A PROPOSED SYSTEM FOR PIPELINE CONSTRUCTION AND OPERATION MONITORING IN WASHINGTON STATE

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LIST OF ABBREVIATIONS

A	-	Alaskan Segment (Alaska Natural Gas Pipeline)
ADEC (DEC)	-	Alaska Department of Environmental Conservation
ADFG (DFG)	-	Alaska Department of Fish and Game
ADOT (DOT)	-	Alaska Department of Transportation
AO	-	Authorized Officer
AOR	-	Authorized Officer Representative
AOFR	-	Authorized Officer Field Representative
APO	-	Alaska Pipeline Office
BLM	-	Bureau of Land Management
DCR	-	Design Change Request
EEI	-	Environment and Ecology, Inc.
EFSEC	-	Energy Facility Site Evaluation Council
EIS	-	Environmental Impact Statement
FECN	-	Field Engineering Change Notice
FERC	-	Federal Energy Regulatory Commission
FI	-	Federal Inspector
FOR	-	Federal Officer Representative
FSO	-	Field Surveillance Officer
FWS	-	United States Fish and Wildlife Service
GAO	-	General Accounting Office
GIE	-	Gulf Interstate Engineering
IFWT	-	Interagency Fish and Wildlife Team
JFWAT	-	Joint Fish and Wildlife Advisory Team
MRI	-	Mechanics Research, Inc.
N	-	Northern Segment (Alaska Natural Gas Pipeline)

NCR	-	Non-Conformance Report
NEPA	-	National Environmental Protection Act
NMFS	-	National Marine Fisheries Service
NTP	-	Notice to Proceed
NTPA	-	Notice to Proceed Application
NTPC	-	Northern Tier Pipeline Company
QA	-	Quality Assurance
QC	-	Quality Control
SPC	-	State Pipeline Coordinator
SPCO	-	State Pipeline Coordinator's Office
TAPS	-	Trans-Alaska Pipeline System
W	-	Western Segment (Alaska Natural Gas Pipeline)

I. ABSTRACT

TITLE: A Proposed System for Pipeline Construction and Operation Monitoring in Washington State

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SUMMARY:

Clallam County, Port Angeles and the Oil Port Task Force sought proposals in February 1980 to perform various analyses related to the proposed construction of crude oil terminals, storage facilities, and pipeline facilities by the Northern Tier Pipeline Company. CDS/QUEST Research was retained to design a construction and operation monitoring and arbitration process. The result is the report in which existing processes in Washington State, and similar and proposed processes used on other large diameter pipeline projects, are reviewed. The report sets out a proposed monitoring process and organization with the authorities and functions necessary to monitor a major pipeline project in Washington State and to force early resolution of conflicts over its construction and operation. The report also provides an exhaustive set of stipulations (terms and conditions) which precedent has shown to be desirable in the construction and operation of a pipeline and terminal complex, an activity varying significantly, both in duration and in distribution of workforce, from purely fixed-site facility construction. The report identifies within a historical and evolutionary context the key elements in a successful monitoring process, the content of such a process, and the organizational and staffing requirements of such a process.

THE PROCESS - KEY ELEMENTS

Seven key elements must be incorporated into the monitoring process in order to assure complete compliance, and to prevent or resolve early any conflict situations. These elements can also be termed "forcing functions", i.e., they are critical to the existence and proper functioning of the monitoring program, without them no program really exists. They are:

1. Reimbursement of Monitoring Costs - A standard practice on federal pipeline projects and also a standard practice of the Washington State Site Evaluation Council (EFSEC). The pipeline company should reimburse state and local government for all pipeline related monitoring expenses.

2. Co-Authority of Disciplines - Biologists, engineers, and local government administrators must all be able to exercise equal authority in the review, approval and monitoring of construction and operations activity to insure that no interests are overlooked or subordinated.

3. Approval of Plans Prior to Construction - The easiest way to avoid conflict and prevent unnecessary delays in the field, is to provide adequate preliminary and final design review of each construction segment. If design review and plan approval are integrated with construction contracting and the initiation of work, then compliance with the terms and conditions of a site certification agreement can be attained more easily.

4. Stop-Work Authority - If the State does not have a means to enforce compliance, monitoring becomes a secondary concern. Financial penalties have little effect unless they are quite severe given the overall magnitude of pipeline costs and profits. Therefore, a more practical forcing function is required, i.e., stop-work authority.

5. Quality Control & Quality Assurance - The State should assume only those monitoring and quality control roles that are necessary to protect the public's resources. However, it should mandate certain performance criteria for the Company installed quality control & quality assurance program.

6. Public Information - Where there is a free exchange of all current, available and relevant information, there is a greater chance that the pipeline will meet (or exceed) approved standards for integrity and performance, particularly if a forum is provided for discussion of the information.

7. Right-to-Perform - Where non-compliance exists and there is no correction of the situation by the Company, the State must be able to correct the situation and recover all costs of such work from the Company. This right serves to insure compliance on all terms and conditions of site certification. During facility construction this right is subordinated to the stop-work authority. However, during operation and maintenance of the terminal and pipeline, when stop-work ceases to have meaning, it provides a primary route of redress for non-compliance with the terms and conditions of certification.

In the final design of processes within the State to monitor the Northern Tier Pipeline Company, or any other pipeline company, all of the above elements must be incorporated.

CONTENT OF THE PROCESS

In formulating a set of draft certification conditions and stipulations for the proposed Northern Tier Pipeline, seven other sets of stipulations from four similar pipeline projects were reviewed and integrated. The proposed stipulations are organized into five groups. These groups reflect the format and content of past pipeline leases, grants and certifications, and reflect the current movement to expand stipulations to cover all true impacts, especially the socio-economic. The five groups are: (1) Certification, Lease, or Grant Conditions, (2) General Stipulations, (3) Environmental Stipulations, (4) Technical Stipulations, and (5) Socio-Economic Stipulations. The proposed set of stipulations for Northern Tier are found in two places within this report. First as Section III B of this report, and secondly as Appendix A. In the latter case each proposed stipulation is displayed along with all parallel or similar stipulations previously used, or proposed, in pipeline construction.

ORGANIZATION AND STAFFING REQUIREMENTS

In order to develop a monitoring organization profile, it was first assumed that a statewide approach was the most efficient way to go for all parties involved. It expands access to specific technical expertises for all local jurisdictions and provides the pipeline company with one-stop monitoring as a sequel to one-stop certification.

Model organization and staffing arrangements are proposed and discussed in this report. They assume a good pipeline quality control & quality assurance program and reflect all valid critiques of models which have preceded it, particularly in Alaska. Since it is a model it is presented independent of current State monitoring arrangements. It could be fully incorporated in EFSEC, created through them or independently established. However, this decision lies within the realm of the State. The key organizational and staffing recommendations are:

1. Create within state government a State Pipeline Coordinator's Office (SPCO) to monitor the fast-paced pipeline construction effort. (SPCO would be disbanded upon the initiation of pipeline operation; during operation monitoring would revert to the standard EFSEC process.)

2. After consultation with effected governments, appoint a State Pipeline Coordinator (SPC) who is empowered to implement all project stipulations and exercise stop-work authority.

3. Retain final authority for issuing statutory permits within state agencies, but have the issuance of all permits coordinated through the SPC.

4. Where final authority is not assigned by statute to an existing agency, assign that authority to the SPCO.

5. Allow the SPC to delegate those powers necessary to resolve minor and immediate problems to supervisors and field monitors, with review and appeal through the supervisors to the SPC.

6. Have four staff sections supporting the SPC: Engineering, Environmental, Local Government, and Administrative.

7. Within each section, except the Administrative, create an in-house design review staff and a field monitoring unit.

COMPLIANCE AND CONFLICT RESOLUTION

The processes proposed in this report have been drafted to integrate both monitoring and arbitration activities. The primary approach to arbitration has been to provide the state with tools and a monitoring process which makes it incumbent upon the pipeline company to resolve any conflicts which arise. This is achieved by having the company agree to specific monitoring enforcement tools in obtaining its state site certification.

The test of any monitoring process lies in its ability to obtain or enforce compliance by the applicant. The crux of the test comes when the applicant and the SPC cannot informally solve a problem and are in conflict over the enforcement of a stipulation. During construction, through the use of stop-work authority, the SPC can force resolution of the conflict to the state's satisfaction. However, once pipeline and terminal construction are complete, stop-work authority ceases to be a significant tool. During the operation and maintenance of the pipeline and terminal the state must have access to other tools to force the resolution of conflicts. One tool is the right of the state to perform work and bill the applicant. If this is coupled with a bond posted by the applicant upon which the state can draw, the state is saved from potential cash flow problems.

Let one assume, for examples sake, that a State Pipeline Coordinator's Office is set up as a project office under EFSEC and the applicant is found not to be in compliance with the terms and conditions of its site certification agreement. If informal mechanisms fail to achieve agreement on the implementation or interpretation of the conditions and stipulations, appeals could be successively lodged by the applicant with the SPC, EFSEC and the courts. However, until such appeals were heard the rights of the state would be protected by stop-work authority and the right-to-perform.

REPORT ORGANIZATION

The substance of this report is outlined above. The report itself is constructed to supply extensive detail to support its conclusions and to demonstrate precedents for all of its recommendations. The report initially discusses monitoring experience on the Trans-Alaska Pipeline System (TAPS) and the application of this experience to the formulation of a monitoring plan for the Alaska Natural Gas Pipeline. These experiences are then juxtaposed to the experience within Washington State in developing monitoring plans. The report then identifies similarities and differences between the proposed Northern Tier project and the TAPS experience. Several conclusions are drawn and a model for a statewide pipeline monitoring process is developed.

Finally, based on industry experience to date a detailed, and annotated, set of certification terms and conditions, or stipulations, are proposed for use in Washington State. These constitute the substance or subject matter of the monitoring process.

II. THE MONITORING PROCESS

A detailed analysis of the Trans-Alaska Pipeline System (TAPS) was undertaken as a first step in the development of a system of coordinated state and local government surveillance of the Washington portion of the proposed Northern Tier Pipeline. The TAPS was used as the prime example because; first it involved construction of a large diameter pipeline similar to the proposed Northern Tier Pipeline, second the TAPS was the first, and to date only, time a system of continuous pipeline-builder reimbursed government surveillance has been employed on any large construction project, and third the TAPS experience is the most applicable to the Northern Tier Project because it reflects the special characteristics and problems of pipeline construction.

Pipelines differ markedly from fixed site facilities, such as coal-fired or nuclear electric power generation plants. Cross country pipeline building is fast-paced and dynamic, with construction occurring at many sites within tight construction schedules. Historically, pipelines have been designed as they were built. (42) As one author has stated,

> "Unlike a bridge, say, or a city office tower, a pipeline does not usually have to be designed in detail before it is begun. Rather, the engineers make a comparatively general plan based on a route sketched from topographic maps to avoid excessive gradients which would impose high pressures on the pipe itself and require extra pumps to move the oil up and over, expensive both to install and to operate; the volume of oil determines the pipe diameter and gauge, and if the oil is corrosive that difficulty is dealt with in the pipe steel specified. With such basic questions settled, local problems--wet, unstable soil, subsurface rock to blast through, river crossings--can generally be dealt with as they are uncovered in the course of construction, by on-the-spot engineering or minor realignment of the route....And in pipeline work, no design can be final until the entire route has been dug and earth's last surprise revealed." (58)

Permit conditions, stipulations, and government monitoring procedures of pipeline construction consequently should differ significantly from those used at fixed site facilities. Northern Tier's proposed oil port and tank farm are in essence fixed site facilities, but, if the TAPS Valdez Oil Terminal is any example (58), the "design it as we go" attitude will also be applicable to them.

After reviewing the TAPS experience to determine which portions of that project were successful and which were not, the federal and state surveillance systems that are being developed for the Alaska segment of the Alaska Natural Gas Pipe System are discussed. The Alaska Natural Gas Transportation Act which was passed by the U.S. Congress in October of

1976 (P.L. 94-586 15 USC 719) authorized the construction of a large diameter natural gas pipeline from Prudhoe Bay down the TAPS corridor to Delta Junction, Alaska, where the line will turn eastward into Canada. The gasline will follow the Alcan Highway into northern British Columbia where it will fork, with the western leg going down through British Columbia, Washington and Oregon before reaching its destination in California. The other segment would cross Alberta, Montana and the Dakotas terminating in Iowa. Based upon their TAPS experience, the federal government and the State of Alaska have already created pipeline monitoring offices, even though construction on this project presently isn't scheduled to begin until 1982. (54, 55) An evaluation of these still forming surveillance organizations reveals how the various government agencies have attempted to correct some of the fundamental surveillance problems that were encountered during construction of the TAPS.

Next, the Energy Facility Site Evaluation Council within Washington State is reviewed. This is the agency which has jurisdiction over the site certification of the Northern Tier Pipeline. A look is taken at its history, authority and function, as well as, the types of site certification conditions and monitoring programs they have written.

Based on the analysis of the TAPS, Alaska Gasline, and EFSEC experiences, a coordinated system of state and local government surveillance for the proposed Northern Tier Project is presented and explained. Emphasis is placed on general parameters, concepts, and critical forcing functions. An alternative surveillance program for the Port Angeles-Clallam County portion of the Northern Tier System is discussed as an option that is available to the local governments of the area that would be most heavily impacted if Northern Tier is approved. Finally, a set of draft certification or lease conditions and stipulations are proposed for the Washington portion of the Northern Tier Project after the comparison of seven sets of stipulations for four different large diameter pipeline projects.

A. THE TRANS-ALASKA PIPELINE SYSTEM (TAPS)

1. Early History

The Trans-Alaska Pipeline System was constructed under provisions of the Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline (41) entered into on the 23rd day of January, 1974 by the United States of America and by seven owner companies that operated through the Alyeska Pipeline Service Company (APSC). General legal, management, organization, and engineering requirements were set forth in the body of the Agreement and Grant. More specific requirements were detailed in five exhibits that were attached to the Agreement and Grant. The stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline were included as Exhibit D. The State of Alaska entered into a right-of-way lease for the Trans-Alaska Pipeline with the Alyeska Pipeline Service Company that was modeled after the Federal Agreement and Grant. The state and federal stipulations were nearly identifical and constituted an integral part of the respective U.S. Government and State of Alaska lease and grant for pipeline construction. These stipulations were the terms, conditions, and specifications that were necessary to obligate the leasee/permittee, Alyeska, to build the TAPS in the most environmentally acceptable manner practical. These stipulations were part of the "Trans-Alaska Pipeline Authorization Act" (P.L. 93-153) passed by Congress and these stipulations were later translated into provisions of the federal and state grant/lease. (12) Congress incorporated the stipulations into law at the request of various political groups as a measure designed to mitigate the adverse effects of pipeline construction. (58, 61) Within these stipulations were requirements for continuous government surveillance of the pipeline system with all government expenses reimbursed by the pipeline company. (41, 61) Congress decided that this condition was necessary to insure Alyeska's compliance with the conditions of their "Grant of Right-of-Way". Continuous government monitoring and surveillance was the primary method utilized to mitigate the environmental disturbances associated with construction of the TAPS. (25, 29, 32, 42, 58, 61)

To have a proper understanding of the nature and posture of government surveillance on the TAPS one must go back to the discovery of oil at Prudhoe Bay in 1968 and follow the events that led to Congress' passage of the TAPS Authorization Act. In February 1969, the oil companies who had found the oil at Prudhoe Bay announced their pipeline plan, to be completed by 1972 at a cost of $900 million. (58, 61, 62, 63, 66, 67) In May, before they had even secured a right-of-way permit, the oil men ordered 500,000 tons of main line from Japan.

> If there had remained any faint possibility for fundamental change either in the pipeline route or in the means of transporting the oil, that possibility was now canceled. Moreover, since the pipe had been specified on the basis of quite sketchy knowledge of the conditions it would face along the route, the whole system would have to be designed to accommodate the pipe rather than the other way around." (58)

As the federal government was about to issue the permits for the Alaska pipeline, five Native villages along the pipeline route filed suit in U.S. District Court claiming ownership of the land intended for part of the pipeline system.

