strongly that this conference would be a meeting ground for persons of many and differing interests and views, so that participants and audience will provide a marketplace of ideas to formulate individual thoughts, but also that you, our audience, will let us know how you feel, how you react, and what you feel should be done. Yet another thought should be entered, one that is easily disregarded if it is noted at all. Is it not ture that "we, the people" demand the good life, a very materially good life, and therefore to have the technical conveniences, the gadgets, the machines for attainment

of this. The oil that many detest and fight is coming our way to satisfy our demands and our dreams of the so-called good life, as well as to maintain the machinery to protect these demands and dreams. So we asked for all this, regardless of cost or technical complications. As long as we want to, or feel the need to step in the car, and on the accelerator, and as long as we love the overly warm house, there will actually be little change in our demand for the limitless continuation of our life style. There is no doubt that all of us together, in search of these comforts, continue to ask for more oil and thus, perhaps, invite danger or disaster. We must anticipate that oil will be spilled in ocean, bay or river and affect marine resources so essential for food and perhaps survival. The presentations that will be made in Bellingham, Port Angeles and Tacoma should give us enough stimulation for pondering the question of oil in Washington waters and whether it is truly a matter of boon or bane.

II. IDENTIFYING THE ISSUES

1. Robert C. Clark, Jr.
National Marine Fisheries Service

This discussion of the basic issues of oil in Pacific Northwest waters concerns the impact on biological resources if petroleum is released into the environment. When petroleum is transported and used, a finite amount is lost. When major oil spills occur, scientists have always found some biological damage. However, it is difficult at the present time to be able to predict future damage, except in a few specific cited cases, or to always adequately establish damage assessment after an oil spill, on a per dollar basis. We have, however, been acquiring more and more information every day on the interaction of oil on the marine biota, although this acquisition of data has resulted in an accompanying appreciation for the complexities of the problem and for our degree of ignorance about the subtleties of petroleum's impact on marine systems.

Whenever we talk about marine transportation of petroleum in Pacific Northwest waters, and we talk about the problem of oil spills, generally we have in view what we have seen on television or in the press: dramatic oil spills. Perhaps in reality we should be more concerned about the less emotional but potentially more threatening damage from the long-term, low-level type pollution, the drip here, the cup there, the gallon or barrel somewhere else. This goes for other toxicants as well as oil--something, incidentally, that we should consider in order to put this matter in perspective. You have in your folders a resource paper on some of the possible problems of oil transportation in the Northeast Pacific.

The National Academy of Sciences in 1973 held a major workshop to try and provide an overview of the petroleum problem on a global scale. They prepared a table of sources, using 1973 data, of petroleum entering the marine environment on a global basis. More than 54% of the input of petroleum to the marine environment came from land-base sources, run-off spills on land which eventually worked into the water courses. The marine sources, including tanker operations, contributed something like 18% and were largely from tank washings, not spills. Bilge discharges were of the order of 8% and this was from any type of vessel, not necessarily tankers. Off-shore production

amounted to only a small percentage of the discharge and accidents came to about 9%. These are the major spills that we hear about, and about 10% of them may be due to natural causes. The conclusion of all this is that about 90% of the discharge of petroleum into the marine environment is somehow caused or influenced by man. However the major spills that we take note of are only a small portion of the total.

Unfortunately most of the spills that we are aware of occurred in the nearshore coastal margins of the continent and these are also the same regions where we have the principal areas of high productivity of marine resources--major fishing grounds, fish nursery areas, etc. The coastal margins also hold large concentrations of people and are major areas of pollution. Some areas have a limited threshhold for recovery from stress placed on them. An area, for instance, might survive with a theoretical oil spill every five years but might not survive if it has a continuous stress on it from day-to-day, low level pollution. In addition, these nearshore areas are stressed by other activities in addition to what we are talking about here today, as an example, the salmon resource. Salmon are stressed also by the removal of natural rivers by dams, by canalization, by dredging, by thermal pollution, and by pesticides, to which we may add oil. No one by itself might be the threshhold for environmental recovery, but combined certain areas' capabilities for recovery may be exceeded.

One of the other things that I think we might consider here is the possibility for the loss of an entire tanker becoming a major source of oil spills. This is probably not as great in Puget Sound as in more exposed areas, so that it is difficult to make generalizations in comparing spill studies elsewhere to Puget Sound. As an example, we could not compare the "Torrey Canyon," nor the "Argo Merchant" to the conditions that we might expect to find in Puget Sound. This is one of the essential facts, that each spill is unique. Each past spill has been unique and in the future they will continue to be. The results, we find, are applicable only for that one time and that one place. This is due to the function of a number of variables which determine the impact of a single spill. Among these are the chemical composition and physical characteristics of the petroleum involved; how much is spilled and for how long; whether it is crude oil that has greater short-term toxicity than some others; whether it is a very viscous material to the point

that when it enters the water, it tends to solidify somewhat; what season it is; whether in specific spawning seasons the water is more susceptible to damage. Oceanographic features are also important--will currents tend to disperse the oil or concentrate it?--as are weather conditions--will the storms tend to emulsify it naturally and cause it to mix in the depths with underlying sediment where it may be available to the environment for many years in the future? Again, is the water part of an exposed open coastal system, or an estuarine environment? What are the habitat types in the substrate? Is it rocky, or is it a mud flat? Each one of these things affects what scientists need to investigate after an oil spill. Also to be considered is the type of clean up involved--mechanical or chemical? Such are the things that go into making each spill unique.

Petroleum is a complex mixture of many kinds of individual compounds. It is not a simple entity. Each one of its compounds can act in combination with a single cell, and with each individual organism in a different way. This expands our problems considerably when we try to generalize about the impact of oil on the marine environment. So what happens if there is a spill? Large or small, operational spill, or dramatic major spill reported in our newspapers, how does it spread? In the resource material provided there is a pamphlet with a picture which shows diagramatically how oil can move around in marine waters. Spreading is governed by gravity that tries to force the oil out into a flat layer and by surface tension that tries to hold the oil together. This is obviously influenced by forces such as waves, winds, and currents. There is also evaporation. The light components can vaporize into the atmosphere from which they may rain back down, or perhaps be photochemically changed to completely different compounds which may have completely different types of impact on the environment--terrestrial and marine. Emulsions can be formed, or else oil can be diluted, becoming progressively more dilute away from the spill area, or with time. Or you can have a water and oil mix--the chocolate mousse frequently described in the "Torrey Canyon" disaster that has also been seen in the more recent Strait of Magellan spill in Chile. A specific type of crude oil forms the latter. Not all crude oils form such a gellatinous sticky material. Oil can be dissolved in water, or form little droplets, and in such a way can be incorporated into the marine food web. This is of prime concern to health agencies, as well as resource agencies.

With sinking of the oil in geological landforms such as river mouths, where sediment is being laid down, the oil may absorb the sediment particles, become denser, and drop to the bottom. This can be done by biological means also. Some very small organisms in the water can actually ingest oil and encapsulate it in fecal material, which being denser sinks to the bottom. However, in sinking to the bottom the oil is not removed from the system. It has merely been moved from one part to another of the marine ecosystem and the bottom fisheries and the bottom biota are then brought into close contact with the oil. On the open ocean tar ball formation is a problem. This is a feature that can exist for weeks, and even years in some places, although microbial modification is possible.

Such is the natural degradation scheme in the environment but note we have been talking about things such as crude oil, which is a naturally occurring product. Many problems have resulted because man tends to concentrate it in specific areas where local systems cannot recover as quickly as would be the case if it were spread out naturally. Oil-incorporated sediments can be released slowly and continuously over months or even years following the original spill with no visible effect on the surface.

Turning to the biological impacts of a spill, the most immediate effect is mortality, the result of direct, short-term toxic poisoning. Aeromatic hydrocarbons, one of the major fractions of some oils, tend to be responsible for a good deal of this, with loss of fish and seabirds. Physical coating or smothering of wildlife also occurs. You can have exposure to water soluble fractions of some oils that are toxic miles away from oil slicks and other evidence of spills and you can have selective mortality at particularly sensitive life stages in specific organisms. For instance, some organisms are far more susceptible to damage from various types of stress at the juvenile stage where they might not be in either the egg or adult form. Oil spills can result in the loss or removal of necessary food sources for fish or other marine organisms not impacted directly. Habitat modification is also possible. Then there is a whole area which is of considerable concern to people, because it involves the longer-term effects, the sublethal effects, where you may not see dead organisms, but where instead may occur considerable degradation of the environment; in other words, the disruption of the ecosystem, its habitats and the food web, for a long period of time. There can be marked

physiological effects. As an example, there have been oil spills where juvenile mussels have not been killed, but they have not matured sexually the following year. There are no dead organisms, but if instead there is a nonreproducing population there will be serious stress on the environment.

You can have interference with chemical communication. You can have the increased synergistic effect combined with other stresses such as heat, thermopollution, pesticides, habitat modification. You can have tainting of commercial species. You can have the incorporation of very minute amounts of carcinogenic or mutigenic compounds into some of the organisms. One of the critical points in the broad ecological sense is that point in the natural processes when accidental input of a contaminant into the environment is effectively neutralized by the natural processes in the environment. In a chronic case we may impact an area more rapidly than the particular habitat or community is able to recover from. This is when we begin to see degradation, with all the slow, subtle effects that scientists often have a hard time detecting until too late to reverse or cope with. Hopefully, environmental impact statements now will help to pinpoint these before they become a problem. Unfortunately, it has not always been possible to do this. Numerous species of organisms have become extinct, in some cases because of man's activities.

The conclusion we can draw from the data on the observation of oil spills is that it is very difficult to make generalizations about the possible biological impact of petroleum using the experience of other marine environments even though we now have a far greater understanding of the basic principles involved. Each cell investigated adds to our appreciation of the complexity of the fate and effects of petroleum, although frequently raising new and perplexing questions. In closing I would like to suggest only by frank dialogue can the facts and hard information be separated from the emotional reaction. By looking at the facts we are able to provide a basis for rational decision-making, including the appropriate water-oriented development for the greater Puget Sound basin.

II (2) B. Glenn Ledbetter
Executive Secretary, Washington Oceanographic Commission

Before I get into the topic itself a little might be said about the Oceanographic Commission in Washington. The Commission is a state agency, and affiliated with it is a research and educational corporation called the Oceanographic Institute of Washington--two separate organizations but linked together in law.

The Commission has no regulatory functions on the oil issue but it does have advisory duties to perform for governor and legislature in the matter. Also it takes stands on public issues such as this. Over the past few years the Institute has done quite a lot of research on oil matters. Eleven studies that deal with oil, gas, and the safety of marine transportation have been conducted and these have been done for the federal as well as state and local governments, and also for private industry. One was completed last summer for the National Oceanic and Atmospheric Agency that looked at oil in Washington and the alternatives for handling it over the next ten years. It looked also at the ability of environmental models to answer certain management questions that were being asked by regulatory agencies and by people in responsible decision-making positions on this issue. NOAA's particular interest in this study was that it wanted to be sure that its modeling efforts were addressing those aspects of the issue that government administrators and managers had to deal with. The study, therefore, provides a good perspective for examination of this topic.

In the study some 480 questions dealing with oil transportation were identified as a result of reviewing the literature and interviewing representatives of some twenty-three different agencies in county and state government. The agencies could be grouped into many categories, the basic ones being environmental, cultural, economic, and jurisdictional. NOAA's particular interest, of course, was in the marine environmental questions, and of the 480 questions, 166 were identified as being marine questions that might be capable of solution through the aid of models. It emerged from this study quite conclusively that, to us at any rate, the marine questions that were most important to the managers that we talked to, and to the public as perceived through the literature reviewed, were those marine questions that had some socioeconomic implications, or some socioeconomic significance. In other words, the purely biological questions that would attract the interest of a scientist are not the ones that the manager

is interested in unless they bear upon some other management question that they have to deal with. One question in particular, concerning the potential damage to the environment in the wake of an oil spill, emerged as probably the central question amongst this whole issue. Leaning heavily on this study, I look at the question of identifying the issues as a matter of establishing a hierarchy of issues.

I would group these into three tiers, which I will not spend much time discussing. I begin with what I call the sub-issues, if you will, or the things that people argue about. They are the things that make a conference like this first of all possible and, secondly, mandatory that it cover at least two days. I can guarantee that after two days there will still be numerous unanswered questions in everyone's mind, and different points of view on all of these. They fill a lot of time at hearings and conferences like this. They are interesting, very important--especially for making decisions--but I would not call them fundamental public issues. They are sub-issues that are important because of the larger policy concerns. Some of these we can talk about in terms of the vessel that is transporting the potentially hazardous cargo--OIL. There will be a lot of arguments about ship construction, design and operation, maintenance; arguments about compartmentalization of vessels, double bottoms, double skins, gas and Arctic systems, automated valves, switches and alarms, tug escorts and whether they are effective or not, twin rudders, valve thrusters, size limitations, whether the 125,000 dead weight ton limit is a good limit, and whether there is a rational basis for it. Likewise, what the Supreme Court will decide on this issue; what the speed limits should be; whether there should be inspections of vessels; questions about vessel age; registry matters and whether Liberian tankers are really worse than any others. And there are probably many others that will be discussed during the conference. Then there is a whole host of other sub-issues, as I call them, that deal with the human element in this transportation system, such as the training of officers and crews, and of pilots. Should it be a requirement, for example, that pilots have certain rest periods, that in order to get a license they should not only pass stringent tests as they do now with the Coast Guard, but that they should be required to do other things, such as complete training course on simulators, and undergo regular retraining programs? Liability laws are another important issue. We have liability law in this state. Not only is there existing federal liability law, but new laws

are being considered by both the State Legislature and the Congress. Contingency plans of both government and private industry raise other questions. Another group deals with the informational patrol system that is a part of the vessel traffic system. Should it be made mandatory or not? Should it remain as it presently is, or should it be extended to the Strait of Juan de Fuca and interact with its Canadian counterpart? Radar, collision avoidance systems, radio chart navigation aids and ability to speak English, are still other questions. Finally, among these sub-issues is the environmental group. What about dredging, and what impact does traffic density have upon the entire system? And upon the larger policy issues? Terminal location, the type and design of the terminal--off-shore buoys, on-shore quays, salvage and cleanup facilities are other questions. The issue of terminal location is a particularly emotional aspect of these sets of issues; there are a lot of arguments regarding the cost of the alternative systems, and the cost-benefit trade-offs. Areas that have relatively high vulnerable resources must be identified, but also whether they are areas of relatively high risk or low risk. Are ones that involve pipelines and tankers safer than ones using mostly tankers? Inherent in this debate of terminal location, of course, is this issue of federal versus state or local control. Lastly there is the routing of the pipelines. These are all what I would call interesting and extremely important, but not fundamental issues.

More fundamental, it seems to me, are the basic scenarios which the state faces in the next few years, because we are now in the transition period. These deal primarily with market and with operational modes. In market, the question is whether we want to continue to serve only the same market, the Pacific Northwest region, with our own refineries, or whether we want to serve also as a transshipment terminal. Alaskan oil is on its way and Washington has a responsibility to the rest of the nation, but as to exactly where we draw the line on the costs and benefits that are inherent in accepting whatever system is involved here is the fundamental question. We are now in what I would call our third supply system in the state of Washington for crude oil. The first was the pre-refinery days. The second began when the first refinery was built by Mobil in 1954 at Cherry Point Mobil to hook up to the Trans Mountain Pipeline, which originally was intended to be a pipeline going all the way to California. It never made it, but it did get to Anacortes and, with right-of-way, to Mukilteo. The third one that we have now is the system where we no longer have the supply coming in from Canada via Trans Mountain Pipeline. Our crude oil is coming

in by vessel alone. We may well ask whether we are really struggling towards a fourth supply system, and one that may or may not involve serving the Pacific Northwest region only. Will there be transshipment and some pipeline from a different terminal location, or will we continue to use the existing facilities at the existing locations, and perhaps modify them? Those are the four basic issues that I think we have to choose between, although there are many different variations that I can rattle off to you. It is obvious that those four can be combined in different ways. We could serve the traditional market, for example, by using independent deep water berths at the existing facilities. We could also serve the traditional market by a communal terminal, wherever it were located. We could become a transshipment center as well, but serve it through independent deep-water ports at existing locations, or we could become a transshipment center and serve it through a communal terminal. Then there are other variations as well that may involve the Tacoma refineries in one way or another, might involve tank trains on a short-term basis from Portland to Billings, Montana; another that might involve a system where one facility at Cherry Point served Mobil and ARCO and another facility at Anacortes served the other two refineries--Shell and Texaco. There are many variations, as I have noted, and the sites can be superimposed on any of these four basic scenarios, if you will, that we must consider in the next decade. I know that, as far as emotional level is concerned, siting is probably a fundamental issue to many of you, particularly those from Port Angeles and, if they were able to give this talk instead of me, they might structure the hierarchy of issues differently. The same thing would be true for the local region. I would expect that people from different groups here might put siting at a different level in the hierarchy, but what I am trying to say is that siting is a means to an end. It would be unrealistic to expect unanimity on this issue ever, but perhaps there is an acceptable solution. If the Legislature--the policy-making arm of state government--could decide between these four basic issues as a matter of policy, then I think that a whole long list of things that I recited earlier would follow from that type of decision. We could proceed towards an objective in an orderly fashion. But the Legislature has been unable to do this, or has been unwilling to do it. I think that part of the reason for this is because there is a yet more fundamental issue. That is the top of my pyramid, the concept of the acceptability of risk that is inherent in this system.

Public acceptance of risk of damage from oil spillage is a critical issue. It seems to me that if the public clearly accepted the risk that is inherent in any oil transportation system, then this would not be a public issue at all, and people from Port Angeles would not be traveling to Bellingham to spend two or three days to protect their interests, whatever these might be. It would just not be an issue. Legislative committees would be occupied on other matters, and the sponsors of this conference, the Washington Commission for the Humanities, would be sponsoring other topics than this. On the other hand, if the public clearly did not accept the risk inherent in any of these systems, then there would be the opposite type of reaction. In other words, plans of action would be in various stages of development, strong leadership would be pushing things through, and there would be a lot of American know-how, unanimity, and drive. I don't see that happening either. What I do see is eight or ten years of argument. This clearly means to me that the public is divided on the issue, and pretty deeply divided, although I don't know what the percentages are. I cannot conclude that it is clearly acceptable, or that it is clearly unacceptable, so it must be somewhere in between. The result has been long delay. We know a lot more about the subject now than we did when the argument started. We also are aware of more unknowns now than we were at that time, and more uncertainties. I contend that this issue, the whole debate about oil, will not disappear until the public is satisfied about acceptability of risk in the system. We are still not in the permit process with some alternatives before us. I don't think we have exhausted the permit applications that are to be submitted.

I believe that unless the public accepts the risks that are inherent in the oil transportation system, as they do appear to in the air transportation and the highway transporation systems, then issues are not going to go away. Let's use technology to prevent accidents. That is the approach that is needed in this particular oil transportation issue. We need to manage risks that are in the system, and we need to demonstrate risks. We all have within our jurisdiction some ability to impact the system in one way or another, whether one is the head of an agency that has strong regulatory power, or merely a voter in the booth; everyone has some means of control, some means of input into the question. I know that both Coast Guard and private industry have demonstrable capability in risk management. There is an R and D program that has been under consideration in Washington for five years, for the Coast Guard to develop a nationwide risk

management system. I know that the oil industry has decision analysis as one of its management tools, that it uses it regularly in business management and also in exploration. Some of these same techniques need to be transferred from these fields of endeavor and from space program and nuclear research to the oil transportation system. It can be done at the state level and the federal level, and one of the most effective ways, it seems to me, that it could be done would be in private industry itself. Frankly I am disappointed that industry has not done more in attempting to reduce risk by putting their emphasis on prevention rather than on cleanup, which is where most of the time, money and sales pitch have gone up to the present. Both are essential. Let me end by saying that the conference poses the question "boon or bane?" I would say we are going to have both boon and bane. We are going to have to take the good with the bad, and we are going to have to manage and control the risks that are inherent in the system.

III. SPATIAL DIMENSIONS AND REGIONAL IMPLICATIONS OF OIL IN WASHINGTON WATERS

William M. Ross
University of Victoria

When asked to address this audience on "The Regional Implications of Oil in Washington Waters" I did not appreciate the full significance of the date and especially a morning appearance.* Given the breadth of the topic it would be all too easy to make a fool of oneself by trying to detail all the implications of oil transport. When I examined my horoscope this morning it did not offer much solace to this possibility. It advised that this is a day in which a great deal of good can be done by staying in the background. Given these rather forbidding facts, you will perhaps understand if I simply make a few observations, ask some questions and suggest tentative alternatives, and then let the experts provide some of the answers and the participants judge whether oil in Washington waters is a boon or bane.

At the present time we are aware of certain facts which preclude alternatives that may have been viable in the past. Crude oil will be arriving at Valdez later this year or early next year and some of this oil will be arriving in Washington State. At this stage the intent is not completely clear since the oil industry has not seen fit to detail just where this oil will move and in what volume. The amount of oil that can be conserved in local refineries will be much smaller than the total volume that can be moved through Valdez. This leads to the first major question. To what intent should Washington State act as a transshipment center for Alaska oil? What would be the benefits, costs and risks to Washington at each volume of oil movement? Does Washington, and indeed all adjacent jurisdiction have adequate prevention legislation and equipment to deal with major movement of oils. We know, for example, that cleanup of major spills is difficult, if not impossible, and that prevention is the only real solution.

Beyond the implications for Washington State that have been outlined by Mr. Ledbetter, there are distinct regional implications at the national and international levels. There would be a reduced need for tankers in Washington waters, for example, if the Canadian Government had not begun to phase out oil exports to the United States. By reference, therefore, it might be possible

*Editor's note: The date was April 1, 1977.

to achieve this same end, if oil could be found and carried to Washington State through Transmountain pipeline, from some other location.

Three alternative ways of moving oil to Washington refineries and to other markets--the east--have been considered. These three proposals include the Kitimat, Port Angeles and Cherry Point proposals. If the Kitimat pipeline were to go ahead, it reduces the volume of oil to enter Washington waters. Indeed it would be possible to feed the oil to Washington refineries without bringing large amounts of oil into Washington waters. While this might be desirable from the point of view of protecting Washington waters, it could present serious problems for British Columbia, which would be forced to accept considerable risk with few benefits. In the case of Kitimat, little study has been given to the long term employment prospects in the area which will be small after the construction phase to the high degree of risk of grounding in waters that have not been adequately chartered for supertankers, and to the sharp turns required in Wright Sound. The question remains, however, "Does Washington and indeed the United States have the right to ask other areas to accept considerable risk, with few demonstrable benefits?" In other words, is Kitimat an attempt to transfer risk elsewhere? Or is it a ploy to force acceptance of the Cherry Point site, given that substantial delay in all deliveries are apparent with the Port Angeles proposal? Moreover, one might question whether a pipeline at Kitimat would keep supertankers out of Puget Sound.

The second major alternative is an oil terminal at Cherry Point, with various permutation of pipeline proposals including the Northern Tier suggestion and the reversal of Transmountain pipeline. The particular location seems to have found favor with the Governor of the state. After a single journey aboard a supertanker to Cherry Point she has pronounced this route safe. It reminds me of another single journey made in 1938, when after one trip a rather well-known individual made a promise of peace in our time. One can only hope that Governor Ray is a better soothsayer than Neville Chamberlain. Navigation to this port is probably easier than to Kitimat but it is much closer to the core of population in the region and hence spills, should they occur, could be more devastating. No one suggests that oil companies want to see any oil spill but we must ask what schemes, if any, really would provide adequate and quick compensation for those damaged.

Perhaps people could accept risk, if adequate and just compensation and prevention were available. I believe very few, and those that are available limit compensation to rather particular parties. Fault must usually be proved. In addition, if the incident were to occur either in Canada or the United States, and the proposed route envisages navigation through the territorial water of both, and if an accident were to cause damage to property in the other, then under present law few if any will be able to achieve adequate and quick compensation. Have the oil companies or governments in either Canada or the United States considered or are there concrete plans or legislation to deal with such a potential crisis before it occurs?

The third major port at Port Angeles is no doubt a less hazardous location than Kitimat from the navigation viewpoint since the route is better marked, better charted and better monitored. The United States Coast Guard admits, however, that Juan de Fuca is one of the world's most dangerous pieces of water. Nevertheless, of the three industry proposals, Port Angeles is probably the safest in terms of the marine link. This is not the major controversy, however. It is questionable if the people of Port Angeles are in favor of having a port, and if a pipeline could be constructed quickly to link the pipeline to the refineries, given the delays inherent in preparation of environmental impact statements and if this, given recent newspaper reports, is a viable alternative. Again, some major questions are obvious. Can the people of any particular location hold a veto over a potential port? Given that oil from Valdez will be coming into the region shortly, is there time to do adequate environmental impact statements? Will environmental impact statements be ignored and a pipeline pushed through under forced conditions? Indeed, can Washington impede the ability of other states to secure reliable oil supply?

To this point the three proposals that have been advanced to handle Alaska oil have come essentially from industry. There may be other locations that could handle this oil that have not been considered or investigated by governments or industry to date simply because such sites would take too long to construct, be inconvenient for individual companies and be costly in the short run, but they may be the least costly and provide most benefits to society as a whole.

Would there be any advantage to Washington in the following alternatives,

for example? If British Columbia could find a site for an oil terminal away from major population centers and to the seaward side of narrow and confined inland passages directly adjacent to Queen Charlotte Sound. If a pipeline were built from such a site to connect with Transmountain at Kamloops, what would be the reaction of industry, of legislators and environmentalists? It is doubtful if British Columbia would accept the risks without certain conditions. These might include guarantee to supply American refineries in Washington State with crude oil through Transmountain in return for America's agreeing to refrain from bringing crude oil into the Strait of Juan de Fuca. British Columbia might also request the option of purchasing Alaska oil at market prices. Perhaps a joint Canadian-United States investigation is needed to recommend a site which is mutually advantageous.

Such an alternative proposal is probably not the only alternative available and immediately invites the question of whether oil is absolutely necessary on Washington waters. It also raises the question of whether Washington waters are too narrow, or focuses in terms of the spatial dimension and regional implications that would flow from the transport of Alaska oil. There are other jurisdictions that have just as important an interest in large volumes of oil from Alaska. The questions posed here do not constitute a full consideration of potential impacts. Unless these and other questions are answered, however, before major volumes of oil move through the Puget Sound, Juan de Fuca, Georgia Strait region, Washingtonians will have incomplete evidence to be able to answer whether or not major increases in the volume of oil carried on Washington waters will be a boon or bane for the state.

IV. COMMUNITY VERSUS REGIONAL AND NATIONAL NEEDS

1. Norma Turner,
No Oil Port, Inc.
Port Angeles

I would like to first of all define what the component parts are in the discussion of oil on Washington waters. There are two basic issues. One is the problem of supply to our local refineries. The second is the problem of transshipment in which we are talking about the distribution of surplus crude and also the Northern Tier refinery supply. We will first talk about the problem of transshipment, since that obviously is the main impetus behind President Carter's forthcoming energy speech in which he will discuss the distribution of Alaskan crude.

The Alaskan crude surplus, which at the time the Alaskan pipeline was conceived was supposed to be nonexistent but has since become a reality, makes one question why the pipeline in Alaska has been progressing so well while at the same time there has been no real progress in developing a West Coast terminal to handle that crude. Obviously the feeling is that there are alternatives, for example exchanging that crude to Japan rather than running it on the West Coast pipeline. The oil companies have already hired tankers to take that crude through the Panama Canal as a temporary means of supplying it to the Midwest. There is a new superport proposed for the Pacific Coast side of the Panama Canal by Northfield Industries which has been approved by the Panamanian government and is supposed to be completed in 1978. That superport will facilitate the lightening process required to lighten tankers so that they are able to use the Panama Canal. So there is an interim possibility of running the Alaskan crude to the Midwest without a West Coast terminal. Then there is the long-term solution to look at. The Sohio proposal at Long Beach has been proposed to handle the Alaskan crude surplus. That proposal would utilize preexisting pipelines. It is our feeling as we look at the escalation and inflation factors that were involved in the building of the Alaskan pipeline that the nation is better off economically and environmentally if we use to the greatest extent possible preexisting pipelines. We realize that there is an air pollution problem in Long Beach; but according to the FEA (Federal Energy Administration) there is an equal air pollution problem at superports in Washington State. It is our feeling that one of the

reasons why Sohio is having some difficulty in California is because the governor is making it hard on Sohio. We feel that the Washington State legislature should have the same type of approach towards transshipment in Washington State.

We will be looking at all the alternatives, but the interesting aspect of the 'swap with Japan' idea is that it is endorsed not only by the oil industries, but also by many of the national environmental groups. So it is an alternative we will have to look at seriously. There is also the Kitimat proposal. I will not go into any depth on this because we do have some people here from Canada who can expound on that proposal. I will just note that, should the Kitimat proposal be adopted, as I understand it, some of the Alaskan crude would still have to be shipped elsewhere.

We hope that President Carter, in his energy speech, will talk about how we might convert our energy source from a heavy reliance on natural gas to a greater reliance on coal and oil in order to conserve natural gas. According to ARCO, if the West Coast decreases its use of natural gas 25% by converting to oil, then there will be no West Coast surplus. All the Alaskan crude could be utilized on the West Coast.

I will not need to go into detail on the Northern Tier proposal because we are very familiar with it. The Northern Tier problem is quite different. The refineries to which the proposed pipeline would deliver the crude are only equipped to utilize low sulfur crude. Without expensive refittings they would not be able to utilize the Alaskan crude. So they are going to continue to look for their supplies from Indonesia or from the OPEC nations. This oil can be brought in through the Gulf Coast. The only way that the Northern Tier refineries can refit is if the price of the Alaskan crude is set low enough that it would encourage them to utilize that crude. But if the price is set at a fairly high level, then the Northern Tier refineries will continue to use low sulfur crude. This crude can be brought in through the Gulf Coast, as outlined in the Williams proposal. The oil would be piped north and would serve Minnesota through North Dakota. It would leave Montana with no supply when the Canadian cutoff comes. But in the last year Montana only received 30% of their crude from Canada. Therefore they have supplemented 20% of their crude supply and this has been supplied to them by Wyoming. Wyoming is a sister state to Montana and one of the top seven oil-producing states in the

United States. There are two preexisting crude oil lines between Montana and Wyoming. F.E.A. studies indicate there are many oil condensates coming out of Alberta fields that Montana is currently utilizing. There is no reason to believe that these condensates will be cut off with the rest of the crude oil loss. Therefore, the condensates imported from Canada combined with the Wyoming crude oil, could well lead to Montana becoming self-sufficient.

We also feel we need to have a strong look at Canadian exchanges. There has been some talk that this is not possible, yet we just recently saw how Shell Oil worked out a partial exchange with Montreal refiners. F.E.A. studies go into extensive economics to show that such exchanges are not only environmentally better, but have economic advantages as well. The F.E.A. states that an exchange between Shell and Montreal refineries could result in a 20 cent a barrel saving for both refineries. Therefore we feel there is a great potential in Canadian exchanges. We have seen new dialogue going on between the United States and Canada. We also see that Canada is going to send south more natural gas than previously expected. We feel that this is a field that we definitely need to look into, especially since we are talking about Canadian and Washington waters.

Next we have the problem of our Northwest needs. The "anti-tanker movement" has been a main impetus behind those in favor of moving the port to Port Angeles. It was first proposed that a common use terminal be built at Port Angeles to serve Northwest needs but the legislature would not accept the idea because it was economically unsound. According to a number of articles the only reason why the anti-tanker movement has decided to endorse transshipment is for the sole purpose of making it economically feasible for a port at Port Angeles. So, in essence what they are saying is, "We're going to save Puget Sound. We're going to do that by off-loading 15 million gallons of oil a day into Port Angeles versus running 14 million gallons a day into our existing sites." We feel that is a poor trade off. If the Port Angeles area were chosen as the transshipment port we feel strongly there is no real guarantee that tanker traffic would be halted in the inner Sound. This important issue should, I think, be discussed to a far greater extent than it has in the past. The feeling on the part of many anti-tanker groups has been that if we can get the port out to Port Angeles it is going to solve all our problems; it's going to stop the tanker traffic in the Sound. This is just

not so! ARCO can stay within the tanker limitation law of 125,000 dead weight tons and can bring ships up to almost that size to their preexisting docks. Moreover, the studies show that as long as the existing refineries can utilize tankers of 100,000 dead weight tons, it will be more economical for them to continue that route than to hook into the Port Angeles pipeline. Therefore there is no economic incentive to hook into that pipeline. The legislature cannot restrict them by legislating limits on dock expansion because in essence they don't need dock expansion. They can always utilize what they have now. The other refineries would need to have dock expansion. Currently in the legislature is House Bill 743. That bill not only mandates a port at Port Angeles, but also stipulates that once that port is built, crude oil traffic will not be allowed in the Sound. That bill has not been able to move out of committee. The legislators are not willing to take that on. They've already taken on the tanker limitation law, and the ARCO suit, and they seem very hesitant to go one step further. Given the predispositions of our current Governor and members of the legislature, it seems almost an impossibility that strong legislation will be forthcoming restricting tanker traffic in Puget Sound. Therefore what we may be faced with is tankers going into the Sound to take care of Northwest needs and a transshipment port at Port Angeles. Such a possibility really turns out to be a very poor trade-off. What the result would be is a quadrupling of our oil transport traffic in Washington State waters.