> "As a federal judge was considering the Native claims issue, three conservation groups--the Wilderness Society, the Environmental Defense Fund, and the Friends of the Earth--filed yet another federal suit in Washington, D.C., to block pipeline construction. The suit contended that the pipeline project violated the 1920 Mineral Leasing Act and the recently enacted National Environmental Policy Act (NEPA). On April 13, 1970, federal district court Judge George L. Hart, Jr., granted a temporary injunction blocking the pipeline project. Hart said there was reason to believe that the project, as proposed, violated both acts--the 1920 law, because TAPS was asking for a far wider right-of-way than the law allowed; and NEPA, because no environmental impact statement had been prepared for the entire project.
>
> The lawsuits made it clear to the oil companies that, although there were environmental obstacles to overcome before construction could begin, the most nettlesome problem was the Native land claims. So, as discussed in Chapter V, the oil companies threw their lobbying strength behind the Alaska Federation of Natives' effort to secure a just land claims settlement, and their support proved invaluable.
>
> With the land issue finally settled by the 1971 Alaska Native Claims Settlement Act, attention turned back to the environmental arguments over the pipeline." (61)
>
> "Successful court challenges notwithstanding, pressures were building for construction of the pipeline." (61)

1973 was the year of the Mideast oil embargo and in the atmosphere of an "Energy Crisis", Congress began to debate the merits of the Trans-Alaska Pipeline Authorization Bill (68, 69).

> "The Senate passed another amendment to bar shipments of Prudhoe Bay oil to foreign countries--with oil-hungry Japan, particularly, on the minds of the senators. Another amendment, proposed by Senator Mike Gravel (Democrat, Alaska), waived the provisions of the National Environmental Policy Act and prohibited further court challenges to the pipeline.
>
> This was the crucial issue. In tension-filled balloting, 49 had voted for the Gravel amendment and 48 against. Then

Senator Alan Cranston (Democrat, California), an opponent of the Gravel amendment who had arrived too late to vote on it initially, came to the floor. After Cranston's vote evened the tally, Vice President Spiro T. Agnew, the presiding officer, cast the dramatic decising vote, making it 50 for and 49 against.

With Senate passage, the House Interior Committee took up the measure and also narrowly approved the waiver of the NEPA provisions, making yet another battle certain on the House floor. Representative John R. Dellenback (Republican, Oregon) proposed an amendment to delete the waiver provision and instruct the courts to expedite challenges to the pipeline. Speaking in support of the amendment during House debate, Representative Morris K. Udall (Democrat, Arizona) warned that 'a lot of those who helped to write the National Environmental Policy Act into law are preparing to gut it.' Udall charged that Congress was bowing to oil industry pressures, that 'the oil companies are trying to panic this country and panic this house and this Congress.' By a 23-vote margin, the amendment was defeated. The House then easily passed the pipeline authorization bill, which was signed into law on November 16, 1973, by President Nixon." (61)

"A decision had been made very early to build a Trans-Alaska pipeline, for whatever short-term reasons. The years of litigation were simply devoted to rationalizing that decision." (58)

The pattern of involvement by government and industry, and policy decisions that resulted from this arrangement are detailed in a U.S. Fish and Wildlife Service Report on Fish and Wildlife Protection in the Planning and Construction of the Trans-Alaska Oil Pipeline (42).

"The general outcomes of this complex of forces can be previewed in summary:

1. Energy development objectives had priority over environmental protection objectives, but not to the exclusion of the latter.
2. Agencies at both federal and state levels whose capabilities and interests were most consistent with the development priority tended to dominate in the pipeline planning and later the construction surveillance processes.
3. The federal government effectively asserted primary control over pipeline surveillance matters, and the State of Alaska played a secondary role--except in the area of fish and wildlife protection.
4. Government responses to Alyeska's interests in pipeline construction tended overall to be facilitative,

but government also demanded assurance of the structural integrity of the pipeline, which, in turn helped assure longer run environmental integrity as well." (42)

"It would be misleading if not a direct misrepresentation of the pipeline act (including the related leasing act amendments) to say that it had the 'dual'--as if 'equal'--objectives of pipeline construction and environmental protection. Rather, the construction objective emerged as the primary one, while the expressed concerns for environmental protection appear as qualifications or conditions placed on the overriding purpose of authorizing construction. The environmental provisions serve to indicate the manner in which the mandated actions were to be carried out by responsible federal officials. Development and environmental values were thus placed deliberately in tension with each other...." (42)

"By the end of 1970, the second year of pipeline planning work, a series of technical engineering problems was dominating the attention of Interior officials at both Washington and field levels, and fish and wildlife protection interests now had to find their place within a much larger set of more pressing concerns. This is not to say that fish and wildlife protection interests and broader environmental concerns were ignored. Rather, it is to indicate the concentration of efforts on basic technical problems affecting pipeline integrity, and the consequent drift of initiative and influence to those agencies and officials best equipped to deal with such issues." (42)

"It was during this final pre-permit phase that FWS (Fish and Wildlife Service) as well as other agencies made their bids for independent surveillance authority and were ultimately overruled at the department level. BLM lost its line authority over the pipeline project when the decision was made in the latter part of 1973 to transform the pipeline division into a separate Alaska Pipeline Office (APO) headed by an "authorized officer" who would report directly to the Office of the Under Secretary. A related decision was that a third-party contractor would be hired by the Interior Department to fill most of APO's needs for increased engineering and environmental expertise and staff support for construction surveillance.

These decisions concentrated authority for pipeline surveillance within Interior and blunted the claims of existing agencies both within and outside the department for independent surveillance authority, based on their special competencies. These decisions, and particularly the third-

party contractor approach, effectively undercut the Corps of Engineers, which had been bidding for control over the basic engineering aspects of the project. The decisions also undermined the interests of USGS (U.S. Geological Service) as well as of FWS, NMFS (National Marine Fisheries Service), and the Environmental Protection Agency (EPA) in expanding their parts in the prospective surveillance system and in insulating such parts from control by the APO's authorized officer." (42)

"In retrospect, it is clear that government's preoccupation was with TAPS and with the companies' interest in building and operating it soon, notwithstanding the intensive, but relatively short-lived, attention given to a possible Canadian alternative. The basic and ongoing task before government and industry officials was to overcome, step-by-step, the many political, legal, administrative, and technical obstacles encountered by the project during the entire course of its development. This circumstance inevitably raised issues of government responsibility for private corporate activities affecting the public interest. Among these issues were how far government can and should go in substituting its judgement for industry's and where the balance should be between a government agency's role as a regulator and its role as a facilitator of industrial development activity." (42)

"Under Secretary of Interior Russell Train, representing the Secretary, had the following exchange with Senator Gaylord Nelson during the course of Train's testimony, which was in support of moving ahead with the TAPS project:

'Senator NELSON. I suppose as usual I have a minority position. I guess nobody has raised the question of why we ought to go in there and take the oil out at this time in any event.

Mr. TRAIN. There is no question that the time frame within which we all find ourselves in the problem has been created in substantial part by the timing of the company's own investments and decisions.'" (42)

"The practical problem before the fish and wildlife agencies was thus to accommodate themselves to events, structures, and decisions in which they had relatively limited roles, and then to make the best of the limited resources of time, money, and expertise available in helping make the project more acceptable and potentially less damaging to Alaska's environment." (42)

"The trans-Alaska route was essentially the oil companies' choice...." (42)

"In the case of the proposed trans-Alaska pipeline, policy makers in the Department of the Interior decided that the available environmental information was adequate for impact analysis. This was determined before the environmental data had been compiled, and it is therefore questionable to what extent the amount of environmental data actually available influenced the design to proceed (emphasis added)." (70)

"Preparation of the EIS appears to have been a diversion from the main line of pipeline decision making at the policy level. It was primarily a response to a statutory requirement that had to be met before the project could proceed. Since the EIS was written after the environmental stipulations were essentially completed, and because awareness of the basic problems to which the stipulations were directed (erosion, siltation, fish passage, big game passage) did not depend on information from the EIS, the EIS could have had little effect on the stipulations. The FWS editor of the 'living resources' sections of the EIS states that there were no changes in the pipeline alignment as a result of the information and analysis contained in these portions of the impact statement. Perhaps the EIS requirement did force Alyeska to accelerate preparation of a project description, but it is not evident that the EIS, per se, substantively influenced project designs.

The EIS very likely had other effects, however, that tended to reinforce one of the basic currents of the pipeline planning process: Since there were so many uncertainties and information gaps, which preparation of the EIS helped to emphasize, it followed that the stipulations had to be general and allow a wide range of discretion, with ample waiver authority. In this way monitors would have the flexibility necessary to deal with many unpredictable problems when they arose at the time that project designs were actually implemented and adapted to specific sites in the field. Beyond spotlighting data gaps in knowledge of impacts and fish and wildlife resources, however, FWS and NMFS involvement in EIS writing seems primarily to have served the purpose of helping to clear the way for authorization and construction of the trans-Alaska pipeline." (42)

This conclusion on the nature of the TAPS EIS is supported by other authors (71) and is best summed up by a former vice-president of the Sierra Club who said,

"The entire...statement seems to us an apology for acceptance of arbitrary decisions previously made. It presents a fairly rosy picture of what just might happen, but hopefully

won't, to the terrain, to the wildlife, and to the Alaskan people and their environment, if the proposed pipeline is constructed....Properly, it should not be entitled an 'environmental impact statement' but a 'construction justification statement'." (61)

Within the federal and state governments one question was which agency would be in what position of authority on the Pipeline project. Inside the federal bureaucracy,

"There was probably as much, if not more, infighting between FWS and BLM over the issue of who should have what authority for construction surveillance as there was over any other issue during the planning period. Essentially, BLM's objective was to keep surveillance authority as concentrated as possible under the authorized officer (AO), who was at that time expected to be both a BLM official and an engineer. FWS aimed for independent surveillance authority. One early FWS version would have split the federal surveillance organization under the AO into dual engineering and environmental sections. Later, FWS sought only to keep its surveillance staff positions independent of AO authority." (42)

"Similar proposals were made again by FWS in Alaska and Washington throughout the fall months of 1973, although the 'dual authority' approach appears to have had a shorter life than the independent FWS monitor scheme. Each time, the proposals met similar opposition and, ultimately, they were rejected at the department level. What FWS officials did obtain was recognition of their right to select and screen their own people for assignment to the surveillance team, and the FWS monitors would maintain administrative ties to FWS while they were under the formal operating authority of the AO. Some last skirmishes occurred over the issue of how many FWS monitors would be hired and when. These questions were not finally resolved until early 1974, but, by then, the fish and wildlife agencies had already scored their best points when agreement was reached that a joint federal-state fish and wildlife (JFWAT) monitoring organization would be established." (42)

"Despite persistent opposition from within the pipeline division-APO group, the JFWAT proposal was finally adopted by Interior, and the third-party contractor scheme was revised to make room for fish and wildlife monitoring by FWS, NMFS, BLM, and Alaska Department of Fish and Game biologists. The fish and wildlife staffs of federal and state agencies, including BLM, had formed an alliance, and critical pressure was brought to bear, particularly from the state side of the group.

It was nonetheless clearly established that in the federal monitoring organization the authorized officer was to have full operational authority within the organization as well ad budget authority over all pipeline-related work of federal agencies in Alaska. Very early on, 'The authorized officer made it clear that he (would) have a low tolerance for (JFWAT) personnel who go running back to their parent agencies in any attempt to go around finished decisions.' In response, two of JFWAT's founders 'anticipated decisions which will not be to our liking and...asked...that biological considerations be given a fair weight in the decision making process'." (42)

"These 'principles' are noteworthy in that they not only affirm Congress' intent that environmental resources be protected (subject to timely completion of construction) but they also administratively add two new limiting criteria. Environmental protection was to be 'balanced' against 'technical capabilities' and 'economic practicalities'. These criteria, together with the requirement for timely completion and the administrative discretion provided for in the stipulations, meant the authorized officer and his representatives would have the very substantial responsibility for deciding how vigorously environmental protection efforts would be pursued." (42)

"The establishment of APO under the Office of the Under Secretary served to consolidate the enforcement of the right-of-way agreement, drawing specialists from different agencies into a single organization which could fulfill the requirements of that agreement more efficiently than several separate organizations. It was in response to Alyeska's desires for 'one-stop shopping' in face of the potential for administrative delays should too many agencies have partial jurisdiction over so large a project." (42)

"In summary, our (FWS) computations show, given some reasonable assumptions concerning the building of the pipeline, rates of price increases of oil, building materials, and labor, that there were significant financial and other incentives to the Alyeska parent companies, state government, and federal government to complete the trans-Alaska pipeline as quickly as possible. Given the constraints of the technical stipulations, environmental protection objectives, and legal requirements, much faster completion was unlikely. However, the incentives were such that all three parties had a strong interest in circumventing anything they might regard as a cause of <u>unnecessary</u> delay. To the extent that any stipulation, regulation, or process was regarded by any or all of these parties as a source of 'unnecessary' delay (and the definition of 'necessary'

> or 'unnecessary' is subject to broad interpretation), each of the parties had ample reason to rearrange construction schedules, ask for (or grant) variances from stipulations, and in general expedite the project by any legal means possible." (42)
>
> "Thus, environmental protection was subordinated to the overriding construction goal, basic environmental problems were defined in engineering terms, and government surveillance authorities were reluctant to demand strict compliance with environmental stipulations, particularly where this might result in construction delays." (42)

Within the Alaska State Government the process and the outcome were much the same.

> "The state interest, as articulated by the governor and other state officials, was in clearing the way as rapidly as possible for construction of a trans-Alaska line, and the motivation was primarily economic." (42)

The state as owner of the land under which the Prudhoe Bay oil is located receives a one-eighth royalty share of that oil. However, the state does not receive any actual royalty money until the oil has been physically pumped from the ground. Since the oil companies could neither produce nor sell any oil without a means of moving it to market, both the state and the oil companies were strongly motivated to start and complete the TAPS in as short a time as possible.

> "In a state suffering from chronically high rates of unemployment and looking to the oil industry for its economic salvation, there were obviously high expectations for the employment and income that would be generated during the three-year construction period. Further, state government financing itself became dependent on the prospective flow of oil royalty payments and tax revenues following the North Slope lease sale of 1969. As stated by Alaska's Attorney General at the U.S. Senate hearings on the pipeline act in 1973, the problem was by then reaching crisis proportions: '...the State of Alaska has significantly more at stake in the deliberations on these bills than does any other state. Continuing delays on the Trans-Alaska Pipeline System are having a crippling impact upon its ability to plan coherently for the future.'" (42)
>
> "Although the general position of the state government in support of the earliest possible construction of a trans-Alaska pipeline was unambiguous, there were significant differences within the state administration on the issues of surveillance policy and organization. And, as was the case at the federal level, state agency differences

took perhaps their clearest form as a jurisdictional struggle. The participants were the commissioners of Natural Resources, Highways, Fish and Game, and Environmental Conservation, and the Attorney General, who comprised a pipeline environmental committee under a cabinet level pipeline task force. The task force's underlying purpose was to promote construction of the trans-Alaska pipeline. The committee's function was to develop policy and an organizational scheme for state surveillance that would be acceptable to the various affected state agencies and consistent with the state administration's interest in pipeline construction with minimum delay." (42)

"With one exception, there was agreement among the committee members that the individual state departments should contribute staff to a single state monitoring agency. The exception was the Commissioner of Environmental Conservation, who sought the lead status in the state's construction monitoring effort." (42)

With the creation of the State Pipeline Coordinator's Office (SPCO) and the appointment of Mr. Chuck Champion as head of SPCO a power struggle ensued between The Alaska Department of Environmental Conservation and the SPC. The SPC did not want to share state control of the pipeline with any other state agency, especially not an "environmental" agency.

"Under state law, the Department of Environmental Conservation was in charge of several matters concerned with water quality: among them, monitoring oil spills, approving sewage-plant designs, inspecting the plants once in operation, checking the discharge to make sure it met the legal standard. The Right-of-Way agreements required Alyeska to respect such laws but were vague as to what the state could do to enforce compliance--in particular, whether Alyeska was obliged to bear the cost of a water-quality inspection program on top of the general pipeline surveillance. The head of the DEC at the time was Max Brewer.... Mr. Brewer concluded that in order to do his job where the pipeline was concerned he would need a staff comparable to that of the SPCO. Alyeska intimated that it would go along, though without specifying just how far.... Eventually, he (Mr. Brewer) intended a staff of twenty-one who, at Alaskan civil service rates of at least $28,000 a year, would add up to an annual budget of about half a million dollars; to get around the vagueness of the Right-of-Way agreements, this cost was to be approved and billed quarterly through the SPCO. Chuck Champion did not like this arrangement any better than Alyeska, though not, of course, for reasons of cost. Five of the proposed positions were moved to the SPCO, but Mr. Brewer continued to insist on a staff of some

kind, even if reduced. In November, Jay Hammond's new administration came in, Republicans with a difference, and Max Brewer was out of a job, but the argument continued." (58)

"At the same time, other departments, including Highways and Fish and Game, sought to guard their own statutory powers, keeping them independent of any new monitoring agency. Department of Highway engineers in particular opposed any scheme that would place their pipeline haul road project under the surveillance of Environmental Conservation or any similar staff.

These interagency differences helped block creation of a strong and autonomous state surveillance organization, and the prerogatives of individual departments, including Fish and Game, remained safe. Another effect was that the Commissioner of Fish and Game remained free to pursue his own department's interest in establishing a joint fish and wildlife surveillance team (JFWAT) with federal agency counterparts even after federal and state officials had decided to create separate surveillance offices. As a result, the state, through the Department of Fish and Game, introduced an independent base of statutory authority (fish and game laws) directly into a federally-dominated surveillance scheme that otherwise exhibited an unusual concentration of authority and degree of autonomy." (42)

"The environmental protection responsibilities of the State Department of Environmental Conservation, on the other hand, were weakened in the area of pipeline surveillance. DEC, having over-reached for authority, damaged its relations with other departments as well as with the State Pipeline Coordinator's Office." (42)

"During the pre-permit period, the Department of Fish and Game emerged as the most active state agency participant in the pipeline planning activities conducted in Alaska and led by BLM's pipeline division. Department biologists were especially active in the fish and wildlife studies work of the Interagency Fish and Wildlife Team. The commissioner and key members of his staff also worked closely with their federal counterparts in creating JFWAT, which assured and effective state presence in the fish and wildlife protection activities of the federal surveillance organization." (42)

2. Government Surveillance on the TAPS

a. Organization - Reimbursement of Costs

Section 12 of the Federal Grant of Right-of-Way, Reimbursement of Department Expenses, stated:

> "Permittees shall reimburse the United States for all reasonable administrative and other costs heretofore or hereafter incurred directly or indirectly by the Department for: (1) processing applications filed by Permittees in connection with the Pipeline System; and (2) monitoring the construction, operation, maintenance, and termination of all or any part of the Pipeline System, including without limitation those portions of the System that shall be located on State-owned lands." (41)

The permittee agreed to reimburse the government for design review, permit processing, and government monitoring of construction, operation, maintenance, and termination of any portion of the TAPS. This lease condition insured continuous government review and surveillance. It also allowed the government to monitor post construction revegetation-reclamation. Section 12 also stated:

> "Permittees acknowledge that the Department has employed or may employ one or more independent consultants, contractors and subcontractors and also has utilized and may utilize personnel and services of other agencies to assist it with: (1) processing applications heretofore or hereafter filed by Permittees in connection with the Pipeline System; and (2) monitoring the construction, operation, maintenance and termination of the Pipeline System. Before employing such consultants, contractors, or subcontractors, the Secretary shall notify Permittees of such employment and shall inform the Permittees of the purpose of employment, the scope of the work to be undertaken, the duration of the employment and the estimated cost thereof; provided however, this notice requirement shall not limit the authority of the Secretary enter into agreements with consultants, contractors or subcontractors. Costs incurred by the Department in connection with the employment of consultants, contractors and subcontractors and with respect to utilizing the personnel and services of other agencies shall be included in the costs for which the Department is to be reimbursed by Permittees under the provisions of subsection A of this Section." (41)

The government employed independent consultants and contractors during TAPS design review and pipeline monitoring. This enabled the government

to obtain the necessary expertise quickly and without the establishment of additional government jobs or bureaucracy. The Federal Government contracted with Mechanics Research, Inc. (MRI) - administration, management, civil, mechanical and electrical engineers; Gulf Interstate Engineering (GIE) - technical pipeline engineering specialists; and Environment and Ecology, Inc. (EEI) - revegetation, erosion control, environmental experts.

> "This 'third party' arrangement had at least three advantages to offer the Interior Department: it provided needed expertise that was in short supply or unavailable within government; it provided for a staff without the high turnover and continuity problems common with temporary posts; and it allowed for the retention by MRI of needed expertise on short notice by subcontract, thereby avoiding the more cumbersome and time-consuming requirements of federal procurement regulations." (42)

The Grant of Right-of-Way goes on to state in Section 12.E.,

> "Agreements entered into by the Secretary with respect to the Pipeline System which result in costs for which reimbursement is required by this Section shall be drawn to avoid unnecessary employment of personnel and needless expenditure of funds. The Department shall administer this Agreement and such other agreements to reasonably assure that unnecessary employment of personnel and needless expenditure of funds are avoided." (41)

To avoid an accumulating government bureaucracy, both the federal and state governments established specific pipeline monitoring agencies which were dissolved or greatly curtailed after the TAPS was completed. The federal Alaska Pipeline Office (APO) was created in the U.S. Department of Interior. The Alaska Pipeline Office has been reduced to a handful of people, while the State Pipeline Coordinator's Office (SPCO) and the Joint Fish and Wildlife Advisory Team (JFWAT) were disbanded on December 31, 1977. People within state surveillance agencies who were not employed by the state prior to receiving their pipeline monitoring positions were employed only for the design review and construction of the TAPS and those people did not have re-employment rights with the state after their pipeline positions were eliminated.

Other parts of Section 12 of the Grant of Right-of-Way stated:

> "Reimbursement by Permittees as provided for in this Section and Section 18 hereof, shall be made for each quarter ending on the last day of March, June, September, and December. On or before the sixtieth (60th) day after the close of each quarter, the Authorized Officer shall submit to Permittees a written statement of the costs incurred by the Department during that quarter which are reimbursable." (41)

"Permittees shall have the right to conduct at their own expense, reasonable audits by auditors or accountants designated by Permittees, of the books, records and documents of the Department and of its independent consultants, contractors and subcontractors relating to the items on any particular statement that shall be submitted in accordance with the procedure outlined in subsection F of this Section, at the places where such books, records and documents are usually maintained and at reasonable times; provided, however, that written notice of a desire to conduct such an audit must be given the Authorized Office: (1) at least fifteen (15) days prior to such audit; and (2) by not later than the seventy-fifth (75th) day after the close of the quarter for which the books, records and documents are sought to be audited; and provided further, that any such audits shall be completed within ninety (90) days after receipt by Permittees of the statement containing the items to be audited." (41)

These and other portions of Section 12 provided that the government submit a statement of reimbursable costs to the permittee each quarter. The permittee can conduct its own audits of government surveillance expenditures and can challenge any item that the permittee deems unnecessary. This protects the permittee from unjustified governmental expenditures and forces the government monitoring agency to closely watch its own expenses.

Section 18 of the Grant of Right-of-Way gave the federal government the Right-to-Perform. It stated:

"If, after thirty (30) days, or in an emergency such shorter period as shall not be unreasonable, following the making of a demand therefore by the Authorized Officer, in the manner that is provided in Stipulation 1.6 for giving written notices, Permittees, or their respective agents, employees, contractors or subcontractors (at any tier) shall fail or refuse to perform any of the actions required by the provisions listed in subsection B of this section, the United States shall have the right, but not the obligation, to perform any or all of such actions at the sole expense of Permittees. Prior to the delivery of any such demand, the Authorized Officer shall confer with Permittees, if he deems it practicable to do so, regarding the required action or actions that are included in the demand. The Authorized Officer, following the procedure outlined in subsection F of Section 12 hereof, shall submit to Permittees a statement of the expenses incurred by the United States during and preceding quarter in the performance by the United States of any required action and, in the absence of

> a dispute, the amounts shown to be due on each such statement shall be paid by Permittees in accordance with provisions of the said last mentioned subsection. If any one or more of the Permittees shall dispute the amount of any item in any statement that shall be rendered in accordance with the provisions of this Section, the procedures outlined in subsection J of Section 12 shall apply with equal force and effect to any such dispute. Permittees may dispute whether the work involved in action required by a provision listed in subsection B of this Section, whether Permittees' failure or refusal to perform any such action was justified, as well as the reasonableness of the specifications for, and the cost of, such work." (41)

Briefly, this section states that if after proper written notification, the permittee does not perform certain work as directed by the government for that permittee to comply with specific lease provisions or stipulations, the government may perform the work and then bill the permittee for that work. For example, if there was an erosional problem that the permittee refused to correct, the government could hire a contractor, have that work done, and then bill the permittee. This section was in lieu of performance bonds; there were no performance bonds on the TAPS. The government agencies on the TAPS never had to use this authority to insure that Alyeska complied with its lease and stipulation obligations.

The Grant also spoke to the termination or suspension of the right-of-way, and access to documents, in Sections 31 and 34, respectively. The former provides legal procedures for termination or suspension of the TAPS right-of-way and lists the conditions that could cause termination. The latter insures government access to the permittee documents that are necessary for pipeline surveillance.

Government field surveillance personnel on the TAPS had their offices adjacent to the Alyeska field management offices. Alyeska provided housing, meals, communications, vehicles and project helicopters for the government field monitors. This enabled the government officers to maintain close communications with the pipeline builders; a necessity on any fast-moving dynamic construction project. If field conditions changed, the government monitors worked with Alyeska to arrive at a new course of action that was consistent with the lease conditions and stipulations. This coordination often prevented construction delays that would have been incurred if Alyeska had had to seek approval from a distant government official.

Part II, Item 6, of the Cooperative Agreement between the United States Department of Interior and the State of Alaska regarding the proposed Trans-Alaska Pipeline stated:

> "Fish and wildlife protection is regarded by the Parties as a special responsibility of the surveillance effort which extends with common concern over the length of the

pipeline. The Parties will encourage the formation, to the extent practicable, of a cooperative effort for such protection, sharing the fish and game personnel and information resources of both the State and Federal Governments, and the application of this cooperative effort over both State and Federal lands." (41)

The Joint Fish and Wildlife Advisory Team (JFWAT) was composed of biologists from the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, Bureau of Land Management, and the National Marine Fisheries Service.

"JFWAT's primary mission was to assure the protection of fish and wildlife resources during pipeline construction. Its primary mode of operation was in its capacity as an advisor to the authorized officer and state pipeline coordinator, who had the responsibility for enforcing the right-of-way agreements and stipulations.

In addition to this advisory function, the parent agencies of JFWAT also had statutory obligations relating to the pipeline construction. Of these, the most important were provisions of the Fish and Wildlife Coordination Act of 1934, Endangered Species Act of 1973, the Bald and Golden Eagle Act of 1940, and, most important, sections of Alaska Statutes, Title 16." (42)

"Title 16 of Alaska Statutes provides for the conservation, development and regulation of fish and wildlife resources within the state by the Alaska Department of Fish and Game. In order to facilitate the enforcement of the state's fish and game statutes, the Commissioner delegated significant authority under this title to ADFG's pipeline surveillance supervisor. Specifically, the state head of JFWAT was delegated the authority to manage, protect, maintain, improve and extend fish, game and aquatic plant resources of the state; the authority to require that every dam or other obstruction built across a stream frequented by salmon or other fish shall have a fishway constructed to provide fish passage; and the authority to determine, require, and issue written approvals for activities affecting anadromous fish streams. This last delegated authority--to issue approvals for activities affecting anadromous fish streams--significantly expanded JFWAT's otherwise advisory role and greatly strengthened their bargaining position vis-a-vis APO and SPCO regarding how strongly fishery protection efforts should be pursued. Alaska Statute 16.05.870 required issuance of a separate permit for each crossing of an anadromous fish stream, as well as for a number of ancillary activities affecting those streams (e.g.,

gravel removal from flood plains of those streams, waste discharges affecting subject streams).

This immediately raised two issues: Was Alaska Statute 16 to be applied to federal lands? and What constitutes an anadromous fish stream? Like other questions of federal/state jurisdiction, the applicability of AS 16 on federal lands was not a question either the state or federal government wished to litigate, nor did they have time to do so. As a practical matter, the federal authorized officer consented to its application on federal lands with the proviso that he did not, by this action, intend to set a precedent in a legal sense." (42)

"As working procedures evolved, the streams appeared on the fish stream list (as updated by current information) also became, defacto, those streams for which an AS 16.05.870 permit would be required. Although this may have been a reasonable accommodation of the realities of construction and field surveillance, meeting the intent of this law became thereby critically dependent upon the adequacy of the data base. During the 1976 construction season, approximately 75 additions and 50 deletions were made to the list, and another 40 to 50 new fish streams were discovered in the summer of 1977. In addition, designation as a fish stream was limited to those streams in which the presence of fish had been documented putting the burden of proof upon JFWAT." (42)

The Alaska Pipeline Office (APO), the State Pipeline Coordinator's Office (SPCO), and the Joint Fish and Wildlife Advisory Team (JFWAT) were created specifically to monitor the TAPS. APO, SPCO, and JFWAT each had their own design review staff, field surveillance personnel, and administrative support; see Figures 1, 2 and 3 for organization charts. In addition, JFWAT had a technical evaluation or research function. JFWAT's technical evaluation was an outgrowth of projects begun by the Interagency Fish and Wildlife Team (IFWT) before the creation of JFWAT. The IFWT had identified major deficiencies in the scientific knowledge and baseline data as related to construction of the TAPS. The IFWT designed research programs to obtain the types of data that they felt were necessary to minimize impact to fish and wildlife resources on the TAPS and similar construction projects. There were eight technical evaluation studies. For the most part, the personnel involved in the technical evaluation projects were answerable to JFWAT only because their funding was reimbursable by Alyeska. Other than that, they were located in their own agency offices and they received all administrative support and supervision through the normal agency channels.

Each of the government surveillance organizations--APO, MRI, GIE, EEI, SPCO, and JFWAT-- were designed and staffed around two assumptions. The first was that Alyeska would have an effective quality control &