What are the problems involved in a port at Port Angeles? One of the things that Mr. Clark alluded to was that there is a lot of emotionalism and excitement about large tanker accidents. Consider the headlines produced by the "Argo Merchant" and "Torrey Canyon disasters. Yet many people feel strongly that it is the chronic spills that really cause the damage because they are small, people don't pay a lot of attention to them and they don't get cleaned up as quickly. This theory is expounded strongly in the F.E.A. study that was done on the movement of Alaskan crude. If we have a transshipment port at Port Angeles and quadruple our oil supply then we obviously are going to increase the chronic spill rate. We also have to talk about where the oil spills in Puget Sound have traditionally come from. Statistics for Puget Sound show that the largest volume of oil spilled has been from barges. In fact 77% of the oil spilled is from barges versus .2% from tankers. I know that the anti-tanker people say that is because we have not had tankers in the Sound; we

are receiving oil by pipeline, and therefore that's not valid. Let's then look at spill rates throughout the United States. Nationwide barges come out as the number one spiller by volume. When we consider that no bunkering facilities are planned for Valdez nor for Port Angeles, and that the bunker state fuel will have to come out to these ships by barge from the existing refineries, barge traffic will be greatly increased in North Puget Sound.

There is the concern of the pipeline going around Hood Canal. I find it interesting that Mr. Clark noted that 54% of oil that made it into the marine environment came from land sources. Part of the argument has been that oil spills from pipelines do not affect the marine environment. Yet the same F.E.A. study that I previously referred to showed that in a four-year period of time in Washington and Oregon, 60% of the oil that affected the marine environment came from pipeline spills. Perhaps that's an unusually high figure. So let's extend that out and look at the entire West Coast, including Central America. Again, in that large area, pipelines came out as the number one spiller. If you extend that across the United States, according to a Department of Transportation study in 1974 pipeline spills were the number two cause of spills. Barges were number one and pipelines number two. Tankers seem to be less significant as far as their impact.

There is also the problem of air quality. I have not had an opportunity to read the latest F.E.A. study but, according to those who have looked at it, the air quality problems that would be created here (in Port Angeles) may well preclude the siting of any future industry in the area that has any appreciable amount of So_2 emissions and hydrocarbon emissions.

Therefore what are we asking Port Angeles to do? We are asking this area to accept a superport that is capital intensive, not labor intensive. We are perhaps going to create 50 jobs, and yet we are probably going to preclude the siting of any future industry that may well be more labor intensive. The mills have expressed concern that Northern Tier's presence in the Hook may well interfere with the logging and rafting process.

Our conclusion from all this is that it is best for regional needs, for local needs, state needs and national needs, and environmental and economic reasons dictate that we look more seriously at preexisting pipelines and the utilization of preexisting terminals and pipelines, rather than creating an entirely new system. In closing I'll just make one final comment. One of

the overriding concerns has been "What about our fisheries?" If we look at the Sohio proposal we see that the California Department of Fish and Game said that if a superport needs to be built somewhere in California it should be in Long Beach since that area is so industrialized there cannot be any more damage.

IV. (2) Robert L. Monahan
Western Washington University

National, regional and even community needs embody a number of basic tenets for wise resource use, including petroleum. If we apply these to petroleum it involves:

1. Use with minimal waste including the protection of other resources in the acquisition and the consumption of oil.
2. Some consideration for the petroleum needs of future generations.
3. The greatest good for the greatest number of people.

Examination of each of these in light of petroleum shipment and petroleum impact on Washington waters may provide some illumination of the conference theme.

To minimize waste of the petroleum resource and to protect other resources, we ask each tanker captain to avoid grounding, to evade collisions with other craft and to prevent accidental discharge of the cargo. This is a reasonable request and one which extends the life of the world oil resources and protects other resources in our environment. For the sake of consistency and for the life of the resource, we should ask ourselves as individuals to do the same, to avoid spills and the waste of petroleum products through such direct action as not topping the automobile gas tank into the filler pipe, turning off the engine when the car is just sitting, turning down the thermostat when away from the home for several hours, and recycling used lubricants in preference to dumping them on the ground. The list could be extended and extended but the reduction of consumption on the part of all United States and Canadian consumers is the most direct and positive way to reduce the adverse impact of petroleum on our environment. If this were done, not only would the impact of petroleum on the waters of Washington and British Columbia be reduced by fewer tankers plying the waters but also on all coastal waters of the United States, plus the reduction in burning petroleum would reduce the detrimental impact on the air quality of the nation, the continent and the world.

Our responsibility to future generations should not be taken lightly. We know petroleum reserves are finite even though we don't know their exact quantity. We need not cease consumption to buy the time needed to find

alternative sources of energy; stopping wasteful and unnecessary use will help us achieve that goal.

Oil Movement

A major factor in the growth of the United States to the first nation of the world in economic production and wealth, has been the relative freedom of movement of goods across state borders, unimpeded by tariffs, duties and the impediments which apply to international transfers. This freedom of movement has been important enough to be copied by the European Economic Community with very favorable economic results. The per capita income in constant dollars has doubled in 25 years in the European Economic Community. I believe free movement is vital and essential to our continued economic success and, therefore, oppose the right of any state to stop movement of the normal commodities of commerce through the individual state. However, it seems right and just to require transportation companies to protect other parts of the environment when their cargoes pose a threat. In the case of oil in Washington and British Columbia waters, the transporters of the commodity should provide protection, including full compensation for losses which might accompany a spill. It is unlikely the marine resources will be destroyed completely by an oil spill, but initial damages and long-lasting effects extending over all the years should be a part of the compensation provided by the companies. The reduced value of a beach with oil on it may be difficult to determine, but a value can be placed on this and built into the liability to be borne by a transporter. The loss of fish harvest is more easily determined and this measured over the number of years and volume of catch reduction are part of the risk assignable to the oil transporter. When these are calculated and made known to the industry and the public, then a rational decision can be made. We can then decide whether the Cherry Point site, the Port Angeles site, the Kitimat site, the Long Beach site, or tanker transport through the Panama Canal is the "best" decision. Even though our economic measures may be imperfect, they beat the "feelings" and are at least a thousand percent better than emotions. Economic valuation has been time tested in the American society for many years.

The question of externalizing or internalizing the costs is another important issue. These descriptive economic terms refer to who pays. In the case of externalizing the costs, the payment is shifted to an organization,

usually a government agency, for payment or guarantee of payment. If this were done in the case of oil in Washington waters, it would be logical to assume the federal government would take the risk, and normal to ask for this risk assumption. The basis of this assignment is the large distribution area the oil would serve which goes far beyond the borders of Washington. The state government might also be asked to assume the burden. State government is attempting to decide where to put the terminal and forcing the costs of any site onto the state may help the state to make a sound and rational decision.

County levels or other smaller governmental units might also be forced to bear the cost of the environmental risk.

Even more reasonable is a combination of the above sharing costs on some formula based on consumption within the governmental unit.

Internalizing the costs, adding them to the transportation bill charged against the oil, is in many ways superior. This places the onus of finding the cheapest means of transport on the oil company which is competing against all other producers. It also places the cost of the oil squarely on the consumer. If the price is high, either the consumer will shift to another source of supply which does not move through Washington waters, or will reduce consumption. In either case, less oil is moved through Washington waters and the risk is reduced. Some provision needs to be made for review and adjustment of costs as the conditions change, technology improves, risks are reduced (or increased) and the experience provides a better point of judgment.

Location of the Unloading Facility

The situation of Puget Sound, including the Strait of Juan de Fuca, has been identified as attractive and desirable. Other situations have also been examined, including the Los Angeles area and tanker movement to the Gulf of Mexico and eastern seaboard. Apparently the current costs assigned to transportation still favor the Puget Sound situation, particularly under the current externalization of some costs and the limited liability for damages which now exists.

We have some knowledge on which to base an assessment of the costs of transportation. We know that by using Puget Sound, Strait of Juan de Fuca and particularly Cherry Point, some twenty to twenty-five thousand jobs are placed in jeopardy, along with annual benefits to the state economy of $200

to $250 million. It is unlikely all the jobs or all the benefits would be destroyed forever but it is possible a sharp reduction could occur and recovery to full production might take a number of years. Other costs should be added to this. For example, the loss of value due to a beach with an oil coating on it which could last for several years. As an alternative to this, the cost of cleanup might be substituted. These costs can be determined and added to the total. Once the full risk is decided then an insurance company or companies can assess the costs assignable to transportation by providing full coverage, or the oil companies and/or transportation companies can post performance bonds and then the risk costs assignable to transportation will be known.

We already know something about various sites within the Puget Sound-Strait of Juan de Fuca situation. The Port Angeles site would save fourteen hours of tanker travel time. No tug escort will be required at Port Angeles and larger tankers can be accommodated at this site, in comparison with Cherry Point. Spill control facilities could be more concentrated because fewer miles of shoreline would have to be protected. This information was discussed by Dr. James Crutchfield at the Bellingham conference.

We also know the movement of oil from Port Angeles to Cherry Point costs three cents per barrel under current internal/external allocation of costs and the present uncovered risks of oil movement. The pipeline movement in a line of 1,200,000 bbl./day capacity to North Bend, Washington and 400,000 bbls. per day capacity to the Puget Sound refineries will cost 62 cents a barrel at full capacity. Mr. Fielding Formway of the Atlantic Richfield Company provided this information in Bellingham. If this line includes risk insurance for the environment, and the risk is not high, based on many years of pipeline experience, the Port Angeles site adds one and one-half to three cents a gallon to the cost of petroleum, excluding the risk insurance for the Port Angeles terminal.

If the risk costs are internalized for these two sites, we can then make a choice between them, assuming Puget Sound-Strait of Juan de Fuca is the optimal location from the standpoint of overall costs. Some consideration should be given to the difference in cost at each site for the Coast Guard traffic control. The increase in Coast Guard personnel indicated by Captain Malm in Bellingham is a cost which should not be overlooked.

There is also some recent interest in a Whidbey Island site which, to the best of my knowledge, has not yet been fully assessed in terms of costs.

One thing becomes very obvious in observing the current situation. A full assessment of the comparative costs of oil movement to different locations for movement to the northern tier market, midwest market and Washington market, has not been made. What are the possibilities and costs of a Port Angeles terminal and a British Columbia lower mainland refinery supply in exchange for an Alberta/British Columbia supply of northern tier refineries? How viable is Kitimat as a tanker terminal when all the costs are included? A much more accurate analysis of the costs must be made before an intelligent decision is possible. The oil must flow but the price of the oil must bear the cost of risks to other facets of the environment.

I propose a two-year moratorium on fixing the location to permit time to study the best location in terms of overall costs. The environmental threat can then be assigned a cost and the locators will have some rational means of decision-making.

Movement of the oil is essential for Alaska because they are deeply in debt for the services provided during pipeline construction in anticipation of oil revenue. They have acted in good faith with federal prodding and if the oil doesn't flow as anticipated, the federal government will have a moral and perhaps a legal obligation to finance the state, an additional external cost, a dangerous and potentially costly precedent, and no solution for the oil supply of the United States. There is also a question of financial responsibility to the oil companies who invested in good faith and who have every reason to expect to begin recovering their investment in the oil fields and pipelines. Thus, if no oil flows there are likely to be substantial costs to the taxpayer which are just as effective in consuming tax dollars as oil spill cleanups, highway construction, education, or environmental improvement.

One possible way out of the dilemma was suggested in the Bellingham conference. If for a limited time, two to four years, we were to make a swap with the Japanese, supplying them with Alaska oil in return for the assignment of an appropriate amount of Middle East oil, we would buy the time needed to make the decision and minimize the economic harm to the state of Alaska, the petroleum companies, and the consuming public.

Immediate appeal should be made to Secretary of Commerce, Dr. Juanita

Kreps, Mr. Brock Adams, Secretary of Transportation, Mr. Larry Bradley, Director, Energy Office, Washington State, and Mr. Hallauer, Director of Ecology, Washington State, for comprehensive studies of the true costs of transportation for the various sites. The studies should include internal and external costs, including the protection of the environment through insurance or bonding, the navigation control system necessary for safety and other charges assignable to the oil movement. Insofar as possible, the costs should be internalized because this provides a much stronger incentive to select the most efficient site and to continue the struggle to reduce costs. Once the true expense of oil movement associated with each location has been determined, the choice of specific location will be simplified. Some may wonder why the great emphasis on assigning dollar values to internal and external expenses of the transportation. In spite of variations among individuals in terms of the value of a clean beach, an oil-soiled bird, and the Coast Guard navigation control, it is possible to assign an approximate dollar sum to most of these which facilitates comparison of sites. Under-valuation of a dirty beach in Port Angeles is likely to be very similar to under-valuation of the same in Cherry Point, or Kitimat, or elsewhere. Also, dollars are one thing that strikes a responsive chord in virtually every American, as well as most Canadians. It should be noted the analysis of costs must include risk insurance for Canadians and the Canadian environment where it is endangered.

Guided by the basic principle of the greatest good for the greatest number, and our Canadian friends and neighbors must be among that number when talking of the Strait of Juan de Fuca and Puget Sound, and knowing the total transportation costs for various sites, the international, national and regional needs for petroleum, we are now ready to assess sites and make a rational choice.

When a port is chosen, the greatest protection will be obtained from the assumption of the full risk costs by the carrier and/or the cargo owner. This will provide the incentive to reduce the risk, avoid spills, and serve the needs of people by truly conserving and wisely using all our natural resources.

V. ECONOMIC AND TECHNOLOGICAL CONSIDERATIONS

James A. Crutchfield,
Professor of Economics, University of Washington

What is the most efficient way to bring oil into the American economy with all costs taken into account, and how should those costs be allocated among the people who share in the operation? That includes all of us. I think it is probably fair to say that no one is going to go unscathed no matter which of the options we choose. But the burden will not fall evenly on everyone. That needs to be defined as clearly as possible. We need to know how the regional economy will be affected by the alternatives that we consider. I think we can take it as given now that we are going to move Alaskan oil, and that it will be beneficial to the national economy to bring it in. Yet the impact on the regional economy will be significantly different, depending upon how we look at the different alternatives. I cannot emphasize too strongly my own feeling about a statement made this morning that the site decisions we make about the receipt of crude oil coming from the North Slope are the most critical that we will make. We cannot reverse them; for all practical purposes they are done, once they are made. And once they are made, the whole pattern of transportation of North Slope oil will have been determined, so we don't have much time to make decisions that cannot be unmade later. We have got to be careful.

A recurrent theme which runs through the work that I and my colleagues and students have done on the whole subject of oil on Puget Sound I think I can summarize in about three sentences. It is not a matter of good guys and bad guys. It does not help to find villains. The oil industry is as concerned as anybody else not to damage the environment. It has certain responsibilities to its stockholders that are part of the game in which it is engaged. What does emerge, however, is that this is one of those crystal clear cases where the accounting costs and revenues as seen by the petroleum industry itself and the total of costs and benefits that accrue to the general public are divergent, and they point to somewhat different paths. In the same way, the distribution of the environmental burdens that have to be assumed in order to get oil from tankers into the mainstream of the American economy are not going to fall equally on everyone. It is not surprising that no one wants

the specific site on the shore opposite their own home, but something has to give.

The economic comparisons, then, that we can make about siting involve a good many statistics, some of which I will introduce in this discussion. Others can be raised in later discussion. The work of Dr. Stokes, which was carried out in some detail, suggests that as far as the national economy is concerned transmission of oil by pipeline through the Puget Sound area is both viable and economically beneficial. From the standpoint of the people of the state of Washington there is a very real doubt as to whether the economic benefit that accrues to the people of the state of Washington from transshipping all or a major part of the North Slope crude is positive at all. It may well be negative, and at any rate it will be very small. The outside estimate of benefits, the largest estimate of benefits, would be something in the neighborhood of thirteen hundred new jobs in the state of Washington, and something in the vicinity of about $5 million a year in additional net income to the economy. Against that must be set the fact that the industries that will be at risk with a tanker movement of the magnitude required to handle most of the crude oil base surplus for shipment through the pipelines from this location involve a loss in the vicinity of 20,000 to 25,000 jobs, and with a total income to the state something in excess of $200-250 million a year. So that even relatively small losses, averaged out over a period of time, to the industries that are sensitive to the water quality of the waters that would be affected, either by dramatic spills or the less dramatic, constant small ones, which the tanker movement would bring, would be appreciable. They involve commercial fishing, recreational fishing and the industry that supports it, the whole second home industry which is vitally important to the economy of the North Sound area and the San Juans, tourism, recreation of other types, beachcombing and boating and the like. Each of these involve not only intangible but vitally important outputs of Puget Sound to the people who live here. They also support major industries that are vital to the welfare of the whole Northwest region. It becomes critically important that we move to a comparison of the economic costs of siting the terminal at Port Angeles or Cherry Point, limiting it to these because these are the ones most widely discussed, although I share Dr. Ross's opinion that we ought not foreclose the possibiltiy of still other sites, even at this late date. But a cost comparison between these two seems to me critical.

I would like to say that I find the task depressing and I am keenly disturbed that the controversy over these figures should be as wide and as unsatisfactory as it is. These are engineering alternatives which can be clearly defined and the range of estimates over costs at one location or another ought to be something that you could come to pretty close agreement about. The suspicion arises that the funny number game is being played by both major groups to the detriment of the decision making. What we need to do is to measure the difference between the cost of getting oil to both pipeline and refinery at Port Angeles or Cherry Point, and that means not the total cost of the new facility at a Port Angeles location, but that total cost minus a number of very important offsets. One of them is the fact that the new facility that will have to be constructed at Cherry Point, or at Anacortes, or elesewhere, will not come free. Additional expansion of facilities will be required there as well, and the expansion will cost something. A second offset is the fact that transit time will be reduced by some 14 hours per round trip if the tankers terminate in the vicinity of Port Angeles as compared to Cherry Point. A third offset is that tankers will not have to be accompanied by tug, as would be the case under present legislation for tankers coming to the Cherry Point location, and possibly the fact that a receiving terminal at Port Angeles would be able to take considerably larger tankers from sources other than the North Slope, which are limited to 125,000 tons. For shipments from Indonesia and elsewhere larger tankers may be somewhat more economical. What this adds up to, stripped of a lot of the garbage that has been floating around about numbers, is something like this. Depending on whose figures you look at, the range of what it would cost in terms of per gallon cost of profit, in choosing the Port Angeles site over the Cherry Point facility, would be somewhere between 0.2 and 3.5 cents per gallon, and I am assuming that that would be spread over all of the product that the refineries turned out. For an average voter that figures out to something like 75 cents to $2.50 of additional cost per year. Actually that is a substantial overstatement since our refineries export out of the state roughly 50 percent of their final product. Washington purchasers, then, would bear something in the vicinity of half of that incremental cost.

And for that additional cost, which would be born by the industry or by its customers, depending on its price policies, what do we buy? We buy, for one

thing, the very substantial reduction in the danger of spills. At the risk of being repetitive for many of you, the principal danger, as far as a spill is concerned, is not collision but of grounding, of mechanical failure, of human failure, of various mistakes in navigation, explosions, and a variety of other accidents that can take place. The analyses of the Oceanographic Commission of Washington, statements by Mr. Kern, the statement by an official of the Mobil Oil Company last night on television, all confirm the fact that statements that we will not have major spills somehwere in the future are ludicrous. The question is whether a reduction in the probability of spills can be achieved by holding tankers out of the Rosario or Haro Straits and adjacent waters. The consensus seems overwhelming on the part of everyone, except industry spokesmen, that reduction in the risk of spills would be very substantial indeed, perhaps by 50 percent or more. In addition, you get an even larger reduction in damage potential because a spill occurring west of Port Angeles is not going to encounter the degree or intensity of competing developments sensitive to oil pollution that would be found in the North Sound and the San Juan Islands and Gulf Islands. The overwhelming volume of assets in commercial fishing, recreational activities, and the shoreline value component of residences, both permanent and recreational, are found in that more sensitive region of the North Sound and its islands. Containment and recovery to the extent that they will occur are certainly likely to be no more difficult at a Port Angeles site, and they may well be considerably easier, given the kind of weather, tide, current conditions one is likely to meet in the riskier parts of the Rosario Strait.

There is, as has been already suggested, the possibility of a trade off that might be considered, and that is a reduction of risk involved in the Cherry Point location, but only by significantly more stringent standards with respect to both vessels and vessel occupation than we now contemplate. I stand to be corrected on this if I am wrong, but I believe the tankers that will be delivering the bulk of the North Slope oil are conventional single screw, single hull tankers. Subsequent legislation does not apply to tankers ordered along the way prior to that legislation. So we will be getting tankers well-built, well-crewed, well-operated, but of conventional types. The risks are substantially greater for ships of that type than they might be with stricter, more vigorously enforced standards of cost. But whether the advantage of much tighter vessel control and operation and construction would

be worth the additional cost is something that needs considering. As far as the Midwest is concerned, how would they fare under the major alternatives? Oddly enough, if the ARCO-Transmountain route is chosen, the Midwest will pay substantially more for its oil than it would from a direct pipeline run from Port Angeles. In addition, the Transmountain reversing plan will not provide enough capacity, without very substantial new construction, to carry more than a fraction of the crude oil surplus that we will have to handle. The Midwest, then, would get less oil and at somewhat higher prices, for a considerable period of time. Even more so, if the Transmountain pipeline must continue to provide service for at least ten days of the month to provide service to the British Columbia refineries. As far as the nation is concerned overall, to the extent that the crude oil base surplus gets to the deficit markets of the Midwest, it makes very little difference whether it gets there through Kitimat, Cherry Point, Port Angeles, or Long Beach, [since the Sohio proposal still seems to be in the picture]. The nation's interest, then, would be pretty much equally served by any of these alternatives.

In summary, then, the industry is quite correct. It would have lower costs if it were to receive additional oil, as it must now, by sea either at its existing facilities or, at somewhat higher costs, at a Cherry Point central receiving facility, than it would at Port Angeles. However, from the standpoint of the general public, a conservative estimate suggests that if something between two percent and four percent of the potential damage that would be suffered by spills in fact occurs, then the public would have lower total costs by having the main receiving facility at Port Angeles, quite apart from any environmental consideration, although these are far from inconsiderable. Either way the state of Washington stands to gain in economic benefits and jobs so little as to be completely crippled on all counts. The negative effects of any major oil transport system are likely to result in a very small increase in jobs. It is not surprising, then, that since the state and the particular locality chosen are not likely to enjoy any significant economic advantage and are going to be subjected to pretty substantial environmental risks, nobody is very eager to have them, and one would hardly expect them to.

My first conclusion is that the comparisons between economic gains--in this case lower actual transport costs for the industry and environmental

losses--are always extremely difficult to make. As Mr. Robert Clark has indicated in his paper, the problem of what losses we will suffer in complex systems of living populations of marine environment is almost unresearchable. It is very difficult, even if we could establish the physical dimensions of the cost, to provide dollar estimates that include not only commercial risks, but the value that we place on a clean, unspoiled environment. What I think comes up in this instance, however, is something a little easier and, unless I am grossly mistaken, I will stick to my figures. The differences in costs between the two major alternative sites that we are considering are so small, and the differences in environmental danger so gross, as to suggest a very clear-cut decision as far as the overall public interest is concerned. The Cherry Point site is the weakest of the alternatives that we have available to us.

A second, and in a sense a more fundamental, conclusion is that we simply cannot continue to read decisions about the siting of major energy facilities to a simple accounting of costs and benefits accruing to the private firms involved. This in no way imputes their motives or their honesty. It simply says there are very much larger costs and benefits in some cases, to society as a whole that must enter into that determination. My third conclusion follows from that. It seems to me that we need to draw a new line between proprietary information and information that is accessible to the general public. I find it intolerable as an American that neither the state nor federal government has any really clear-cut ideas of what the petroleum industry's plans have been for disposition of this major quantity of oil to be added to our lives. We simply cannot tolerate a shoreline management program as mandated by the state to both governor and legislature, when we do not even know the major impact which that shoreline environment will face, until it is manifestly too late to consider all, and in some cases perhaps some, of the best alternatives that we might have wished to evaluate. These types of decisions, then, should not and I think cannot continue to take the form of an adversary proceeding, with tame experts providing filtered figures on both sides of the question. The results of this kind of decision-making process have been harmful both to the industry and the general public. We were years late in getting facilities in place to dispose of oil that was going to start flowing pretty soon. And it is going to have to go somewhere. Strange as it may

sound, we may well wish to consider the possibility of permitting the industry to sell that surplus to Japan in exchange for rights to Middle East oil, which makes somewhat of a mockery of all the arguments we listened to but which might be a lot cheaper in the long run than making hasty decisions as to siting now, and trusting to luck that they will not be too bad in the future.

VI. THE RESPONSES OF INDUSTRY

1. Comments of Fielding Formway, General Manager, ARCO, Ferndale

I am Fielding Formway, the general manager of Atlantic Richfield's Cherry Point refinery in the southern part of Ferndale, Washington. The purpose of my discussion today is to present some economic realities, and from these an economic projection that should be considered in reaching a conclusion on the future of oil in Washington waters. We realize that there are substitutes for everything. Intelligent choices require balancing of additional costs against additional imposed deficits. The Washington State refineries are processing slightly over 330 thousand barrels of crude oil a day. All but three thousand barrels a day of this crude are currently being delivered to the indiviudal refineries by tankers. Our present cost of delivery of this crude to the refineries is lower by $66 million per year than any of the alternate delivery methods we have heard proposed.

Before discussing the details of some of these numbers, it is necessary to present some facts relating to the oil industry in the state of Washington. The original cost of the physical assets of the oil industry in the state of Washington was $2.2 billion, most of this spent on the building of refineries and pipelines. The oil industry spends more than $100 billion per year in materials and services. Our taxes pay the state and local governments $25 million. There are more than 4,500 oil industry employees and more than 19,000 employees of other industries directly dependent on the oil industry. Taking into consideration the families of the oil industries, it is estimated that over 80,000 people in the state of Washington obtain their livelihood directly from the oil industry. The industry is a major contributor of jobs in the state and this important fact must be considered in any conclusion about oil on Washington waters. The state of Washington consumes 254,000 barrels of petroleum products per day. Approximately 138,000 of these are received directly from the refineries in the state of Washington. Seventy-five thousand barrels of petroleum products per day are produced in other places and delivered by tanker to the state of Washington. Thirty-three thousand barrels of petroleum products per day are delivered to Eastern Washington by pipeline from Montana and Wyoming and nearly 8,000 barrels per

day are delivered to Eastern Washington by pipeline from Utah. There are some 5,500 deep-sea vessels entering into the Strait of Juan de Fuca each year. Of these, less than 450 are tankers. More than half of these tankers are bringing petroleum products to this state. Of the ships that call at the major refineries, most are bringing crude oil into the state. Some are coming to pick up products that do not have a market in the state of Washington, for example heavy fuels and military jet fuels.

It is important to note that when more crude is available later this year the number of crude-carrying tankers supplying the existing refineries will not increase from what it is now. It will mean that the major part of the crude coming to our refineries is coming from Alaska in American built tankers served by American seamen, rather than coming from foreign countries in non-American built tankers served by non-American seamen. It is also important to note that the cost of delivering this crude from Port Angeles to our tankers is less than three cents per barrel.

It has been proposed by some groups that a terminal be built at, or west of Port Angeles, and that all crude tankers be banned east of that point. A single-point unloading buoy or berth would be built and all crude tankers would be required to offload there. This proposal also includes the suggestion that the terminal be built large enough to move not only the Washington State requirement, but to move 800,000 barrels per day east to the land-locked refineries in the northern tier states. These states after the first of the new year 1978 will not have sufficient crude to continue to operate. The proposed crude pipeline would circle south, then north around the Sound to an area near North Bend, Washington where it would then turn east to the land-locked refineries. Starting at North Bend a new pipeline would be built which would run north to Burlington, Washington, where it would connect to the existing Transmountain pipeline to supply the existing four refineries. Our engineers have estimated the tariff on this pipeline from Port Angeles to be 62 cents per barrel if the movement is 800,000 barrels per day east and 400,000 barrels per day to our refineries. It is very unlikely that, at the beginning at least, 800,000 barrels per day would be moved east, and it is certain that 400,000 would not be moved north. Even at 62 cents per barrel difference, this would mean an additional cost of $62,000 per day to our refinery, or $22 million per year that would have to be passed on to the

consuming public. It is important to note, by way of comparison, that the entire cost of moving crude from the ice-free port at Valdez to our refinery by tanker will be less than 30 cents per barrel. The proposed pipeline from Port Angeles would not be suitable for low sulfur crude and the 200 plus tankers per year would still be needed to bring the 75,000 barrels per day of finished products. This proposal does have the advantage of supplying to the landlocked states the additional crude they unquestionably will need. Whether it can be built in time is the question.

We the citizens of Washington must keep in mind that more than 41,000 barrels of petroleum products per day are being supplied to eastern Washington from the states of Montana, Wyoming and Utah. Another proposal to supply these neighbors is one advanced by my company on December 7, 1976, at the request of the Senate Interior Affairs Committee in Los Angeles. In 1974 when the federal government passed the Enabling Act that allowed the Alyeska pipeline to begin construction, certain restrictions were placed on the project. One of these restrictions required that the Alaska crude be made available to all states. We at Atlantic Richfield feel we have a legal and moral obligation to make North Slope crude available to the northern tier states. Our proposal would accomplish this.

In the simplest terms, our proposal is to add to the Cherry Point dock an additional berth, additional crude tankage and a new pumping station and then utilize the idle Transmountain pipeline formerly used to deliver Canadian crude to the four northwest refineries. The flow would simply be reversed to Edmonton, Alberta, where it would then enter into the distribution system which supplies the northern tier states. This facility could be ready within 18 months. Phase I of the Transmountain/ARCO project would be able to supply 160,000 barrels of crude per day. Presently the four refineries are bringing in about 21 tankers per month to supply the crude needs. If this crude were delivered to the four refineries plus 160,000 barrels per day for our neighbors in the landlocked northern tier states, the number of trips would be eighteen and one-half or two and one-half less trips per month. Unless the other refineries choose to do so, rather than spend the money to expand their dock facilities to accommodate larger, more efficient tankers, the efficiency I speak of relates to energy conservation as well as dollars. For example, a 275,000 ton vessel can move petroleum products using half the energy that a

50,000 ton vessel would. These are important savings in our energy-scarce world today.

Another proposal has been made by Transmountain Pipelines to build an off-loading terminal at Kitimat, Canada, and an 800 mile pipeline to Edmonton. From there the oil would move to the existing Transmountain pipeline distribution system. I do not know the economics of this project or the likelihood of it becoming a reality.

The costs to the existing Washington refineries of utilizing any of the more expensive methods of receiving crude can be great. First, the Washington refineries would surely lose all opportunity to compete for the military fuel markets where major contracts are decided on the basis of a cost differential as little as three or four cents per barrel. Even if the Washington refineries continue to be competitive in this market, other products such as gasoline would have to be increased disproportionately to recover the added transportation costs. It is unrealistic to assume the added cost could be absorbed by oil company profits because there are many years when our profits do not equal a cent and a half per gallon. The consequence of losing some of the markets is often more far-reaching than merely dollars, for some crude strains that are blended into military jet fuels, for example, are not suitable for any other marketable product. The costs of petroleum products to Washington citizens and industry would increase by $60 million per year.

Petroleum traffic has been moving on the waters of Puget Sound by tank barge and tankers for more than 50 years. At the same time other waterborne commerce, fishing and recreational vehicles, have shared these waters under a multiple use concept. In the last few years certain interests have set out to demonstrate the hazards of oil, and the need to keep oil traffic, primarily tankers, off Puget Sound. Apparently Puget Sound will only be available for fishing, recreation, petroleum tank barges, and cargo ships. They stress the hazards of oil but never really quite say how much of a hazard it is, or what hazard level for oil is acceptable. They paint a gloomy picture indeed, but my studies lead me to believe this outlook is not justified. One of the best means to develop an understanding of tanker risk is to compare tanker vessel traffic densities in various waters. As most knowledgeable students of accidents agree, the number of accidents increases with the number of vessel trips. Fifty-five hundred vessels per year enter the United States Coast

Guard traffic system near Cape Flattery. In 1973 our refinery had 178 tankers call. In 1974 the number was 140, dropping to 118 in 1975 and 110 in 1976. The average age of the tanker bringing crude to our refinery was less than four years. In 1976 we had 49 crude tankers call at our dock and we are expecting less than 60 this year as most of our crude in 1976 was brought by tanker. The Coast Guard has established the incoming traffic lane width as one mile, narrowing to a half mile near Port Angeles. Thus we have 5,500 vessels per year in a half to one mile wide lane. By contrast, the traffic density in the half-mile wide lane in Rosario Strait, also one way to large tankers, is about 350 per year. The Rosario Strait waterway is nine-tenths of a mile wide. After pilots embark at Port Angeles the total incoming traffic splits, with about half going north through Haro Strait to British Columbia, and the other half going south, primarily to the Port of Seattle. A relatively small amount of traffic also proceeds north through the Rosario Strait, Guemes Channel and Bellingham Channel. These vessels serve the four refineries and the Port of Bellingham.

The safety record of tanker traffic in Puget Sound confirms the safety of these waters. The data on oil spills in Puget Sound are available from the Coast Guard pollution incident reporting system. All oil spills must be reported to the Coast Guard, and an oil spill is defined as any quantity of oil that forms a sheen on the water. These data confirm that the number of oil spills are directly related to the number of trips and not to tanker size. They also confirm that, fortunately, there have been no spills of consequence, and risk analysis run on the data is meaningless.

There are things that we know can and should be done to further increase tanker safety, the most important being to increase the effectiveness of the Coast Guard vessel traffic system. The system should be made mandatory from Cape Flattery and radar coverage should be extended. Each ship in Washington waters should be able to communicate with the Coast Guard traffic system. Functional, modern radar and radio and other navigational aids should be mandatory in all ships in our waters with severe penalties leveled against all violators. The Coast Guard should be given the authority, the personnel, and the funds, to enforce these regulations.

Other suggestions are the following: A committee composed of knowledgeable seamen, and others should be commissioned to draft a more complete and

comprehensive set of rules for each inland waterway. There is a need for upgraded financial liability-fixing in the event of oil spills. Finally, if an oil spill should occur clean-up capabilities must be present. It is important to note that the oil companies in the state of Washington are actively involved in the Clean Sound Cooperative (for cleaning up oil spills) and will continue to support it in all possible ways.

In closing, I repeat, the waters of Washington can function under a multiple use concept and a prohibition on crude oil tankers would place an unnecessary financial burden on the citizens and businesses of the state of Washington.

VI (2) Comments of John H. Wiechert, Manager
Clean Sound Cooperative

The Cooperative Approach to Oil Spill Cleanup

The oil industry, like most concerned citizens, is deeply mindful of oil spills and their potential environmental and economic impact. Some spills have caused damage to property, beaches, and marine life. They have led to confusion and apprehension, and the public has questioned the oil industry's ability to deal with the problems.

It is obvious that concern about oil spills has intensified in recent years as the quantity of oil transported by ship has increased. As reliance on waterborne crude oil increases, so will concern about the risk of oil spills.

Over the past several years the government and the oil industry have conducted extensive research and development programs to learn more about the effects of spilled oil on the environment. These investigations also have been directed at developing better methods of preventing spills, as well as containing and cleaning up spilled oil.

In addition to research and development activities, a number of oil and transportation companies in many areas of the United States have taken other action to combat oil spills. These companies have pulled together to form "oil spill cooperatives" that have the primary objective of combining their resources, equipment, and manpower to provide effective regional spill control programs.

Clean Sound was formally organized in April of 1971 and formulated certain basic goals:

One - To share oil spill containment and recovery equipment owned by individual companies. The local managers of these companies have pledged their resources and experience to aid other members in preventing and cleaning up oil spills.

Two - To finance large, expensive oil spill containment and cleanup equipment that would otherwise be uneconomical for individual members to own and maintain.

Three - To assure that a viable, private oil spill cleanup contractor with trained personnel is available to rapidly respond to cleanup spills that occur whether the source be member, nonmember, or unknown.

Four - To insure that Clean Sound has the most modern and efficient equipment available through a continuing program of testing and evaluation.

Membership at present consists of fourteen oil and oil transport companies, namely: Atlantic Richfield Company, Chevron U.S.A., Inc., Crowley Maritime Corporation, Fletcher Oil Company, Foss Launch & Tug Company, GATX Tank Storage Terminals, Mobil Oil Corporation, Olympic Pipeline Company, Shell Oil Company, Texaco, Inc., Time Oil Company, Transmountain Pipeline Company, Ltd., Union Oil Company of California, and U.S. Oil and Refining Company.

Since 1971, Clean Sound and its member companies have spent over 3 million dollars for equipment to prevent environmental damage from oil spills. Clean Sound currently has available through direct ownership or under contract an impressive array of equipment including:

- more than five miles of oil containment boom;
- fifteen portable oil skimmers, eight oil-skimming vessels, of which two have a rated recovery capability of over 800,000 gallons per day and two of which have a rated recovery capability of over 400,000 gallons per day;
- thirty-four boats, thirteen of which are greater than 18 feet long and two that have speed capabilities in excess of 30 knots;
- over 11,000 feet of absorbent boom for use in protecting sensitive areas;
- a vessel-lightering system with a nominal pumping capability of 1,000 gallons per minute;
- an extensive communications system, including fixed relay units known as repeaters on two sites and a mobile repeater for use in remote areas;
- a large quantity of miscellaneous sorbents, vacuum equipment, pumps, portable oil storage containers and other auxilliary equipment.

Clean Sound, through its contractor, has a design cleanup capability of about 4-1/2 million gallons per day. If one were to include additional equipment available from other contractors, the Coast Guard and Navy, the design cleanup capacity exceeds 8 million gallons a day. This capability, of course, can vary according to logistics, weather, and operating conditions.

Clean Sound considers that, given prompt notification and normal weather conditions, they have the capability to clean up 90 percent of a 2 million gallon oil spill in semi-protected waters within two weeks. Some of the remaining oil may reach inaccessible shorelines and would require additional time to recover.

In examining the oil spill cleanup equipment available, one must realize that the technology is rapidly improving. As new containment and recovery devices become available, they will be added to the inventory to meet existing needs as well as future requirements.

Additional resources are available from five other major cooperatives on the West Coast through an established mutual aid agreement. Other co-op equipment and experienced personnel can augment Clean Sound should it be necessary to meet an emergency in Washington.

Clean Sound is wholly funded by its membership. Expenditures for equipment and operations in 1976 totaled over 1 million dollars. Approximately three quarters of a million dollars has been budgeted for 1977 in a continuing effort to upgrade the cooperative's response capability.

In an effort to overcome the logistics problems associated with oil spills, the cooperative's equipment has been based in several strategic locations for use in the waters of Western Washington. Bellingham, Anacortes, Seattle and Tacoma are the locations for storage of the primary equipment. Secondary equipment is stored at Ferndale, Everett, Renton and Port Angeles. All of the equipment and resources are available to state and federal governments should the need arise.

As previously mentioned, one of the Clean Sound's goals was to insure that a viable, private contractor was established. At the time Clean Sound was organized, the Marine Oil Pickup Service was formed with the same basic purpose--to keep the waters of Puget Sound clean. Marine Oil Pickup Service has become Crowley Environmental Services Corporation and has combined their special expertise, facilities, equipment and manpower to provide a "fire alarm" response service around the clock as the oil spill cleanup contractor.

Clean Sound provides substantial financial support to Crowley Environmental Services in the form of a sponsorship fee which currently amounts to $200,000 annually. In order to remain economically viable, Crowley Environmental Services engages in several activities allied to oil spill cleanup.

These include training schools, diving, salvage, booming of docks and ships, contingency planning, consulting services, and the sales of boom, sorbents and other equipment while being available to respond to spills. As defined in our agreement, Crowley Environmental Services is required to respond within one hour. The short response time is to provide early containment that will mitigate the effect of an oil spill by preventing dispersal and recovery complications.

Responsibility for small spill prevention and cleanup for Clean Sound's member companies rests with local management. All of the member companies' contingency plans have been written to mesh with Clean Sound's Oil Spill Response Plan so that in the event a spill occurs that is beyond the capability of local management, Crowley Environmental Services can be activated and a smooth transition take place. The oil spill response manual outlines quick and decisive actions for all oil spill situations. The manual contains detailed call-out procedures, organization, and call lists of member company personnel that are available as "advisors" as well as equipment available through the Coast Guard, Navy, other cooperatives and contractors. Periodic amendments and changes are made to keep the oil spill response manual current.

Since Clean Sound has been in existence, there has not been a "major" spill in Washington waters. However, Clean Sound has proved its capability by providing lightering equipment to offload the freighter "Vanlene" which ran aground in Barkley Inlet, British Columbia in March of 1972, assisted in the cleanup of 400,000 gallons of spilled crude oil when a pipeline ruptured in February of 1973 near Lynden, Washington, shipped the skimmer "Petro Sponge" to assist the Port of Portland by skimming oil discharged from the U.S.S. Princeton on the Willamette River in September of 1975, and recovered 14,000 gallons of Bunker C fuel with the Bellingham-based skimmer "Petro Scoop" that was spilled when two freighters ("Erawan" and "Sun Diamond") collided in Vancouver, British Columbia in September of 1975.

Crowly Environmental Services cleaned up 78 spills in 1973, 95 spills in 1974, 99 spills in 1975, and 87 spills in 1976. Most of the spills are small, however, on occasion Crowley Environmental Services is called upon to clean up larger amounts of oil. For example, in 1976 seven of the eighty-seven spills amounted to 1,000 gallons or more. These included:

1) 25,000 gallons of mixed lube oils from a reclaiming plant in Tacoma;

2) 11,800 gallons of Bunker fuel from a sunken tugboat in the Duwamish River;
3) 3,800 gallons of light crude oil from a tanker in Tacoma;
4) 2,200 gallons of light oil from a tank farm in Port Angeles;
5) 1,500 gallons of crude oil from a vessel in Seattle;
6) 1,000 gallons of crude from a tanker in Tacoma; and
7) 1,000 gallons of Bunker fuel from a vessel in Seattle.

It is hoped that Clean Sound will never be required to perform the services for which it was organized. The member companies are dedicated primarily to the prevention of oil spills. It is recognized, however, that there is a time when prevention fails and the cooperative must be ready with the next best step--to clean up the spill as rapidly as possible. Full scale field exercises are held periodically to insure the readiness of the equipment and the capability of the personnel. These exercises or "spill drills" are conducted by the cooperative alone or jointly with the Coast Guard. Maintaining the equipment and the training level of personnel is stressed so that the cooperative's resources are ready to assist all agencies that might be in need of them.

In the future, Clean Sound and its contractor, Crowley Environmental Services, will continue to provide the resources and response capability to control oil spills on the waters of Washington State. Some additional future plans include:

- the acquisition of additional containment and recovery devices;
- development of fast response craft capable of boom transport and deployment;
- continued training of personnel through classroom and field exercises;
- continued development of equipment and manpower resources for response to a spill on the state coastal waters;
- application of improved technology to beach cleanup.

Clean Sound and their contractor, Crowley Environmental Services, represent one of the most effective spill control programs in the country. Their extensive capabilities have been recognized by the State Department of Ecology in a report submitted to the Governor in July of 1976.

VI (3) Comments of Bill Rodgers,
Vice-President, Oil, Chemical & Atomic Workers International,
AFL/CIO Local 1-590

I appreciate the opportunity to participate in this conference, primarily because I believe the average working people are being forgotten when the question of Puget Sound and the oil industry is discussed. First of all let me say that the Oil, Chemical and Atomic Workers Union is now, and has always been concerned about the environment long before that became the popular position to take. We have in the past, and continue even more so, to insist that the oil industry make every possible effort to ensure that the environment is protected. However, we do believe this problem of transporting oil in Puget Sound must be resolved logically and not emotionally. We believe crude oil can be transported both safely and economically to the existing refineries in Washington State.

Now the question arises, what is the safest method of transporting that oil? Should we have a central unloading facility, and transport the oil by pipeline to the refineries? If so, where should that facility be located? Or should we continue to transport crude oil by tanker to each refinery? Let us assume that a central unloading facility is chosen. Where will it be located? The two locations most often suggested are Port Angeles and Cherry Point. If Port Angeles is chosen, it would require a pipeline over 300 miles long opposed to the 60 miles distance required by tanker. The construction of this pipeline is estimated to increase the cost of transporting a barrel of oil by about 60 cents per barrel, as opposed to the 5 or 6 cents per barrel if it is transported by tanker. That is, of course, the economic aspects of the pipeline. How about the safety aspects?

With a central unloading port, many more tankers would be coming to and leaving the same location, with much more likelihood of an oil spill. But let us not forget that the possibility of a spill exists also over the 300 miles of land pipeline that would be needed. Should Cherry Point be chosen as the location of the central unloading facility, that would tremendously cut down on the expense since pipeline already connects all four existing refineries. But, because this pipeline is much shorter than the 300 mile pipeline from Port Angeles, the possibility of a pipeline oil spill is reduced many times over.

We in the Oil Workers Union believe that the most practical method of bringing oil into our local refineries would be to continue with tankers unloading at each of these. This would eliminate both the tanker congestion that would be created by a central unloading facility, and the possibility of oil spills from the pipelines connecting the refineries. We urge that whatever method is chosen, the proper safeguards be instituted to ensure the possibility of an oil spill be kept to a minimum. Some people are demanding guarantees that there will never be an oil spill in Puget Sound. Such guarantees are an impossibility. Looking back to the time when the first refinery went into operation in 1954, there have been very few oil spills. None of them has caused any permanent damage and even very little temporary damage to our beaches and marine wildlife. I believe the oil industry, as well as regulatory agencies and the general public, are so much more aware of this problem that oil spills will become fewer and even smaller in size as time goes on, as we develop more and better safeguards.

What would happen should we insist upon such stringent restrictions on the oil industry that it is no longer economical for them to continue operation in the state of Washington? Some people seem to think the oil industry has so much money that they can afford almost any expenditure. For the most part this may be true. However, they are no different from other industries in that they will seek to operate where they can make the most profit. For example, in the last few years Mobil oil has completely shut down three refineries, one in East St. Louis, Illinois, another in Wood Haven, Michigan, and yet another in East Chicago, Illinois. And these refineries were not closed because they were unprofitable. They were closed because Mobil could make more money elsewhere. I am certain Mobil's Ferndale refinery will also be closed should some other restrictions be placed on them that have been suggested. Let us suppose that all four refineries should decide to cease operations here and relocate elsewhere. What would be the impact upon us? First, about 1,500 people would immediately be without jobs. This figure does not include contractors and their employees and various businesses and their employees whose livelihoods depend on the oil industry. Without these jobs, members of our union and their families are going to suffer tremendously, as well as many who are not directly employed by the oil industry but whose income depends largely upon the money flowing into the communities from oil industry payrolls.

So in thinking about this problem we should take into account the present job market. We have many people already unemployed, with more coming out of our high schools and colleges who will be seeking jobs. We can ill afford to chase a multimillion dollar industry from our state.

By all means let us protect our environment, but let us also protect our citizens' jobs. Let us find a solution to the very important problem of transporting oil in Puget Sound, and by all means let us do it quickly, as quickly as possible without making hasty decisions which we may regret later.

VII. ENVIRONMENTAL CONCERNS AND APPREHENSIONS

1. Charles J. Flora

Oil and the Marine Environment*

Visualize if you will a single acorn barnacle attached to a rock at the mid-tide zone in a pool on one of our local beaches. Exposed, the animal "hunkers down" inside its tiny volcano with its "lid" tightly closed, activity almost nil. Under water, as in a pool or at high tide, the animal responds to some stimulus and opens its covering plates and begins to stroke the water with its filamentous appendages, capturing plankton which are swept down to the mouth at the bottom of the "volcano." If the water warms the animal strokes faster--other factors being equal--until it nears the death point. If the water cools stroking is slower--other factors being equal. But other factors are never equal--except in the most artificial circumstances. Should it rain into the pool reducing the salinity water would tend to move into the cells of the animal's tissues causing swelling. It takes effort to remove this excess of water, effort requires energy, energy requires a higher metabolism which can be reflected in increased activity. Thus, other factors being equal, decreasing salinity should cause increasing activity, i.e., faster stroking. And, conversely, as the salinity increases slower stroking should be expected. Increasing temperatures in our tidepool should increase the evaporation rate, increase the salinity and decrease the rate of stroking. But we have already said increasing temperature and increasing stroking rate go together. Under conditions of declining concentrations of dissolved oxygen (D.O.) our barnacle's activity level may for a time increase in about the same way we breath faster as oxygen becomes scarce. Warm water holds less D.O. than cold and thus, under increasing temperature, less oxygen may be available and the rate of stroking might increase. Of course our barnacle isn't alone, it never is. Neighbors of all sorts consume dissolved oxygen so that even if the temperature remains the same, the stroke rate may increase. Then too perhaps our pool has abundant plant life which, through photosynthesis activated by the sunlight makes it warmer, produces oxygen reducing

*I am grateful to Mr. Mahmood Ali of Kuwait for providing me with references and advice during the preparation of this paper. Mr. Ali is a graduate student at Western Washington University.

the speed of stroking. Now please understand, tiny barnacles tend to stroke faster than larger ones--other things being equal. Small animals have greater surface area relative to volume than do larger individuals, respond more directly to the environment and generally have higher metabolic and activity levels. Then too our barnacle was not always in a "volcano." Earlier it was a microscopic bit of flotsam "trying hard" but ineffectively to control where it might attach and grow. In this stage temperature variations affect the animal very differently than as an adult and at sexual maturity it reacts differently than at other times. Under conditions of molting its reponse will be different than on other occasions. And of course other organisms in the area, including predators, the presence and kinds of nutrients, the nature of the substrate, the duration of light, the height of the water, the strength of the wind, humidity of the air, etc., etc., all can affect our barnacle's response to temperature and must be part of the story if we are to understand fully the relationship between our animal and temperature. But this is the simple part. It turns one's brain to clay to contemplate the relationship between temperature and barnacle food. Our barnacle isn't terribly selective, anything small and planktonic is likely to be a part of its food--mussel larva, detritus, snail larvae, crab larvae, etc., etc. If we are to <u>fully</u> understand the temperature-barnacle story we must know the temperature story of every food source--and that becomes one hell of a mess.

Accordingly, when someone asks me a question such as "What is the relationship between barnacles and temperature?" I shudder.

I have been asked to discuss the relationship between oil and the marine environment and in a fit of absence have accepted. I wish I had fled town. I thought of saying "April Fool" and leaving.

In view of the difficulties with barnacle-temperatures, it should not surprise us that the issue of oil in the sea is enormously complex, that our knowledge is incomplete and that the matter is premature. But I'll do the best I can, initially making a few general observations and then becoming more specific.

First, the term oil isn't very meaningful in the ecological sense. There are many sorts of crude oil, and they're all different--Kuwait Crude is different than Louisiana Crude is different than North Slope Crude, etc., and

the biological effects differ. Thus, when twenty different crude oils were evaluated against the species Littorina obtusata (reported in Nelson-Smith, 1973), mortality rates after one hour's exposure to the same concentrations and allowing a five-day recovery period varied from 1 to 89 percent. Moreover, the various classes of hydrocarbons in crude oil are different, i.e., alkanes differ from alkenes and alkenes are unlike aromatics. There are high boiling alkanes, low boiling alkanes, etc. I am not a chemist, so suffice it to say, the specific nature of the particular hydrocarbon is essential to our ultimate understanding of the effects of oil on the marine ecosystem.

Secondly, the where of an oil spill is vital to understanding its effects. Thus oil from the Torrey Canyon spill off Cornwall, England on March 18, 1967 had little demonstrable effect upon subtidal marine life (Smith, 1968) perhaps because the area was directly exposed to the open ocean, whereas from the wreck of the Tampico Maru in March 1957 terrible damage was reported (North, 1965), perhaps because the spill occurred at the mouth of a cove, confining the oil to a small area. The massive December 18, 1974 spill from the Mizushima refinery into the Inland Sea of Japan, an isolated body very like Puget Sound/Georgia Strait, probably produced environmental consequences more akin to the Tampico Maru than the Torrey Canyon (for a description of the Mizushima spill see Nicol, 1976).

Thirdly, the condition of the water containing a spill is important. Thus the time of year or the latitude may be significant. The low-boiling, lighter molecular weight hydrocarbons, some of which are directly toxic to some marine organisms, evaporate more quickly in warm water than cold. Further, evaporation is enhanced by rough seas, and intense sunlight (Boesch, et al., 1974), (Anderson, et al., 1974).

Fourthly, oil in the sea is not a new phenomenon. Captain George Vancouver reported oil seepage off Santa Barbara, California, in 1793 and coastal Indians used natural tars for waterproofing long before the white man visited Pacific Shores (Hodges, 1973). Oil has been shipped on the high seas for years but it seems until the Torrey Canyon spill in 1967 there was little enthusiasm for scientific research in the area. Since the Torrey Canyon, just as oil shipping on the seas has increased annually, so has the number of scientific publications having to do with oil in the sea.

Approaches to studying the effects of oil on the marine environment

include:

1. Controlled experiments in the laboratory wherein various species are subjected to various concentrations of different sorts of crude oil or fractions thereof.

2. Field studies in which plots are contaminated with known materials over various periods of time.

3. Combinations of laboratory and field study in which the projections from the laboratory are tested and confirmed in the field.

4. Field studies associated with a spill. Usually little or nothing is known about the particular habitat prior to the spill and only follow-up observations are possible.

5. Baseline studies. These attempt to list all forms in a given area such that when a spill or other contamination occurs, the damage can be assessed.

Of these, the baseline approach, laudable from a natural historical viewpoint, I believe, contributes least to an understanding of the effects of oil in the sea. Typically, plant and animal life is catalogued for a period of two or three years in a given locality. The numbers of species are great and the taxonomic problems formidable. Often only a few people are involved in a given study and to expect them to sample completely and to classify accurately the full range of many hundreds of plants and animals is unrealistic. Further, many species normally display population cycles, i.e., periods of abundance following periods of paucity. Such cycles are rarely revealed in two or three years. Baseline studies will add richly to our general biological awareness but I fear will add little to our appreciation of the effects of oil.

The combination of laboratory and field analysis under controlled conditions is, in my opinion, the best hope for generating the kinds of knowledge we need to make rational decisions. This is where we should spend our money. A few, not nearly enough, such studies have been undertaken.

There follows a potpourri of observations on the effects of oil on the marine biota. (Please understand this is by no means complete.)

It appears that oil spills can be less harmful than certain cleanup attempts. In the Torrey Canyon spill and others drawing large public attention, various solvent-emulsifiers were used and are believed responsible

for the deaths of many marine organisms, including birds (Nelson-Smith, 1973). Cleanup chemicals have also killed beach fleas and other scavengers, leaving large accumulations of organic debris on beaches following a spill (op. cit.).

Species differ widely in their sensitivity to the toxic effects of oil. Thus it has been shown (Anderson, et al., 1974) that certain estuarine fish are less sensitive to crude oil than are three species of shrimp examined. It has been suggested that fish, in general, may be quite resistant to the presence of oil and oil fractions because of their mobility and protective mucous on the body and gills (Nelson-Smith, 1973) (Boesch, et al., 1974). Larval fish are probably entrapped in surface oil (Boesch, et al., 1974) but the magnitude of this is unknown.

We are quite ignorant of the effects of oil on plankton and published accounts vary. Some phyto plankton mortality was reported from the Torrey Canyon but none for the Zooplankton (Smith, 1968). No mortality for either was reported as a result of the Santa Barbara blowout in 1969 (Oguri, et al., 1971) (McGinnis, 1971). As a matter of fact, Gordon and Prouse in 1973 reported that concentrations of petroleum hydrocarbons below 10 to 30 ppb stimulated photosynthesis in phytoplankton but at higher levels tended to suppress it. Unfortunately, information on hydrocarbon concentrations in the sea is almost nonexistent so it is difficult to translate effects noted in the laboratory to actual circumstances in the ocean, but it has been suggested that concentrations in the Inland Sea of Japan from the Mizushima spill were initially high enough that planktonic diatoms and flagellates were reduced dramatically in numbers but that later levels declined to 0.1 ppm or less, and were followed by blooms of diatroms and dinoflagellates including toxic red tides (Nicol, 1976).

We are almost totally lacking in knowledge of the effects of oil on the neuston, i.e., those organisms such as floating algae and various invertebrates which live in close association with the ocean surface. This is a striking bit of ignorance since spilled oil is in large measure a surface phenomenon. Moreover, almost nothing is known of the ecology of the neuston, thus assessing the impact of oil here can be a futile exercise.

Because oil is a surface problem, at least when first spilled, one of the obvious consequences of heavy oil is smothering. Short barnacles are more vulnerable than tall ones (Nicholson, et al., 1971), algae, such as kelp,

with mucilage coating seems little affected while certain marine grasses without such protection fair badly (Foster, et al., 1971).

Some forms, such as snails (e.g., Littorina, Thais, etc.) may not be directly harmed by an oil covering but can be induced to withdraw into the shell, lose their attachment and be swept away by currents (Nelson-Smith, 1973). Of course, everybody knows that diving birds can become fouled with oil, lose their mobility, lose body heat and quickly die. Very often, the mortality is increased by cleanup techniques which at best save only a very small percent of those affected, e.g., of the 5,700 birds caught and cleaned after Torrey Canyon, only about 100 survived to fly another day (Hodges, 1973).

There is little in the literature on the direct toxic effect of oil spills in the sea though it appears that the Tampico Maru spill in 1957 was significantly so (North, 1965) and also the West Falmouth, Massachusetts spill in 1969 (Shipton, et al., 1970). Both spills involved light fuel oils and both were confined areas which would tend to cause high concentrations. Wipeout was reportedly nearly complete, though please note some hardy polychaete worms survived the Falmouth spill. But considerable laboratory evaluation of toxicity has been done. Thus it has been shown that petroleum in water establishes a thin surface film which can disperse into droplets and be absorbed into and onto suspended particles which are consumed by filter feeders, e.g., clams, oysters, mussels, etc. It has been shown that mussels treated with 302 mg/1 of diesel oil became noticeably weaker than untreated individuals, lost their byssal attachments and in about 50-60 days died in large numbers (Fossato, et al., 1976). Loss of attachment in the sea would probably cause death since the adult mussel is a mid-tide form that doesn't get about very well, thus mortality would start earlier than in the laboratory. In this same study it was shown that mussels could accumulate in their tissues in excess of 1,000 times the exposure levels, but that with fair speed hydrocarbons could be eliminated once the exposure ended.

In work done in Port Valdez, Alaska, it was reported that a common mudflat clam, Macoma balthica, after 60 days seemed unaffected when Prudhoe Bay crude oil equivalent to one ton/100 km^2 was dumped on the animal on the beach, but with a concentration equivalent of one tone/20 km^2 significant mortality occurred (Shaw, et al., 1976).

A. Nelson-Smith in 1973 published an excellent treatise entitled

Pollution and Marine Ecology in which he summarized many of the published effects of oil and its fractions on marine biota, e.g., carcinomas and papillomas have been observed on the lips of bottom-feeding fish near an oil refinery; hyperplasia was reported in the ovicells of a bryozoan (Schizoporella unicornis) growing in water around structures treated with creosote and asphalt, dissolved hydrocarbons (especially aromatics) irriate delicate surfaces stimulating heavy mucous secretions interfering with osmotic regulation; some forms are smothered, some are driven away and so on. He goes on to report that goose-barnacles may attach to floating oil lumps, and benefit thereby, that the quahod (an edible clam, Mercenaria mercenaria) seems practically immune to oil pollution; that limpets have survived for months, seeming to "graze without concern" on weathered oil but die rapidly when exposed to fresh Kuwait crude. It is claimed that lobsters are attracted to low concentrations of kerosene and that the European shorecrab, Carcinus maenas, does well in chronically polluted oil-docking areas. The Black Sea crab, Pachygrapsus marmoratus, seemed unaffected by 1 mg/l of fuel oil but the hermit-crab, Diogenes pugilator, was killed by 1/100th of that amount in similar tests. Echinoderms are apparently very sensitive to any change in water quality and the Tampico Maru spill "wiped-out" Pisaster and Stronylocentrotus for several years after the event--apparently the tube-feet become inactivated--but on that same occasion, the anemone Anthopleura xanthogrammica seemed unharmed. Some polychaete worms tolerate heavy oil concentrations and sometimes numbers increase in the face of constant oil pollution and cockles appear to be more sensitive than oysters or mussels--perhaps because their shells close less tightly.

Some organisms, such as copepods, can ingest large quantities of petroleum and eliminate it directly as fecal matter without substantial degradation or effect (Clark, 1976).

Species in the same genus may differ widely in their response to the same situation. Thus among periwinkles, Littorina planaxis suffered almost no loss attributable to the Tampico Maru spill (North, et al., 1965), L. scutulata was wiped out. L. neritoides was apparently less affected by oil than L. saxitalis in work reported from Milford Haven where L. obtusata was eliminated (Crapp, 1969). Such variation has also been observed in the laboratory. Moreover, within a single species, there can be considerable variation between individuals; in most laboratory research reports, whatever the design, mortality

is rarely 100%, suggesting that some individuals are more resistant than others and that adaptation is possible to some degree--given an unrealistically slow increase in contamination. In an unpublished report by a Western Washington University student it was shown that Littorina sp. from near Bellingham could survive higher oil concentrations for longer periods than could individuals of the same species from several miles distant (Terrell, 1976). Some adaptation or perhaps adjustment seems to have taken place.

Time of recovery is of great concern to all with an interest in marine oil pollution. And the picture is unclear. After the Tampico Maru spill, the barnacle population was "back to normal in two years." Some limpets and chitons did not return for five years and took several more before their "normal" numbers were present and abalones were absent for almost as long (North, 1965). A Japanese government report indicated that water quality was back to normal within months after the Mizushima spill but this was protested by fishermen and university researchers (Nicol, 1976). But it will be some years before full reports are available, whatever the rate of recovery. Obviously recovery time is a function of every factor mentioned in this paper and more. It remains a matter of speculation.

And so it goes. Thousands of bits and pieces. Several categories of potential damage caused by oil pollution in the marine environment have been listed by various authors, including Blumer in 1971, categories ranging from smothering to interruption of propagation events and occasional authors have advanced a few generalizations, e.g., "the usual and most obvious effect of pollution is to reduce diversity, the total number of individuals remaining may be as great or greater but the number of species will be fewer" (Nelson-Smith, 1973).

No grand scheme has yet been advanced by which we can assess the overall effects of oil on the marine environment or accurately predict consequences in a given area. Such require that we accumulate a great many more bits and pieces, take a lot more time, spend a good deal more money and face the problem with a good deal more objectivity than often exists on this topic.

Is oil in the sea boon or bane? From my viewpoint, it's more bane than boon, but how bane? That's society's problem.

That barnacle I started with thinks it's pretty bane too!

LITERATURE CITED

Anderson, J. W., J. M. Neff, B. A. Cox, H. E. Tatem, and G. M. Hightower. 1974. Characteristics of Dispersion and Water Soluble Extracts of Crude and Refined Oils and Their Toxicity to Estuarine Crustaceans and Fish. Marine Biology, 27, 75-88.

Blumer, M. 1971. Scientific Aspects of the Oil Spill Problem. Environmental Affairs. 1.

Boesch, Donald F., C. H. Hershner and J. H. Milgram. 1974. Oil Spills and the Marine Environment, Bollinger Publishing Co., Cambridge, Mass.

Clark, Robert C. 1976. Impact of the Transportation of Petroleum on the water of the Northeastern Pacific Ocean. Marine Fisheries Review. MFR Paper 1219, Vol. 38, No. 11.

Crapp, G. B. 1969. Oil Pollution in Milford Haven. Nature in Wales, 11. pp. 131-137.

Fossato, V. U. and W. J. Canzonier. 1976. Hydrocarbon Uptake and Loss by the Mussel Mytilis edulis. Marine Biology, 36, pp. 243-250.

Foster, M., M. Neushul and R. Ziugmark. 1971. The Santa Barbara Oil Spill: Part 2 - Initial Effects on Intertidal and Kelp Bed Organisms. Environmental Pollution, 2.

Gordon, D. C. and N. J. Prouse. 1973. The Effects of Three Oils on Marine Phytoplankton Photosynthesis. Marine Biology, 22 pp. 329-333.

Hodges, Laurent. 1973. Environmental Pollution, Holt, Rinehard and Winston, Inc., New York.