May 15, 1975

ALASKA PIPELINE OFFICE ORGANIZATION CHART

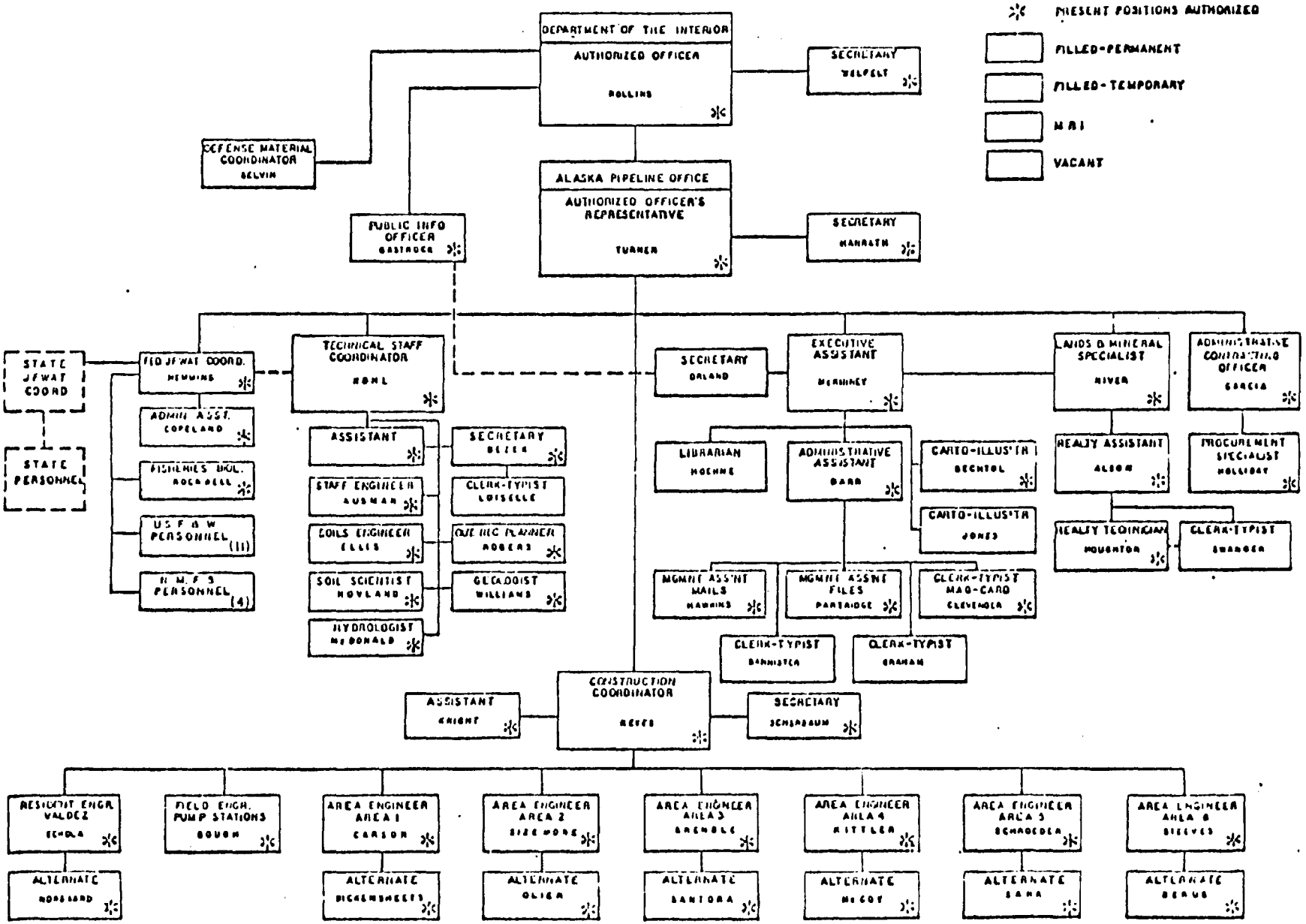


FIGURE 1

ORGANIZATION CHART
STATE OF ALASKA
PIPELINE MONITORING
FEBRUARY 15, 1976

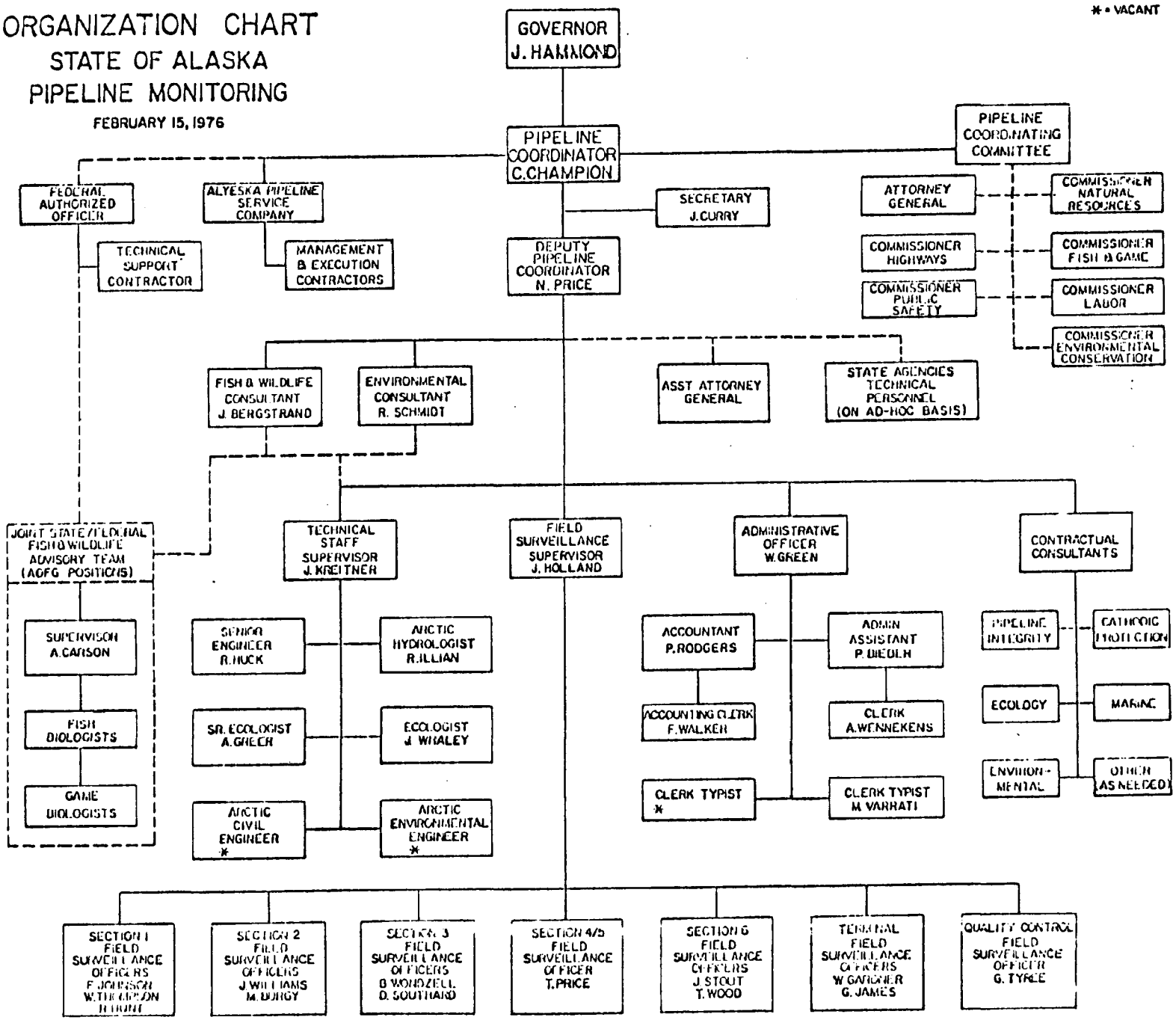


FIGURE 2

State Supervisor (ADF&G)	Federal Coordinator (BLM)
Assistant Supervisor (ADF&G)	Assistant Coordinator (USFWS)

Field Surveillance

Habitat Biologist (ADF&G)
Habitat Biologist (ADF&G)
Habitat Biologist (ADF&G)
Habitat Biologist (ADF&G)
Fishery Biologist (NMFS)
Fishery Biologist (USFWS)
Fish & Wildlife Biologist (USFWS)
Fishery Biologist (USFWS)
Fish & Wildlife Biologist (USFWS)
Fish & Wildlife Biologist (USFWS)
Fishery Biologist (USFWS)
Fish & Wildlife Biologist (USFWS)
Fish & Wildlife Biologist (USFWS)

Administrative Support

Administrative Assistant (BLM)
Clerk-Typist (ADF&G)
Clerk-Typist (ADF&G)
Clerk-Typist (ADF&G)

Technical Evaluation

Fishery Biologist (NMFS)
Game Biologist (ADF&G)
Game Biologist (ADF&G)
Fishery Biologist (ADF&G)
Fishery Biologist (ADF&G)
Fishery Biologist (ADF&G)

Design Review Staff

Fish & Wildlife Biologist (USFWS)
Fishery Biologist (BLM)
Fishery Engineer (NMFS)
Fishery Biologist (USFWS)
Environmental Info. Officer (ADF&G)
Habitat Biologist (ADF&G)
Engineer-in-Training (ADH)
Fishery Technician (ADF&G)

FIGURE 3

Totals: 3 BLM positions, 3 NMFS positions, 17 ADF&G positio
1 ADH position, 11 USFWS positions
totalling
17 Federal positions, 18 State positions

quality assurance program which would only require a spot check level of monitoring by the government. (12, 25, 31, 42) The government surveillance organizations were not designed to provide 100 percent inspection of any construction activity. The monitors saw a much smaller portion of construction and, based upon their verification of compliance with stipulations, specifications, and approved plans, the government would have an idea of the degree of linewide compliance. If quality control & quality assurance (QC&QA) proved to be chronically weak, a presumption of compliance linewide would not be justified.

> "From the early days of BLM's pipeline division, government construction-monitoring strategy was to field a relatively small team of professionals to 'spot check' construction as a means of evaluating the effectiveness of Alyeska's quality program and, thereby, the project's compliance with the terms and conditions of the right-of-way agreements. It was felt that 'if government (was) going to impose itself on private industry for the benefit of (the) public, it should be efficient' and that this strategy would best meet that criterion. It also meant that the efficiency of government monitoring efforts, including those of JFWAT, would in part be dependent upon the adequacy of Alyeska's QA/QC program." (42)

The government's second assumption was that its interest (and Alyeska's) in early project completion would best be served by centralizing government responsibilities and authority in the Alaska Pipeline Office and State Pipeline Coordinator's Office and thereby providing, insofar as possible, a "single point of contact" for the permittee. Thus authority was centralized in the hands of government engineers.

The Federal Authorized Officer (AO), retired U.S. Corps of Engineers General Rollins, delegated his authority to the Authorized Officer Representative (AOR) who in turn redelegated part of his authority to Authorized Officer Field Representatives (AOFR) who actually monitored construction. On the state side, the State Pipeline Coordinator (SPC), Mr. Chuck Champion, had delegated a portion of his authority to Field Surveillance Officers (FSO). All the AOFR's and FSO's were engineers. There were two AOFR's assigned to each of the six TAPS construction sections plus the terminal. MRI stationed one Area Engineer in each Section. There were also two EEI personnel, two GIE engineers and two JFWAT biologists in each of the six Sections. AOFR's, EEI's, GIE's, and JFWAT's worked ten days on and four days off. Each individual spent nine days in the field and one day in their respective Anchorage offices where the field monitors attended staff meetings and wrote trip reports. This scheduled overlap at the beginning and end of each tour facilitated communications between the two AOFR's, two EEI's, two GIE', and two FJWAT's and provided coordination among the government surveillance organizations. The FSO's worked two weeks on with one week off. This facilitated three FSO's per each two Sections. One permanent FSO for each of two Sections working one week staggered tours and then an alternate FSO would spend one week in one Section and then

another week in the second Section. Neither APO, SPCO, MRI, GIE, EEI, nor JFWAT rotated their personnel between construction Sections. All the monitors were assigned to one Section so that they acquired a detailed knowledge of that Section. However, the FSO's schedules did not synchronize with those of the AOFR, EEI, GIE, or JFWAT because they worked fourteen and seven instead of ten and four. The good personnel interrelationships and the more thorough understandings of Section-specific problems that were produced by permanently placing people in the same area were found to be of great value in minimizing the adverse environmental effects of TAPS construction.

The AOFR's, FSO's, or their superiors were the only people who could officially communicate with the Alyeska Pipeline Service Company. The AOFR's could not officially deal with Alyeska's Execution Contractors or Quality Control personnel. EEI and GIE were subcontractors of MRI and hence EEI and GIE spot check reports were reviewed by the MRI representative before MRI forwarded those "spot checks" to the AOFR. MRI, GIE and EEI were advisors to the AOFR. JFWAT could not deal directly with Alyeska, the Execution Contractors or Quality Control. JFWAT were advisors to the AOFR and FSO, but because of JFWAT's interagency structure, the AOFR and FSO did not supervise JFWAT or direct the latter's activities. Unofficially, everyone talked to everyone else, but only the AOFR or FSO could actually direct Alyeska to do anything. There were many problems with this system. The primary difficulty was that APO, SPCO, and their respective field engineers thought that they were helping Alyeska build the TAPS. (58) Environmental protection was subordinated to the overriding construction goal, basic environmental problems were defined in engineering terms and APO and SPCO were reluctant to demand strict compliance with environmental stipulations, particularly where this might result in construction delays. (12, 42)

The federal government was responsible for pipeline integrity on the entire TAPS project though the state claimed concurrent jurisdiction on state owned lands. APO was responsible for environmental protection on federal lands which comprised 70% of the project while SPCO monitored environmental compliance on state lands or about 30% of the project. Less than 0.5% private land was involved in the TAPS and the state claimed authority on private lands with the consent of the landowner. This situation is reversed with the Northern Tier Pipeline. Of its proposed 1,491 mile length, 121.5 miles (8%) is on federal lands, 60 miles (4%) is on state owned lands, 26 miles (2%) on Indian reservations, leaving 1,284 miles (86%) miles on private land. (19)

b. Design Review and Notice to Proceed

i. General.

Since neither the exact location of the Alaska pipeline nor its design specifications were finalized prior to the TAPS grant of right-of-way, the government attempted to minimize the adverse impacts of construction by reviewing Alyeska's designs and including any mitigation

measures in the notice to proceed (NTP) that the government issued prior to pipeline construction.

> "The TAPS companies gave early indications that they did not have answers to basic design problems, and there were serious doubts at first that they were even aware of the most critical problems. The outstanding instance was their plan to bury all but about 40 or 50 miles of a line that would cross 800 miles of a region mostly underlain with permafrost. And this decision had been made on the basis of a very limited core soil sampling project, which was expanded only after DOI forced the issue. USGS then brought the construction mode (above ground-below ground) problem to a sharp focus through its permafrost studies. (In the end over one-half of the line was build above ground.) But as critical and dramatic as this issue was, it was still only a symptom of a larger problem that would persist throughout the planning period: Alyeska's inability to develop acceptable design criteria except under the continuous pressure of the government monitors, who themselves had to assume part of the burden of developing such criteria.

Alyeska was not allowed to construct any portion of the TAPS without goverment design review of specific plans. Alyeska submitted their plans to the government and Alyeska could begin construction only after those plans were approved.

> "The procedural and substantive requirements for design submissions were set forth in the right-of-way agreements. Prior to any construction activities, Alyeska was required to:
> 1. In cooperation with state and federal officers, 'agree to a schedule for the time, scope, and quantity of (preliminary design submissions and notice to proceed applications)...to assure that permittees' submissions and applications shall be reasonable in scope, and filed in a reasonable time frame, insofar as the workload thereby imposed on...(state and federal pipeline office staffs)...is concerned;
> 2. Submit preliminary designs for each construction segment to the appropriate state and/or federal pipeline offices for review and approval;
> 3. Submit a time scaled Summary Network Analysis Diagram for the entire project;
> 4. Submit for review and approval plans for comprehensive quality assurance program 'designed to assure that the environmental and technical stipulations...will be fully complied with throughout all phases of construction, operation, maintenance and termination of the Pipeline System'; and
> 5. Apply for a Notice to Proceed to the appropriate state and/or federal pipeline office(s) for review and approval." (42)

ii. Preliminary Design.

The first major design interface between Alyeska and government pipeline offices was the submission for review of preliminary designs for each construction segment of the project. Preliminary design submissions were to be reviewed within thirty days and either approved or granted a waiver prior to submission of applications for notices to proceed. TAPS Stipulation 1.1.1.23. (see Appendix A) stated:

> "Preliminary design means the establishment of project criteria (i.e., construction, including design and operational concepts) necessary to delineate the project to be constructed. As a minimum, it includes the following: design criteria and project concepts; evaluation of field data used to establish the design criteria; drawings showing functional and technical requirements; reports of all test data compiled during the data collection and preliminary design evaluation; design drawings (if applicable) or drawings to support structural design concepts of each typical facility or structure; Proposed Construction Mode; outline of project specifications; sample computations to support the design concepts and basis for project siting." (41)

> "...(APO) saw the requirement for preliminary design submission as being for the benefit of Alyeska. The real emphasis was to be on final design submissions.

> Because JFWAT was not organized until late May 1974, review of preliminary design submissions for fish and wildlife concerns was largely the responsibility of APO's fisheries and game biologists, although Ecology and Environment's (EEI) review covered numerous items of major importance to fish and wildlife resources.

> In contrast to the interdisciplinary review of all items received in BLM's pipeline division during the pre-permit phase, preliminary design reviews were highly compartmentalized with separate review groups seeing only those portions assigned to them. Responding to the Interior Department's 'request for proposal' for a technical services contractor, MRI had anticipated making a 'systems study' of the entire project to identify critical environmental and technical areas that would later be subject to 'spot check' design review and/or field monitoring. Probably due to time constraints, APO management decided against the idea.

> A number of technical services contractors and APO reviewers state that preliminary design review was

largely proforma since the design was already well advanced--close to final design in several areas--and, consequently, government review comments could not effectively be used as inputs to final design.

Preliminary design review was essentially a negotiation process. Its aim was to demonstrate to government monitoring offices (and they, in turn, to assure) that the design concepts were adequate to meet all technical and environmental stipulations. Much of the process occurred de facto prior to 1974." (42)

An MRI-contracted study of the APO monitoring experience concluded in part that the design review process "did not put enough emphasis on introducing environmental, and particularly ecological, criteria for impact abatement into the preliminary design concepts," and noted that the procedure did not allow sufficient lead time to affect design implementation in those cases where implementation was "governed by long lead times for the supply and delivery of material and equipment." (25) This suggests that greater emphasis and lead time should be given preliminary design reviews for future projects.

iii. Notice to Proceed Applications.

After the preliminary design had been reviewed and accepted, Alyeska had to physically survey and mark the proposed centerline before they could make an application for a notice to proceed under TAPS Stipulation 1.7.4.3. This enabled the government monitors to field check the surveyed centerline. Field verification was an important procedure for minimizing adverse environmental effects. It is one thing to draw a centerline on a topographical map and from that line make recommendations to minimize pipeline impacts, but quite another realization to actually see where the pipeline is scheduled to be built. (Often a minor realignment of the pipeline to avoid a sensitive environmental area will be much less costly than the restoration of that disturbed habitat. In one instance on the TAPS, the shifting of that pipeline 500 feet to the east over a 21,000 foot section would have completely avoided a productive fish stream. Instead, Alyeska made four crossings and three channelizations of that stream which became known as Million Dollar Creek for the money that Alyeska spent restoring an area that they could have totally avoided by a minor change in the pipeline alignment. (72)) Once a corridor has been selected, government agencies need to be closely involved in selecting specific alignments (31) if the effects of pipeline construction are to be minimized.