McGinnis, D. R. 1971. Observations on the Zooplankton of the Eastern Santa Barbara Channel from May 1969 to March 1970. In: Biological Oceanographical Survey of the Santa Barbara Channel Oil Spill, 1969-1970. Vol. 1. Ed.: D. Straughan. Allan Hancock Foundation, University of Southern California.

Nelson-Smith, A. 1973. Pollution and Marine Ecology, Plenum Press.

Nicholson, N. L. and R. L. Climberg. 1971. Biological and Oceanographical Survey of the Santa Barbara Channel Oil Spill 1969-1970. Vol. 1 Ed.: D. Straughan. Allan Hancock Foundation, University of Southern California.

Nicol, C. W. 1976. The Mizushima Oil Spill - A Tragedy for Japan and a Lesson for Canada. Environmental Impact and Assessment report, Env.

Canada. Report E.P.S.-8-EC-76-2.

North, J. W., M. Neushul, Jr., and K. A. Clendenning. 1965. Successive Biological Changes observed in a Marine love Exposed to a large Spillage of Oil. Symp. Poll. Marine Micro. Org. Prod. Petrol, Monaco, 1964 (Comm. Lut. Expl. Scient. Mer. Mediterr.)

Oguri, M. and R. Kanter. 1971. Primary Productivity in the Santa Barbara Channel. In: Biological and Oceanographical Survey of the Santa Barbara Channel Oil Spill 1969-1970. Vol. 1 Ed.: D. Straughan. Allan Hancock Foundation, University of Southern California.

Shaw, D. G., A. J. Paul, L. M. Cheek, H. M. Feder. 1976. Macoma balthica: an Indicator of Pollution. Marine Pollution Bulletin, Vol. 7, No. 2.

Shipton, J., J. H. Last, K. E. Murray and G. L. Vale. 1970. Studies on a Kerosene-like Taint in Mullet (Mugil cephalus), Journal of the Science of Food and Agriculture, 21.

Smith, J. E. (Ed.) 1968. Torrey Canyon Pollution and Marine Life: A Report by the Plymouth Laboratory, Cambridge University Press.

Terrell, T. 1976. An unpublished student project in Bio. 205, Western Washington University, Fall Quarter.

VII (2) Bob Lynett
Coalition Against Oil Pollution

Endorsement of an Oil Transfer Facility

The purpose of this article is to outline why the Coalition Against Oil Pollution is supporting the Northern Tier proposal to construct a single oil offloading facility at or west of Port Angeles for crude oil tankers.

Early in 1972 many conservationists recognized that the discovery of oil on the North Slope in Alaska would bring pressures to make Puget Sound a major oil port terminal for Alaskan crude. At a minimum, we could see that our Canadian crude that came to us via a pipeline would be replaced by Alaskan crude. Recognizing the dangers of bringing large tankers into Northern Puget Sound, we looked for other options. In order of preference, our wish list went like this:

1. Continue Canadian crude supplies and reject any transshipment of Alaskan crude to the midwest.
2. Build a port 5-10 miles off the Pacific Coast and pipe the oil to our refineries.
3. Build a port at or west of Port Angeles and pipe the oil to our refineries, going around Hood Canal, Olympia, and then north to Anacortes.
4. Same as 3, but crossing Puget Sound west of Whidbey Island (less expensive, but involves a water crossing).
5. Implement tough safety standards and let tankers go to the existing terminals while resisting any transshipment proposals (considered a last ditch position--not satisfactory to anyone, but better than nothing).

We then set to work in two areas: (1) getting an idea of the feasibility, practicality, and economic and environmental impacts of each alternative, and (2) raising the public and lawmakers' awareness of the issue of oil in Puget Sound.

Our options were narrowed by further studies and international events. The Army Corps of Engineers had concluded that an offloading facility off the Pacific Coast was not technically feasible due to winter sotrms with wave heights exceeding 30 feet for extended periods (offshore systems can be

used only up to 17 foot wave heights). Meanwhile our own research confirmed that, if Canada cut off our source of crude oil, our four major refineries would have to bring in 300-350,000 barrels of oil per day by tankers. The casualty records revealed a sad story--bringing in that much oil through the dangerous Rosario Straits would expose us to a significant risk of dumping a large quantity of oil in the worst place--the San Juans. Containment and cleanup in the San Juans would be next to impossible. By now Canada had formally announced their intention of cutting off our crude oil. Our efforts to work through our Congressional delegation and the State Department to continue the Canadian crude were fruitless.

Wanting to confirm our findings, we pressed the Legislature for an in-depth study of the whole oil issue. We were successful and the Oceanographic Commission of Washington (OCW) was given $427,000 to do the study. The OCW study was honestly done and confirmed the Corps' conclusion relative to the impracticality of an offshore facility, and our casualty figures, while also bringing more attention to the issue. During this time we lobbied (successfully) against the Oil Refinery Siting bill, saw the publication of Superspill, and expanded our contacts with the press and key state leaders.

By now SOHIO was in the process of choosing a site for offloading North Slope oil for the midwest. We lobbied against their using Puget Sound (there was a very real possibility that they could pick North Puget Sound and we would not be strong enough to stop them. Besides we were pursuing our third alternative--a port at or west of Port Angeles just large enough to handle our local needs).

SOHIO subsequently chose Long Beach, California, for their port. We had continuously been working to find ways to keep up the flow of Canadian crude, but this looked more and more doubtful. (In 1975, for the first time in contemporary times, Canada imported more oil than it exported.) The 1975 legislative session saw the first serious consideration of a port at or west of Port Angeles, but we were not even close to passing enabling legislation. However, as an interim measure, and to increase the incentives for an offloading facility in the Straits, we did see passage of HB527 which required tug support for tankers over 40,000 DWT and prohibited tankers over 125,000 DWT from proceeding past Port Angeles if they didn't have a number of safety features (no tankers currently have all the safety features requred by HB527).

In January 1976, we went to Olympia with the objective of legislating a port, but with instructions from our Board to accept transshipment if it was the only way to get a port at or west of Port Angeles. This was a crucial decision and not made without careful deliberation. The pressure to expand the existing offloading facilities was mounting as our Canadian oil allocation was reduced. Once the state granted these expansions we would never get the refineries to switch to a new port.

The facts showed that a port at or west of Port Angeles, even with transshipment, was far safer than bringing in fewer tankers to the existing docks to supply our four refineries. To make matters worse, the expansion by Shell involved a very precarious tanker route around Sinclair Island and between rocks 1,000 feet apart.

Despite continuous hearings in the House Transportation and Utilities Committee, by the beginning of February it was obvious that any legislation to create a port just for our local needs was not possible. Objections were many: the state should not legislate the oil companies or get into the business of handling oil; sincere doubts that a port was necessary; reluctance to move in an election year; powerful arguments by oil executives relative to the expense of a port, the small chance of spills, etc. (the oil companies were flying vice-presidents in from California and Texas for every hearing).

By now the northern tier states (Montana, North Dakota and Minnesota) were in trouble since Canadian crude would be completely cut off by 1979-1981 and they were faced with no supply in sight. This was also bad for us since much of eastern Washington is supplied with oil products from Montana; this supply would dwindle, causing a vast increase in oil traffic by barge up the Columbia river. A consortium was formed (Northern Tier Pipeline Company) to run a pipeline from Puget Sound to the northern tier refineries. Their choice was Cherry Point--the worst possible site insofar as spills were concerned. Facing severe opposition from the Coalition and the Governor's office, Northern Tier reluctantly agreed to put the port at or west of Port Angeles, to size the facility to handle enough oil to pipe up to our local refineries, and to run the pipeline along existing right-of-ways east to south of Port Townsend, south to Olympia then back north, thereby avoiding the Admiralty Inlet crossing completely. We agreed not to oppose the project as long as the above agreements were met and as long as our major refineries hooked up

to the line, thus eliminating crude oil transport in North Puget Sound. We also want (and should be able to get) legislation prohibiting any refineries or petrochemical plants from being constructed on the north side of the Olympic Peninsula.

That is where we are today. We have all been forced to make a hard choice--continued tanker traffic in North Puget Sound or more, but much safer traffic, to a point at or west of Port Angeles. On balance, we chose the latter. Spills will be much reduced in both number and the severity of their impact. Although it will be hard to convince the residents at Port Angeles, their risks do not go up since, without the port, tankers would still pass their doorstep and, in fact, we believe the marine environment even in the Straits will be safer with the new port. Nevertheless, it is a big pill Peninsula residents will have to swallow and we can expect them to resist the port. We can only ask true conservationists on the Peninsula to try and recognize the alternatives--all of which are bad.

If the port goes ahead, our obligation is to make it the safest port in the world. Increased radar control, better tug support, the best spill containment and cleanup capability possible, better operational procedures, etc. CAOP pledges to pursue all of these as vigorously as we have pursued our alternatives. On balance, we have come a long way in four years. Four years ago Northern Tier could have put a port in Northern Puget Sound with little resistance; today that is not possible due to increased awareness in our state (we have a reputation United States-wide of being the state most sensitive to oil spills). Our tanker ban is the first in the nation--a landmark piece of legislation. We would rather have had a port just to handle our local needs, but that turned out to be not attainable, so we opted for the next best alternative. To refuse Northern Tier's modified proposal would have lost us the support of many factions, including the Governor and many legislators; we might well have passed up any chance for a port in the Straits. (We well remember the conservationists' unbending stand opposing the Alaska pipeline. If we had compromised earlier on a Canadian pipeline instead of the Alaska pipeline, we wouldn't have this tanker problem to contend with today.)

It seems that more and more we are faced with hard environmental decisions. Fortunately in this case we started early enough to become a very real part of the solution. Whether or not the Northern Tier proposal goes

through now depends upon the resistance of the Peninsula residents. At least we have offered the state a choice.

Advantages of a Port in the Straits:

1. Less casualties by at least 5:1.
    a. Shorter distance.
    b. Avoids Rosario Straits and south Puget Sound routes.
    c. Easier to control:
        1) Radar more effective.
        2) Can time port calls to outgoing tides.
        3) Traffic lanes more effective.
2. Spills would do less damage.
    a. Can concentrate containment and cleanup equipment.
    b. Resource at stake less by at least 5:1.
    c. Better flushing in straits.
    d. Less damage if groundings occur.
3. Avoids barging oil up Columbia to eastern Washington.

Conditions for Port in Straits:

1. Best construction and operating standards.
2. Radar coverage over entire route.
3. Major refineries in north Puget Sound must use.
4. Prohibit refineries and petrochemical plants on Peninsula.

Risk Assessment:

	Risk of Spill		Damage Severity		Relative Exposure
1. Regional needs go to northern Puget Sound.	1.0	X	1.0	=	1.0
2. Regional needs and Northern Tier in Straits.	.3-.6	X	.2	=	.06 -.12

VII (3) Comments of Shelley McIntyre, Coalition Against Oil Pollution

I want to comment on some highlights of a few things that were said earlier this morning and add some ideas of my own. First of all there has been some play made of Governor Ray's ride on the "ARCO Fairbanks" from which she is reputed to have come away with the idea that piloting a tanker is easy, that anybody can do it, there is no problem. Not everybody, however, had that same feeling. We had a report from one of the senators on the ship and he came away from the whole experience very shaken. He said that his most profound memory was sitting there when the order was given "hard left rudder." He waited for the response and stood there on deck counting very slowly to ten before he could feel any perceptible movement at all in the ship. He said that was very frightening to him. He has been forced into an about-face, and he's pretty upset about it. There is, then, contrary opinion on how easy it is to maneuver a tanker. As for the comment about Montana and Wyoming digging up their coal for us, this simply does not arouse sympathy. I can't relate to that at all. They are not just doing it for us. They are not altruistic. So I refuse to be sucked into the idea that because Montana is doing it for us, we ought to do something in return for them.

As for the problem of pipelines crossing watersheds, I realize this is very controversial. I realize it is a problem and I do not want to minimize the question. Instead, I would like to point out that there are pipelines crossing watersheds all over the country. Look at a map of pipelines and you quickly see how they zig-zag across these. It can be done safely, and it must be done safely. Northern Tier is a conscientious enough company that it is going to do its best to see that these are safe pipelines. There probably will be added cost, but that is the price we pay for a clean environment. It is happening everywhere.

I also have a difficulty in blaming Canada for what is our problem. We are the consumers of the oil, so I do not see how we can blame Canada. I am flattered, however, that environmentalists are considered by Wilbur Hallauer to be swing votes, and you had better believe it. And now to a phrase that is thrown around quite a bit when we talk about energy. I have had more economics than I would care to impose on anybody. Let me assure you, an economist does not use the word "need." The word he uses is "demand." Demand is a function of price, taste, and various other things, so there is no such thing

as an energy "need." I cannot stress that enough. I get very impatient when I hear people talk about our energy needs in 1990 or 1985 or whatever; it is demand, and demand changes. A lot depends on price. Hitherto we have never paid the full price for the energy that we use; we are just starting to pay it. France, which is considered to be a fairly civilized country, uses approximately 50 percent of the energy that we use on a per capita basis. And, although this is not really the forum for stressing energy conservation per se, it is something I would like you to keep in mind.

A statement was made earlier about the market being perhaps the best determining factor for the decision of where oil will go. Vern Ledscott argued this matter the other day in hearings in Olympia. As a lobbyist for the oil companies, one of his closing statements on a bill being proposed was that economics ought to take care of the problem. His view was that we should not discourage private enterprise, and that we should not have the government making these decisions. Surely, though, if the oil industry is in the business of making money, it is not in the business of considering environmental factors and social welfare. I am horrified at the idea that the oil industry could be allowed to make this decision. Anything that threatens the environment is a public decision, it requires public involvement. That means government, that means you, that means me, that means all of us. Please do not let industry make the decisions for you. This has been happening a lot. You can see it happening also with the Bonneville Power Administration. For years BPA has determined the rate of growth for the whole region by the prices it sets on energy. Conservationists have become very upset with this. They have complained that there is no way for the public to become involved, that there is no public forum. We want more involvement. So that leads us to what can we do?

Political involvement today has a nasty tone to it. I am sorry that that has happened because I believe political involvement is very important. This is a republic. That means that representatives try to do what they believe the constituents want but they cannot know what constituents want unless you, the constituents, tell them. They do listen. Ask Mary Kay Becker. Certainly there are some real creeps and a few jerks who just won't do anything, but by and large representatives are responsible people, and they try to do a good job. Write your state representatives. Tell them how you feel. You don't

have to be fancy. You don't have to cite specific bills. If you are opposed to tankers in North Puget Sound, which I hope you are, tell them that flatly. You don't want a lot of tankers messing around in Northern Puget Sound. Write to Speaker of the House Bagnariol. He's going to be very important in this issue. He's going to maneuver the bills. The Legislature is going to be making some really hard, important decisions in the next few weeks and, as I sit here today, things don't look good. I'm really nervous about it. The Legislature is under enormous pressure from the Governor, and is under pressure from industry. Let them know how you feel.

But what of the Federal Government? It's possible to stall this whole thing long enough because Port Angeles doesn't want a port, and we don't want one at Cherry Point, and Los Angeles doesn't want one, and Long Beach doesn't want one, and Kitimat doesn't want one. What then are we going to do? I see a real possibility of the Federal Government saying "We need that oil. If you guys can't get it together we're going to tell you what to do." As far as I know the entire state delegation strongly opposes transshipment facilities at Cherry Point. Senator Magnuson is pretty powerful. He has made it clear that he wants his legacy to be a clean Puget Sound, and we commend him for that. Write to the state delegation and tell them how you feel. Thank Magnuson for the work he's done. Find out what Senator Jackson is doing. Ask him. He really has been quiet lately on this matter, and it makes me nervous that he's so quiet. Congressman Meeds has really put himself on the line on some major issues recently. He stuck his neck out on the Alpine Lakes, did a terrific job on it, but he lost votes over it. Support him, tell him he's great. Tell him that you don't want tankers on Northern Puget Sound, if that is what you want. I'm not telling you what to do. If you do want them, tell him that too. But just make it known, tell him how you feel. Join a group. Groups need support. The Coalition Against Oil Pollution needs members, it needs money. And there is a new group that is just forming here: Protect Our Waters. Join it. They need support. They will need money too. They will need workers, and they are going to need a lot of talent.

VIII. POLITICAL CONCERNS AND GOVERNMENT ACTIONS

1. State Senator H. A. "Barney" Goltz
42nd Legislative District
(Whatcom County)

(This paper is a composite of the two addresses by Senator Goltz, April 2 in Bellingham, and May 7 in Tacoma.)

Thank you for inviting me to participate in this public conference on Oil in Washington Waters: Boon or Bane? On behalf of the Washington State Senate I commend the Washington Commission for the Humanities, the co-sponsors, and the organizing committee, especially the directors Dr. Manfred Vernon and Dr. James Scott, for bringing public attention and discussion to this issue.

Next to funding of public education no subject is of greater importance to the Washington State Legislature. There are numerous bills addressing the subjects of siting facilities, energy conservation, and tanker control. Tacoma Senator Ted Bottiger, chairman of the Senate Energy Committee has become one of the nation's experts and leaders in the field of energy legislation--part of this expertise coming out of an unusually competent staff to whom I am also indebted for much of the research contained in this report.

The primary issues appear to be:

1) Must the state of Washington be a transshipment port for Alaskan crude oil to find its way to the lower 48 states' markets? This question is still to be answered. The House is inclined to say no, the Senate seems willing to say yes.
2) If so, what commitment do we have to the northern tier of states? At the recent Governors' Conference the northern tier governors, with the exception of Minnesota, stated their preference for an all-American pipeline, but left the question of port location unanswered.
3) What protections does the state have the power and right to provide?
4) How can we insure that boon would prevail instead of bane? How can we minimize the risks and maximize the benefits?
5) Who is going to make these decisions?

Support of Existing Refineries

The state of Washington must support the existing refineries in every

way possible. The regional petroleum energy requirements, the refinery jobs and the oil company investments in those facilities all must be protected. For these reasons I have supported tanker delivery of crude oil supplies directly to the refinery docks to supply 100% of refinery capacity (approximately 380,000 barrels per day), if necessary, although I would much prefer that the transmountain pipeline supply be available.

Tanker Traffic on Puget Sound

Because it appears that no pipeline supply of crude oil will be available to Washington State refineries for some time, we can expect increasing tanker shipments. We can also anticipate significant shipments of refined products from refinery docks to other points both within Puget Sound and to other locations. To reduce risk as much as possible I support strong facility and navigational standards, close monitoring, and fixed liability for all tankers plying state waters. It is the current legislative position, now being tested in the courts, that the state does have a special responsibility to protect its environment and jobs, which may go beyond federal shipping standards on the high seas. If the state loses in the case, I believe the federal government and the Washington State Congressional delegation will make special provision for Puget Sound in the Federal statutes. I also believe this state's right to regulate transfer of oil through its land use powers remains and is yet to be used.

It must also be recognized that national and state policies concerning oil shipments on Puget Sound are of great concern to Canadian and British Columbia interests. These policies cannot be imposed unilaterally without consultation with the appropriate Canadian authorities.

Oil Transshipment to the Midwest

On the issue of whether or not the state of Washington should authorize a port for the receiving and transshipment of crude oil to midwest refineries, we must take a somewhat different and more cautious position. While we have some obligation to share our resources with our sister states, we have every right and responsibility to demand the highest degree of protection available for our own environment, jobs, and economic well-being.

I favor the use of a trans-Washington pipeline to move crude oil to midwest refineries. A connector from the trans-Washington pipeline could also serve Puget Sound refineries with Alaskan crude and further reduce tanker

traffic on Washington inland waters. (The earlier position paper supported the transmountain pipeline concept, however the two-way yo-yo demand on that pipeline and the lack of service to Eastern Washington has caused a change in position.)

The evidence seems clear that oil transshipment to the midwest from Cherry Point would produce very few new jobs and would risk existing jobs. The Washington State Energy Council findings of a negative economic impact under these circumstances becomes a very important consideration. The oil company representatives have advised that it is technically and economically unfeasible to refine Alaska crude in Washington and to transship refined products to midwest markets.

In light of that information, there would be very limited additional refinery investment (and tax base), few construction jobs, and few additional operating jobs. Oil transshipment from Cherry Point has no long-term economic benefit to the state of Washington.

It is my belief that we must assume that economic factors are at least as forceful as political factors--that the legislature cannot repeal certain laws of economics. But also remember that economic laws do not apply solely to the oil industry. As Dr. Crutchfield and the Washington State Energy Council have pointed out, the economics of fisheries, tourism, second homes and real estate, recreation, etc., easily offset the economic benefits of oil transshipment.

I believe that inner Puget Sound should be declared a natural resource of such importance that further threat by supertanker oil transshipment should be banned. But there are other ways to transship oil--if we must!

The location of any oil transshipment port should:

1) Cause the state of Washington to receive some economic advantage to offset any risk, and I believe such economic advantage should be generously bestowed upon those local units of governments most directly involved for loss of future industrial growth, pollution impacts, declines of property values, etc.

   At Port Angeles and Cherry Point, for example, the E.P.A. air pollution standards would be over-taxed by an oil port. Existing SO_2 and other pollution would prohibit future development.

Furthermore--large, deep-draught supertankers would disrupt roe herring and salmon fishing grounds just off Cherry Point and Boundary Bay.

2) Localize risk--A single transshipment terminal should be required, and such a terminal must be connected to the pipelines serving the existing northern Puget Sound refineries--not that they be required to purchase Alaskan crude, but that it not be denied them.
3) Minimize risk--navigational aides, tanker safety, oil spill clean-up possibilities, an inventory of Puget Sound resources, must all be legislated and vigorously monitored.
4) Maximize independence and benefit--We should encourage the conversion of the existing refineries to use Alaskan crude through tax incentives, although Shell and Texaco have valid reasons for continuing the use of Mideast and Indonesian crude.

We should also insist that our independence requires an all-Washington State pipeline to serve northern tier states. The governors (except Minnesota) agreed.

These assumptions and conditions can be met only if:

1) The port is located as far out of inner Puget Sound as possible--certainly not north of Rosario Straits requiring a dangerous S curve over rocky reefs.
2) Washington refineries should be converted to Alaskan crude refining capability as early as possible.
3) We recognize that not all foreign tankers will be kept out of Puget Sound, so that the navigational aids should serve the poorer ships and not just the best.
4) We encourage industrial development along a pipeline in Eastern Washington, as for example Moses Lake or Ephrata where air pollution is no problem and markets for petroleum products and petrochemical products (fertilizers) now come from remote refineries.

Washington State can legislate:

1) Size of tankers.
2) Navigational aids including tug escorts.
3) Tax breaks for conversion.
4) Utility and property taxes.

5) Siting procedures--The Energy Facility Siting Council can consider applications and make recommendations to the governor. Local governments do not have the right to decide--the state has preempted this responsibility.

Competition should be encouraged.

If the state cannot decide--the Federal Government may preempt.

Let us look at some of the background of state law, state authority and state experience which influence our decision-making.

Washington State uses most of the common types of energy: coal, petroleum, natural gas, hydro and thermo electric. Those forms of energy being studied by the state and its agencies for future application and general use are solar and geothermo energy.

Petroleum accounts for some 48 percent of Washington's energy demands, with hydroelectric power second with 28 percent. Washington is provided with hydro power through in-state sources, but must rely on other states and countries for petroleum resources. Nationally, the United States uses 38 million barrels/day which is expected to continue to be the major United States energy source, but its total share of the energy supply will drop to about 43 percent from 48 percent by 1990. Natural gas is expected to drop its share from 26 to 18 percent in the same period, with nuclear power and coal energy increasing making up the supply lost by oil and natural gas.

The Legislative Transportation Committee developed an "Energy Map of Washington State" in 1975 which graphically depicts the total energy demands in Washington (using 1973 as a base year). While the map is no longer available, copies were mailed to libraries, school districts, colleges and universities throughout the state and should be available in those locations.

As the energy map indicates, and we all know, Washington depends on oil, natural gas, coal, hydro and thermo electricity to meet its energy demands. But let's focus more closely at the oil and petroleum area to outline where we obtain our oil, how we obtain our oil, and what has been happening with respect to oil during the past few years.

Washington has four major refineries: ARCO at Cherry Point, Mobil at Ferndale, and Shell and Texaco at Anacortes. Two smaller refineries, U.S. Oil and Sound Refining, are located in Tacoma. In addition to the refineries,

there are many petroleum-docking facilities throughout Puget Sound, Grays Harbor, and along the Columbia River for refined petroleum products. The importance of marine transportation of crude oil and refined petroleum products issues increased significantly during and after the Arab oil embargo of 1973-74 and when the Canadian government indicated it would curtail its oil exports to the United States. Historically, the number of tanker deliveries of crude oil to Washington refineries has been low due to the availability of Canadian crude shipments through a pipeline from the Alberta oil fields. The cutoff of Canadian crudes, especially the rate of that decline, resulted in a corresponding increase in marine deliveries of crude via tanker. The marine shipments of refined products remains fairly consistent because only pipeline shipments of crude were affected by the Canadian decision.

The ARCO refinery at Cherry Point was built in 1972, is contained on a 1,200 acre site, its present capacity (1974) is 96,000 barrels per calendar day with a potential capacity of 300,000 barrels per day. The refinery can store approximately 20 days of crude, employs 380 people, and uses 3.7 million gallons of water per day. The refinery uses a catalytic reforming and hydro cracking process to refine its products. The marine terminal at ARCO is exposed to the weather and waves. The controlling depth of the approach channels does not affect the size of tankers coming into the docking facility but the depth at the berth is 65 feet, leaving a principal controlling vessel dead weight capacity of 125,000 dead weight tons. A tanker of 138,000 dead weight tons had previously called at Cherry Point prior to the 1975 passage of the Oil Tanker Tug Escort Act (Chapter 125, Laws 75E1).

The refinery at Ferndale for the Mobil Oil Company was built in 1954 and is contained on an 800 acre site. The present capacity is approximately 71,500 barrels per day with a potential capacity of approximately 200,000 barrels per day. The facility can store up to eight days of crude, and employs 300 people using 4.2 million gallons of water per day. The Mobil refinery uses various processes to refine its crude oil and its marine terminal is exposed to weather and somewhat limited to wave exposure. There is no controlling depth for the marine terminal which would limit the size of oil tankers calling, except for the depth at the berth which is 45 feet, limiting vessels to approximately 60,000 dead weight tons.

The Shell refinery at Anacortes was built in 1955 and is contained on

800 acres. The refinery's present capacity is 91,000 barrels per day with a potential capacity of 200,000 barrels per day. It may store up to seven days of crude, employs 400 people, and uses 4 million gallons of water per day. Shell uses a variety of processing methods in its refining. The marine terminal is sheltered from both weather and waves and the controlling depth when vessels come through Guemes Channel is 54 feet with an 84 foot controlling depth east of Guemes Channel. The controlling depth at the berth is 45 feet, limiting the maximum vessel dead weight ton to approximately 60,000 dead weight tons.

The Texaco refinery was built at Anacortes in 1958 and is contained on 850 acres. Its present capacity is 78,000 barrels of crude per day with a potential capacity of 210,000 barrels per day. Storage is up to twenty days, employment 400, and water use at 3.8 million gallons per day. The Texaco refinery marine terminal is limited to the similar sizes of the Shell refinery at Anacortes; however, the design of their facility does permit dredging to accommodate vessels up to 85,000 dead weight tons.

U.S. oil and Refining of Tacoma has a capacity of approximately 16,000 barrels per day, has a sheltered marine facility, and the controlling depth is approximately 40 feet at the berth and 35 feet in the approach channel limiting the vessel size to approximately 35,000 dead weight tons. It is quite common for a larger tanker to call on Tacoma and liter the oil into smaller barges or vessels for transit up through the narrow Tacoma waterways to the refinery. Sound Refining of Tacoma has a capacity of approximately 4,500 barrels per day.

For additional information concerning Washington's refineries, I would suggest that you look to the "Offshore Petroleum Transfer Systems for Washington State" study conducted by the Oceanographic Commission and its report to the 44th Legislature, available from the Oceanographic Commission or in most libraries.

While refineries are the largest receivers of crude oil, there are many additional petroleum products shipped on Puget Sound waters. It is quite common for tanks and storage facilities located at Anacortes, Bellingham, Edmonds, Everett, Ferndale, Olympia, Port Angeles, Richmond Beach, Seattle, Tacoma, Neah Bay, Port Townsend, and other locations throughout the state in which gasoline, jet fuel, kerosene, fuel oil, lubricants and other products of the petroleum refining process. These are shipped over the waters in barges and smaller vessels. Quite commonly most of the "oil spills" we

have experienced in Washington State have occurred from these product transfers. Again, additional information concerning refineries, the shipment of products over Puget Sound, the economics and environmental concerns and other data associated with refineries and transfer points may be found in the Oceanographic Commission study.

We have discussed refineries and overall energy needs during the past years, and I thought you may like to know what state government has been doing, and especially the Legislature, with regard to laws which have been enacted.

WATER POLLUTION CONTROL ACT (90.48 RCW)---First enacted in 1945 and amended subsequently in 1967, '70, '71, and '73, the Water Pollution Control Act protects the waters of the state from pollution, sets up a permit process, and also provides for the "Coastal Protection Fund." One specific purpose of the fund is to cover "all costs involved in the abatement of pollution related to the discharge of oil" (RCW 98.48.400(b). Funds expended to abate pollution are recovered from those persons liable for the pollution discharges. As it specifically relates to oil, it would affect all refineries and petroleum transfer points in the state.

SHORELINES MANAGEMENT ACT OF 1971 (RCW 90.58)---Enacted by the people in 1971 after being referred by the Legislature, this legislation demands that adequate planning take place for the shorelines development of the state. Drilling for oil and other regulatory provisions apply broadly to the oil issues facing the state--especially as it regards development of oil transfer terminal facilities.

PUBLIC LANDS ACT (79.01 RCW)---This legislation had its "roots" established just after statehood--in 1897. Updated quite often since that time, the act regulates the public lands of the state under the supervision of the Commissioner of Public Lands, a state elected position, and the Department of Natural Resources. Primary input here to oil issues is the lease of state lands for oil exploration, use of the tidelands of the state, the Harbor Commission, and other state land management activities.

PORT DISTRICTS (Title 53 RCW)---The series of statutes regarding port districts affects very much the oil port development by government. It relates to the powers of port districts and their authorities and additionally, port districts are much concerned over marine transportation issues--especially oil.

WASHINGTON STATE PILOTAGE ACT (88.16 RCW)---This legislation which can be traced back prior to statehood was finally readopted in 1935 and requires state licensed ships' pilots on all foreign vessels entering state waters. The Board of Pilotage Commissioners, the regulatory agency, has been much the subject of controversy in the past few years, and legislation is pending to upgrade this particular act. In 1975, the Legislature enacted the OIL TANKER TUG ESCORT ACT (88.16.170-190). This 1975 law is presently pending a final decision by the United States Supreme Court as the Atlantic Richfield Company has contended the state overstepped its boundaries when enacting the legislation in this filed suit. Specifically, the bill requires state licensed pilots--those mariners who intimately know the waters of the state--on board oil tankers. Those oil tankers not having specific construction or safety features, such as double bottoms, must be escorted by tugboats through inland waters. A little later I will get to several amendments pending to the Pilotage Act.

MARINE POLLUTION BASELINE STUDY (RCW 43.21A.405-420)---To fully determine the effects of oil pollution on the shorelines on the 2,700 miles of shorelines of the state, the 3 million acres of submerged lands of the state, and the 300 islands of the state, the Department of Ecology is to prepare a baseline of information. The language of the act allows that the information "have multiple use, including use as supporting evidence of environmental damage resulting from oil pollution," "of the potential or existing risks and impacts of oil pollution," and "for reduction of risks and maintaining water quality standards." The baseline studies were to begin immediately in those areas most likely to show affects of oil pollution, but the Department of Ecology needs additional appropriations to complete the baseline studies.

There are other statutes on the books concerning oil spill liability, the Energy Office, an Energy Site Evaluation Council, and other laws which may be amended this legislative session. Those of you who are interested in the particular pending legislation should contact the Senate Energy Committee, 2nd Floor Institutions Building, Olympia, WA 98504. But as you can see, there are pollution laws on the books. The problems with the effectiveness of those laws, the funds to complete the studies and implement the programs, and additional problems must be solved, primarily through the appropriation

of additional funds. There are many state agencies working in this area, some have already been mentioned, but a more complete list should include Department of Commerce and Economic Development (which conducted an industry-environmental government study to develop common data which were accurate and to use an analysis of oil issues), Department of Ecology, Board of Pilotage Commissioners, Department of Natural Resources, Energy Facility Site Evaluation Council (broadened to cover all energy facilities from only thermonuclear power plants in 1976, the council is responsible for siting applications for the northern tier pipeline proposal and the ARCO/Transmountain Oil Transshipment Port Facilities; it also covers liquified natural and propane gas facilities), the Energy Office (responsible for keeping accurate data on state energy use and issues of energy), and the Oceanographic Commission (which is the study and research arm of the Legislature).

Congress has enacted many laws relating to oil, oil ports, marine transportation and broadly, energy. Federal agencies involved in the oil issues include the Army Corps of Engineers, Departments of Interior, Commerce, Transportation (Coast Guard), and the Environmental Protection Agency. The Federal Power Commission, Interstate Commerce Commission, Federal Trade Commission and the Justice Department, the Council on Environmental Quality, the Federal Maritime Commission, and the Federal Energy Administration. Federal legislation of particular note would be the Ports and Waterways Safety Act of 1972 (offered by Senator Warren Magnuson of Washington State), the Coastal Zone Management Act, and the Deep Water Port Act.

One basis for the ARCO v. Washington lawsuit regarding oil tankers is the "preemption issue." That issue is that when a federal law is on the books, regardless if it is enforced, that law preempts the states from acting in that particular area. That argument will, as mentioned earlier, be decided by the Supreme Court late this or early next year. But the issue of inaction or nonenforcement of federal legislation, such as by the Coast Guard regarding oil tanker safety, is much in the news and most important to Congress and the State Legislature alike. Federal/state relations under the Carter administration stand a good chance of being improved over past years. An example which illustrates the inaction of the federal government, specifically the Coast Guard, is the Ports and Waterways Safety Act of 1972.

Washington United States Senator Warren G. Magnuson was the prime mover

of this legislation which gave broad powers to the Coast Guard for oil tanker safety and port safety. The Coast Guard assured Maggie that all tankers would have double bottoms and that tougher requirements would be forthcoming. Five years after the passage of the act, the Coast Guard has taken no such action and, indeed, has taken a position exactly opposite to their prior position, which is very similar to that of the oil companies. I do not mean to say that the oil companies are always wrong; however, not all oil tankers are as modern and well-fit as, for example, the ARCO Fairbanks. We just have to look back to the events of last December and January, which include the Argo Merchant-sunk off Massachusetts, the Sansinea-exploded in Los Angeles, Olympic Games-grounded in the Delaware River, Oswego Peace-spill in Connecticut, Grand Zenith-disappeared, all of which were oil tankers of Liberian or Panamanian registry. Those accidents, which I am sure you all recall happened in a very short period of time, point to the laxity of oil tanker regulation, especially as it regards the flags of convenience, the Panamanian, Liberian, and several other countries who do not have proper inspection, safety, or crew licensing requirements. Increasing oil shipments to Puget Sound, includes increased shipments in the older, improperly manned, poorly-trained-crews, unlicensed officers, tankers flying the Panamanian, Liberian, and other flags cannot but cast a shadow on those who say the possibility of a spill occurring in Puget Sound is slight.

Just a few weeks ago, Governor Ray took the modern ARCO Fairbanks, a 120,000 dead weight ton oil tanker, between Port Angeles and Cherry Point. The ARCO Fairbanks is a modern sleek vessel, has a very capable licensed crew, has all the modern technical devices for assisting in safety and vessel location; it is one of the best tankers available today. That is one reason she will be used to test supertankers entering the Valdez area in Alaska being conducted this and last week. But a few days before Governor Ray's much publicized trip, the Trade Endeavor brought oil to Anacortes. Their radio power supply was not working, emergency receivers were not calibrated and required repair, antennas were corroded and performance was "low and poor," fuses and resistors of the radio gear were burnt out, automatic alarms were not working, the VHF receiver "cut out," portable life boat transceivers were defective, the emergency light system was inoperative, the main transmitter was "inoperative and ineffective" and required "replacement"; another

transmitter required a major overhaul, the direction finder--that piece of equipment which fixes the location and position of the ship--was in need of calibrations and the bearings given were incorrect, and the emergency power supply for radio communication was dead and required replacement. The Trade Endeavor is a Liberian registered ship. Certainly this vessel's deficiencies point to the need for improved oil tanker safety, especially on the tankers flying the flags of convenience.

Given the great volume of favorable publicity that Governor Ray and the ARCO Fairbanks received on the side of tanker safety, perhaps ARCO and the state of Washington should offer a Liberian tanker and Dewey Soriano equal time.

Shortly after Brock Adams, former Washington Congressman, assumed the position of Secretary of Transportation in the Carter administration, one of his first official acts was to implement a partial inspection program on oil tankers calling on United States ports and to require installation of a specific type of sophisticated radar (LORAN-C) in all oil tankers. Over two-thirds of all the oil tankers calling on Puget Sound ports since the inspection program was initiated in late January have been deficient in some manner, primarily related to venting and the oil transfer process. The radar requirement was published in the January 31, 1977 Federal Register and is pending final approval later this year. Additional requirements in the January 31 Federal Register required all ships to have appropriate charts, inform pilots of deficiencies in equipment, to have the vessel properly manned, and generally to improve safe navigation and maneuvering. But the radar requirement, the inspection program, and all regulations, do not necessarily insure safely unless they are expanded, improved, and the tankers, especially of foreign registry, are hounded into decent shape. The Trade Endeavor is due back to Anacortes April 10, at which time if she cannot perform adequately, her insurance company will cancel all insurance. If that vessel does not have insurance, it will not be going any place, but what about the risks to which Washington State has already been exposed?

To assist in federal/state relations, the National Conference of State Legislatures has initiated a task force to study these relationships as they regard marine transportation in general, and oil, specifically. State and federal governments must work together to solve the problems of oil tanker

safety. The Coast Guard has been hesitant to act on safety improvements unilaterally because they fear reprisals from other nations--the United States Navy especially fears these reprisals. The Coast Guard urges coordinated action through the United Nations International Marine Consultation Organization (IMCO) program of intergovernmental cooperation in setting vessel construction standards, crew licensing requirements, and other safety features. But IMCO has been insufficient in the past to deal with these issues and has been hesitant to act primarily because of the "flag of convenience nations."

Presently pending in Congress is legislation by Senator Magnuson and Congressman Norm Dicks (of Bremerton) to upgrade oil tankers (the Oil Tanker Safety Act of 1977) and strengthen liability laws (National Oil Pollution Liability and Compensation Act of 1977). The Congressman and Senator hope that this legislation will be through this session of Congress.

Legislation pending on the state level would increase liability for oil spills, revise certain powers of the Energy Site Evaluation Council, limit or broaden state preemption of local planning statutes as it relates to oil ports, train ships' pilots for handling the larger oil tankers, and an overhaul of the State Pilotage Act, just passed out of the Senate Transportation Committee last Tuesday. These are amongst many other bills relating to or having an affect on oil, oil transportation, oil transfer, and oil facilities and taxation.

To avert conflicts between federal/state regulations, I mentioned earlier the National Conference of State Legislatures has initiated a special task force for marine transportation of oil. Additionally, the seven state conference between Governors and legislative leaders scheduled in early April should also assist states in developing a uniform policy as it relates to oil. While it may be too much to believe that this conference could establish a seven state uniform policy, it will make the states' position more concise. Similar conferences have been discussed and we may expect several throughout the coming year.

I have discussed the Canadian curtailment of oil shipments to the United States and noted the state may be transshipping oil to the Midwest, also cut off from Canadian oil. The transshipment issue has resulted in a very large study by the Federal Energy Administration and several proposals for shipping oil to the Midwest including two using Washington ports. Briefly, the other

proposals outside of Washington to transship oil to the Midwest are to off-load oil at Kitimat, British Columbia, and pipe it through Canada to the United States; SOHIO (Standard Oil of Ohio) off-loading in California piping it through to Texas and up to the Midwestern states; using the Panama Canal; and tankers going around Cape Horn.

One of the Washington transshipment proposals is pending before the Energy Facility Site Evaluation Council. It is for building an oil transfer facility--oil port--at Port Angeles. This has been controversial since originally proposed. ARCO/Transmountain will soon have another proposal for an oil port before the Energy Facility Site Council.

Both of these proposals are to transship oil to the Midwestern oil-starved states. These states had their Canadian sources of oil curtailed just as Washington's refineries did, but they do not have an alternative as does Washington, such as having deliveries of crude made by tanker. This is the major problem facing the federal and state governments and which has placed a strain on federal/state relations.

The Northern Tier Pipeline proposal, which would off-load oil at Port Angeles and have storage facilities nearby, includes a pipeline going south around Hood Canal through Olympia, north through Pierce and King Counties then over the Cascades and through Eastern Washington eventually leading to Minnesota. The proposal calls for 800,000 barrels per day of crude oil to be delivered--just about the amount of oil in one 125,000 dead weight ton oil tanker. The ARCO/TM proposal calls for tankers to call at Cherry Point, reversing the existing pipeline from Canada, which previously brought Canadian oil south and finally reentering the United States in the Midwest. Both proposals will result, if actually developed, in a significant increase of oil tankers and these tankers would be <u>in addition to oil tankers serving Washington refineries</u>. Additionally, SOHIO may be back in Washington as they have run into severe air quality problems and Governor objection to transshipment through California.

In addition to increasing oil shipments, Washington may expect developing commerce of natural gas shipments. Liquefied natural gas (LNG) is a very cold liquid. Much more lethal to human life than oil, LNG is flammable, requires special ships, special training for ship and dock personnel, and is a result of the Alaskan North Slope Oil Exploration. If an LNG carrier has an accident and the liquid is spilled, it immediately turns into a gas.

That gas does not disperse into the atmosphere because it is much heavier than air. It remains in a cloud, hugging the ground until ignited--causing an immediate tremendous fire which follows the cloud back to the ship. It may or may not result in a shipboard explosion, and if it does not result in a ship explosion, the gas leaking from the ruptured vessel continues to burn and there is little, if anything, that can be done to stop the fire. One proposal already exists to handle LNG at Longview, Washington. It will be some time before the company is ready to submit an application to the Energy Council which would allow time to conduct a study proposed in legislation pending before the Senate Energy Committee.

You will recall the Fern-Valley LPG (Liquefied Propane Gas) carrier on which Washington Pilot Dewey Soriano ignored Coast Guard directions late last year. Legislation pending before the Legislature would resolve this and other problems with ships' pilots, their qualifications, training, and pay. Other legislation would beef up the advanced notice required for shipments of these hazardous natural and propane gas substances. While local shippers and port officials have been cooperative, those shippers along the west coast have objected to Washington laws to protect against shipping accidents, saying Washington doesn't have authority to act--only the federal government does.

Washington presently has a number of oil tankers calling at Washington refineries. Washington has been very lucky thus far, considering the number of tanker movements on Puget Sound, in avoiding a major oil spill. Oil companies have been responsible for upgrading their U.S. ships' crew qualifications and U.S. vessel equipment standards, in supporting the vessel traffic system and radar expansion by the Coast Guard (the vessel traffic system was developed pursuant to the Ports and Waterways Safety Act of 1972), and in purchasing cleanup equipment through the Clean Sound Co-op to combat potential oil spills. But more needs to be done.

Since the Oil Tanker Tug Escort bill was passed in 1975, 267 oil tankers have made approximately 950 oil port calls--this was between September 8, 1975 and December 31, 1976. The Legislative Transportation Committee is in the process of computerizing the oil tanker deliveries logged since the Oil Tanker Tug Escort Law became effective (9/8/75) and will be studying the various tankers, their nations of registry, where and when they were built, and other information to try and identify those tankers which are older, and may place Washington's waters in jeopardy.

I have already discussed Governor Ray's trip upon a good, new oil tanker, the nations of registry, especially the flags of convenience of the Liberian, Panamanian, Greek and other nations, and some of the numbers of oil tankers calling. I have discussed the possibility of liquefied natural gas and propane gas shipments, the transshipment proposals pending before the state and alternatives thereof, the location capacity and marine facilities of the Washington refineries, the Washington State legislation to date and some of the pending legislation, the state and federal offices and agencies dealing with the oil issues, some of the federal/state problems, and several other issues. I hope this has given you a general background as to the overall oil issues facing the state, what the state has accomplished, what we hope to accomplish, and hopefully that we may expect better federal/state cooperation if we are to avoid a major oil spill from an older, inefficient, ill-equipped, improperly manned oil tanker. I thank you for allowing me to participate in the symposium. Please feel free to contact me in Olympia, or use the Legislative toll-free Hot Line by dialing 1-800-562-6000 to contact me or other legislators regarding oil issues. I most heartily recommend that you continue to read newspaper articles and keep in touch with the Senate and House Energy and Utilities Committees, Senate and House Transportation Committees, Senate and House Ecology Committees which handle the various oil legislation presently pending in Olympia. I would also suggest that you continue to write and keep in contact with Senator Warren G. Magnuson regarding federal energy issues.

In summary, the primary issue remains whether or not Washington State is to become a transshipment state for Alaskan crude to reach other states--especially along the northern border and midwest markets. That issue is unresolved and will require a declaration by the Federal Government to satisfy the law which reserves a certain amount of Alaskan crude for those northern tier states.

The state of Washington should determine as quickly as possible the limits and alternatives acceptable to this state for the location of a transshipment port and the necessary pipeline. Such transshipment should be limited to a single port, and it should include all necessary provisions to minimize the risk and to maximize the benefits to the state of Washington.

In my judgment we should limit the port location to the Straits of Juan

de Fuca and we should insist that a connector to the existing refineries be offered--although I recognize that not all refineries can use Alaskan crude at this time without retrofitting.

It would be less than desirable to use the Transmountain Pipeline through Canada for a variety of reasons. Such an alternative would eliminate the possibility and benefit of refinery and petrochemical industrial development in Eastern Washington where the air quality standards, nearness to markets and economic advantages would be very beneficial.

It would be possible to gain nearly one billion dollars of direct economic input from an oil port, pipeline and policy approval as outlined. This would come from:

A central transshipment port	$150,000,000
A cross-state pipeline	400,000,000
Retrofitting existing refineries	200,000,000
Eastern Washington industrial investment	250,000,000

Washington State does have a plan for locating any transshipment port. The Coastal Zone Management Plan puts it at Port Angeles or west of Port Angeles. This is consistent with the Oceanographic Commission findings, the action of former Governor Evans, the National Congressional delegation and, I believe, the State Legislature.

Washington State also has a policy with respect to existing refineries. That is to be sure that they can be served totally and as safely as possible.

In reaching these policy decisions it is imperative that we have an enlightened public, for in the final analysis it is the people who must decide what these policies will be.

VIII (2) Remarks of Wilbur Hallauer
Director, Department of Ecology, State of Washington

The few words I have to say today are not on the specifics of the different things that make up the day-to-day actions concerning the control of oil in the state of Washington, but rather on the political atmosphere concerning oil on Puget Sound and in the state of Washington. As you all know, political tides ebb and flow just like those of the ocean. We had a major change in the direction of the tides at the time of the Arab boycott about four years ago, soon after the last episode in the Arab-Israeli conflict. That demonstration of Arab strength in relation to our energy problems here in the United States and our increasing demand for foreign oil, has resulted in a totally different practical question concerning energy in the United States. This, of course, is having its effect on all of us, so that as a nation we are changing our position on environmental requirements, especially our attitudes on all the different elements that make up the answers to our demands for energy.

For example, stepping away from the question of oil for a few moments, here in Whatcom County we have Ross Dam. The question was last before the Ecological Commission, which is part of my department at Olympia, some four years ago. The Commission then split 3/3, with 1 member abstaining, on the question of whether the state should go along with the idea of approval for the raising of Ross Dam. In that deadlock situation Governor Evans chose to take the position that Washington should cast a negative vote as far as increasing the height of the dam was concerned. If the same question were to be voted on today, would we get the same answer? It is my assertion here today that the different set of circumstances would produce quite a different result. The political argument is now at a point where it will probably change significantly because of the current drought conditions in the state. Energy is short, Seattle is beginning to feel the pinch of increased rates for high cost electricity out of California and the need for reassessment is great.

Coming back to the question of oil, when we were cut off from Canadian supplies shortly after the start of the Arab boycott or were turned down as far as those supplies were concerned, the state of Washington was forced to look entirely to other foreign sources--largely those of Indonesia and the Persian Gulf states--for its supplies. At least at the industry level, we

are beginning to look at importation problems in a much more pragmatic way than we might have done eight or ten years ago when we were satisfying our oil needs from the Canadian pipelines. It has been a rather interesting thing to watch industry change its awareness of energy needs and problems, and I think that the political context is changing as a result of that. The election of Governor Ray, who is a pro-energy person, in the last election is one example of this. She did not slough the issues at all. She met them head on and set the right tone to her election campaign, in which she made it clear that she wanted to see adequate energy supplies available in the state of Washington. By so doing, industry could be served, there would be jobs, and a healthy economy.

One of my duties as director of the Department of Ecology has been to host the visit of some Canadian officials to discuss some of our joint energy problems. Such visits have been a regular routine in different departments of the two governments for some number of years. In their recent visit the Canadian officials made it quite clear to us that the last place they wish to see chosen as an oil terminal is Cherry Point. Given a choice they would prefer to see such a facility go to Port Angeles. This, of course, would satisfy the environmentalist groups in British Columbia that are vehemently opposed to the shipment of oil on the inland waters of Puget Sound, and the Strait of Georgia. Although this is a very appropriate thing for them to do, looking at the problem in another way from our side of the border we are forced to rely upon tankers because we no longer have pipeline supplies from Canada. Looked at from this viewpoint it seems a little inappropriate to me that we have free advice offered from the people who caused us the problem. At any rate, the meeting with the Canadian officials was a good and productive one, and it will lead to further meetings of the same kind.

Turning to another example of the problems of oil development and the reaction of environmentalists, I was reading just yesterday a report about the developments of the oil shales of Colorado and Utah. With the adoption of the national clean air standards it has become impossible in Colorado and Utah to go ahead developing their extensive shale deposits because atmospheric conditions at certain times of the year are such that the natural levels of dust particulates violate national clean air standards. Consequently, the $440 million that has been bid by oil companies for oil shale leases is now under a 1 year moratorium, while government officials and the companies try

to figure out just how to handle these atmospheric problems. In other words, nothing is going on because we have over-structured our environmental requirements in such a way that we cannot proceed even with the experimental work that would possibly make available to us the wealth of these expensive oil shale deposits.

In brief, the environmentalist constituency is a strong one. The department I head was created for the purpose of serving that constituency, and it is a good thing to serve. I should make it clear, however, that I favor a good housekeeping approach to the way we treat our environment in this state, and I want to see some way found by which we can balance the effects, and still serve the energy needs without undue destruction of the environment and, if possible, with no harm at all. In the energy questions we face on more specific levels every day, I hope that the state of Washington can find a middle way. I hope that the pendulum's swing has come back a notch or two, and that we will be able to take those steps that will enable us to supply our oil, electricity, and other forms of energy in such a way that we continue to have a prosperous economy here, and that we all will be able to enjoy our way of life, pay our taxes, and expand our public sector as needed. Unless we have a prosperous economy we will be unable to do this.

VIII (3) Remarks of Larry Bradley,
Director, State Energy Office, Olympia

A lot of ground has been covered in previous presentations on the subject of oil tankers on Puget Sound, leaving little or nothing in the technical sense to be added, except to make a few observations. The presentation of the ARCO representative rightly was based on economics, involving continuation of expansion of the ARCO refinery facility at Cherry Point. I want to bring before you a much more critical situation that will lend some poignancy to whatever evolves in this urgent national concern. The Federal Register of March 1977 reported that the new allocation of Canadian crude would be 315,000 barrels a day to be shared by 69 refineries. Right now the local refineries in Washington are processing in excess of 300,000 barrels a day. Where then does that leave us? We have become dependent on other sources, including Indonesia and other East Asian countries, from OPEC nations. We are victims of whatever boon OPEC nations make, and we are now talking about $14 for a barrel of oil. And, although sooner or later the so-called surplus from Alaska will be ready to be delivered someplace in the United States, there is already indication that the cost of that oil will parallel the price paid for Indonesian or Persian Gulf oil. I don't need to tell you, and some of you with sharper pencils than I have right now can calculate what a dent that is going to make on our pocketbooks as we continue to rely increasingly on foreign supplies of oil.

When I look at the statistics of gallons of oil used in the state of Washington, as I do quite frequently, I have to tell you that we are using more today than we used this month last year. That may surprise you, but it shouldn't. We have more people than we had last year. It might be true, as some suggest, that the use of petroleum products is geared to the costs involved but recently it does not seem to have made any inroad in the demand. So now we are faced with the proposals that will come out of the President's office on April 21. The flyer that I received on this indicates what will be presented. It indicates that there will be a terribly high incremental increase in the cost of Alaskan oil--upwards of 25 cents more per gallon. That makes the cost of gasoline from between 75 cents and a dollar almost a reality. The only relief we will have, and that will be temporary, is that the amount of crude from Alaska will help meet much of our national need, but it is no more than a

stop gap. It means we can buy some time. That's all we can do. Time for what? Time for establishing new fuel sources, time for establishing new ways to use present sources or new fuel sources of the future, and time maybe to change a little of our lifestyle on a voluntary, hopefully not on a mandatory basis. The day has not yet come when someone can in dictatorial fashion tell you how you are going to live your lives. It may come to that even though there are those who would be willing to pay any price to do what they want.

The diverse means I am getting at are ways to cut back on fuel consumption. As the new director of the State Energy Office and in the absence of mandatory powers to curtail or to guide your use of the petroleum products, I am faced by many problems and few solutions, although they are not the direct concern of this conference.

Let me turn, then, to some of the matters that have come up today, one of which is how to deal with oil spills. House Regulation 8462, which was passed out of one committee but failed to come out of another committee, meant that the Congress, with its usual alacrity at doing nothing, failed to take any action on this bill. It has now been reintroduced as House Bill 776. The bill concerns itself with funding to take care of oil spills of some magnitude. Other bills concerning control of oil spills are in the offing. The bills do not preempt state law in any way.

Mr. Ogar of ARCO has brought up the matter of the number of spills. You have heard his definition of a spill. The Coast Guard stipulates that a spill is little more than anything that leaves a sheen. That makes a very difficult set of figures to work with because, in a sense, every outboard motor used on the Sound right now is liable to create an oil spill. Just think about that for a minute. There are thousands of reported oil spills yet only 5 percent leave spills in excess of 100 gallons and, in these particular waters, only about 3 percent of known oil spills are in excess of 100 gallons. That might be an insignificant situation to some and it certainly is no Argo Merchant situation. As of now there has been no reported damage from that spill, as large as it was. That does not mean, of course, that we can take such a spill in Puget Sound. It simply means that we must avoid any chance of such a spill occurring, and so I will echo what Mr. Ogar has said about the control mechanisms that must be installed in those tankers that come into our waters. Senate Bill 3116, introduced in the state legislature this session and on which hearings

will be held this week, incorporates requirements for tanker traffic control on Puget Sound water. You are all aware of the state's involvement with the ARCO Company and the kind of tenuous situation we are in at the moment, waiting for a Supreme Court answer. Assuming that the state fails in this, and it might, pilotage rules that are now under state jurisdication may become federal rules. I must emphasize that. If we are preempted by the federal law in terms of traffic control admonishments, in terms of how a ship will function, and in the equipment it may contain, the one way we can control the situation is to require a pilot, before he goes on the water, to make inspection of the equipment aboard any vessel he is engaged to pilot. If the equipment is inadequate he just gets off and that's all there is to it. I think that most of you who are maritime-oriented realize that a ship coming into these harbors, into these waters, without a pilot, would probably lose its insurance coverage and, losing that, I am sure no skipper in his right mind would proceed. Let's look, then, at the problem of rules, and let's incorporate them in 3116. That means adequate horsepower in any vessel, and all the rest. Radar systems in working order are an absolute necessity, together with such additional navigational aids as may be required by the Board of Pilotage Commissioners.

Another bill that has just come into the picture will interest you. This is one introduced by Representative Joy Browning. The bill proposes a quarter of a cent per barrel tax for a clean-up fund. About $1,000 a day would be generated and the fund go up to $200,000. This would provide redress for spills by unidentified offenders, such as the recent spill from an unknown source in Willapa Bay in which about two or three hundred birds were affected by the oil and the water and the adjacent shoreline messed up. I think Representative Browning's bill is an approach in the right direction.

Now, I would like to go from these practical kinds of things, gather them up and give you some idea of where we are in the state in terms of the oil transport situation itself. It's an awesome thing to get into when you know that you are sitting with your hand on the spigot. The oil is going to be made available out of the pipeline in Valdez this summer, but at the present time there is no way, absolutely no way that it can be taken care of, except by big tankers going south around Cape Horn and to discharge areas on the east coast. Under those circumstances our refineries will suffer. The refineries in Montana and Wyoming will suffer, and we will suffer because it is from them that the products that this state uses from the Yellowstone pipeline are

delivered to us. And if they are out of business there will be no products. We would then have to rely on other sources, probably foreign sources and much of that would be delivered by tanker. This will inevitably increase our tanker traffic, primarily from foreign sources. The recent cold snap in the mid-continental states was an experience none of us want to see happen again. I happened to be back during that time so I saw firsthand the problems and, while gas was a cheap commodity that was in short supply, oil was also in short supply because there was no way to get oil into the mid-continent states and their very scant supplies were utterly exhausted. So there is an oil interdependency in this nation, and we have to take that into consideration here in the state of Washington.

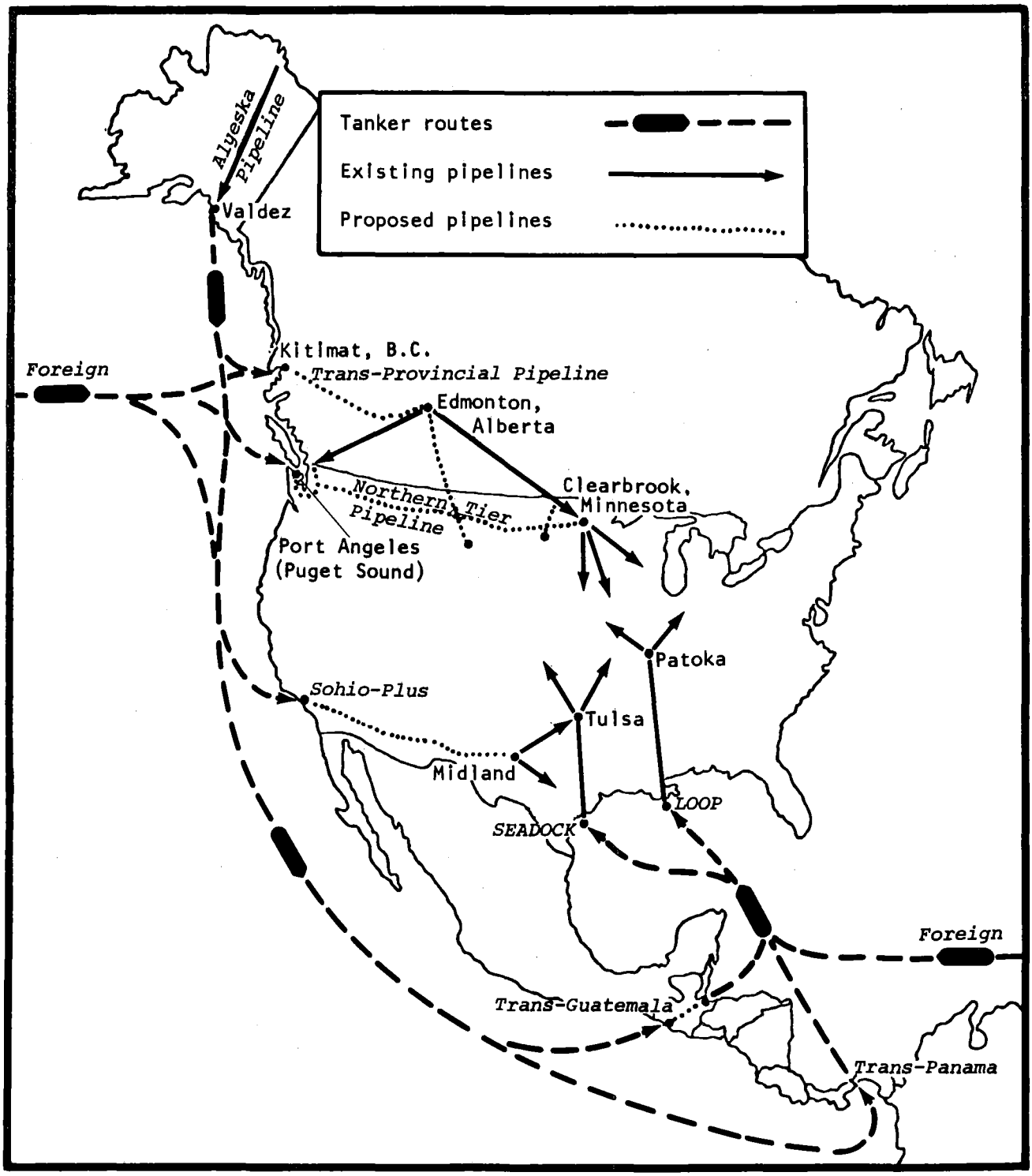
But what's in it for us? What's in it for us to have our shores dug up for the pipeline and the counties to the south of us and trout streams and salmon streams crossed with pipelines? What do we get out of this? We add a pipeline across the country to the coast, or to the Cascades, from the Cascades to the Idaho border, and then eastward into the northern tier states, so we tear up a lot of states. We'd like to know exactly what Idaho's attitude is. We'd like to know exactly what Montana's attitude is, and North and South Dakota's attitudes. And beyond into the Minnesota area. We have invited governors from those affected northern tier states and also the mid-continent states to meet with us in Olympia later this month (April 24). The main purpose is to discuss this whole matter from a national standpoint. We can no longer be provincial on this matter. For that reason, as far as a Siting Council is concerned I am confident, and you should be confident too, that the evaluation steps that we go through in connection with oil ports, transshipment ports--whether it is a single port, or a multitude of ports--will be handled in the most circumspect manner. In comparison with other states, we are a lot further down the road to doing the job in the right way. There has been criticism on how we handle some of our affairs, in this part of the state particularly. I don't know what the general attitude is, but I receive lots of letters in favor of the Port Angeles facility, and lots of letters against such a facility. I think some of you here today are against it. The first thing I noticed was that the program was printed in red, and the next thing that the conference title was "Oil <u>In</u> Washington Waters," as if it were already spilled, and I thought "Well, I'm walking into a loaded meeting but I'm going to go anyway." I am proud of what we have been doing, and I am satisfied with doing what you want us to do, in the ultimate sense.

VIII (4) Remarks of Fred Adair
State Energy Office, Olympia

First I would like to review briefly the overall energy situation. Everyone is now familiar with our oil import situation and our rapidly accelerating demands. More than 50 percent of our total consumption is imported and this is threatening our national economic well being, as the price for oil has risen to more than $40 billion a year. Secondly, when the undergirding of our economy is dependent upon foreign sources, this then means that we have less control of our own national destiny and hence it constitutes a threat to our national security. Can we be satisfied with this situation? Alaskan oil fits in as a partial offtest but we are talking here of less than 2 million barrels a day out of a total deficit of somewhere between 8 and 10 million at the present time. The rest of the gains have to be brought about through other means. Conservation is of immense importance but there are limits to how much can be done.

Alaskan oil is projected to be surplus to the needs of the three West Coast states, but elsewhere in the United States there are shortages so the oil has to be moved inland, which brings us to statements made by Governor Ray. First, that she wants to insure a continuing supply to the local refineries. Second, that she feels we have a responsibility to the inland states such as Montana, North Dakota and Minnesota, which do not have ocean ports, and on which we rely for other things. For instance, at the present time over a million kilowatts of Pacific Northwest electricity is generated in the states of Montana and Wyoming. We are using their coal, polluting their skies. They are taking risks for us. There are three current proposals for routes to clear Alaskan oil, including the Sohio proposal that has not gotten anywhere in California. Sohio had interest in our area about two years ago and this interest is now being renewed. The routes are shown in the accompanying map.

Turning to the matter of oil movements, how many ship movements are needed to get a certain amount of oil into the region? Table 1 shows estimates of the number of tankers needed of different sizes, the larger the tanker the smaller the number needed. Our local refineries can process between 350,000 and 400,000 barrels a day so the transshipment initially, if we used the ARCO proposal, would involve the import of 160,000 barrels a day,



Map 2. Crude Supply Alternatives for The Northern Tier States

Table 1

POTENTIAL TANKER ARRIVALS PER MONTH

(Estimated)

Volume B/D	Tanker Size 25,000 DWT	50,000 DWT	100,000 DWT	150,000 DWT	200,000 DWT	250,000 DWT
200,000	30	15	7	5	4	3
400,000	60	30	15	10	7	6
600,000	90	45	22	15	11	9
800,000	120	60	30	20	15	12
1,000,000	150	75	37	25	19	15
1,200,000	180	90	45	30	22	18
1,400,000	210	105	52	35	26	21

whereas the Northern Tier proposal, which I will discuss in more detail with you shortly, looks towards somewhere between 600,000 and a million barrels a day.