A notice to proceed (NTP) was the basic document issued by the authorized officer (AO) or State Pipeline Coordinator (SPC) authorizing construction for the particular construction segment therein described and was issued after the submission of a 'notice to proceed application' (NTPA). The governing NTP, together with all applicable stipulations, constituted the controlling documents for both Alyeska and government surveillance reports. NTPA submissions consisted of: (1) a final design; (2) all reports and results of environmental studies considered in that design; (3) any additional data required to demonstrate how stipulations would be

complied with; (4) a schedule of work and additional submissions for NTPAs and other permits required in the construction segment (section); (5) a map; and (6) any other data required by the AO or SPC. More details of the notice to proceed application (NTPA) and notice to proceed (NTP) process can be found in Section 10 of the TAPS Grant of Right-of-Way and in TAPS Stipulations 1.7. through 1.7.4.6., all of which are contained in Appendix A of this report.

After Alyeska's notice to proceed application was received, the Alaska Pipeline Office and the State Pipeline Coordinator's Office distributed copies of that document to staff specialists, MRI, GIE, EEI, and JFWAT for a technical and biological review of Alyeska's plans. SPCO and APO, if they chose, could then incorporate these review comments into special requirements or restrictions that were attached to the notice to proceed issued to Alyeska. As an NTP condition, SPCO and APO mandated that before Alyeska could physically commence construction under any NTP, Alyeska had to obtain a written field turn on from either an SPCO or APO field engineer, depending on land ownership. This insured that the government engineers could evaluate the actual site specific conditions and could modify the NTP requirements as the field circumstances warranted. This condition was incorporated to allow the government a means of minimizing engineering and environmental problems that often arose in the field and as a further control point on company activity.

> "Following submission by Alyeska, NTPAs had to be approved, rejected, or returned for modification or additional supporting data within 90 days.
>
> The first NTPAs for right-of-way clearning were submitted in September 1974, with some river crossing NTPAs following in October and most of the remainder submitted from November 1974, through January 1975. By the end of September 1975, 679 NTPs had been reviewed and approved by APO and SPCO. Average review periods were 70 days for APO and 65 days for SPCO.
>
> Alyeska could, and frequently did, request variances from specific stipulations at the time an NTPA was submitted. Such requests were to include justification and any other back-up information required by the state or federal pipeline officer....
>
> Especially in the early stages, a large percentage of NTPAs were not deemed acceptable. Problems included conflicts with approved preliminary design criteria or data, inaccurate construction scheduling, and insufficient detail or back-up data. Particularly significant was the lack of adequate hydrological profiles--especially for meandering rivers with wide flood plains--to support river crossing NTPAs. Alyeska's problems with NTPA approval were not limited to the early start-up period. Through 1975 'Alyeska was often required to alter or completely change the design of a particular site to

insure pipeline integrity and protect environmental amenities, such as visual impact, soil erosion potential, and fisheries impact.' " (42)

NTPA experiences on TAPS, as cited elsewhere, include the following:

"Initially, JFWAT was forwarded only those NTPAs with obvious and substantial fish and wildlife concerns. Later it was discovered that other applications, which had escaped notice during preliminary screening, had significant implications for, or potential impacts upon, these resources. Subsequently, JFWAT requested and received all design submissions for review.

JFWAT's review process, like many other elements of the project, took some time before it came 'up to speed'. In addition to the discovery that many important fish and wildlife issues were frequently buried in apparently unrelated and voluminous technical engineering documents, it took some weeks for JFWAT to develop a systematic review process and to gain an understanding of what would be required....

Considerable time pressures were put on reviewers (JFWAT as well as other monitoring elements) to submit comments within specified times, which sometimes resulted in a more superficial review than was desired. In some cases, this was caused by internal time frames which were more stringent than the 90 days allowed by the stipulations, but was also a result of an uneven flow of NTPAs from Alyeska, without a corresponding flexibility in review staff size." (42)

"The Permittees scheduled the filing of most of their NTP applications 90 days prior to the scheduled start of the various construction activities in the field. This approach by the Permittees put extremely heavy workloads on the (governmental monitoring) organizations. Even when filed, the NTP applications often lacked supporting information, which forced the AO to give conditional approvals and in turn increased the review effort and the paper work." (25)

"It should be noted that one of the stipulations provided that the authorized officer (AO) could require additional data and, in such cases, the 90 day review period would begin upon receipt of that data. This provision could be invoked when the AO felt the situation warranted it. On the other hand, the congressional mandate for prompt pipeline completion, and the highly sequential nature of pipeline construction, undoubtedly

gave considerable leverage to such tactics of the permittee. APO often gave tentative approval to NTPAs that lacked adequate back-up data." (42)

"Ecology and Environment Inc. (EEI) and JFWAT share the common perception that APO management gave major emphasis to technical and engineering questions during NTPA (and design change request) reviews and was generally unresponsive to the comments and recommendations of environmental specialists. JFWAT recommendations for environmental conditions to be attached to the NTP were frequently rejected, the reasons most frequently cited being: '(1) the requested conditions were also project stipulations and, therefore, unnecessary and redundant; or (2) the requested conditions were within the discretion of the AOFR and should be requested in the field.'

In general, the design review process leading up to issuance of notices to proceed was accomplished under substantial time pressures and, at least in the case of preliminary designs, did not result in an entirely acceptable document. The design review process and related negotiations were not able to secure an effective quality program from the permittees....

Neither, it would appear, were fish and wildlife interests effectively accommodated in the preliminary and final design review process." (42)

"Furthermore, APO's reluctance to include NTP conditions requested by JFWAT, while indicative, perhaps, of a general attitude toward fish and wildlife interests, did not in and of itself constitute a repudiation of those concerns but rather a deferral to the field level. Partly in response to this situation, the state wide of JFWAT decided to issue permits for activities affecting anadromous fish streams at the field level in conjunction with AOFRs' field turn-ons, instead of attaching them to the NTPs as originally intended. This procedure allowed for a last-minute field assessment before issuance and for that reason probably better served JFWAT's interests. Typically, the JFWAT monitor would attach any conditions he thought necessary to the permit at that time." (42)

The MRI-contracted study of the TAPS surveillance organizations concluded in part:

"The Stipulations did not specify that the support documentation accompanying the NTP applications should form part of the execution contract documents. However, both sub-section 1.2.3(4) and 1.7.1.2 clearly indicate that it was the intent of the Stipulations that NTP support data would be the same as the technical and

special provisions of supply and execution contracts.

Alyeska did not integrate the NTP application procedure as a routine part of the design-administrative procedure, particularly for the pipeline construction.

Alyeska decided that their schedule would not permit the use of general construction contracts based on firm unit prices for the pipeline construction, even though this type of contract is generally preferred by pipeline companies." (25)

This study went on to recommend:

"For future pipelines and major resource developments requiring extensive use of federal land and involving compliance with applicable national policies, it may be advisable to make an independent check to ensure that the applicant has allowed sufficient time in the pre-construction period to develop suitable forms of contract.

The forms of contract should be designed to include the implementation of environmental protection and pipeline integrity provisions approved by the AO. The technical specifications, plans, and special conditions in these contracts which pertain to environmental protection and pipeline integrity should be the same as the support data for NTP applications." (25)

Another author elaborated on Alyeska's separation of the government's required NTP process from the company's execution contracts by stating:

"In view of the elaborate documentation that Alyeska was required to produce in order to secure the state and federal Notices to Proceed for each phase of the project, it would seem both sensible and efficient for those plans to have formed the substance of its contracts and work orders. That was not the case: the two processes, approval and contracting, ran separate and parallel, unconnected. From what we have seen the effects, we risk one more conclusion: Alyeska did not take very seriously the conditions imposed on it--quality control and 100 per cent radiography, environmental sensitivity and all the rest. Another oil company rigidity." (58)

iv. Design Changes.

Alyeska field engineers could change the pipeline design within certain latitudes without approval of their design headquarters. Correspondingly, APO and SPCO field officers could approve minor variances

in NTP's by the issuance of field memos. If Alyeska wanted to or had to make major design changes, Alyeska had to submit a field engineering change notice (FECN) or a design change request (DCR) for government review and approval before that construction was begun. Approximately 3,000 FECN's and DCR's were processed by the government surveillance agencies. This indicates that the TAPS notice to proceed process was not an unnecessary bureaucratic encumbrance. If the TAPS notice to proceed process had been more thorough, perhaps 3,000 major design changes would not have been required.

> "As it turned out, however, after six years of preliminaries and all the impassioned debate, the pipeline design was in fact revised in detail almost every foot of the way as the backhoes and bulldozers disclosed new facts about the right-of-way that required engineering solutions." (58)

> "Chuck Champion (State Pipeline Coordinator) figured that '80 per cent' (often quoted) of the pipeline was redesigned in the course of construction." (58)

> "Alyeska experienced numerous occasions when a final design for which an NTP had already been issued had to be changed. The reasons for those design changes fell into three broad classes: (1) unanticipated field contitions required a variation from approved final design or related specifications; (2) what the execution contractor built in the field was at variance with the final design as approved in the NTP; or (3) Alyeska or their contractors encountered opportunities to increase cost effectiveness (relatively rare).
>
> Amending an NTP by the design change process could be initiated either by Alyeska or by the AO (or SPC), but in practice, design changes were usually initiated by Alyeska.
>
> Reviews of design changes were based on one of two controlling documents: field engineering change notices (FECNs) or design change requests (DCRs). Due to variable site conditions, Alyeska's field engineers were given latitude in adjusting final designs to actual conditions. When a field evaluation resulted in a finding that site conditions were inconsistent with the approved design and within discretionary authority of field engineering to redesign, or if the as-build condition was at variance with final design, Alyeska's field engineering submitted the redesign as a FECN to the government field chiefs for review and approval. When the AOFR determined (frequently after consulting the authorized officer's representative or construction coordinator by phone) that the FECN was acceptable, he gave approval in the

field and construction continued. FECNs affecting fish and wildlife resources (e.g., for work affecting streams) generally resulted in advice from a JFWAT field biologist to the AOFR prior to his determination of acceptability. If the AOFR determined that a FECN required a more thorough review, it was sent to the Alaska Pipeline Office for consideration.

In cases where the AOFR found a FECN unacceptable, or if the variance from approved design was beyond the authority or capability of field engineering to redesign, the issue was forwarded to Alyeska engineering in Fairbanks or Anchorage for resolution. Additionally, in some cases, design changes were initiated by Alyeska before going to the field. Redesigns were then sent to the government surveillance agencies as design change requests (DCRs) for review and approval.

APO review of DCRs and FECNs was complicated by two important factors. Because of the sequential nature of pipeline construction, and the generally close timing of construction activities, design changes required prompt review. Secondly, in part due to highly variable site conditions, but for other reasons as well, the number of design changes requiring review was much larger than had been anticipated. As of April 8, 1977, APO had reviewed 2,841 design change documents.

Like 'notice to proceed' applications, DCRs and FECNs were initially screened by APO and routed to staff elements including MRI and JFWAT, according to required expertise. Reviewers usually then had 24 hours to return comments for consideration before a response was sent to Alyeska. Because of the large number of documents and short time frames involved, the screening process was not always sufficiently discriminating to insure all items relevant to fish and wildlife resources were reviewed by JFWAT. In addition, review documents frequently lacked sufficient information to thoroughly evaluate the proposed action.

After a period of receiving only those design changes obviously affecting fish and wildlife, JFWAT requested and received all future DCRs and FECNs so that less obviously related items could be reviewed. JFWAT experienced some difficulty in getting their comments included in APO's responses--as many as 40 to 50 percent were initially excluded--and there were several APO-JFWAT meetings on the issue throughout the construction phase. It is uncertain whether the problem was a result of the sheer volume and time constraints involved or if it was one of disagreement, but initially APO frequently cited

problems with receiving JFWAT comments within the allotted time. Whatever the reason, JFWAT later stamped all design change documents with the date and time of receipt, thereby insuring and documenting that the 24-hour turn around requirement was met. Thereafter, conflict over inclusion of JFWAT comments was reduced, but not entirely obviated.

The design change request or field engineering change notice, then, was an amendment to an existing notice to proceed and was reviewed in a similar manner, including JFWAT review, but in a much shortened time." (42)

Mr. Terry Lenzner, Special Legal Council for the Alaska Pipeline Commission, which investigated the costs and charges incurred by Alyeska during construction of the TAPS concluded:

"Alyeska claimed that the delay in initiation of construction from 1974 to 1975 was caused primarily by overly stringent government approval requirements. It appears that most of the delay was, in fact, largely a result of Alyeska's own failure to complete designs promptly for governmental approval.

The effects of incomplete design extended well beyond the start-up of construction. Indeed, the Execution Contractors complained of insufficient engineering support all the way through the 1976 construction season.

In sum, drawing upon the evidence gathered by the investigation and analyses of expert consultants retained by the Commission, the Special Counsel determines that at least $1.5 billion of the TAPS expenditures were imprudently incurred...." (24)

c. Government Sanctions - Stop-Work Authority

The Alaska Pipeline Office (APO) and State Pipeline Coordinator's Office (SPCO) had five levels of control or sanction for the enforcement of project conditions:

i. Review and approval of design documents and the power to impose conditions on notices to proceed;

ii. The administrative requirement that notices to proceed (NTPs) would be subject to AOFR or FSO approval by field memo ("field turn-on") prior to commencement of work;

iii. Authority of the AOFR or FSO to issue non-conformance field memos and to require correction by Alyeska;

iv. Authority to issue stop-work orders; and

v. Authority to have outside contractors perform remedial work at Alyeska's expense.

In addition, the Secretary of the Interior had at least nominal legal authority under the Mineral Leasing Act of 1920, to terminate the right-of-way for "non-compliance with any provision of Section 28 of that Act (80), however improbable its application. Alaska could also cancel its pipeline right-of-way lease.

The use of field turn-ons served to ensure that the conditions stipulated were met and to similarly ensure that the AOFR or FSO was appraised of all current on-going activities. In addition, field turn-ons assured the AOFR or FSO an opportunity to confirm that field conditions reasonaly approximated those anticipated in the NTP's final design. The use of field turn-ons is also noteworthy in that, like design review, it was a point of control where government monitoring efforts could operate preventively by affording the AOFR or FSO and the JFWAT field biologist an opportunity to identify potential problems prior to construction activities. Non-conformance field memos and stop-work orders, on the other hand, came into play after provisions of project conditions were violated and those violations were brought to the AOFR's or FSO's attention.

The authority for federal government stop-work power was set forth in Sections 24 and 25 of the Right-of-Way Agreement. Sections 26 and 27 specified the procedures the permittee was to follow if they chose to appeal a Temporary Suspension Order. Sections 24 and 25 read as follows:

> 24. Duty of Permittees to Abate
>
> A. Permittees promptly shall abate, either completely or, as the case may be, as completely as possible using their best efforts, any physical or mechanical procedure, activity, event or condition, existing or occurring at any time: (1) that is susceptible to abatement by Permittees, (2) which arises out of, or could affect adversely, the construction, operation, maintenance or termination of all or any part of the Pipeline System, and (3) that causes or threatens to cause: (a) a hazard to the safety of workers or to public health or safety (including but not limited to personal injury or loss of life with respect to any Person or Persons), or (b) serious and irreparable harm or damage to the environment (including but not limited to areas of vegetation, timber, fish or other wildlife populations, or their habitats, or any other natural resource).
>
> B. Permittees shall cause their respective agents, employees, contractors and subcontractors (at any tier) to observe and comply with the foregoing provisions of this Section.

25. Temporary Suspension Orders Of Authorized Officer

A. The Authorized Officer may at any time order the temporary suspension of any or all construction, operation, maintenance or termination activities of Permittees, their agents, employees, contractors or subcontractors (at any tier) in connection with the Pipeline System, including but not limited to the transportation of Oil, if in the judgment of the Authorized Officer:

(1) An immediate temporary suspension of such activities is necessary to protect: (a) public health or safety (including, but not limited to, personal injury or loss of life with respect to any Person or Persons); or (b) the environment from immediate, serious, substantial and irreparable harm or damage (including but not limited to, harm or damage to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource); or (2) Permittees, their respective agents, employees, contractors or subcontractors (at any tier) are failing or refusing, or have failed or refused, to comply with or observe: (a) any provision of this Agreement necessary to protect public health, safety or the environment; or (b) any order of the Authorized Officer implementing any such provision of this Agreement or of any other agreement, permit or authorization that shall have been duly approved, issued or granted by the Secretary in connection with all or any part of the Pipeline System.

B. The following shall be applicable to any temporary suspension order that may be used in accordance with the provision of subsection A of this Section, if the order would have the effect of suspending (1) the operation of the entire Pipeline, (2) transportation of Oil through the Pipeline, (3) operation of the entire Valdez terminal facility, or (4) construction of an entire Construction Subdivision:

(a) If the order is issued in accordance with subsection A (1) of this Section, the Authorized Officer shall transmit a copy of the order, and a preliminary report with respect to the order, to the Secretary within six (6) hours after the order has been issued and, thereafter, the Authorized Officer's report and the order will be reviewed promptly by the Secretary; provided, however,

that nothing herein shall require the Secretary to take any action following such review; or (b) If the order is to be issued in accordance with subsection A (2) of this Section, the Authorized Officer shall not issue the order unless and until the Secretary gives to the Authorized Officer the Secretary's written prior written approval with respect to the order.