I want to cover two matters which are somewhat interrelated. First, the Energy Facility Site Evaluation Council's process, and the Norther Tier Application. I will mention a couple of problems, and these are matters that are being worked on in pending legislation that may correct them to some degree. When an application is submitted to the council it is supposed to provide information on certain eventualities and concerns. You may recall there was some controversy on how well these were covered in the Northern Tier Application. The next step is for the council to hold hearings in the counties affected to ascertain whether or not the proposed application is consistent with county and city land use plans and in compliance with local zoning ordinances. After that determination the council engages a consultant to review the applicant's submissions, to see whether they discuss issues in sufficient depth and breadth. Applications may be returned for further work, and then after that is submitted all concerned parties gather, and the council holds case hearings to listen to all interested parties and receive any additional pertinent material. Following this the council deliberates and develops its recommendation to the governor as to whether or not that particular facility

should receive certification. The governor then has 60 days to act upon the council's recommendation. I might add that it is not commonly understood that the governor's scope of consideration is quite a bit wider than the council's. The question of alternative facilities being better or worse is more in the governor's domain than it is in the council's.

Now, turning to the Northern Tier application, what it is, and where it is, The Northern Tier Pipeline Company, a Montana organization, filed application before the council in July 1976 to build a pipeline consisting of a terminal, tank storage facilities and a pipeline to Clearbrook, Minnesota. The terminal is planned to be on the south edge of Ediz Hook. A submarine pipeline is a proposed alternative. The application was the subject of controversy initially, and actions taken by the council are now under challenge by Clallam County. The county had enacted legislation earlier, declaring that an oil port was not part of the county's land use plans. After receiving the application the council arranged for land use and zoning hearings. It was new ground for the council because the council's activities hitherto had always dealt with facilities that were located in a single county. Now there were ten Washington counties involved along the route of the pipeline. It was concluded that the proposal was determined to be consistent with land use plans and in compliance with zoning ordinances in all except one county, Clallam County. This involved the location of the proposed tank farm, which was found to be inconsistent with and not in compliance with the Clallam County's land use plan and its zoning ordinance. Prior to 1976, when the amendments to the siting law were made, it was pretty generally the conclusion that that would have stopped the proceedings right there. But the 1976 amendment had a new section in it which gave the state preemption rights in the location and operation of the facilities. However, left in the act was the requirement to have land use and zoning hearings--the cause of some ambiguity. The Attorney General, asked for an opinion, gave no clear-cut answer, just some guidance. The finding of inconsistency or noncompliance by the state, however, is not a bar to further proceedings, although this may be a factor to be considered by the council in arriving at its recommendation. This then raises the question "What is Northern Tier Pipeline Company going to do?" They have proceeded to the point where a consultant has been engaged to produce a preliminary survey. And a letter just received in the council's office indicates that Northern Tier deposited a check

to go ahead with that study for $83,000. The council, however, has declared its intention of proceeding with the siting application processing and the proposal as it exists.

There have been other troubles with this application. Along the west side of Hood Canal there are many rivers that have enormous recreational resources and that are very important to the state's fishery. The terrain is very precipitous and in many cases unstable, so placing a 42 inch pipeline along this coastline is going to be very difficult. The council in its land use hearings is assuming that all conditions in the ordinance could be met. However, during contested case hearings those assumptions will be examined with great care. Thurston County objects to the planned route which happens to cross some marshy areas, so the county wants it relocated and relocation will lead to added cost. As the pipeline comes up the west slope to the Cascade Mountains it traverses the Tacoma and Seattle watersheds, the subject already of enormous controversy and legal action by the two cities. And finally, over in Spokane County, Spokane's water supply is an aquifer that flows westward through the panhandle of Idaho and under the city of Spokane. Deep wells provide the city's water supply and the pipeline will go over the top of that, a very uncomfortable situation indeed.

Will the state then be faced with the making of a preemption decision? If this application is continued and our law remains the same this will probably be inevitable. However, in addition, the Transmountain Pipeline Company and ARCO have indicated their intention of filing an application with the council on April 29 for the expanded terminal at Cherry Point, and the use of the Transmountain Pipeline. And finally, Standard Oil of Ohio, which has probably the largest single holding of the Alaska oil deposits is showing renewed interest in the Northwest due to the fact that they are having difficulty getting oil out of California. As the current law stands, the state is in the business of receiving applications and responding to them and, as Senator Goltz has said, is the state going to make that decision or will it be left to the federal government? That is the question that is still outstanding. The governor's mind is open. She is in a difficult position. She does not want to preempt the actions of the council, but at the same time she wants to give guidance in order to arrive at the best possible solution, and she is very much of the opinion that all tanker movement should be made as safe as possible.

She supports very strongly the ongoing efforts of Senator Magnuson and Secretary Adams but, as I said earlier, she does believe that we have the obligation to our sister states for providing a terminal if it is determined that Washington is the best place from which to move it inland.

VIII (5) Remarks of Captain Richard F. Malm,
Captain of the Port of Seattle,
United States Coast Guard Service

I would like to comment first briefly on something that Dr. Vernon said earlier today. He mentioned the fact that nobody had looked forward to the time when the last drop of oil would be coming down the pipeline. Depending on what analysis you read that might be ten years, twenty-five years or fifty years from now. But Dr. Vernon inferred at least that we must have some long-range plans. Well, 25 or 50 years, I suppose, is long-range planning. Hark back to about 27 years ago when with the United States Coast Guard I visited Holland and a group of cadets and some Dutch people got to talking about their dyke system and how they had devised this system, how they would do things a bit at a time, and then how they destroyed the entire system during World War II, and rebuilt it later. We asked, "When did you get started with this program?" "About a hundred years ago" we were told, to which we replied that the system must be so devised that to get it done obviously would take some long-range planning. When asked further when they expected to have the program completed we were told another 100 years from now. We who talk about long-range planning in terms of 10 years, 25 years, what pikers we are!

May I make a few comments. First of all let me talk about why I have come to Port Angeles and why I went to Bellingham two weeks ago. What did I expect to get from this conference? First, I wanted to find out who was interested and to tell us why they were interested in the problem. I wanted to know what the stance of these people was, in what directions they intend to go. With this information the Coast Guard and I should be better able to meet the demands in the meetings of this public. Secondly I am interested in providing information on the Coast Guard Service. I would hope you will find out what services the Coast Guard performs and how the Coast Guard Service relates to you, how it responds to your requirements.

Let me start out, then, with what the Coast Guard is and what it does, and I'd like to do that in seven sentences. It covers a hundred and some odd years of history. The forerunner of the United States Coast Guard, that is the Revenue Cutter Service, came into being in 1790 and by the mid-19th century it was operating on the West Coast regularly. We have been here ever since, and we expect to remain here for as long as there is maritime activity. The

Coast Guard is comprised of 25,000 people, officers, enlistees, and civilians deployed worldwide and, incidentally, that is 12,000 less people than were in the Kingdome the other night for the opening night of the Mariners. We are the federal maritime safety organization and our responsibilities are many. Throughout our history the Coast Guard's responsibilities and duties have developed in response to immediate and pressing needs of the country, not because of any predicted future requirement, so you see I really have some expertise in talking about that as long-range planning. I would commend to your attention a little flyer I put out on the table outside that shows a linear perspective of the United States Coast Guard from 1790-2000. It shows how the duties of the Coast Guard have stacked up over the years, and you might find it interesting.

With specific note to problems, what is the Coast Guard's stand with respect to oil in Washington waters? Well, whatever the decision, whatever the competent authorities, the Coast Guard will respond as necessary to meet the demands and needs of the situations which will arise. We feel that our current capability in the Puget Sound region is sufficient to meet present and near future conditions. And we are now developing what we consider appropriate plans to deal with the changes expected to take place in the future. The examination of the legislation regulatory action both on the state and federal level, shows that more often than not these actions tend to be crisis-related rather than planned. Ultimately the bottom line in respect to every maritime activity is dollars, dollars which the consumer ultimately pays. Thus it is important to conserve, and that includes everybody along the line, not just the company which produces it, not just the person at the end of the line who consumes it, but everybody who is along the line must have a significant say in determining what the risk is worth.

IX. CANADIAN CONCERNS

(1) Comments of the Hon. Robert Wenman, M.P. Fraser Valley West

I'd like to commend Dr. Vernon and the organizers of this event. I think indeed it is a worthy kind of thing to do, not just this conference but the three preceding it, dealing with problems of mutual concern between Canada and the United States. I've entitled my remarks this morning "A Small Piece of a Very Large Puzzle."

This morning, as I flew down from Belllingham I was thinking about the issue of oil on Washington waters. I had the plane take a jog around Cherry Point, then down the Puget Sound and over the Bangor facility and it reminded me of what a small piece of this very large puzzle we are looking at today. Unfortunately today, as usual, we are looking at the oil issue in isolation. We in Canada are feeling great pressure from the developing giant to the south. We feel the need to act immediately--a pressure related to timing--on the issue of oil transportation because of your great need to dispose of the newly available Alaska oil. Thus we are not able to plan in terms of what would be in the best interests of our nation. This kind of pressure is normal in the relationship between our two countries and we can appreciate it, but we want you to recognize that as Canadians we would like the opportunity to express our needs and our concerns.

On April 24, 1977, the United States governors met to discuss energy policy. They issued a joint communique. Although nonbinding, the communique stated that "the undersigned governors support the delivery of crude oil to a port in the state of Washington, and then through a pipeline running from that port to the northern tier states." An indication of why the governors emphatically supported the all-United States route is contained in Governor Ray's remarks:

> "In the past there has been little reason shown by the Canadians to believe that fossil fuel prices and delivery arrangements are to be relied upon by United States purchasers. We are deeply concerned about the delivery of United States energy resources coming under the control of another country."

I must say I have great concern with that kind of talk because I think we had better recognize that there is mutual interdependence between Canada and the

United States, not just on the question of oil but other questions as well. And that interdependence is not diminishing. It is growing. So therefore we should be striving towards more cooperation--not less.

Many newspaper columnists have commented on how, when politicians come up with a solution to your problem, you have not just one problem but two. The epigram easily fits Governor Ray's recent remarks. She and her fellow governors have associated themselves with the pipeline application before the benefits and cost of each proposal have been publicly debated or alternatives suggested. Her statements weaken our friendship and therefore possibilities for joint cooperation.

Canadians are presently involved in hearings regarding the Kitimat application. Once the proposal has been thoroughly examined, the federal cabinet will deliver a binding decision.

A greater appreciation of Canada's role in the debate about oil tankers can be acquired if I give a brief commentary on events leading to the debate. In February 1973 Canada abruptly began slowing down crude oil exports. The National Energy Board, which is responsible for the approval of energy exports, had been receiving inflated oil reserve figures from the oil industry. It was in the multinationals' interest to have a large committed market, hence the optimistic reports upon which Canada's export contracts were based. Up until 1972 government agencies and the oil industry were worried about restrictive United States import quotas, not the heavy Canadian exports. It is ironic that when the Alaska oil was discovered Ottawa was not worried about the detrimental effects it might have on the environment. Ottawa was worried about the detrimental effects that it would have on the Alberta exporters! Now Ottawa is worried it won't be able to acquire any of the Alaskan oil because of Congress's recent decision to retain the surplus.

The 1973 decision to begin cutting crude exports to the United States marked Canada's rejection of the continental approach to oil and gas development. A new stage in Canadian-American relations had been entered into. Canada had discarded its fifty-first state mentality regarding energy. However, the problem is that Canada has not developed a long-term energy policy. The Canadian government itself admits that. A January 1976 speech of the Minister of Energy, Mines and Resources stated that Canada's objectives presently rule out any comprehensive resource and trade package which results in a continental

energy deal with the United States. Thus we are trying to plan an energy policy which serves Canadian interests while at the same time we are faced with American actions which affect our interests. The result is, in the eyes of Americans, obstruction by Canada or delay in making our policy known. I can understand the frustration with Canadian delay but we have not had the pressure. We haven't had the same crisis so we are slower to react. Slow reaction by Canada or negative reaction is unsettling to Americans, especially on issues as sensitive as oil transportation.

In Canada there are two major government inquiries. One is an oil inquiry on the feasibility of Kitimat and other possible West Coast oil ports, and the other a provincial royal commission on electrical energy. From these inquiries and others our government must formulate its energy policy. An energy policy would include an assessment of the effects of production, recovery, and discharging of energy materials within the environment. It would have implications for the superport construction because the value of energy for our society weighed against environmental damage would be properly assessed. We have much to do towards bringing proper legislation to our Parliament and to our nation.

Whether a tanker port is constructed in British Columbia or in Washington, financial benefits and environmental risks should be shared. There is going to be a superport either in Washington State or British Columbia. If Kitimat is dead, fine. I still would like to see the inquiry go forth because to stop this inquiry at this point would mean that it will fail and not have the proper impact that it should have on overall Canadian policy. Much of the debate in Canada has centered around the risk of environmental damage that British Columbia residents would have to bear, and I can assure you that the concern for environmental damage in British Columbia is justified. The various petroleums' effects would be devastating to the biological communities in the sea. If petroleum should pollute the sea resource on the Northwest Coast, the economic community would be driven from the area or, at the very least, from their livelihood. A vast renewable resource could be tainted for years or driven away from normal fishing grounds. The pipeline with a life of 25 years would not yield a fraction of the monetary value of the fisheries. And how does one calculate the value of a pursuit which has such a tradition and hold on the people as a fishery in British Columbia? The sea is a resource with incalculable value. It is impossible to attach a number to it. Its value appreciates

and grows each day relative to manufactured amenities as technology is incapable of replacing it. It cannot be taken for granted. We must make every effort to preserve and protect it.

If the Canadian government rejects the Kitimat pipeline proposal and the Cherry Point proposal is accepted by your government, the southern British Columbia coast will be open to serious environmental damage. Canada will have no control over reducing that risk. Depending upon wind conditions, an oil slick could foul our coast and destroy our fisheries.

Your new Transportation Secretary Brock Adams has promised new tanker rules, but he must overcome the strenuous lobbying efforts of shipping and oil interests. It is both sad and ironic that the oil spills in December led to these new initiatives. Will more oil spills be needed to get the strict regulations that are needed?

Obviously Canada faces a serious dilemma on how best to reduce the risk of environmental damage. Cooperation, not confrontation, will yield satisfactory conclusions to the Canadian dilemma which is also the American dilemma. However, Canada will not revert back to its role of eager subservience of the 1960s, offering its resources up to the master.

The Kitimat superport and pipeline complex does present many opportunities for the northwest British Columbia coast region and Canada. The port would provide jobs and tax dollars for the Northwest Coast. For Canada it would provide a new port of entry on the West Coast for crude products. There will be a very large surplus of North Slope oil which could be sold to the western Canadian refineries, although this option may have already been eliminated by Congress' recent decision to prohibit export of the Alaskan crude excess. It is an interesting anomaly to talk about the export of excess American oil to Canada when we previously talked about just the opposite. We hear that Canada owes the United States its excess production. Somehow we owe that to you, but when it comes to your turn, Congress passes an act that says no way. How are we supposed to see this? Are we supposed to just close our eyes? Why does Congress pass such legislation?

Oil pollution is only one piece of a very large and complex industrial puzzle. A cooperative United States-Canadian effort to solve the west coast tanker problem will at least spark an awareness in other nations that we recognize the problems of oil pollution and are prepared to take action. I

repeat, it is a small part of a very large puzzle. Here we are today gathered talking about oil on our salt water supply. Canada again is being asked to carry the risks with little advantage. Not even any oil is being asked for Canada. We carry the whole risk of environmental damage to our salt water supply. At the same time we receive a desperate message from the United States (in this area) that says we want to dirty your salt water but look after your fresh water, we want to drink that. We want you to build a big dam and become a storage area for a fresh water supply to the United States (Seattle). Unfortunately it seems that I often speak with my American friends about your needs and our needs but each time it seems that there is a pressure of time. You want this resource that we have. You want it now. We are not prepared to give it to you now. It is not in our interest to give it to you now because we are not competent to know how to give it to you or whether to give it to you. Our government does not have a definite energy policy. Are we going to go ahead and provide you with our gas, oil and water, and our other resources, and say "Well, we will figure out what we need later and then when we do find out we have to cut you off"? You say, what villains; you don't honor your treaties! I don't think Canada can make trades until it has a real policy, a policy which is in the interest of Canada. Right now we are just not quite ready. So let me say that I hope you have patience with our unreadiness. In Canada our interest is to move cautiously on these subjects. Do not look at our caution as reticence because we do want to cooperate with our neighbor, our best friend. I have been around the world twice in the last two years and when I come back I am so thankful that you are our neighbor. I do not want to act in confrontation with you. I want to act in cooperation with you. All I ask is for you to give us some time.

IX (2) Comments of the Hon. Donald W. Munro M.P. Esquimalt-Saanich

Let me make it clear that I am not a spokesmen for any government in Canada, neither the government of British Columbia nor the federal government. I am, however, deeply concerned with the problems of oil tankers because my constituency lies just across the Strait of Juan de Fuca. I represent the people of the Saanich Peninsula and Esquimalt. Hence the name of my constituency is Esquimalt-Saanich. As their representative in the parliament of Canada, I think I speak for them when I stand before you quite unabashedly opposed to the entrance of tankers into these waters, even those that are now here.

I am clearly a baner as far as oil tankers on the West Coast are concerned. I take this position for a variety of reasons, some of which I will go into now, others which can be discussed later in the small groups. I am not a booner.

First, of course, there is the obvious pollution danger which has been so adequately covered this morning by Mr. Clark. Navigational hazards in these waters are well known. We have seen two cases illustrating very poor navigation in these areas within the last three to four months. I am sure that when you get a chance to hear from Captain Malm he will tell you of the improvements that have been introduced on the American side and on the Canadian side. The fact remains that there have been serious breaches of navigation rectitude, if I may use that term, within the last few months.

There is another problem that really bothers me. That is the failure of our two governments to reach agreement on safety standards for all craft using these waters--not just tankers, but for all craft. When I am driving my car on the highway I recken I am no better a driver than the other guy. That, I think, stands at sea as well. If the other ships are faulty, their seamanship poor, and the equipment ill cared for, your ship, even with the best navigation crew and equipment, will not inevitably avoid an accident.

Another reason I have for my stand is that anomalies exist as to the jurisdication in these waters between Canada and the United States. Some of the waters are regarded by one country as international. Some of the waters are territorial. Thus a spill in these waters could lend to a major jurisdictional dispute. Pilotage is a problem here too. The distinction is still unfortunately made between mandatory and voluntary systems.

The threat of pollution is a threat to our fisheries. The last great

fishery, I suppose, on the lower Pacific Coast today, is the fishery that comes in and out of the Fraser River. A great many of those fish go through these waters. Pollution is a threat to that fishery, a food resource which is so much needed in this world, and the livelihood of those who live by that fishery.

There is another reason why I oppose oil tankers in these waters and that is the threat to Canada-United States relations posed by disputes arising out of a major spill. We don't need that at all.

My final reason is that there is a perfectly good alternative to both Port Angeles and Cherry Point. I have mentioned it before and I will mention it again. It is going to take some dredging, it needs some improvement. I say Grays Harbor is your answer. So far the Coast Guard, and the engineers, particularly the American Corps of Engineers, has turned this down because of the dredging problems. I reckon that the dredging problems there could be solved at a cost infinitesimal compared to the overall costs of cleaning up a major spill. Therefore I favor the use of Grays Harbor as an alternative.

Another possible alternative is the use of a different type of vessel. We don't have to go with a great long rigid vessel as presently proposed. There is room for improvement. We could devise a closely articulated sea train which could be composed of honeycombed cells for carrying the oil so that if one cell broke it would not mean the outflow of large quantities of oil.

I'm satisfied that the American people are going to get the oil from Prudhoe Bay. There's no question about it, it is theirs. They want it and they are going to have it. I think that they should choose the place that is best for all. An additional advantage of Grays Harbor is that it is a very short distance from there to the pipeline which passes Olympia. The right of way already exists. Trains could convey the liquid petroluem from the port of entry across the Peninsula to the pipeline.

That's all I think I need to say at this time, but I would welcome joining a discussion later.

IX (3) Comments of Howard Paish,
Oil & Energy Consultant,
Vancouver, B.C.

Although I have done extensive consulting for the Canadian federal government and the British Columbia government under previous administrations, I am not here as a representative of the British Columbia government or as a consultant to the British Columbia government. I am not here today as an employee or representative of any government. As I understand it, my assignment is to provide a Canadian perspective on this very important issue before us.

I've been listening to what has been said so far in the conference and can't resist a little philosophical shot: Everyone is being so damned rational. Of course we have to be, but let us not lose sight of the fact that man makes most of his important decisions on a fairly irrational basis. In spite of the fact that the price is going up, we are still using petroluem products. Whether we are making a rational decision I don't know.

In 1972 (when it first became apparent that the Alaska pipeline was going to be for real and that there was in fact going to be big shipments of oil into Puget Sound) our company did a comprehensive study. Apart from basic costs, our conclusions and recommendations are the same today. Now, four and one-half years later, we are asked to start looking at the same questions. One of the important things we recognized then and must be recognized now is that oil transportation on the West Coast is only one small part of what should be a major international accord between Canada and the United States on the manner in which oil is going to be moved from Alaska to the United States markets. You've already heard views expressed on this. From the standpoint of environmental damage, we forget what the impact of the potential oil spill will be on the Canadian shoreline. But the impact on the adjacent United States coastline will of course be equally devastating. Sooner or later we have to face up to the harsh realities of ecological and environmental imperatives, not man-made imperatives. I don't mean national security or arbitrary boundaries. Are we to determine whether or not men or nations can live in harmony with their environment? It is the environmental imperatives and not the man-made ones which must act as the real constraints on international oil shipments. Both nations must face up to the fact that the problems inevitably associated with oil tankers do not respect international boundaries. An accord between Canada and

the United States must be made with this in mind.

I realize that this is totally idealistic because we haven't been able to do it elsewhere. We haven't devised a very good system yet of moving food around the world to where people are starving. And here we are talking about a luxury commodity, at least insofar as North Americans conserve energy and the way we use it. It should be relatively easy for Canadians and Americans to plan for the utilization of the continent's resources. Obviously I am treading on rather dangerous ground here for a Canadian. The whole concept of continental energy is fraught with pitfalls because it involves water, fossil fuels and God knows what else. And it's very important in a draught year. I remind you of a comment that the Prime Minister made a few years ago about the mouse sleeping next door to the elephant. You are affected by every one of his rumbles,but God help you when he rolls over. Nonetheless, some level of international cooperation is absolutely essential. I have just come from a conference where I listened to the California position being put quite articulately where they were trying to buy some time to avoid oil coming in to the Long Beach area. They were talking about major manipulations in a way that would send Alaska oil to Japan. This would involve, of course, a political shift for you to make down here. The way in which we make these kinds of decisions is complex. I think that it calls for a level of international cooperation that you normally only associate with wars. The comment that someone made this morning about a creeping Pearl Harbor is, I think, a very real case in point. With national sovereignty still uppermost, I personally don't know whether we are prepared to accept the level of international cooperation that is required.

Quite a bit of comment has been made here and in Canada about conservation. A lot of interesting work has been done in Canada on evolving a conserver society and it's a pity that it hasn't had more international recognition. Of course it isn't totally realistic. Populations continue growing and we very quickly fall back into our complacency. We are prepared to be conservers if it means holding the line today, not making any sort of cutbacks. I think realistically that's about the best we can ever hope for from a conserver society; that we are actually going to be able to hold the line and trim our rates of growth to some extent. There is an important perspective that we tend to overlook. I buy life insurance. I don't buy life insurance because I'm going

to get sick, or to provide for temporary disability or a minor oil spill. I buy life insurance on the basis that some day I'm going to get killed, or I'm going to die. A major catastrophe is going to happen. I'm betting it's not going to happen, I'm hoping it's not going to happen, but I must be prepared against the day that it will. I still can't buy some of the comments that I've heard today that we should try and put the idea of a supertanker spill out of our minds. I can't do that. I try and imagine ourselves up at Kitimat, a little remote community way up the British Columbia coast, trying to mobilize 250,000 people to fight an oil spill there.

I'll switch to some of the political realities as I see them. I think you want to hear from a Canadian about some of the realities of the West Coast situation. First of all I think that the delay by our governments in Canada is pretty deplorable. I believe that our governments took the sort of ostrich-like approach--they hoped it would go away. They hoped that somehow the Sierra Club or somebody was going to stop Americans from building that pipeline in the first place. I don't know what was going through their minds but they delayed far too long. The problem has been made far more complex, of course, by the Mideast oil scare. But, without being too hard on the politicians, where is the sense of urgency from the public and their citizen groups? What was the major wildlife group in British Columbia arguing about during the past couple of years? Gun legislation? They were getting headlines on whether or not DDT should be sprayed on a particular local ditch. In the meantime the Alaska pipeline was being built and we were getting closer and closer to the day where we are today. I asked Mr. Munro this morning how many questions he got about oil transporation in the last federal election campaign. "None at all! This hasn't loomed as a major political issue in Canadian politics until now." I'm also a little bit disillusioned to see in a city of 16,000 people such a small turnout here today. Now maybe it's because your citizens' group leaders have gone and done such a good job and this is the result.

British Columbia has been criticized in British Columbia for having no position on Kitimat, or on where oil should go. I'm not sure that is a completely fair criticism, although I think that the British Columbia government could explain better why it doesn't have a clear-cut policy at the present time. British Columbia has clout, not only in terms of its legal powers, its constitutional powers, certainly within its negotiations with the federal

government within Confederation to stop Kitimat if it wants to. But I also want you to think for a moment, it's only in the past five or six years that British Columbia has really begun to recognize her role as a maritime province. I'm not sure how true that is down your coast. We are just smartening up to the fact that we are seaside nations, to use the old European phrase, and to suddenly be confronted with a major potential crisis on our shores, we just haven't got the expertise built up within government to deal with it. So it shouldn't come as a surprise that we aren't that prepared. And then there's the extremely difficult problem of comparing Kitimat where we know so little to the area of the southern Strait of Georgia and northern Puget Sound, one of the greatest potential mari-culture areas in the world. Mentioned a while ago was a super fund to help take care of losses. This makes sense, but we don't always measure just in dollars. The disruption of lifestyle--Indian people spent eight thousand years developing a culture that hinges very much on clam beds, and intercepting a particular salmon run. We know that the clams will probably recover in three to four years but three to four years interruptions on an 8,000 year cultural cycle is something we have to take pretty seriously. You people think that our only language problem in Canada is whether or not we speak French. I'm beginning to think, as a resource negotiator, that I better start learning the native languages, especially when the Judge Boldt decisions are more widely read by the native people of British Columbia.

We are very proud about the way in which we have started to manage our fisheries on the West Coast. Canada is just debating putting in $300 million into some more enhancement programs on the West Coast. We've got our salmon harvesting program, especially sockeye, pretty finely tuned. Imagine an oil spill effect. It may not even be a major spill, but the disruption of the harvesting can undo many years work in salmon management. These are the sorts of specific problems associated with oil spills that we tend to overlook. Instead, we say we will set up a $100 million slush fund. That doesn't always compensate for these other types of problems mentioned.

A final issue is British Columbia's relationship to the rest of Canada. We have exactly the same problems that your state representatives have when they deal with the governors and representatives of other states. We have an obligation in British Columbia, as a port of Canada, to insure a continuity

of supply for central Canada. We have obligations as you do in that we are the funnel to the outside world. Thus our interests are not merely local in nature but must include as well the energy interests of the larger country. At the same time, decisions made in Washington State which affect British Columbia will also inevitably affect the rest of Canada as well.

IX (4) Comments of William Ross,
Associate Professor of Geography, University of Victoria

I will begin by repeating what Mr. Munro said. In no way do I speak for Canadians or the Canadian government and press. One of the things in which Mr. Munro and I are in disagreement is that I see no clamor in Washington State by industry, by the government, by the people, for Grays Harbor, much as Grays Harbor may well be a good site. It therefore doesn't seem to be a very realistic and practical alternative.

The second point I would like to make is that perhaps, with the exception of Grays Harbor, all of the proposals--Kitimat, Cherry Point, Port Angeles, Southern California--are proposals advanced by industry.

The third point that I would make is that the oil out of Alaska and the gas that is associated with it inevitably involves Canada and the United States. Alaska is not a contiguous part of the Unites States yet. There is foreign territory in between. So, whether it is oil or gas, there are, as Mr. Munro mentioned, a whole host of boundary problems associated with its transportation from Alaska to the lower forty-eight states.

This suggests to me, therefore, that what we need to do is to take a look at the west coast between the panhandle of Alaska and the Panama Canal. We need to say "All right, there are really many ports along this coast that could take oil in some way, shape or form." But we have had no systematic study of which port is the best port. There has been no study on the part of Canadians or Americans. We have a boundary commission that exists between the two countries called the International Joint Commission (I.J.C.). The I.J.C. has, since the beginning of this century, looked at boundary waters problems. True they have focused mainly on problems of fresh water bays boundaries, but the I.J.C. has also investigated air pollution, they have been involved in the Skagit dispute and, for those of you who may be from Eastern Washington who remember back to the 1930s, they were involved as well with the Trail Smelter Case. Here is a body that for over fifty years has developed a credibility for looking at problems between the two countries. They have reported numerous times and their findings have been unanimous about 98 percent of the time.

What I suggest to you is that Bob Monahan's proposal for a two-year moratorium should be backed up. Hand the oil tanker issue to the I.J.C. and say "Look, we know that oil is probably going to have to come in along the West

Coast some way and somewhere. What, in your view, is the best place for this to come in? How should it come in?" It may mean that we only have one tanker terminal on the Pacific Coast for these major tankers. But by doing that we would at least focus the risk in one particular place. Now it may very well be that the proposed ports that I mentioned are not the best ports at all. I've suggested in other forums that, for example, an alternative might be to establish a port in the vicinity of Namu on the British Columbia central coast. Perhaps Grays Harbor. I don't know. But I am a bit suspicious of proposals that are advanced by industry because, by and large, I understand their sympathies. They want to promote their own self-interest, their own profit, and I go along with that. But that may not be for the public good in this state, in Canada, or anywhere along the Pacific Coast. In essence I am backing up Bob Monahan's call for a two-year moratorium, but perhaps going a bit beyond that and suggesting that possibly we limit the number of ports and let the International Joint Commission make the recommendation. My fear is that we may not be talking about a single oil port at Port Angeles. We will probably have that and, if we are not careful, we will also have oil ports at Cherry Point and in Kitimat. I see potential for all three being built. That is my concern.

X. RESPONSE OF THE HUMANISTS

(1) Comments of Werner Quast
Professor of Political Science,
Peninsula College, Port Angeles

As a humanist I am somewhat concerned about the very fine address of Dr. Monahan in which he indicated that eventually we will have a decision made by the decision-makers, and those will probably be our politicians. Their decision will be based on quantitative evidence, the quantitative evidence probably being economic matters. But I would like to look at the innerside for a minute. I think that two or three major events that occurred in his ascent have had the most drastic impact upon man.

Perhaps the greatest breakthrough in intellectual history was that of the Greeks when they emerged from mythology into philosophy, into science and cosmology. Why was this possible? It was possible because they had managed to harness energy, in those days human energy, that of slaves. The slaves worked so hard that their owners had leisure to contemplate. They could go to their symposia, a very small minority engaged in philosophic or speculative contemplation. I should hasten to add that the majority of the Greek populace hung on for centuries more to the age-old myths which were offered to them, their gods and their religion. Another event of like nature took place after 1945. Up to that time man looked at war philosophically, saying that it was really a continuation of diplomacy by other means. But by 1945 war had become such an evil that everybody seemed to have awakened to the fact that there was no longer the hope of being part of the survival unit. With the seven times overkill now available to the superpowers, there is no survival unit.

This brings me to our particular subject. First I would like to say that the future is not what it used to be. No longer can we say the air is light, or that there will be light at the end of the tunnel. If we go on as we have been doing, we can be assured there will only be darkness at the end of the tunnel, unless we learn to react rationally and to learn to live moderately. What I heard earlier in Bellingham, and what I have heard in Port Angeles, leads me to think that we are engaged in the "them" versus "us" syndrome. It reminds me of the days of the Royal Air Force and the 8th Air Corps bombing my home town. Sitting in a shelter, hearing the bombs whistling down, you were hoping, indeed you were praying, that they would hit the neighbor's house. And

when one did in fact hit the neighbor's house you were immediately compassionate, and you hoped you would be able to dig them out. But at least you were spared. This type of attitude seems to prevail everywhere. Industry is looking for a port to dump the oil but none of us wants it. Wait! We need it, or at least demand it. In fact, if you look at the articles we buy, the motor home industry, which is rapidly expanding, vehicles that get six miles to the gallon, who can doubt that. We also know that the major automobile makers have all those small cars they overproduced following the OPEC fiasco three years ago. All this we happily have forgotten. What we need now is a human, political Pearl Harbor. Last night I suggested that would come, perhaps with President Carter's energy speech. Good news (or perhaps bad news) as long as we are confronted not with a Pearl Harbor in the form of a Sunday morning attack, but with a creeping Pearl Harbor in energy, we tend not to react. We think things can go on as they have done all these years. We still think in terms of the American dream of unlimited resources, a pragmatic approach to life, an almost unlimited optimism that things in some way will work out, that we will muddle through, but will we?

I have made it my business to look at the actors on the scene. It is amazing what kinds of games we play. Some of this dates back to the days of childhood, to card games like Black Peter. I don't know if you know this one. Whenever you received the Black Peter you would fake unconcern and try to pass it off nonchalantly to someone else. Due to decisions made during the Evans administration we at Port Angeles ended up holding the Black Peter. People became stirred up, controversy was aroused, decisions were delayed and, with a change of administration, the Black Peter in the form of a Dan, changed into a Black Peter in the form of Dixie. But then Dixie steered her tanker through the various straits to Cherry Point and Bellingham woke up holding the Black Peter. That was why the conference received such a tremendous reception in Bellingham. Now we are back in Port Angeles and this morning we have a number of speakers trying to pass the Black Peter to Long Beack, to Grays Harbor, and to Kitimat in British Columbia. And all the time the lights are going out.

Place yourself in the role of decision-maker, the decision maker of ARCO and Sohio. You have borrowed $21 billion, as you will hear probably this afternoon, and you pay $600 thousand in interest a day. So you have a mortgage on your house and someone says "you can't move in." What are you going to do?

You try to find a different, more accurate decision-maker. So far as Washington State is concerned, the decision-making platform has been transferred out of Olympia because it got too hot there. The contingency was too close. So we have transferred the decision-making to a different level, to Washington, D.C. Take a look at the actors there. Brock Adams, five congressmen, and two senators are adamantly opposed to having oil on Puget Sound, but the only one who is opposed to oil in Port Angeles is the local congressman. Where, then, should the terminal be located? If the decision-makers look at quantitative figures it is very obvious where it will be, but in the meantime the decision is delayed. Perhaps we will know very soon where and along what route the pipeline will be built. In all probability the terminal will be here.

X (2) Comments of James W. Scott
Director, Center for Pacific Northwest Studies, WWU

My presence here this evening is due, I assure you, not to any expertise I might have in the science of ecology--marine or other--or to any technological knowledge regarding petroleum and the problems and hazards of its transportation, but rather to my being a humanist who, from time to time, conducts courses and seminars on such topics as population and transportation. I make no excuse for this. Apart from the fact that this conference is underwritten in part by a grant from the Washington Commission for the Humanities, the need for humanistic input and, hopefully, education, is self-evident.

Before going further I think I might reveal the fact that it was with some degree of trepidation that I proposed many months ago the final phrase of the title for this conference, "Boon or Bane." A somewhat cynical colleague of mine opined that only a "damned Englishman" could think of such a title! Nonetheless, it seems to have caught on--at least it has been used many times today and I am sure that many here, as well as many who could not attend, have looked up one, perhaps both of the words. The phrase has perhaps a quaintly archaic ring, but it poses an up-to-the-minute, highly pertinent question.

In our conference on the fisheries of Puget Sound held a year ago we posed the questions of public good and private interest. The same questions can be posited here, although they are not synonomous with boon or bane, overlapping though they might be to some degree.

Before we decide in our own minds what might be the best solutions to these extremely complex questions that are raised by the transshipment of crude oil or its refined products into and out of Washington waters, we must attempt to divest ourselves on the one hand of any irrational emotion (provoked by the belief that we have to move heaven and earth to prevent assault on our environment and resist all attempts to introduce new technologies) and, on the other hand, any stubborn attachment we might have to the simple idea that science and its often obstreperous handmaiden technology can between them provide the answers to all our ecological and attendant problems. I find myself wavering constantly between these two extreme points of view. In looking the other day at an apt and rather amusing cartoon in the Seattle Post-Intelligencer, showing Governor Ray as the elaborately carved figurehead of a grossly-elongated supertanker, I was reminded of the famous lines on Helen of Troy and (with apologies

to Christopher Marlowe) I wondered "Is this the prow that launched a thousand spills?" As to the burning of "topless towers of Illium," I'll leave that to your imagination!

Since man first began to tame the earth, to grow his food and store his grain, to build his farms and settle his towns, lay out his roads and erect his factories, he has been changing the face of the earth. In the words of the great French scholar Jean Brunhes, "man has made an indelible imprint on the face of the earth." And he will continue to do so. This need not, of course, be for the worst. Many of the most profound changes have resulted in boon to man rather than bane.

The baneful consequence of man's impact, however, have seldom been foreseen quickly enough to restore the status quo--and even more seldom have they been anticipated--the creeping deserts of North Africa and elsewhere are eloquent testimony to long centuries of overgrazing and overtilling. The changes that occur so slowly, so insidiously cause slow but often erratic deterioration, much more difficult to measure, to forestall than those of catastrophic proportions. As Robert Clark suggested in his earlier comments, if I understood him correctly, some of the greatest threats we face here in the waters of Washington are those that may result from a myriad of small spills. It is with these that insidious changes take place virtually without our notice, and certainly with little or no publicity. In his book The Wounded Earth Carl Marzani points out that

> exclusive of production accidents, about a million tons of oil is spilled annually into the ocean by leakages, flushing of bilges and tanks, and accidents to vessels (p. 78).

He goes on to refer to the estimates made by Dr. Max Blumer, Woods Hole Oceanographic Institute, that total oil pollution in the oceans is between 10 and 100 million tons each year. I suggest that it may be fair to say that the few gallons of oil released here and there by pleasure boats, fishing vessels and other light craft on Puget Sound and the Strait of Georgia adds up to much more pollution than the amounts released in the occasional spills from tankers and oil terminals that have resulted in instantaneous publicity, but which have occasioned immediate attention and clean-up by the various oil-spill cooperatives. Without doubt, the impact of a massive oil spill will be more immediate as well as more newsworthy, than the very small spill, but by the same token more likely to be given adequate attention. Perhaps this argument is beside the point but

I believe it is worthy of note.

There are no absolute rights or absolute wrongs in this matter of oil in Washington waters, although there are good aspects and bad, results that might bring benefits to many and distress to the few, and results that might result in benefits to the few and disastrous environmental consequences for virtually all of us. If we cannot voluntarily curb our demands for ever-increasing volumes of fuel, and if there are no mandatory cuts to effect reduction in demand, then there is no doubt that the oil must continue to flow from its source to our individual furnaces, lawn mowers, and automobiles. But whether the waters of Washington State should be the part of the United States to risk loss of much of its marine life, in the event of some calamitous spills, is one of the questions we are asked to consider. We would all prefer that it were some other region that had the question to ponder and, eventually to answer--and there may indeed be better and safer places. I doubt, however, that there is any longer the opportunity to ask this question in the Pacific Northwest. We have oil tankers here already in some number, and in all likelihood they will increase in both number and size. Perhaps the best we can hope for is that every effort will be made by all concerned--industry, regulatory agencies, legislators, marine scientists and environmental groups--to see that the environment is as little endangered as possible, that technology is constantly updated and improved, and that the personnel involved are well trained, ever-alert and conscientious.

Finally, let me say that I fear the boon, if it materializes, will be limited and probably short-lived but that the bane might well be extensive and long-lasting. The two will certainly remain side by side; it is not a question of either/or, but of both.

RAPPORTEUR'S COMMENTARIES

Murray Morgan

Summary Comments

Bellingham

In his opening remarks Dr. Manfred Vernon reminded us that the need for energy is obvious, but that the limits to most sources of energy have become apparent. Future generations are unlikely to use oil for transportation or heat but, pending conversion to other forms of energy, the problems of getting oil to present users continue to divide society. Indeed, they divide individuals, for many of us who demand the good life strenuously object to the side effects of obtaining and distributing the oil on which much of our comfort depends.

The first plenary session of the conference was designed to identify the problems of oil on Puget Sound. To the first speaker, B. Glenn Ledbetter, the executive secretary of the Washington Oceanographic Commission, (a public administrator), the basic problems appeared to be those of managing public opinion. He said some 480 issues have been identified with oil on Puget Sound; they lie in the areas of environment, social, economic, political and jurisdictional aspects. Of these, 136 deal with the marine environment and range across a spectrum that runs from vessel construction to liability laws, from dredging to the language spoken by radio operators. All concern the means to an end. The central question remains that of acceptability of risk.

If there were clear agreement that the risk of moving oil on Puget Sound is acceptable, oil would not be an issue. If there were clear agreement that the risk is not acceptable, attention would focus on plans of action for reducing the risk. But, Mr. Ledbetter thinks, the public is divided, closely divided, and what seems to lie ahead is more years of argument, more years of delay; as the oil industry applies for permits, the government processes them and the courts test them.

The stalemate could be resolved by some crisis: a massive oil spill or a series of spills; a real shortage of energy at reasonable cost; a war.

The problem of oil on Puget Sound is made more difficult to solve, Mr. Ledbetter observed, by the fact that oil is messy, and spills often occur

near populated places. They attract attention. This makes it harder to persuade the public to accept the risk of oil transportation than to accept the hazards of automobile travel or air transport. He doubted, for instance, that the recent 747 collision would noticeably reduce air travel. He concluded with the prediction that a means can be found to manage the risks, to show that they can be reduced so that the public will accept the bad with the good, the bane with the boon.

Dr. William Ross, a geographer from the University of Victoria, and author of the recent study, Oil Pollution as an International Problem, felt the analogy to air and highway safety was not appropriate. Insurance and liability laws help make acceptable the risks of driving and flying. No such protection has been established against damage caused by an oil spill, not even for direct damage to property, let alone the damage, say, to people in the tourist industry if a spill reduced tourism in Whatcom County to the degree the Santa Barbara spill seems to have affected tourism in that area. There is the compounding factor of damage that could be done on the far side of the international border from where a spill occurred. He suggested that perhaps the Washington legislature should provide a plan for adequate and just settlement of damage claims before the people are asked to accept the risks, willy nilly.

But for Dr. Ross the basic question seemed not to be acceptability of risk but whether the movement of more oil through Washington waters is really necessary. Valdez oil is certainly going to be loaded on tankers, he said, but the oil industry has not seen fit to reveal where it will go and in what quantity. It is not certain it will be delivered on Puget Sound. Kitimat in northern British Columbia remains a possible terminal site, though from the Canadian point of view there would be considerable risk and little benefit. Noting that to date proposals for sites have come mainly from industry, he suggested that it might be advisable for the United States and Canada to conduct a joint survey to find the most suitable delivery point from a standpoint of the long-range costs and benefits to both countries. But Dr. Ross did not appear sanguine that the governments would act in time. He made the facetious suggestion that a pair of fully loaded tankers be sent to ram into each other off Victoria, because governments do respond to crises.

In a panel discussion that followed, Betty Jones of the League of Women Voters touched on the dangers involved in a major spill in Puget Sound where the water flushes slowly. She considered the central issue to be whether the Sound should be made to serve as a laboratory for studying the effects of a marine disaster.

Bill Rogers, vice president of the Oil, Chemical and Atomic Workers International, Local 1-590, said he spoke for the otherwise forgotten average working people who loved the environment but also need jobs. He felt a Cherry Point terminal would be safer and less costly than the rival Port Angeles site; that while "it is impossible to guarantee there would be no spills," it is possible to protect the environment and protect jobs, "and to do it quickly, without hasty decisions."

Robert C. Clark of the National Marine Fisheries Service emphasized the need for more study. "There is" he said, "a growing knowledge of the complexity of the problems and the extent of our ignorance." The effects of spills are sometimes dramatic but are often subtle and long term. A program to gather baseline data against which data can be measured has been started, but some of the figures will not be complete for at least twenty years and the program has not been guaranteed continuous funding. As things stand it is impossible to make estimates in dollars of the effect of spills.

Captain Richard Malm of the Coast Guard was sure the service could cope with increased tanker traffic. The Coast Guard's mission is to be ready for whatever happens. A no-nonsense pragmatist, he had a succinct statement of the problem: the central question is dollars.

The afternoon session closed in on a narrow aspect of the problem. If oil is to be brought to Puget Sound, which will be the lucky area that gets it? or doesn't? The program brought something resembling Dr. Ross's proposed full-bore collision, a head-on meeting of Dr. James Crutchfield of the University of Washington and Fielding Formway, the general manager of ARCO, Ferndale.

Dr. Crutchfield felt that at this stage the all important question is site selection. It will be a decision that cannot be undone, and one which

will affect the economy for a very long time. He urged that the decision be based on all factors, not just on the accounting considerations of private firms. He contended that, while the oil movement through Puget Sound would be beneficial to the United States as a whole, it would probably be of slight benefit to the economy of this region and could damage it seriously. He argued vigorously that on an overall basis the Port Angeles area as a terminal would be best for the Puget Sound region--that not only would the number of spills be reduced but the cost to the northern tier consumers would be lower. Industry might be better served by Cherry Point but the public interest would be better served by Port Angeles. The difference in cost is small, the difference in environmental risk gross.

Mr. Formway countered with the argument from the ARCO point of view. The Cherry Point cost would be $66 million lower than that of the crude delivered to ARCO by the pipeline starting at Port Angeles. This cost would have to be passed on to the consumer. This would put at risk the jobs of 4,500 employees, and the livelihood of many thousands of others.

The company has acted in good faith. It could not anticipate the decline in the rate of growth of consumption of petroleum products which came with the Arab boycott, a decline which has left the West Coast unable to absorb the anticipated amount of North Slope crude. But the northern tier states have been promised a share of the North Slope production. ARCO has a plan to deliver it from Cherry Point. With interest costs running at $600,000 a day the company cannot afford delay.

John Wiechart detailed the work of the oil producers and transporters cooperative to provide equipment to clean up spills. His fellow panelist, Ned Thomas, editor of the Port Angeles News, said "thanks but no thanks" to Dr. Crutchfield's gift of an oil terminus to his home town. Port Angeles doesn't want it, Mr. Thomas said. Bellingham seems to. So what's the fuss?

Questions from the audience brought out information that ARCO's third-stage plans for Cherry Point call for the arrival of up to 550 tankers a year, that not all of the oil would be Alaskan oil nor would all the tankers be of American registry. This third-phase plan calls for company expenditures in the neighborhood of half a billion dollars.

It was also agreed by the panel that as things stand there is no home for all the North Slope oil. It will soon be coming out of the pipeline at Valdez. We don't know where it is going.

The morning and afternoon sessions had not addressed themselves to the exact theme of the conference: Oil on Puget Sound--Boon or Bane. Dr. James Scott of the Center for Northwest Studies confessed authorship of the quaintly archaic subhead at the evening session and drew the day's biggest laugh with a reference to the recent Collins cartoon showing Dixy Lee Ray as figurehead on a supertanker. "I wondered, Is this the prow that launched a thousand spills?"

The theme of the evening session was closer to "Public Apprehensions of Catastrophe" than the scheduled "Environmental Concerns and Apprehensions," but the tone was not always ominous. Dr. Jerry Flora, director of the Shannon Point Marine Laboratory, treated the audience to a sensuous account of barnacle stroking as he made the serious point that determining the effect of oil in water is, for a marine biologist, excruciatingly--and delightfully--complex. His review of the literature on oil spills underlined the point made earlier in the day by Dr. Clark: what we have learned is how much more there is to know.

There was nothing light about the presentation by Robert Lynett of the Coalition Against Oil Pollution. His was a horror show (parental guidance needed) as he used photos of spills, charts and the statistics of international tanker troubles to dramatize the threat he foresees in the increasing movement of oil through the closed-in waters of the Sound, dangers he conceives to be heightened rather than lessened by putting the crude in larger packages.

Engineer Lynett's point of view was shared by Shirley McIntyre, a forester, who in the panel discussion cited reports that Puget Sound is the most hazardous water in the United States for tankers. Her statistics, and those of Mr. Lynett, were challenged by Captain Malm of the Coast Guard.

At the close of the evening session Mrs. Turner of Port Angeles was given a brief, unscheduled opportunity to rebut the position taken by the Coalition Against Oil Pollution that, if there had to be tanker delivery,

it should be at Port Angeles. She felt the Coalition was simply transferring the risk, that there simply should be no transshipment.

On the second day the conference surveyed the area of political decision making.

State Senator Barney Goltz (whose speeches always diminish my lack of faith in Olympia) read an admirably concise paper on the situation at the moment. There is general agreement that the needs of the existing refineries on Puget Sound--380,000 barrels a day, at maximum--should be met, by tanker if necessary. There is no agreement that Washington ought to be the point of transshipment to the west. The benefits seem scant in comparison to the risks. But if there must be transshipment, then the key questions are who decides where the terminal will be, and how the risks can be limited and the benefits augmented.

Senator Goltz warned that if Olympia can't reach a decision, the federal government will; it may preempt the decision anyway. Under the terms of the national legislation authorizing the North Slope development, the President has the power to (among other things) lift the ban on the delivery of Alaska crude abroad. A trade could be arranged, for example, under which Prudhoe Bay oil would go to Japan, freeing Kuwait oil for western Europe, in turn freeing Venezuelan oil for delivery to the United States and assuring the north tier states a supply without the necessity of delivery through Puget Sound.

Whatever happens, from the standpoint of Puget Sound, the decision should be to localize the area involved, minimize the risk, maximize benefits.

Fred Adair of the State Energy Office cited the gap between domestic production of oil and its consumption as justifying the use of Puget Sound for transshipment. He argued that since Montana suffers damage to its environment to supply this region with coal, we owed the northern tier states some risks to meet their energy needs. He stressed the limitations of the authority of the Site Selection Committee, which can only pass on proposals put forward by industry; the complexity of the jurisdictional problems (the Port Angeles to Minnesota line would pass through ten counties in Washington

alone); and in response to a question from the audience indicated that either the Governor or "market action of private enterprise" might be most influential in determination of the terminal site.

Wilbur Hallauer, director of the State Department of Ecology, said he feels that because of the oil embargo and the energy shortage, there has been a change in attitude toward environmental requirements, that the public is more pragmatic now about energy needs and that, for instance, if the question of raising Ross Dam were to come up again, the answer would be quite different from when it was defeated. He felt Governor Ray's election was an indication of the change in mood. Mr. Hallauer felt the state is facing "totally different practical questions," that there is a realization that we may have "over-structured environmental requirements" and he expressed the hope of finding a middle way which will permit the taking of steps to assure the prosperous economy necessary to provide jobs and profits and the taxes which help support the public sector.

The final questions from the audience brought responses indicating that no one is sure who will make the basic decisions, and on what basis. Will those who decide feel the concerns of capital paramount? Where does the public interest lie?

All through the conference, in formal statements and especially in the audience participation phase, I sensed suspicion, not so much about what we know as about what we are not being told. There is a feeling that many facts are not on the table; that the public has been and still is being maneuvered; that industry, and government, have permitted, if not conspired to bring about, situations in which long-considered plans can be put into effect as emergency solutions.

Fateful decisions have already been made. The state of Alaska and the oil companies are deeply in hock. The oil must flow. The choice now seems not boon or bane--but how to mitigate the bane. Scant argument was made during the conference that transshipment will be a boon to this region. The strongest argument for bringing the tankers to Cherry Point was the money already spent by ARCO, and that $600,000 a day interest. The strongest argument for Port Angeles was not that a terminal would do Port Angeles good

but that one there would put less of our sea-in-the-forest at risk.

The most impelling reason for deciding in haste where to deliver the oil is that the oil will soon be pumped from the North Slope, heated and pumped to Valdez and when it comes out of that pipe it has to be taken somewhere. So, ten years after the planning started, our problem is how to solve the problems our past decisions have created.

And we do not even know who will decide--the companies, the legislature, the governor, the president.

Whoever decides will do so because the people permit it. The ultimate responsibility belongs to the citizenry--all of us. We are--as Dr. Vernon reminded us in his closing remarks--the stewards of Puget Sound, the custodians of a heritage beyond price.

What we have not taken up at this conference is whether we can afford to maintain our present standard of living at the expense of our heirs.

Is it enough to trust technology, and Maggie, from whom all blessings flow?

Port Angeles

The discussion of Oil in Washington Waters--Boon or Bain? was opened this morning by Robert Clark, a chemist and oceanographer with the National Marine Fisheries Service, who also spoke at Bellingham. He reiterated that the effect of oil pollution is complex and the effects are difficult to assess from a dollar standpoint--but they are not inconsequential. Scientists, he said, have always found some biological damage from spills.

Clark emphasized that tanker spills may present less danger than continued low-level pollution. A 1973 National Academcy of Sciences study indicated that the slow seepage of small amounts spilled and dumped on land accounts for more than half of the total marine pollution from petroleum.

Norma Turner, president of No Oil Port, Inc., spoke with a clarity that put me in mind of a letter I found in the University of Washington archives in which an opponent of woman suffrage in 1888 complained of "the infuriating poise, the appalling indefatigability and the impeccable information" of the ladies.

Mrs. Turner divided the issue of supply for Puget Sound refineries from

that of transshipment of oil elsewhere and confined her argument largely to the case against using Puget Sound as a transshipment point. She found an odd contrast in the speed with which the Alyeska line was authorized and constructed and the long delays by the company in deciding where the Prudhoe Bay crude will go and who will process it. The implication was that a crisis is being contrived, and she warned of a situation in which Port Angeles would get the terminal, Cherry Point would continue to receive tankers, the movement of oil through inland waters would be quadrupled, and barge service--the greatest source of current spillage--would be increased.

Mrs. Turner argued that it would be in the best interest not only of Port Angeles but also of the region, the state and the nation to make the necessary swaps of Alaska, Japanese and middle eastern oil to buy time in which a rational oil movement could be arranged: one using preexisting pipelines and terminals rather than new facilities which, by themselves, would require vast expenditures of energy.

Dr. Robert Monahan, a geographer from Western Washington University, spoke with the dry, understated humor of a rational man bemused by the way we are not managing our affairs. His proposals, though understated, were by no means uncontroversial.

Citing our responsibility to future generations, he urged that decisions about energy be made in terms of absolute cost--not just in the cost of moving the oil to market. Cost should reflect effect and danger. The cost of protection, of insuring full compensation for damage, should be included in the cost of the energy to the consumer. He argued that internalizing costs--adding the cost of insurance to the product--would be better than externalizing it by having federal, state and local governments pick up the tab, because that would bring to the consumer the price he, and society, was paying.

Dr. Monahan proposed a two- to four-year moratorium on site selection, and recommended imposition of a 50 cent a gallon gas tax to reduce consumption and raise money to finance research and development on alternative sources of energy.

Dr. Monahan and Mrs. Turner joined four panelists in a free-wheeling discussion of energy problems, during which B. Glenn Ledbetter, executive

secretary of the Oceanographic Commission, discussed the paradox of a situation where government intervention seems necessary for a solution, but the public, which demands a solution, denounces the exercise of governmental power.

Donald Monroe, Member of Parliament for Esquimalt-Saanich, expressed his "unabashed personal opposition" to the entry of any tankers into these waters. Such movement, he argued, contributes to pollution, risks catastrophe which could, among other things, strain United States-Canadian relations (he cited "serious breaches of navigation rectitude") and are unnecessary. Mr. Monroe styled himself a Baner, not a Booner; and proposed banning the bane by giving it to Grays Harbor. He also stressed need for research on new types of vessels, especially an articulated container train less subject to massive outpourings; and the use of geothermal sources of energy, some of which he suggested were close at hand.

Dr. Bill Ross, our friendly but feisty neighbor from the University of Victoria, seconded Dr. Monahan's call for a moratorium on the selection of a transshipment site and Mrs. Turner's call for a wider investigation of possible terminus sites. He suggested that the International Joint Commission, which has a 50-year record of achieving unanimous proposals by American-Canadian members on problems ranging from river flow to air quality and smelting, be asked to study the coast from the panhandle of Alaska to the jungles of Panama and recommend the least-damaging, most efficient point for bringing vast quantities of oil ashore and getting it into pipes.

Dr. Ross felt that so far only proposals put forward by industry have been seriously examined, and he had doubts that their prime consideration in selecting sites was the public good. Like Mrs. Turner, he feared that all of industry's proposals--Cherry Point, Port Angeles, Long Beach and Kitimat--might share the boon, and only the public the bane.

Dr. Werner Quast, speaking next, wondered if corporate decisions should really be defined as nonpublic decisions. The boards represent a broad range of stockholders who cannot be separated from the rest of the public.

But Dr. Quast's main themes were that serious decisions must be made if there is not to be darkness at the end of the tunnel, and that the future isn't what it used to be. He hoped for a decision based on the realization of the finiteness of the world oil supply and the necessity for cooperation

rather than the deep-rooted self-concern he recalled from his experiences in Bremen during the World War II air raids. But a scenario he proposed as a possible way the decision would be reached was hardly reassuring. After tracing the decision-making process so far--a process in which the capacity to decide has flowed away from the local to the state level and now seems to have disappeared into the federal miasma--he concluded with a situation in which President Carter makes up his mind on the basis of an 800-word memo shaped by information which had been filtered through Secretary of Transportation Brock Adams, who doesn't want tankers crossing Puget Sound, and Energy Czar James Schlessinger, who may share his friend Scoop Jackson's worry about American oil crossing foreign soil. Ergo: Port Angeles as terminal.

Subsequent discussion among the panel members resulted in the raising of a number of questions which were not answered: can Japanese refineries handle Prudhoe crude? What was the role of Japanese steel mills in financing the Alaska pipeline? Did the oil companies consciously delay decisions on shipments and refineries to create a crisis situation under which the President would be justified in suspending the law which mandates that Alaskan crude go only to American refineries? Why would Japan want such oil if, as seems certain, it would cost more than the oil they now get?

There comes a time in a meeting like this when my capacity to absorb facts reminds me of Dr. Clark's description this morning of how oil spreads on water. There's gravity pushing downwards and surface tension resisting absorption. I am not certain I caught the significance of all the figures cited by Richard Ogar for ARCO, but the general picture is that 313 thousand barrels now delivered to Ferndale by tanker would, if brought in roundabout by a pipeline starting in Port Angeles, cost the refinery an additional $66 million a year. This would have to be passed on to the consumer. The additional price would make it impossible for the refinery to compete for sales to the military. The cost would therefore fall on the general user--the motorist, and industry. This would put at risk thousands of oil industry related jobs in the Puget Sound area.

Mr. Ogar said that legal and moral obligations to the northern tier states led ARCO to propose last December its plan for shipment to those

states. He felt the first phase could be completed in 18 months, would meet the problem, and would not increase pollution on the Sound. He favored improved navigational aids and laws fixing liability for damage. With them the waters of Washington could safely continue under the multiple use concept.

Larry Bradley, the director of the State Energy Office, adlibbed a lament on press coverage which has concentrated on his more colorful statements. He then said he "suspicioned" that Senator Magnuson was withholding funds for improved navigational aids in order to maintain a high level of fear about tanker traffic on the Sound.

Mr. Bradley added to the friendly dialogue with Canada by averring that he did not want American oil to be in the hands of some foreign nation. He explained that our experience with contracts and treaties "has not always been the best," and added that "we've had enough already" in dealing with foreign governments." He specifically mentioned Canada and the OPEC nations, but did not mention which contracts and treaties caused his distress.

Mr. Bradley said he recognized that local people who might have a pipeline terminal bestowed upon them could ask, "What's in it for us?" His office and the Governor have invited governors of the Northern Tier states to discuss their need for oil from a national standpoint. The decision "will be made in a most circumspect nature," and the basis of evaluation of siting applications will be on technological considerations.

Howard Paish, a Canadian consultant to governments past (not speaking for the present British Columbia government) put in a good word for irrationality, pointing out that sometimes not being too damned rational works well, as manifested by the activities of the marriage market.

His own observations were most rational: We need more studies. The decisions should be made on the broad, lasting <u>environmental</u> considerations rather than on man-made imperatives such as national boundaries. Cooperation is mandatory--perhaps cooperation at a level we usually only associate with wartime alliances. That is rational. It is also idealistic. And Mr. Paish did not make clear how we and his fellow Canadians can convince our elected masters and their appointees that they should work for a common good.

Bill Rogers of the Oil, Chemical and Atomic workers got things back

to more parochial concerns. He reasserted the possibility that a decision cutting off tankers in the eastern sound would mean refinery closures, and that the job-holders would be called on to sacrifice their jobs.

This brought the topic back to Dr. Quast's brilliant symbol of self-interest, a childhood game in which the aim is to make sure you are not holding Black Peter when play stops. Amid all today's talk of study and co-operation, there has been at play the Black Peter principle: if the worst happens, how can we make sure it happens elsewhere?

So ended the second phase of this dialogue on the possibilities, good and bad, in oil movement on Puget Sound. Our next speaker will be President Carter on Monday. By the time we meet again in Tacoma May 6 and 7 we may be looking at the question from an altered perspective.

Tacoma: Summary at Opening of Conference

The Bellingham and Port Angeles conferences have stressed the appalling dilemma of our era: our civilization needs energy in vast amounts, the limits of most sources of energy are apparent. Oil is a finite resource. We must find alternate means of turning wheels but, pending conversion to other forms of energy, we continue to need oil. And the problems of getting our remaining oil to consumers continue to divide society--indeed to divide individuals--for many of us who protest the side effects of distributing oil demand the conveniences which now depend on the consumption of oil. Having followed four days of discussion of the present and possible future movement of oil in the Puget Sound region, I have been struck by the unexpected complexity of the Puget Sound region, I have been impressed by the dedication and expertise of the panelists, by their devotion to their separate areas of expertise, and their passionate conviction that what is best for Anacortes is best for us all, or ARCO or aquaculture, or agro-business in the Northern Tier; for Oil, Chemical and Atomic workers or for gillnetters, purse seiners and trollers; for old folks with beach cabins and old folks with Shell dividends. So, as ever, we have in these conferences met the enemy only to find they is us. And, as ever, we face the question of "What can we do?"

My answer is, I don't know. But being here is a fine start. Information is basic to any decision. Having heard most of them before, I can

assure you most of the speakers you will hear today and tomorrow will offer facts and focuses that will challenge your assumptions.

No one can hear Mr. Robert Clark, who will be the keynote speaker this morning, without being impressed by the complexities of the problems of determining the effects of oil in a marine environment. There's so much the experts don't know. If we laymen get no more than the realization that politicians of any gender are more politician than scientist when they dismiss the danger as chimerical, not chemical--well, something gained. I'm increasingly reassured by scientists who don't have the answers.

And I'm reassured by activists of various persuasions and all three genders. It is reassuring to see people organize to defend ideals. Oil has certainly roiled the political waters of Puget Sound--and of the advocates of a point of view, none has been more articulate and effective than Norma Turner, the president of No Oil Port, Incorporated, or Port Angeles. She reminds me of a complaint voiced by an opponent of woman suffrage in Washington Territory back in 1888 when he complained of "the infuriating poise, the appalling indefatigability and the impeccable information" of the ladies who debated him. She has been part of a community movement in Port Angeles which recalled county commissioners, established the city's position, and continues to challenge state authority.

Mrs. Turner's position is that no oil port is needed, not just at Port Angeles, but on the Sound. You will find her most impressive.

But then it is impossible not to be impressed by Dr. James Crutchfield, professor of economics at the University of Washington, who speaks this afternoon. He is the most persuasive spokesman for the idea of an oil port near or west of Port Angeles on the Straits of Juan de Fuca, with its line leading southward through the Olympics, then eastward over the Cascades, with a branch running to the existing refineries on the Sound.

But Dr. Crutchfield's figures will be challenged by Rich Ogar, the enrironmental quality control officer for the ARCO plant at Ferndale, Bill Rogers of the Oil, Chemical and Atomic Workers International Local, and other industry and job-oriented spokesmen scheduled for this afternoon.

These arguments are not abstract. The Alaska pipeline is nearing completion. It is only a matter of months before the apparatus that we have

been assembling out on the Tacoma tideflats and barged north goes into operation, and the heavily-paraffined crude comes out from under the Arctic Ocean, is heated and starts flowing south to Valdez. Once it starts flowing it can't be stopped without catastrophic cost in getting the line back in operation. When it pours out at Valdez there have to be tankers there to carry it away, and ports to receive it. The facilities are not here. The sites have not been chosen. Decisions have to be made, and soon, as to where it will go.