C. The Authorized Officer shall give Permittees prior notice of the temporary suspension order as he deems practicable. If circumstances permit, the Authorized Officer shall consult with Permittees, prior to issuing the order, to discuss appropriate measures to (1) forthwich abate or avoid the harm or threatened harm that is the reason for the issuance of the order, or (2) effect compliance with the provision or order, whichever is applicable.

D. After a temporary suspension order has been given by the Authorized Officer, Permittees shall promptly comply with all of the provisions of the order and shall not resume any activity suspended or curtailed thereby except as provided in this Agreement or pursuant to court order.

E. Any temporary suspension order which, in an emergency, is given orally shall be confirmed in writing, as provided for in Stipulation 1.6.2. Each written order or written confirmation of an order shall set forth the reasons for the suspension. Each temporary suspension order shall be limited, insofar as is practicable, to the particular area or activity that is or may be affected by the activities or conditions that are the basis of the order. Each order shall be effective as of the date and time given, unless it specifies otherwise. Each order shall remain in full force and effect until modified or revoked in writing by the Authorized Officer or the Secretary.

F. Resumption of any suspended activity shall be promptly authorized by the Authorized Officer in writing when he is satisfied that (1) the harm or threatened harm has been abated or remedied, or (2) Permitttees have effected, or are ready, willing and able to effect compliance with the provision or order, whichever is applicable.

G. Any temporary suspension order that is given or issued in accordance with this Section shall be subject to the provisions of Stipulation 1.5.1." (41)

On the TAPS, stop-work orders could be issued to Alyeska by only the APO and SPCO field engineers or their superiors. JFWAT, MRI, EEI, and GIE only wrote advices to these government engineers; they could not stop work. APO and SPCO instituted stop-work procedures only for violations of approved stipulations, specifications and plans. If the AO wanted to shut down the entire project he had to have prior written approval of the Secretary of Interior. If an AOFR wanted to shut down an entire construction Section he had to have prior approval of the AO or AOR (Authorized Officer Representative - second in command). An AOFR could stop-work on his own initiative for anything short of an entire construction Section. The state delegated its stop-work authority in a similar manner.

APO and SPCO field engineers could issue Alyeska four types of field memos: (1) field notice to proceed; (2) request for service; (3) other; and (4) non-conformance report (NCR). When the government field engineers observed a situation that was in non-compliance with approved procedures, they would usually discuss their concerns with Alyeska or quality control to try to obtain compliance by verbal means. If Alyeska did not correct the non-compliance, SPCO or APO officers could issue Alyeska a written non-conformance report detailing the problem and giving Alyeska a time limit in which to correct the matter. If Alyeska continued to ignore APO or SPCO directives, the field engineers could order Alyeska to stop-work until that specific problem was corrected. In some instances, government engineers issued NCR's to Alyeska without prior verbal warnings. This usually happened after the government field engineer had previously warned Alyeska about similar non-conformance situations. In a few cases, the government engineers stopped work immediately with a verbal order. This step was instituted very rarely and only under circumstances where Alyeska's activities were causing unnecessary and clearly avoidable non-conformance situations.

> "Where a surveillance officer did encounter work of whatever kind that was substandard, the Stipulations gave him the power to order that it be stopped. It was a power rarely exercised. Against it was the double purpose of the authority under which he acted--his job was to ensure conformity to the Agreement, but not to delay the job....those who impeded the work--they were 'not project-oriented' and did not stay long on the job'." (58)

A number of reviews of APO's operating procedures have found that, while the monitoring system as a whole was generally adequate, sanctions, and particularly stop-work orders, were not used to the extent they should have been to assure adequate compliance with project stipulations and other conditions. For instance, a survey by a certified public accounting firm submitted to Mechanics Research Inc. in early October 1976 concluded in part:

> "(T)he actions taken by personnel appear to have been appropriate, as envisioned in the policy guidelines, with the exception of the use of the Stop Work Order. We found that the Stop Work Order was not always utilized as a result of 'urgent' non-compliance reports. We also found that the timeliness of Stop Work Orders and other actions could be improved." (23)

These findings were also echoed by the congressional General Accounting Office's 1977 report on pipeline construction. The GAO found that:

> "Federal monitoring data shows that many nonconformances occurred during the 1975 and 1976 construction seasons because of inadequacies in Alyeska's quality assurance program and the Authorized Officer's unwillingness to use proper authority to assure compliance. The Authorized Officer brought these nonconformances to Alyeska's attention but the corrective action was not always initiated in a timely manner." (21)

However, in sharp contrast to the findings quoted above, another study contracted by Mechanics Research Inc. stated:

> "It is the conclusion of this analysis that, even though the 'power to shut down' is a necessary power, there were few if any instances during the construction of the Trans-Alaska Pipeline where the intent of the Agreement would have been better met or the public and the national interest better served if the AO had exercised his power to shut down. The approach generally taken by the AO was to work out acceptable remedial action." (25)

A study contracted by the U.S. Fish and Wildlife Service to evaluate fish and wildlife protection on the TAPS project made these observations on APO's use of authority in relation to wildlife concerns,

> "When JFWAT identified field problems not requiring immediate attention, they were assembled in 'punchlists' and transmitted to Alyeska for remedial action. Transmittal of environmental punchlist items was a biannual occurrence with work to be accomplished either pre-freezeup or pre-breakup--when remedial activities would have minimum impacts upon fisheries resources and construction activities. Typically, Alyeska would make commitments that the work listed would be accomplished, but a substantial portion would not get done. APO would then have to put those items not completed on the next punchlist, Alyeska would commit itself to completion and the work would not be completed. This pattern was repeated from the pre-breakup punchlist of Spring 1975 through the pre-freezeup punchlist for Fall 1976.

Authorized officer's field representative (AOFR) logs cite four frequent explanations why punchlist items were not completed on time: (1) Alyeska civil engineering did not direct execution contractors to do the work, (2) there was more important, production-related work to be done, (3) required equipment was not available, and (4) there was insufficient bedspace in construction camps available. That is, Alyeska and its contractors did not want to divert resources away from construction to do remedial work, particularly for environmental and other non-production related items.

Finally, in mid-March 1977, the acting authorized officer wrote to Alyeska's president, listing a number of APO concerns--half of them relating to remedial work. The letter stated:

'The most critical current scheduling item from our standpoint is that effort associated with pre-breakup work...we want a satisfactory schedule within a week... it must provide the mechanism where your quality assurance manager, et al., can in fact judge the progress and acceptability of the work. If we do not receive such a schedule and assurance of pre-breakup work accomplishment, I have no alternative but to shut down all pipeline-related construction except backfilling of the fuel gas line.'

Although this elicited a credible response by Alyeska, the letter was sent just a month before breakup and work crews were able to address only JFWAT's first-priority punchlist items.

Subsequently, the Fish and Wildlife Service contingent of JFWAT, having obtained a commitment from their area director to take the issue to the Assistant Secretary's Office if necessary, went with JFWAT's federal coordinator to APO's management in late May. They insisted that Alyeska be required to correct outstanding fish and wildlife related problems on federal lands, arguing that it was the last chance to effectively compel remedial action. The acting AO responded by delegating to three federal JFWAT biologists AOFR authority to monitor stream-related remedial work. He also contacted Alyeska and directed that remedial work be undertaken immediately and that all necessary manpower and equipment be made available." (42)

"Problems in getting adequate responses from Alyeska on non-conforming items were not limited to environmental concerns. One AOFR who had written 'two thick stacks of NCRs' told us that when he put deadlines for

remedial action on field memos, Alyeska met only about half of them. Similarly, the state pipeline coordinator felt that Alyeska was adept at avoiding government's wishes and also at playing state and federal monitoring efforts against each other." (42)

The Fish and Wildlife Service funded report concluded in part:

> "APO had adequate sanctions to achieve substantial compliance with project stipulations. Notwithstanding this, APO was uncessful in its efforts to get Alyeska to field an adequate quality control program. As a result, JFWAT was placed in the position of having to provide much more intensive monitoring coverage than had been anticipated or for which they were staffed. Furthermore, as a result of the priority APO gave to expeditious construction, fish and wildlife related non-conformances were not corrected in a timely manner. Particularly significant in this regard were chronic problems related to aquatic systems--e.g., violations of siltation/erosion control and fish passage requirements. Nevertheless, APO, at JFWAT's urging, did move aggressively to correct fish and wildlife related problems once pipeline construction was substantially complete." (42)

In a TAPS critique session that was held in Anchorage in August 1977, it was suggested that "some form of economic sanction, such as fines, might be desirable for future projects" (31) as an additional means of insuring the Company's compliance with stipulations and permit conditions. A laborer writing about his experiences on the TAPS expressed the idea that, "In general, Alyeska's method has been to do exactly what they want to do. In some cases they get caught, and in others they don't. But even if they do, its not likely that they will lose very much. For an outfit that is spending five million dollars a day, a million dollar fine, which is very unlikely to be levied anyway, does not amount to much." (60) This point is well taken since any fine levied against the pipeline company would have to be exorbitantly high before that fine would serve its intended purpose. In some instances on the TAPS, Alyeska found that it was to their advantage to simply violate certain state laws and, if they were caught and successfully prosecuted, to pay a $25,000 per count (day) maximum penalty. (78, 79) Time was more important to Alyeska than money--a situation which could be expected to exist in the development of any major pipeline.

d. Quality Control & Quality Assurance

i. General.

A quality control & quality assurance (QC&QA) program can be a defined as a comprehensive program designed to assure that project construction is performed in accordance with contract plans and specifi-

cations, and that environmental and technical stipulations on the project are implemented throughout all phases of construction, operation, and maintenance of the project. In general, the quality control (QC) portion of the program is responsible for the daily inspection of construction progress in accordance with the guidelines and procedures set forth by quality assurance (QA), and for conducting statistical measurements necessary to assure that construction is being performed within the specified limits of the contract plans and specifications. In general, the quality assurance portion of the program is responsible for the establishment of guidelines and procedures to be used by quality control for the continual inspection of construction, for establishment of reporting formats, for maintenance of a records control system for retrieval and security, and for the performance of periodic audits to evaluate the performance of both the QC group and the executive contractors.

The basic requirements for Alyeska's QC&QA program were specified in Section 9 of the right-of-way agreement, and by Stipulations 1.18.1., 3.9.1., and 3.9.2. They read as follows:

> Construction Plans and Quality Assurance Program
>
> A. Permittees shall submit construction (including design) plans, a quality assurance program and other related documents as deemed necessary by the Authorizing Officer, for review and approval prior to his issuing Notices to Proceed.
>
> B. The quality assurance program shall be comprehensive and designed to assure that the environmental and technical Stipulations in this Agreement will be fully complied with throughout all phases of construction, operation, maintenance and termination of the Pipeline System.
>
> C. The following criteria shall be included in the quality assurance program, although Permittees are not limited to these criteria:
>
> > (1) Provide adequate and appropriate means and procedures for the detection and prompt abatement of any actual or potential conditions that is susceptible to abatement by Permittees which arises out of, or could affect adversely, the construction, operation, maintenance or termination of all or any part of the Pipeline System and which at any time may cause or threaten to cause: (a) hazard to the safety of the workers or to public health or safety (including but not limited to personal injury or loss of life with respect to any person or persons) or (b) serious and irreparable harm or damage to the environment

(including but not limited to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource).

(2) Provide adequate and appropriate means and procedures for the repair and replacement of improved or tangible property and the rehabilitation of natural resources (including but not limited to revegetation, restocking fish or other wildlife populations and reestablishing their habitats) that shall be destroyed if the immediate cause of the damage or destruction arises in connection with, or results from the construction, operation, maintenance or termination of all or any part of the Pipeline System.

(3) Provide for comment and systems quality through adequate quality control management and planning, and inspection and test procedures.

(4) Assure that the selection of Permittees' contractors, subcontractors and contract purchases of materials and services are based upon the above quality control procedures.

(5) Determine quality performance by conducting surveys and field inspections of all of the facilities of Permittees' contractors and subcontractors.

(6) Maintain quality determination records on all of the above procedures to insure satisfactory data identification and retrieval.

(Stipulation) 1.18.1. During the construction, operation, maintenance and termination of the Pipeline System, Permittees shall conduct a surveillance and maintenance program applicable to the subarctic and arctic environment. This program shall be designed to: (1) provide for public health and safety; (2) prevent damage to natural resources; (3) prevent erosion; and (4) maintain Pipeline System integrity.

(Stipulation) 3.9.1. All construction, operation, maintenance and termination activities in connection with the Pipeline System shall be conducted so as to avoid or minimize thermal and other environmental changes and to provide maximum protection to fish and wildlife and their habitat, and people. All working platforms, pads, fills and other surface modifications shall be planned and executed in such a way that any resulting degradation of permafrost will not jeopardize the Pipeline foundations.

(Stipulation) 3.9.2. Acceptable plans, procedures, and quality controls that ensure compliance with Stipulation 3.9.1. shall be submitted in accordance with Stipulation 1.7. (relating to Notices to Proceed, etc.)." (41)

Alyeska's quality control & quality assurance program had both policing and documenting functions that affected all aspects of the TAPS. Alyeska, as the company in charge of building the pipeline, had prime responsibility for quality control. As has previously been stated, each of the government surveillance organizations--APO, MRI, GIE, EEI, SPCO, and JFWAT--were designed and staffed around the assumption that Alyeska would have an effective quality control & quality assurance program which would only require a spot check level of monitoring by the government. (12) The government surveillance organizations were not designed to provide 100 percent inspection of critical construction activities. The monitors saw a much smaller portion of construction and, based upon their verification of compliance with stipulations, specifications, and approved plans, the government would have an idea of the degree of linewide compliance. If quality control & quality assurance proved to be chronically weak, a presumption of compliance linewide would not be justified. (42)

Alyeska submitted the first of its quality control & quality assurance manuals to APO for review in mid-February, 1974. Following several months of negotiations and revisions, Alyeska's quality control & quality assurance program was tentatively approved by APO on July 19, 1974, subject to certain revisions, "so that construction would not be delayed." (20) Construction on the TAPS actually started early in 1974 and was well in progress when APO tentatively approved Alyeska's quality control & quality assurance plan. This was in violation of lease condition 9A and Stipulation 3.9.2. which stated that Alyeska's quality control & quality assurance program had to be approved by the government before any notices to proceed could be issued and before any construction was physically initiated in the field. APO did not enforce this lease provision and allowed Alyeska to begin construction without an approved quality control & quality assurance program. (12, 42, 25)

Over the next several months, Alyeska did little to correct the deficiencies in its quality control & quality assurance program. In June, 1975 the congressional General Accounting Office took the matter up with APO.

> "In July 1975, the Authorized Officer, the State Pipeline Coordinator, and Alyeska studied the quality assurance problems to determine what corrective actions should be taken. The study showed that many of the quality control problems were similar to the concerns expressed by the Authorized Officer when he tentatively approved the quality assurance program. The study showed the need
>
> --to give quality control representatives the authority to halt nonconforming work;

--for a closer interface between Federal and State monitors and Alyeska so that nonconforming work found by the monitors could be quickly corrected; and

--for many more environmentally oriented quality control personnel." (20)

Following corrective actions by Alyeska, including delegation of stop-work authority to quality control personnel, APO gave final approval to Alyeska's quality control program on August 19, 1975. (20) Quality control personnel did not have stop-work power until August 5, 1975; one and one-half years after the beginning of construction. (33) Before August 5th, quality control upon observing a stipulation or specification violation, could only write a report to their superiors who then could discuss that matter with Alyeska. (33) Quality control could see a violation and they could not stop it. (33) The subjective evaluation of one JFWAT employee was that,

"...by 1975 construction had gained such momentum that the only important objective was the completion of the pipeline as soon as possible. Delays in tight construction schedules had already caused slippage in some phases of the project and the attitude among the top construction and management personnel appeared to be that environmental stipulations were a hinderance, but they could be avoided through diplomacy, red tape and procrastination." (8)

During construction, environmental quality control was particularly deficient (12, 20, 15, 30, 32, 33) even though TAPS lease Section 9 and Stipulations 1.18.1., 3.9.1., and 3.9.2. specifically mandated that environmental protection was to have been an important function of Alyeska's quality control & quality assurance program.

"This deficiency increased the frequency of stipulation violations since the contractors building the pipeline and facilities were not adequately controlled by Alyeska management. A functional environmental quality control system with qualified personnel was not apparent before late spring of 1976." (12)

In the latter stages of construction, there were nominal environmental quality control field inspectors, but these were too few and they frequently had other, primarily civil, quality control functions to perform. As a result, in order to assure that fish and wildlife resources were adequately protected, surveillance biologists of the Joint Fish and Wildlife Advisory Team were forced into attempting to provide 100 percent inspection instead of the intended spot check role. JFWAT was not staffed to assume this task. The basic reasons for the failure of Alyeska's quality control program were lack of support from Alyeska's senior management and the inability or unwillingness of APO and SPCO to utilize their authority and available sanctions effectively to compel compliance by Alyeska.

"Most of...those who had worked in the field on quality assurance, felt the Alyeska's quality control & quality assurance was an abysmal failure--at least in regard to environmental concerns. Totally inadequate was a phrase that cropped up several times. The primary complaint was that there were too few environmental quality control people available, they spot checked rather than doing continuous checking, and that at least during the early part of the construction they were inadequately trained. Consequently, JFWAT's people ended up doing environmental quality control by default, a job for which they were neither adequately staffed nor funded. It was also pointed out that there are no environmental quality controls working during the final operative stages." (31)

"During construction, environmental quality control was particularly deficient. As one government inspector put it,

'Nearly every (report of non-compliance with stipulations) written by the agencies results from inadequate inspection by Q.C. Most probably, we have been negligent for not writing many more...based on poor inspection.' " (42)

To provide additional documentation on the TAPS quality control program extensive material is quoted below from the Alaska Pipeline Office (APO) TAPS Overview Study (25). This study reflects the official position of the federal Alaska Pipeline Office.

"This concept of selective review and spot check monitoring is intended to provide a measure of the Permittee's compliance with the Stipulations and quality of construction, and should in no way be considered a duplication of or substitution for the Permittee's (Alyeska's) quality control or management effort." (25)

"The Permittees did not include the implementation solutions to the intent of the Agreement and the Stipulations as integral parts of the project design in which the Permittees fell short in meeting the requirements to implement the obligations under the Agreement and the Stipulations: (1) Quality Assurance, as is called for in Section 9 of the Agreement; (2) Compliance in all respects with the Notice to Proceed provisions, as is called for in Section 10 of the Agreement.

Specifically, the Permittee's Quality Assurance/Quality Control program and the organizational concept for the implementation of this program during the first full season of pipeline construction (1975) had many shortcomings. The radiography/welding deficiencies can be directly

traced to the Permittees' failure to pay adequate attention to the Quality Assurance/Quality Control functions." (25)

"Section 9 of the Agreement requires that Permittee establish a comprehensive Quality Assurance Program to assure compliance with environmental and technical stipulations throughout all phases of construction, operation, maintenance and termination of the project. As stated in part therein, the program is to:

> Provide adequate and appropriate means and procedures for the detection and prompt abatement of any actual or potential condition that is susceptible to abatement by Permittees which arises out of, or could affect adversely, the construction, operation, maintenance, or termination of all or any part of the Pipeline System....

Although specific provisions for surveillance of Alyeska's quality assurance program by the AO are not clearly derfined in the Stipulations, requirements for this function are implicit throughout the pipeline design, construction and operation phases. To determine the adequacy of the proposed QA Program, major documents, plans and procedures were reviewed by the TSC prior to the commencement of construction. Implementation of these plans were also monitored in the field on a spot check basis after construction began in early 1975." (25)

"A thorough review of the plans submitted by Alyeska revealed major deficiencies, the magnitude of which warranted a complete revision of the documents. The Authorized Officer tentatively approved the QA Program in July 1974, subject to Alyeska's correction of these deficiencies. However, the Alyeska final version of the plan resubmitted in July 1975 effectively removed power and authority from the Alyeska QA/QC function. The Authorized Officer gave final approval to the QA Program in August 1975. By this time, approximately 22 per cent of the total project had been completed, including installation of about 33 per cent of the mainline pipe.

Because of the basic inadequacy of Alyeska's QA/QC Program, numberous non-conformances were reported throughout the 1975 and 1976 construction seasons. In fact, by mid-1975 the spot check reporting system demonstrated Alyeska's inability to halt and correct the recurrence of major deficiencies such as welding and taping defects.

While non-conformance trends were brought to the attention of Alyeska, corrective action was not always performed in a timely manner. Additionally, the AO was reluctant to exercise his authority under the Agreement such as stop work directives, to obtain necessary corrective action.

During the early months of 1976, Alyeska revised certain aspects of their QA/QC plan; however, no significant changes were made to the organizational structure of the plan. The revised plan, while attempting to meet the basic intent of the Stipulations, still lacked the necessary organizational and procedural policy revision to improve implementation of the program. Field spot check reports and documented construction problems such as mainline girth weld defects, erosion control mitigation, and installation of belowground pipe at river crossings provide evidence that the revised plan was ineffective." (25)

"This analysis found that, with respect to environmental protection and quality assurance/quality control, there were inherent weaknesses in the ranking of authority in the Permittees' corporate management and particularly in the Pipeline Department." (25)

"The quality control function of pipeline construction was assigned to the senior manager of construction. The QA/QC function should have been independent, reporting to VP Project Management or to a 'senior manager engineering'." (25)

"Thus, the 'senior project manager pipeline', from a functional point of view, is really the 'construction manager' and, as such, should not have the line responsibility for 'quality control and radiographic services'." (25)

"The purpose of separating the radiographic services from quality control, as done in the 1976 organization, is difficult to understand." (25)

"Conclusions

The QA/QC plan utilized throughout 1975 and early 1976 could not be effectively implemented for the following reasons:

--The unconventional organization of the Quality Control inspectors under the Senior Project Manager for Pipeline Construction.

--The establishment of the Quality Assurance group separate from the QC organization.

--Lack of intent by Alyeska top management to achieve appropriate environmental abatement through quality control.

--Lack of an effective means to evaluate and integrate Alyeska QC and APO Non-conformance Reports (NCRs) in the field, and in a timely manner.

As a result, the QA Program was in reality functioning only to collect and document data for the purpose of historical retrieval only." (25)

"Recommendations

On future projects it should be mandatory that the Permittee establish a proper Quality Assurance - Quality Control Program compatible with the AO's spot check surveillance function. A program similar to the criteria specified in Standard 10 CFR 50, Appendix B - Quality Assurance Criteria for Nuclear Power Plants, should be considered. Consistent with this criteria, the QA/QC program should receive equal weight in the Permittee's organizational structure with engineering, construction, and cost/scheduling.

The Quality Assurance and Quality Control inspection group should be organized under one department, rather than formed as separate organizations." (25)

"The quality control function should be assigned to a separate manager, ranked equal to the engineering and construction managers." (25)

"The QA/QC group must have adequate power and authority to halt recurring, serious non-conformance work for a given work activity. Line-wide stop-work directives should be imposed only as a last resort for blatant violations.

The QA/QC Program must establish an effective procedure for evaluating and correcting non-conformance work in the field, and in a timely manner. A procedure similar to the use of an Ad-Hoc Review Board comprised of representatives from Engineering, Quality Assurance, Construction Management, and required specialists/consultants should be responsible for evaluating and recommending disposition of all major non-conformances." (25)

"The Authorized Officer's surveillance program should interface with the Permittee's quality control organization in the field. Non-conformance reports issued by the technical support contractor's field representatives should be delivered to the Permittee's designated quality control inspector on the pipeline segment involved. Remedial action taken by the Permittee to correct such non-conformances or other disposition should be reported by the Permittee's quality assurance group directly to the Authorized Officer's Representative and to the Technical Support Contractor's project manager." (25)

Mr. Robert Mead in his historical account of the building of TAPS (58) makes these observations about Alyeska's quality control program:

"On the Alyeska organization chart, the quality-control staff was part of the production department charged with all the steps involved in actually assembling and laying the pipe. Moreover, the authority of the individual QC within that department was quite limited." (58)

"In mid-July, Alyeska granted the quality-control people authority to order its contractors to redo work that did not conform to specifications or, if that failed, to stop the work altogether; but the QCs remained within the production department. Five weeks later, concluding the procedures outlined in the Right-of-Way Agreement, Mr. Rollins formally approved Alyelsa's quality-control program. By then close to 250 miles of pipe had been completed." (58)

"It (stop-work power) was a frail authority: if exercised, it would place the lone QC in the position of telling his Alyeska supervisor, the various contractors' managers, and perhaps hundreds of disgruntled men on the job site that they were doing the work wrong, that they must stop and start over. As one would expect, that did not happen very often. When it did, the luckless QC found himself the object of persuasions ranging from loss of job to a broken arm to a stick of dynamite lying suggestively on the driver's seat of his car." (58)

"...the performance of its quality-control department is not a kind of information Alyeska has ever chosen to include in its voluminous public relations program." (58)

On the subject of quality control, the TAPS critique session that was held in Anchorage in August of 1977 concluded:

> "It was generally agreed that for any future construction project similar to TAPS, the project description, criteria, and performance specifications should be submitted prior to issuance of a permit. QA/QC should be included in the design criteria and project plan and be carried into the construction contract documents. Industry and government should work closely in developing criteria so that everyone is familiar with what the final product is to be. There was no general agreement as to whether or not the QA/QC function should be paid for by the Permittee or should be done by a separate auditing firm." (31)

> "There also seemed to be a consensus that self-inspection should be avoided. There was some discussion as to whether the government, rather than industry, should perform the environmental quality control function. The Alyeska representatives took the position that quality control is a function of industry only." (31)

A man who worked as a laborer on the TAPS summed it up when he wrote:

> "They are aiming at their favorite solution to problems of quality: lower the standards." (60)

This statement is not as out-of-line as it at first sounds. In one extensively documented case, Alyeska simply rewrote a portion of its quality control procedures right in mid-project so that what used to be a non-conformance was no longer one. (30) In this instance Alyeska gave authority to its restoration engineers to "write-off", without any corrective action, non-conformance reports that had been written by Environmental Quality Inspectors. (30)

Within the government surveillance organization when GIE and EEI would write non-conformance reports (to stipulations, specifications or approved plans), and spot check reports, the AOFR would often not direct Alyeska to correct the non-conformance situation. APO and MRI suppressed GIE and EEI non-conformance reports (NCR's). In some instances, AOFR's directed MRI representatives to write off GIE and EEI NCR's so that those NCR's would be removed from APO's computer tabulations. MRI often complied with the AOFR's requests. The AOFR could not write off GIE and EEI NCR's themselves because GIE and EEI did not work directly for APO since they were subcontractors to MRI. The TAPS welding scandal, which received extensive coverage in the national media (73, 74, 81) and was the subject of several congressional investigations (22, 75, 76) and Government Accounting Office Reports (20, 21) is an example of APO's and SPCO's relationship with Alyeska and of the failure of Alyeska's quality control program.

ii. TAPS Welding Problems.

TAPS Stipulation 3.2.2.3. required Alyeska to verify the soundness of each pipeline girth weld by radiographic or X-ray inspection.

The wall thickness of the TAPS mainline pipe is either 0.462 or 0.562 inches. This is too much metal to weld together with only a single pass of welding rod, thus 6 or 7 complete passes were required to produce each finished weld. The TAPS mainline pipe has an outside diameter of 48 inches and a circumference of 150 inches. Hence, there were 150 inches of weld per welding pass and 6 or 7 passes per joint. After completion, the welds were X-rayed and the films identified by a process called radiographic fingerprinting.

Every piece of pipe is held together by a weld from end to end, and when two joints are lined up for welding the ends of these longitudinal seams fall in different places, probably never in quite the same relationship on any two welds; further, in making the girth weld that joins two pieces of pipe, the welder starts his final pass from somewhere near the top and leaves a little lump of metal at that point, called a 'top button', which is visible on the X-ray film along with the ends of the two longitudinal welds, and the chances are pretty good that the relationship of all three of these reference points will never be exactly repeated. To fingerprint a weld you carefully measure all these distances. Radiographic weld interpretation is not an exact science but is instead an interpretive art because a three dimensional medium, the weld, is represented on a two dimensional plane, the X-ray film. Alyeska's 100% X-ray standard was above industry practice and U.S. Department of Transportation Codes. [NOTE: The Northern Tier Pipeline Company has stated that they would X-ray 100% of the girth welds on their project (17, 19).]

> "The welding problems on the pipeline received more attention in the national news media than any other construction or environmental aspect of the project. Perhaps the issue would never have been made public had it not been for Peter Kelley, a former employee of Ketchbaw Industries, Inc., a Texas firm which had the welding monitoring contract. Kelley, in September 1975, filed a civil suit alleging he was fired by Ketchbaw after he complained about the company's falsifying X-ray records of pipeline welds. Kelley then assisted Alyeska officials by pointing out to them cases where X-ray welds were faked. At any rate, the weld problem was well publicized in Alaska's newspapers in the last few months of 1975 and, according to Champion, pretty well resolved before Congress and Lower-48 newspapers latched onto the issue. An internal audit by Alyeska eventually reported finding 3,955 'questionable welds.' These were ones for which X-rays were unreadable, or for which a reading of the X-ray showed that the weld failed to meet federal safety standards.
>
> Well into 1976 stories about the weld problems appeared in major publications in the Lower-48, prompting congressional and U.S. Department of Transportation investigations. In July 1976, a team headed by John W. Barnum, deputy secretary of DOT, visited Alaska. Barnum promptly

reported that the questionable welds had occurred in 1975 and were no longer a problem. However, a visit to Alaska during the same period by the staff of the Energy and Power Subcommittee of the House Interstate and Foreign Commerce Committee, produced different findings. The staff report submitted on September 9, 1976, stated that 'every one of the major 1975 problems had been repeated in 1976'." (61)

Mr. Terry Lenzner, an attorney for the Alaska Pipeline Commission, after investigating Alyeska's welding problems, concluded:

"The most dramatic example of costly and persistent quality control and quality assurance problems related to welding, where remedial work cost the project at least $80 million. One of the most serious welding problems experienced in all pipeline sections was the unreasonably high weld reject rate, which averaged 30% and reached as high as 80%. The slow pace of X-ray crews, which lagged several miles behind welding crews, perpetuated faulty welding techniques and production of welds suspected of having a high percentage of defects. As early as May, 1975, owner company representatives observed first-hand the poor X-ray productivity and inefficient quality control which led to a high percentage of weld rejects.

In view of the serious deficiencies which pervaded the TAPS welding and radiography program, Alyeska began an audit of radiographs for the entire pipeline. This audit indentified 3,955 'irregular' welds, 1,015 of which were 'critical', e.g. already buried under rivers. At the same time, it came to light that radiographers at the double-joint yard at Fairbanks had participated in a scheme developed by Bechtel's quality control to falsify numberous X-rays.