There are--as the Bellingham and Port Angeles conferences have made clear--other problems. It is not only North Slope oil that is involved. It is not just a choice of Bellingham or Port Angeles. Not just a choice of an all-American or a part-Canadian route. But the North Slope decision is the one that has to be made right away, and that decision will influence all others. It's a political decision, and tonight we shall hear from State Representative Mary Kay Becker, and tomorrow from State Senator H. A. "Barney" Goltz, both of Bellingham, neither as unconcerned about tankers on Puget Sound waters as Governor Ray. They should give us an insight into possibilities of legislative decision, while Dr. William Ross of the University of Victoria and the Honorable Robert Wenman, Member of the Canadian Parliament from British Columbia, can point out how things look from across the border.

The problem is more than economic, more than political. It is one of the profound problems of human relations in our age. And to give a broader perspective we will be hearing today and tomorrow from academics representing several disciplines--such men as Dr. Roland DeLorme of the Western Washington University history department, Dr. James Scott, the director of the Center for Pacific Northwest Studies, Dr. Robert Monahan, geographer from Western Washington University, Dr. Frank Peterson of the University of Puget Sound, Dr. Werner Quast of Peninsula Community College, Dr. Manfred Vernon, the conference director, and Dr. Don Alper of the political science department, Western Washington University.

So stay alert, there may be a pop quiz!

Critique of the Tacoma Conference

Even the legislature cannot keep its constitutional schedule. It should not surprise us that events refuse to tailor themselves to man's institutions.

Oil from the North Slope of Alaska, though it will move south some five years later than originally proposed, will begin pouring from the pipe at Valdez before the United States is ready to receive it.

During the discussions held during the past five weeks at Bellingham, at Port Angeles and here in Tacoma, the nearest approach to unanimity has been in the expressions of desire for more time:

- Time to find ways of moving the Alaska crude to markets in the midwest (which is not where it was supposed to go when the project was announced).
- Time for the scientists to learn the extent of the damage they all agree is done whenever hydrocarbons seep, splash, run off or flood into a marine environment, especially in the delicate coastal areas.
- Time to persuade or force the industry to reveal its intentions, and not hide behind the excuse of "proprietary privilege."
- Time for the industry to develop new techniques and assemble new equipment for mopping up when there is an obvious mess.
- Time for the Coast Guard to be equipped with later generation electronic devices, and mandatory control systems, and for the men on the foreign ships to learn to <u>understand</u>, not merely speak, English.
- Time for our elected masters in Olympia and Washington to sort out priorities.
- Time for Canada to decide what is in its own best interest; and time for the United States to adjust to the fact that our oldest friend and closest neighbor is an indenpendent nation; time to learn to respect that independence and to cultivate that friendship through cooperative effort; and time for our elected officials to drop their knee-jerk jingoism and emulate the Canadians' urbanity in discourse.
- Time even to study anew the question of where in the long perspective a transshipment terminal would be most efficient and do the least violence--if, indeed, a new transshipment terminal is needed.

But there is little time.

The Alaska pipeline is nearly ready. Within months it will be ready to

move oil. When it is ready, the oil companies will demand to get things flowing so they can begin to pay off that $600,000 a day interest the ARCO spokesmen have emphasized--and to make a buck or two besides. Even if one wonders to what extent the people of Puget Sound are obligated to reduce the risks for the venturers of risk capital, there is the problem of the state of Alaska, which is also in hock.

The national economy, the very patterns of our life, float on the dwindling sea of oil. We are to a great extent prisoners of past decisions, perhaps past mistakes, which also were made against just such self-imposed deadlines as we now face, decisions which seem to have been made not in pursuit of happiness but of an ignoble hedonism.

Some time can be bought. A portion of the outpouring from the pipeline can be processed at Ferndale. Some can be shipped through the Canal or around the Cape. The President may discover it in the national interest for some oil to be traded off to Japan.

The symposia and colloquia, the speeches, arguments, hinted suspicions and open name-calling of the Bellingham, Port Angeles and Tacoma conferences have added to the possibility that time so purchased could be used profitably. For in the welter of opinions and statistics with which we have been confronted, several patterns can be discerned.

There is general agreement that transshipment of oil through Puget Sound would, at the very best, be a minor bane, a sacrifice of local interest for that of other areas.

There is general agreement that the existing refineries on Puget Sound should continue to be served. Barring the unforeseen, that means continued traffic by tanker in the Northern Sound.

The marine scientists are agreed that oil damages the marine environment, and that more study is needed to determine the extent of damage. There is growing concern about subtle effects, for instance the possibility that small marine organizers, on which the chain of marine life depends, could have their sexual signals jammed by the presence of hydrocarbons.

There is agreement that where there is the movement of oil there will be some spillage, and that there is the possibility of catastrophe. On the odds, the bookies disagree. Listening to the Pollyannas of the petroleum industry debate the Cassandras of crude oil on the meaning to be found in

the entrails of a computer printout, most people probably apply the touchstone of their prejudices. But all agreed that catastrophes are best when they do not occur.

There were areas where agreement was not complete, where the implications of proposals involve fundamental shifts in our way of looking at problems, but which seem to offer interesting possibilities. I'm thinking of Jim Crutchfield's urgent pleas for using other criteria than the industry's bookkeeping in determining the advantages of possible terminal sites, and of Bob Monahan's like-minded argument for internalizing costs; that is, for including in the price of oil products such items as the cost of insurance against worst-possible case catastrophe, and of Coast Guard policing of the traffic lanes. Nobody ever went broke underestimating the willingness of Americans to give up accustomed conveniences voluntarily--but we are impressed by high prices.

That brings up a question which remained submerged, almost subliminal, throughout the conference, but which is fundamental. It is the question of quality of life. Quality of life cannot be discussed meaningfully in terms of dollars. You can't buy a sunset, a dollar won't create the taste of a Dungeness crab, fishing is an elemental activity and pricing its satisfaction to a fisherman is like trying to work out the cost-benefits of motherhood.

One of the most encouraging things at the conference has been the interest, and the organizing ability, shown by the citizens in the communities at risk, and the rise of truly eloquent and diligent spokesmen for opposed causes. That was the good news; the bad news was that a community such as Port Angeles, which could not have made its wishes more clear, may nonetheless have a terminal shoved down its lovely throat. Surely the processes of democracy can work better than that.

But time ticks on. Major decisions cannot be put off indefinitely and when made they will bind us and our heirs, as the decisions made by others now bind us. This conference has deepened not only the public's awareness of the issues and the stakes, but has added to the understanding of the participants, some of whom will influence the decisions. This is important, for we and our representatives are the stewards of Puget Sound, the custodians of a treasure beyond price.

A SUMMARY OF THE CONFERENCE

by

Phyllis Bultmann

Originally planned as a single, two-day forum, the 1977 Conference entitled Oil in Washington Waters: Boon or Bane? eventually went on the road with sessions in Bellingham (April 1 and 2), Port Angeles (April 16), and Tacoma (May 6 and 7).

Director of the Conference was Manfred C. Vernon, Professor-Emeritus of Political Science and Lecturer in Political Geography, who worked closely with James Scott, Director of the Center for Northwest Studies, and Jane Clark, Director of the Bureau for Faculty Research, all of Western Washington University. The organizing committee included Dean Frank Peterson, University of Puget Sound; humanists Don Alper, political scientist, and Phyllis Bultmann, historian, both of W.W.U., and Werner Quast, political scientist from Peninsula College. Chris Goldsmith of Public Information, W.W.U., Joan Lynott of Public Relations, U.P.S., Pam Hamilton of B.F.R. and Geri Walker of B.F.R. completed the full committee, as it functioned for all three locations.

Oil in Washington Waters was sponsored by the Center for Pacific Northwest Studies, and co-sponsored by the Bureau for Faculty Research, and the Bellingham Chapter of the League of Women Voters. Subsequently, as the two additional sessions were prompted by the extraordinary topicality of the subject, it enjoyed co-sponsorship by Peninsula College (Port Angeles) and the University of Puget Sound (Tacoma). All three meetings were supported by matching funds from the Washington Commission for the Humanities.

Spanning an interval of almost six weeks during which the proposal to locate an oil transshipment port in the Strait of Juan de Fuca (at Port Angeles) or in the North Sound (at Cherry Point near Bellingham (was firing major disputes from Olympia to the border and beyond, the on-target Conference drew a total registration of 541 concerned citizens. Attendance at the three locations was in diminishing numbers (367 at Bellingham, 98 at Port Angeles, 78 at Tacoma),

suggesting not so much that the theme of the Conference lost urgency during those six weeks, as that people who lived closest to the proposed sites felt most immediately engaged by the probable benefits or hazards that might result from the final site selection. As Cherry Point was the front runner at that time, so the Bellingham Conference drew the largest and most actively participating audience. Tacoma, concerned at the risk of a pipeline across its county, but not mentioned as a possible site, drew the smallest audience.

In all three sessions, the Conference sought to present and evoke a full spectrum of public opinion concerning an oil transshipment port. It focused on the tankers that would carry Alaskan oil; on the immediacy of the Alaskan oil which was about to flow in the pipeline from the north slope ("It has to have somewhere to go!"); and on the need for oil in the interior of the United States.

Opening gun was a brief address of welcome by Paul Hansen, chairman of the Board of Trustees, W.W.U., who outlined the complex and interrelated issues involved in a site selection. Thereafter, specialists in many related fields provided auditors with facts, figures and premises concerning the handling of oil in the inland waters of Washington and British Columbia. Viewpoints were expressed by a variety of spokesmen for both local and national government, for the oil industry (management and labor), the Coast Guard, the marine sciences, the fisheries, the voters and the press--including many who represented Canadian agencies, both public and private.

Professional humanists (historians, political scientists, geographers and economists) led discussions, presented commentaries, and evaluated the ideas of the Conference in humanistic terms. Through their efforts, audience participation was provoked and encouraged in small study groups as well as in assemblies of the whole.

As the Conference moved to its second and third locations, many of the participants (audience as well as speakers and panelists) moved with it. An advantage of the moves, however, was that new ideas and opinions were introduced and woven into the fabric of the Conference by residents, humanists and resource persons in the Port Angeles and Tacoma areas. In Port Angeles, for example, the president of No Oil Port, Inc., Norma Turner, President Paul Cornaby of Peninsula College, and Howard Doherty, Clallam County Commissioner, all made significant contributions to the Conference and brought more Port Angeles light to bear on discussions which had tended, during the Bellingham meetings, to

feature Cherry Point.

In Tacoma, President Phibbs of U.P.S. welcomed the group, humanist and native Tacoman Darrell Reeck, also of U.P.S., spoke persuasively about his city's attitudes toward the oil issues, and a statement of her position on these issuess--sent in by Governor Ray--was read to the assembled Conference.

Since decisions regarding an oil transshipment port were thought likely to rest at least in part with the State Legislature (unless preempted by the Federal Government), it was important to have legislators present, both to express their feelings for the Legislature's stand, and to hear the opinions of the voters who made up the rest of the Conference. The possibility of a site in Canada, also widely bruited at the time of the Conference, made the presence of Canadian legislators desirable. Among those who attended and participated were Washington State Senator H. A. "Barney" Goltz, the Honorable Robert Wenman, M.P. for Fraser Valley West, and the Honorable Donald W. Munro, M.P. for Esquimalt/Saanich. Washington Representative Mary K. Becker, scheduled to participate, was at the last moment prevented from doing so by some unexpected assignments in the House.

Humanists not on the planning committee but participating in the program included Dean Robert Collier, College of Business and Economics, W.W.U.; James Crutchfield, economist, University of Washington; William Ross, geographer, University of Victoria; William Bultmann and Roland De Lorme, historians, W.W.U.; Robert Monahan, geographer and director of the Canadian-American Studies Center, W.W.U.; and others.

Wilbur Hallauer and Larry Bradley, directors respectively of the Washington State Department of Ecology and the State Energy Office, spoke at several meetings. And Captain Richard S. Malm, captain of the Port of Seattle, U.S. Coast Guard, was one of the most faithful, equable and informative participants at all three Conference locations.

Humanist Murray Morgan of Tacoma served as Rapporteur for the Conference, ably summing up the principal points of conflict that emerged. We all, he pointed out, agree on a need for TIME, which will allow us to make a wise decision. We have no time.

Publicity before, during and after the Conferences gave them impact on far more citizens of the state than the attendance records suggest. Newspapers from Olympia to Vancouver and Victoria printed advance announcements, sent reporters and discussed proceedings in their editorials. Television and radio

interviews related to the Conferences increased communitywide awareness of the oil port and transport issues.

As the possibility of an oil spill from increased tanker traffic prompted most of the opposition to the proposed oil ports, so the papers in the areas likely to be affected--the islands, for example--cooperated in publicizing these discussions. The editor of Seattle's primary boating magazine, Tom Kincaid, attended the first Conference and devoted his next editorial to the ideas presented there. Some parts of the Conference were "televised live" and shown the same night in regional news programs. Repercussions were seen in "letters-to-the-editor" columns and in other, more unexpected quarters. For example, a student at W.W.U. attended the Bellingham sessions of Oil in Washington Waters, learned there of the activities of P.O.W. (Protect Our Waters), and began attending meetings of the latter community group. Another form of repercussion felt in the Legislature was forecast when Senator Goltz--in response to a request from the floor--said he would examine any proposed Senate bill to be sure it made only one transshipment port approvable, and would call any discrepancy to the Legislature's attention.

Because so many informed citizens participated in the Conference, it is impossible to give all their names; however the proceedings of the Conference will be sent to all principal participants. It will be sent also to other interested persons upon request.

APPENDIX 1

A Statement by the Governor of Washington, Dr. Dixy Lee Ray

Oil will continue to be fundamental to our economic well-being for decades, even as we respond to the necessity for lessening dependence on it.

There are essentially no known oil deposits within the state, but there are geological indications to the contrary. In any event, there is no prospect for meeting a significant share of state oil demands with intrinsic fossil fuel resources in the next decade. Oil has come by pipeline from Canada, but this source has been phased out almost completely to Washington refineries and will be to the inland Northern Tier refineries by 1981. Alaskan oil will begin to flow in 1977 and will come in amounts in excess to the needs of the three coastal states. In the years ahead, sources other than Prudhoe Bay may contribute substantial flows. The solution to the potential Alaskan surplus may or may not involve Washington, and the same is true for the inland Northern Tier refineries. In any case, local refinery supply must be assured.

Oil now must come in by sea and the transit of large, not-very-maneuverable ships in restricted inland waters is of concern. The major refineries (at Anacortes and Ferndale) were built to process sweet Canadian crude oil. Only one of the four is prepared to process Alaskan crude oil. Capital retrofit investments, in substantial but varying amounts, must be made in the other three. Also, the same three must add to their terminal facilities in order to handle the larger, more economical ships.

The surest way to preclude a major crude oil spill in the commercially and recreationally valuable inland waters is to deny access to crude oil tankers, an obvious impossibility. A common use terminal in the Straits of Juan de Fuca (Port Angeles or westward) with connecting pipeline is many times more expensive than improving terminals at the refinery sites. The cost differential is enough that one or more of the refineries likely would close down rather than meet the added costs. Close-down, particularly in Skagit County, would have a severe impact on the local economy. Further, there are reasons other than local economic impact for keeping the refineries operating. A

solution would be for the state to subsidize construction and operation of a common use terminal. On the other hand, the spill risk is very low. Moreover, construction of a pipeline down the eastern side of the Olympic Peninsula or across Puget Sound would be difficult, costly, and involve substantial environmental impacts and risks. These factors must be weighed against the added risk of bringing ships further in. On balance, crude oil should be brought in by ship to a point or points where a pipeline does not have to be routed under or around Puget Sound.

There is acknowledged room for improvement in safety rules for ships, especially certain foreign ones--the "Flags of Convenience" ships, and also improvement in oil spill response capabilities. These improvements are being sought and will be applicable to any selected port or ports. Such improvements will minimize but not totally eliminate risk.

It will soon be clarified whether or not Washington is the best terminal for serving land-locked midwestern refineries and moving inland any Alaskan oil surplus to the coastal states. If Washington turns out to be the best choice (and it may, since transit distances are less than to other ports and Washington inland waters contain the best deepwater ports on the west coast), we should, in the national interest, agree to the terminal. A transshipment terminal involves added risks, but will bring some, though not great, economic benefits. There would be opportunity for locating additional petrochemical industries close to a pipeline and, at the same time, close to both east and west points of produce use.

Funding must be generated from the terminal function to provide for the costs of necessary protection. It is not inappropriate and not without considerable precedent to place some added expense on end users in order to protect local environment. However, gouging to generate income for other purposes must be prevented, as such would further a developing trend which is deleterious to our national well-being.

APPENDIX 2

Senator Magnuson's Position on Oil Shipments to Puget Sound

Summary:

1. Senator Magnuson opposes transshipment of oil from Puget Sound to the Midwest.

2. He opposes any tankers larger than 125,000 d.w.t. entering Puget Sound.

3. He will continue to insist upon rigorous operating and construction safeguards for all tankers that do move on Puget Sound, regardless of size.

Transshipment: The risks of major oil spills and continuous minor spills increases as the amount of oil brought into the Sound increases. This increased risk is not offset by any economic gains. The number of jobs created by a transshipment center would be miniscule. But the number of jobs lost in the fishing, aquaculture and recreation industries would be substantial if spills did occur.

Consequently, Senator Magnuson believes that no oil should be brought into Puget Sound except for regional needs. He opposes (a) any pipeline to carry crude or refined products from Puget Sound east to the Midwest, (b) any increase in refining capacity except that needed to supply the region, and (c) any increase in tanker traffic on Puget Sound except that required to supply the region.

Washington currently exports to other states one-third of the oil it refines. As new refineries are built in the Portland area, refined oil shipments to Oregon will decrease. Consequently, Washington should not need to increase refining capacity for some time to come.

Senator Magnuson will attempt to persuade the major oil companies not to build a transshipment center in the Puget Sound region. If the companies refuse, he will urge Washington State officials to use the full range of state powers to prohibit construction of transshipment facilities.

Supertankers: The largest tankers currently operating on Puget Sound are 125,000 d.w.t. Technically, these are not "supertankers," which are generally defined as tankers of more than 175,000 d.w.t. Nonetheless, a 125,000 d.w.t. tanker is a very large vessel, capable of carrying 870,000 barrels of oil.

The Torrey Canyon which wrecked in the Scilly Islands a few years ago, was a 125,000 d.w.t. tanker. The pollution from this wreck spoiled miles of English and French coastline, and killed tens of thousands of seabirds and other marine animals.

Senator Magnuson does not believe the safety of Puget Sound should turn on the technical definition of the word "supertanker." He opposes any vessel larger than 125,000 d.w.t. entering the vulnerable inland waters of Puget Sound, including the waters around Cherry Point and Anacortes. Moreover, he will insist that all 125,000 d.w.t. tankers be accompanied by tugs from the time they enter these waters. If the Coast Guard does not issue this requirement, Senator Magnuson will attempt to legislate it, as he recently legislated the double bottoms requirement.

If no transshipment center is built in the region, there should be no need at all for tankers larger than 125,000 d.w.t. in Puget Sound, even west of Port Angeles. If the oil companies propose to use heavier tankers in this area, Senator Magnuson will consider extending the limit on tanker size into the Straits of Juan de Fuca as well as inthe inland waters of Puget Sound.

Tanker Safety--Construction and Operation:

1. Senator Magnuson has already written three important legislative measures designed to minimize the risk of oil spills as a result of tanker operations.

a. The first Magnuson measure (P.L. 92-63) requires "bridge-to-bridge" radio communication between all ships on inland waters. This will help prevent collisions--a major source of oil spills.

b. The second Magnuson measure--the Ports and Waterways Safety Act of 1972 (P.L. 92-340)--has two purposes.

i. The Act creates a vessel traffic control system (VTS) for inland waters. This system is already operating in Puget Sound, and is now entering a second and more sophisticated stage involving the installation of radar. It minimizes the risk of collisions and groundings, just as air traffic control systems minimize the risk of mid-air collisions and crashes. VTS utilizes radio contact, traffic separation schemes, radar, and shore control of vessels to manage maritime traffic in congested areas.

ii. The Act mandates the Coast Guard to set construction and operating standards for all vessels, including tankers. The Coast Guard has used Senator Magnuson's law to require two important anti-spill construction standards: tank size limitation (which limits the amount of oil outflow if a tank is ruptured), and segregated ballast systems (requires separate tanks for cargo and ballast water preventing discharge of oily ballast water, a major source of oil pollution).

c. Senator Magnuson had told the Coast Guard that its new standards under the Ports and Waterways Safety Act of 1972 do not go far enough. For example, the Coast Guard refused to require double hulls on tankers entering inland waters--even though the Coast Guard admits that 90% of the oil spills from groundings between 1969 and 1973 could have been prevented by double hulls. Consequently, Magnuson wrote a third bill (an amendment to the Cargo Preference bill-H.R. 8193) which requires double bottoms on all newly constructed tankers bringing oil to West Coast ports from either Alaska or foreign fields.

2. Senator Magnuson has also asked the Coast Guard to expand its regulations to include such features as twin propellers, bow thrusters, double boilers, stronger auxiliary power systems, and other tanker construction requirements to make tankers more stable and maneuverable on inland waters. In light of the Magnuson-Coast Guard battle on double bottoms, and the outcome of that battle, Senator Magnuson believes the Coast Guard now may use the authority granted it under Magnuson's Ports and Waterways Safety Act to require these features. If the coast Guard refuses, Senator Magnuson will attempt to legislate these requirements, as he did the double bottoms requirement.

Oil Spill Liability: Senator Magnuson has instructed the staff of his Senate Commerce Committee to prepare for a complete re-examination of the liability and compensation system for oil spill damage. The potential damages from a major oil spill has passed far beyond the limits of liability in existing law, mainly because of the dramatic increase in tanker size in the last few years. An overhaul of applicable Federal law is now necessary.

PROGRAMS OF THE THREE CONFERENCES

A. Western Washington State College, Bellingham, April 1 & 2, 1977.

Program

Friday, April 1, 1977

8:30 a.m.	Registration (Foyer)
9:00 a.m.	"Welcome to Western" Vice President James Talbot
9:10 a.m.	"The Range and Purpose of the Conference" Manfred C. Vernon, Conference Director
9:20 a.m.	FIRST PLENARY SESSION: "Oil in Washington Waters: Identifying the Issues" Chairman: Paul Hanson, Bellingham, Board of Trustees, W.W.S.C. Keynote Speaker: B. Glenn Ledbetter, Executive Secretary, Washington Oceanographic Commission "Spatial Dimensions and Regional Implications" William Ross, University of Victoria.
10:30 a.m.	Coffee Break
10:40 a.m.	FORUM: Paul Hanson, Chairman Betty Jones, League of Women Voters, Bellingham Chapter Bill Rodgers, Vice President, Oil Chemical & Atomic Workers International, AFL/CIO Local 1-590. Robert C. Clark, Jr., National Marine Fisheries Service Captain Richard F. Malm, U.S. Coast Guard Service, Seattle.
11:40 a.m.	DISCUSSION GROUPS Section A - William Bultmann, W.W.S.C. Section B - Werner Quast, Peninsula College Section C - Roland DeLorme, W.W.S.C.
12:30 p.m.	LUNCH RECESS
1:45 p.m.	SECOND PLENARY SESSION "Oil in Washington Waters: Economic Realities and Technological Responses" Chairman: Robert Collier, Dean, College of Business & Economics, W.W.S.C. Speakers: James Crutchfield, University of Washington Fielding Formway, General Manager, ARCO, Ferndale
2:45 p.m.	Coffee Break
2:55 p.m.	PANEL DISCUSSION Chairman: Dean Collier Thomas Glenn, Manager, Port of Bellingham John Wiechert, Clean Sound Oil Spills Cooperative, Seattle Ned Thomas, Editor, Daily News, Port Angeles
3:50 p.m.	DISCUSSION GROUPS Section A - Peter Steffens, W.W.S.C. Section B - William Bultmann, W.W.S.C. Section C - Don Alper, W.W.S.C.

4:30 p.m. RAPPORTEUR'S COMMENTS
Murray Morgan, Tacoma

4:50 p.m. RECESS

7:30 p.m. THIRD PLENARY SESSION
"Oil in Washington Waters: Environmental Concerns and Apprehensions"
Chairman: William L. Honeysett, Publisher, Bellingham Herald
Speakers:
Representative Mary Kay Becker, Bellingham
Jerry Flora, Director, Shannon Point Marine Laboratory

8:30 p.m. Slide Presentation
John Wiechert, Manager, Clean Sound Oil Spills Cooperative

8:45 p.m. Coffee Break

9:00 p.m. PANEL DISCUSSION
Chairman: William L. Honeysett
Shirley McIntyre, Coalition Against Oil Pollution
Captain Richard F. Malm, U.S. Coast Guard
James Scott, Center for Pacific Northwest Studies

10:00 p.m. Adjournment

Saturday, April 2, 1977

8:45 a.m. Registration (Foyer)

9:15 a.m. FOURTH PLENARY SESSION
"Oil in Washington Waters: Political Actions and Responses"
Chairman: Ken Hertz, Mayor of Bellingham
Speakers:
Senator H. A. "Barney" Goltz
Wilbur Hallauer, Director, Washington Department of Ecology
Larry Bradley, Director, State Energy Office

10:15 a.m. Coffee Break

10:25 a.m. FORUM: Mayor Hertz, Chairman
Manfred Vernon
Shelley McIntyre
William Ross

11:20 a.m. DISCUSSION GROUPS
Section A - Roland DeLorme
Section B - Werner Quast
Section C - Peter Steffens

12:15 p.m. RAPPORTEUR'S COMMENTS
Murray Morgan

12:45 p.m. Adjournment of Bellingham Conference

B. Peninsula College, Port Angeles, April 15 & 16, 1977.

Program

Friday, April 15, 1977 -- Faculty Lounge

7:30 p.m. Round Table Symposium
"Oil in Perspective: The Energy Crisis and the Role of Washington State."
Moderator: President Paul Cornaby, Peninsula College

Participants:

Invited humanists, resource personnel, community leaders, and members of the news media.

Saturday, April 16, 1977

8:30 a.m.	Registration (Foyer)
9:00	"Welcome to Peninsula College," President Cornaby
9:10	"Report on the Bellingham Conference" Murray Morgan, Tacoma FIRST PLENARY SESSION "Oil in Washington Waters: The Basic Issues" Chairman: James W. Scott, Director, Center for Pacific Northwest Studies Keynote Speaker: Robert C. Clark, Jr., National Marine Fisheries Service, Seattle
9:50 a.m.	"Oil in Washington Waters: Community Versus Regional and National Needs" Speakers: Mrs. Norma Turner, Port Angeles Robert L. Monahan, Director, Canadian/American Studies Program, WWSC
10:30	COFFEE BREAK
10:45	FORUM: James W. Scott, Chairman B. Glen Ledbetter, Washington Oceanographic Commission Donald W. Munro, Member of Parliament, Esquimault/Saanich William Ross, University of Victoria Werner Quast, Peninsula College
11:50	SMALL DISCUSSION GROUPS Section A - Phyllis Bultmann, WWSC Section B - Paul Cornaby, Peninsula College Section C - Don Alper, WWSC
12:30	LUNCH RECESS
1:45 p.m.	SECOND PLENARY SESSION "Oil in Washington Waters: The Response of Industry & Government" Chairman: Howard (Mike) Doherty, Clallam County Commissioner Speakers: Senator Gordon Sandison Fielding Formway, General Manager, ARCO Larry Bradley, Director, State Energy Office
3:00 p.m.	PANEL DISCUSSION Chairman: Howard (Mike) Doherty Bill Rodgers, Vice President, Oil Chemical and Atomic Workers International AFL/CIO Local I-590 Howard Paish, Consultant on Energy, B.C. Provincial Government John Wiechert, Clean Sound Oil Spills Cooperative, Seattle Captain Richard F. Malm, U.S. Coast Guard Service
3:50	COFFEE BREAK
4:00	SMALL DISCUSSION GROUPS Section A - Don Alper, WWSC Section B - Werner Quast, Peninsula College Section C - James Scott, WWSC
4:30	RAPPORTEUR'S REMARKS The Conference Assessed Murray Morgan
4:45	Port Angeles Conference Adjourns

C. University of Puget Sound, May 6 & 7, 1977.

Program

Friday, May 6, 1977

8:30 a.m.	Registration
9:00	"Welcome to UPS" President Phibbs
9:10	"The Range and Purpose of the Conference" Manfred C. Vernon, Conference Director
9:20	"Report on the Previous Conferences" Murray Morgan, Tacoma
9:35	FIRST PLENARY SESSION: "Oil in Washington Waters: Identifying the Issues" Chairman: James W. Scott, Director, Center for Pacific Northwest Studies Keynote Speaker: Robert C. Clark, Jr. National Marine Fisheries Service, Seattle
10:05	"Oil in Washington Waters: Community Versus Regional and National Needs" Speakers: Mrs. Norma Turner, President, No Oil Port, Inc., Port Angeles Robert L. Monahan, Director, Canadian-American Studies Program, WWSC
10:45	COFFEE BREAK
11:00	FORUM: James W. Scott, Chairman B. Glenn Ledbetter, Executive Secretary, Washington Oceanographic Commission Captain Richard F. Malm, U.S. Coast Guard Service The Honorable Robert Wenman, Member of Canadian Parliament, B.C. Werner Quast, Political Science, Peninsula College
12:15	LUNCH RECESS
1:30 p.m.	SECOND PLENARY SESSION "Oil in Washington Waters: Economic and Technological Considerations" Chairman: Roland L. DeLorme, History, WWSC Speaker: James A. Crutchfield, Professor of Economics, University of Washington
2:15	PANEL DISCUSSION Chairman: Roland L. DeLorme "Industry Responds" John Wiechert, Manager, Clean Sound Oil Spills Cooperative Bill Rodgers, Vice President, Oil, Chemical & Atomic Workers International, AFL/CIO, Local I-590 Rich Ogar, Environmental Quality Control, ARCO, Ferndale Virgil McNabb, Western Gas & Oil Assn., Seattle
3:30	COFFEE BREAK
3:45	SMALL DISCUSSION GROUPS Section A - Roland L. DeLorme, WWSC

Section B - Darrell Reeck, UPS
Section C - Paul Cornaby, Peninsula College
Section D - Don Alper, WWSC

4:45 RECESS

7:30 THIRD PLENARY SESSION
"Oil in Washington Waters: Environmental Concerns and Apprehensions"
Chairman: Dean Frank Peterson, UPS
Speakers:
State Representative Mary Kay Becker, Bellingham
Jeff Bland, Chemistry, UPS

8:30 SLIDE SHOW - John Wiechert

8:45 COFFEE BREAK

9:00 PANEL DISCUSSION
Chairman: Dean Frank Peterson
Captain Richard F. Malm
Howard Paish, Resource Management Consultant, Burnaby, B.C.
Shirley McIntyre, Coalition Against Oil Pollution
Betty Jones, President, Protect Our Waters (POW), Bellingham
Rich Ogar, Environmental Quality Control, ARCO, Ferndale

10:00 ADJOURNMENT

Saturday, May 7, 1977

9:00 FOURTH PLENARY SESSION
"Oil in Washington Waters: Political Actions and Responses"
Chairman: Werner Quast, Peninsula College
Speaker: State Senator H. A. "Barney" Goltz, Bellingham

9:45 PANEL DISCUSSION
Chairman: Werner Quast
Fred Adair, State Energy Office
B. Glenn Ledbetter
William Ross

10:45 COFFEE BREAK

11:00 EVALUATION SESSION
"Oil in Washington Waters: Where Do We Go From Here?
Chairman: Senator Goltz
Panelists:
Darrell Reeck
Werner Quast
Manfred Vernon
James Scott
James Crutchfield
Fred Adair

12:00 RAPPORTEUR'S REMARKS
"The Conference Assessed"
Murray Morgan

12:15 Conference Adjourns

Sponsor of the Conference:

The Center for Pacific Northwest Studies, W.W.S.C.

Co-Sponsors of the Conferences

The League of Women Voters, Bellingham Chapter;
Peninsula College, Port Angeles;
University of Puget Sound, Tacoma;
Bureau for Faculty Research, W.W.S.C.

Organizing Committee

Don Alper, Political Science;
Jane Clark, Director, Bureau for Faculty Research;
Phyllis Bultmann, History;
Chris Goldsmith, Public Information;
Pam Hamilton, Bureau for Faculty Research;
Geri Walker, Bureau for Faculty Research;
James Scott, Center for Pacific Northwest Studies;
Manfred C. Vernon, Political Science, Conference Director

The three conferences were made possible by a matching grant from the Washington Commission for the Humanities.