The failure of the project's quality control program to perform adequately not only contributed to the high weld reject rate, but also caused numerous construction delays. As a consequence, welding costs soared far beyond budget control estimates: large numbers of man-hours were spent on weld repair and re-X-ray while millions of dollars worth of equipment was purchased to implement the work. A conservative estimate is that the mismanagement of the welding and radiography programs resulted in excess expenditures of $80 million." (24)

Mr. Mead, in his history of the TAPS, added these observations on Alyeska's welding problems (58):

"Actually, the welding problem involved two separate questions: the objective quality of the welding in actual use; and the validity of the means by which that quality could be verified in advance." (58)

"...but the big change demanded, the QCs' authority to stop nonconforming work, was a sword of paper and remained so till the end; and as we shall see, the program's failings were already apparent and would become increasongly visible." (58)

"The early rejection rate for welds was extraordinary, 50 or 60 per cent, in some places and at some periods nearly 100 per cent." (58)

"...the <u>average</u> repair rate for the two full years of pipe work was something like 30 per cent." (58)

"By contrast, in Texas, where conditions are not so very different from Alaska in summer, pipeline contractors figure on having to redo no more than 2 per cent of their welds, and a 5 per cent reject rate is considered the maximum tolerable." (58)

"The more intelligible of the two summary tables (to me, at least) divides the problems into four categories. For one, 37 welds were found to contain defects so serious as to require cutting out a length of pipe and replacing it with a pup. Missing or duplicated radiographs added up to 895--that many welds would have to be X-rayed, according to the Stipulations, to determine if they were acceptable though presumably they would not be. The films also showed 1,911 welds that would need various minor repairs but would probably not have to be cut out; and 1,112 where the film was ambiguous--the welds might or might not be defective, and whether they were would be determined by visual examination. The total of all categories was 3,955, of which nearly half occurred in Section 5/6, the northernmost part of the line. In the newspaper accounts, it was invariably said that Alyeska had admitted to 3,955 bad welds, but it had done nothing of the kind: what it admitted was 37 welds that were clearly unacceptable, 1,911 that called for limited, sometimes trivial, repair, while the rest either needed new X-rays or could not be adequately judged from the films alone...." (58)

"And finally, given the rings of authority with which the project was surrounded, how could radiographers conspire without the connivance of the QC/QA inspectors, of government surveillance men and executives on up through the ranks of Alyeska and the various departments of government?" (58)

"Three weeks later, President Ford dispatched an investigative team from the Department of Transportation, which by law would eventually have to certify that the pipeline, a common carrier, was fit for public service. Simultaneously, Congressman Dingell posted subcommittee staffmen on a parallel quest. Andrew Rollins, the Department of Interior's Authorized Officer in charge of the Alaska Pipeline Office, found these congressional attentions in particular distasteful; since the Ketchbaw charges in its $40-million suit, the APO had become not only highly visible but, to a degree, a public adversary, like Alyeska itself. When the two investigators insisted on interviewing his staff, Mr. Rollins wanted an APO lawyer present..." (58)

"In May, bypassing the APO, the Department of the Interior had ordered Alyeska to stop tapping, burying, and insulating the pipe until it could provide foolproof assurance that the prescribed weld-inspection process, including radiography, would really be completed while the welds were still accessible. This work was allowed to resume after four days, but eventually, in July, Alyeska acceded to a further order that required it to identify every weld with a unique and permanent code number visible on the X-ray film (something it had not yet thought to do) and to furnish the APO with a photographic print of every film; Alyeska glumly referred to these procedures as "redundant markings and radiographs." (58)

"And in May it (APO) commissioned Arthur Andersen & Company, the Chicago-based international accounting firm, to examine the methods by which Alyeska had performed its audit of the 1975 radiographs and welds. The Andersen report, completed two months later in mid-July, was carefully inconclusive: the records were not, it suggested, auditable; there was no way of determining from them whether the findings in the White Book were accurate or not. Alyeska revised its methods, but in January 1977, after a further examination, the Andersen accountants once more declined to certify them." (58)

"On December 10th...Mr. Dingell convened a further subcommittee hearing, this time closed to the public so as to protect the several former radiographers who testified. The subject was the double-joint welds done under controlled conditions by automatic welding machines and not so far seriously challenged; and the functioning of the APO. What was said of the federal surveillance team and its boss can only be inferred, but the radiographers insisted that there had been highjinks with the shop welds and X-rays, just as with those done in

the field; and (as the welders had been saying for some time, defensively) that they had found unreported defects in the few inches of the longitudinal welds that showed in their circumferential X-rays.

In consequence, Alyeska performed an audit of its double-joint radiography, completed in February 1977, which confirmed the subcommittee testimony: about 600 welds were added to those to be dug up, examined, X-rayed, and repaired, and apparently this was done." (58)

"On the other hand, what seems to have been a random sample from the inventory of 1975 radiographs showed that perhaps 20 per cent of the measurements from which the weld 'fingerprinting' derived and on which the identification of welds to be examined or repaired was based was erroneous. That finding, if correct, would, I should say, invalidate Alyeska's entire repair program, by this time nearly complete; but that was not a question that anyone at this point--it is now sometime in February 1977-- was prepared to pursue." (58)

"Against this doubtful performance, both Alyeska and the APO submitted to independent laboratories that were apparently actual welds identified as questionable radiotraphs and cut out from the line; and the welds were subjected to the full series of destructive tests and certified as functionally sound. From these physical tests, Alyeska, while grimly pursuing its repair program, insisted that most of its repairs were of no practical significance. The two surveillance groups were in broad agreement.

'A vast majority of the 3955 weld discrepancies identified by Alyeska's Quality Assurance [Chuck Champion wrote in his final report] were of a cosmetic nature and definitely not hazardous to pipeline integrity. National publicity...prompted...the expenditure of millions of dollars to make unnecessary repairs.' " (58)

e. Relationship of JFWAT, APO, SPCO, and Alyeska

It is logical to ask how the welding problems arose when Alyeska's construction activities were continuously monitored by government surveillance organizations. GIE had documented various aspects of the "welding problem" with numerous GIE NCR spot checks before Mr. Kelley brought public attention to this matter. APO and the AOFR's failed to act on the GIE NCR's in a manner that would have corrected the problem. If APO engineers did not listen to GIE engineers on technical pipeline considerations, APO was even less receptive to JFWAT's fish and wildlife advices. To document the interaction of JFWAT with APO and SPCO, the author will quote extensively

from a JFWAT publication written by Ms. Nancy Kavanagh: The Interagency Approach to Environment Surveillance: A History and Evaluation of the Joint State Federal Fish and Wildlife Advisory Team. (29) Ms. Kavanagh worked for the Alaska Department of Fish and Game assigned to JFWAT as a staff biologist from 1974 to 1977. Ms. Kavanagh's statements represent the official position of the entire JFWAT group, not just the opinion of one biologist.

i. Relationship Between JFWAT and APO/SPCO.

"Primarily the difficulties stemmed from the fact that there was only limited recognition of biologists as professionals. The general feeling among the engineers and those in authority in both offices was that JFWAT had no ability to assume a responsible role in the surveillance program since biologists had not history of inspecting large construction projects. This attitude, which stemmed from an ignorance of biological principles and scientific discipline, hampered the development of a good working relationship between engineers and biologists throughout the construction phase of the project....

The difference in philosophy between biologist and engineer as a factor in environmental protection activities cannot be overemphasized....The biologist, on the other hand was often appalled by what he considered to be a lack of environmental sensitivity on the part of the engineer, whose only goal he considered to be expediting the construction of the pipeline. The biologists were also frustrated by the fact that persons with no biological expertise were interpreting the environmental stipulations for enforcement" (29)

"Unfortunately, biological advices were too often taken as personal criticism by government field officers rather than deficiencies in the permittee's method of operation. This issue was particularly sensitive with the FSO's. Whereas the AOFR's had a staff consisting of members of JFWAT, Ecology and Environment, Inc., Gulf Interstate Engineering and Mechanics Research Inc., the FSO had no assistance other than JFWAT. Rather than considering JFWAT to be an extra pair of eyes and ears, FSO's often viewed any negative reports as reflections upon their ability to do their jobs....There was a feeling in the government pipeline offices that the environmental stipulations were of lesser importance than those having to do with pipe integrity or other engineering aspects. As a result, neither APO or SPCO adequately fulfilled their obligation of making Alyeska comply with the environmental stipulations in a timely manner.

Neither APO nor SPCO formulated a concise policy for enforcing environmental stipulations. This resulted in the individual engineers interpreting and enforcing them according to their own inclinations. The lack of consistent enforcement among the field engineers of both APO and SPCO is an example of the blase' attitude toward the environmental stipulations." (29)

"The reasons for the negative attitudes toward the environmental stipulations cannot be solely attributed to the philosophical differences between engineer and biologist. Some of the reasons can only be speculated. For example, the attitude of the Alaska Pipeline Office could merely have been reflecting the general attitude of the Nixon-Ford administrations toward environmental matters. Although this opinion cannot be easily substantiated, it was present among those interviewed." (29)

"Another source of friction between APO and JFWAT was the enforcement of Alaska Statute 16.05.870, which prohibited any disturbance in an anadromous fish stream or tributary without a permit from the Commissioner of Fish and Game or his representative....

The cooperative agreement between the State and Federal governments required the APO to enforce State laws on federal lands when they were more stringent than federal laws (Reference 2). However, APO adopted the attitude that A.S. 16.05.870 did not apply on federal land (letter dated February 8, 1975 from James W. Brooks, Alaska Department of Fish and Game, Juneau, Alaska). They never brought the matter to a legal test but the attitude persisted throughout the project and caused considerable discord between the two offices.

Neither SPCO nor APO went out of their way to coordinate their surveillance activities in keeping with paragraph 1 of Section II of the cooperative agreement. This section established the ground work for both offices to freely exchange ideas and information and to station personnel in the field so that maximum use could be made of each office's expertise and logistical support. For the most part, the offices tended to operate totally independently of one another. In the field, AOFR's and FSO's were more competititve than cooperative which further complicated the job for the JFWAT monitor who had to respond to both. The primary reason for the lack of cooperation between APO and SPCO appears to be the personal dislike between the AOR and SPC." (29)

ii. Relationship Between JFWAT and Alyeska.

"The main problem, as JFWAT saw it, was that Alyeska never had any intention of fully complying with the environmental stipulations. Nothing observed during construction of the pipeline altered that opinion. In most cases, Alyeska exhibited flagrant disregard for environmental matters and often times were abusive and hostile toward JFWAT representatives. The favorite ploy was the delaying tactic. Instead of doing a job in an environmentally acceptable manner to begin with, Alyeska would stall repeatedly, issuing barrages of paper work with engineering jargon until JFWAT was forced to the wall on some issue. Often, Alyeska found it necessary to go in and correct a problem, perhaps more than once, when the whole thing could have been done right in the first place from both the engineering and environmental standpoints." (29)

"If Alyeska had any intention of fully complying with the environmental stipulations, they would have fielded an effective Environmental Quality Control program. As it was, their EQC program was practically non-existent....

The reasons for Alyeska's apparent duplicity toward environmental matters could stem from two sources. First, it must be remembered that Alyeska is a private company and, as such, is in the business of making money. And in the case of the Trans-Alaska Pipeline, making the most money in the least amount of time since the start of the project had been delayed from 1969 to 1974.

Secondly, the petroleum industry has, until the recent past, operated with very little government control. The pipeline project was different. All of a sudden there was a plethora of government inspectors, rules, regulations, stipulations, etc. This created a lot of resentment within the industry ranks and did not foster an attitude of willing compliance with the stipulations, environmental or technical." (29)

"Despite Alyeska's unwillingness to comply with environmental stipulations, many conflicts and frustrations for JFWAT could have been avoided if APO and SPCO had forcefully required APSC to comply. JFWAT was of the opinion that it was not too surprising that APSC did not live up to their commitments because, after all, being industry, they were bound to try to get away with anything they could. However, it was not expected that a good share of JFWAT's battles would be fought convincing the government agencies that they should require APSC to fulfill their commitments." (29)

"It was clear that JFWAT felt it had been the environmental 'conscience' on the job." (29)

iii. Problems Within JFWAT.

"JFWAT's internal problems arose primarily from two sources: 1) JFWAT was organized after construction began; 2) it was an interagency organization....

As one interviewee put it, "You can imagine all the difficulties when you throw a bunch of biologists into an office with the command, 'Now go enforce the environment!'"

In no other large construction project have biologists been vinolved to such a high degree. Consequently, when team members were being recruited there were very few applicants who had the appropriate construction background and even fewer who had an arctic construction background. New JFWAT employees' training consisted of being shown a map of pipeline and being told, 'Now go monitor it!' The job had to be learned by everyone from scratch.

The situation was complicated by the fact that very little data existed for much of the pipeline route, especially the area north of the Yukon River. Monitors found it necessary to make fast decisions on a site with little or no information to back them up....

It became evident as the project continued that, even though the original JFWATers had learned how to operate in the field, when new personnel were added, JFWAT failed to adequately train them. New monitors had to go through essentially the same learning process that the team had as a whole gone through. This was undoubtedly due to the fact that when construction was in full swing, there was no time to carefully train a new employee. Each monitor had to cover approximately 150 miles of pipeline and their presence was usually needed in several places at once. Work days rarely were less than 12 hours. Days off were much needed. Norton (1976) says 'If I chanced to meet one of these biologists in transit at the airport, with a duffle-bag and cold weather gear, one look at their face and posture usually told me quite eloquently whether they were on the way out to a 10-day tour, or were on the way back to town after such a tour.' Whatever the reason, it cannot be denied that thorough training of new personnel would have eliminated unnecessary lag times and mistakes." (29)

"The design review staff discovered that if they had been involved much earlier in reviews, fish and wildlife considerations could have been injected in many cases before designs had progressed to the point where Alyeska was reluctant to change them" (29)

"Because it was felt that both APO and SPCO lacked the expertise and/or manpower on their staffs to determine which design documents pertained to fish and wildlife, JFWAT reviewed all types of material submitted by Alyeska. This enabled the team to make its own evaluation of the pertinence of individual documents rather than leaving the decision to someone who most likely did not have biological training. It also produced a prodigious amount of paperwork. For example, rough counts revealed that from June 1974 through June 1975, JFWAT reviewed and issued advices on over 2100 documents, from July 1975 through August 1976, documents reviewed numbered approximately 2350 and the count through July 1977 was 950. Some of these documents, particularly the Design Change Requests, carried a very short suspense date. DCR's required reply within 24 hours. It was not unusual, in the height of construction, to receive 30 DCR's per day for review." (29)

"In essence, JFWAT was thrown into the fray with no operations or policy guidelines. All guidelines were formulated as the work progressed." (29)

"Most new monitors considered the situation to be analogous to being thrown into the river and commanded to swim. This situation could have perhaps been avoided or at least alleviated by preparing a handbook for new personnel." (29)

"The lack of firm operational guidelines produced problems with consistent enforcement of stipulations in the field. One monitor might write an NCR on what he considered to be a problem but which his counterpart did not." (29)

iv. Recommendations for Formation of Future Teams.

"In a recent TAPS critique held by the U.S. Department of the Interior, it was suggested that the leader be neither biologist nor engineer but should be an administrator capable of taking advice from either side and acting upon it. Hopefully, this would eradicate the built-in biases held by persons of both professions." (29)

"It was suggested that, under the leader of the surveillance team there be chiefs of the environmental and the engineering

sections. Each would have equal standing and authority. The engineers and environmentalists under them would have equal authority, too. No one discipline would be subservient to the other. Biologists would not be strictly advisory to engineers as they were for the majority of the TAPS project. It should be pointed out that at the end of the construction phase, APO did appoint JFWAT monitors to be biological AOFR's. In this capacity, JFWAT accomplished a great deal in assuring fish passage through the pipeline workpad and access roads. Why the change was made at that time is uncertain. There are indications that the move was politically expedient." (29)

President Carter upon assuming office removed General Rollins as head of the APO and appointed Mr. Cecil Andrus as Secretary of the Interior. In addition, political pressure was being applied by various environmental groups (12) and the State of Alaska had prosecuted Alyeska under AS 16.05.870 (77) and Department of Environmental Conservation (DEC) laws (78, 79). The federal government had always maintained that Alyeska did not need state DEC or Department of Fish and Game permits for construction activities on federal lands. In a case involving Alaska's Anadromous Fish Stream Protection Act AS 16.05.870, a federal AOFR had told Alyeska to disregard the objections of an Alaska Department of Fish and Game biologist and to dig a hole in the river bed because he, a federal AOFR, said that it was alright. In this Fish and Game case (77) and in the Department of Environmental Conservation (DEC) cases (78, 79), State District Courts held that state laws do apply on federal land and that Alyeska was in violation of these state laws. The fact that APO approved of Alyeska's violations of state laws was not a legal basis to avoid state regulations, especially since, in the TAPS Cooperative Agreement between the federal government and Alaska (Section II, 3), the federal government had agreed that if state laws or regulations were more stringent than federal laws, regulations, or stipulations, that state laws would prevail. (41)

"On lands subject to the Federal right-of-way authorizations, the Department will determine compliance with the terms and stipulations regulating the construction of the pipeline system. On lands subject to the Federal right-of-way authorization, where applicable statutes and regulations of the State providing for the protection of resources, the environment, or public health, safety or general welfare, impose additional requirements to, or more stringent standards than, those required by the Federal terms and stipulations for pipeline construction, operation or maintenance, the State law will control" (41)

In court, Alyeska was quick to point out that they were not a party to the TAPS Federal State Cooperative Agreement and hence were not bound by it. In the Fish and Game case the then acting head of APO, Mr. Morris

Turner, testified to the effect that this section of the TAPS Federal-State Cooperative Agreement was only included to appease the state and that the federal government did not feel bound by the agreement, especially that part that made state laws applicable on federal lands. This situation should be avoided on future projects by obtaining a clear delineation between local, state and federal authorities and responsibilities.

3. Cost Philosophies on TAPS

"At the heart of the story is incredible greed." (60)

Because of the huge profits to be made once the Prudhoe Bay oil began flowing to markets, Alyeska found that pipeline construction costs were immaterial when compared to the expeditions completion of the pipeline. For this reason, Alyeska negotiated "no strike" labor contracts with all the craft unions (58, 59, 60, 61) and in return the unions received high hourly rates, long hours, time-and-a-half for all work beyond 40 hours a week and many special work rules. It was common for the union members to work seven ten or twelve hour shifts per week, or longer, which resulted in gross earnings ranging from $1,000 to $2,000 or more per week, or from $50,000 to $100,000 per year. Under the union's hiring rules, after a worker had worked six months and had his "A" card, he could quit one $80,000 a year job and have another $80,000 a year job the next day. Thus the workers on the TAPS achieved a degree of freedom obtained by few people; the freedom to work when, and at precisely what, one chose. (58, 59, 60) Because of this situation and the unions' special TAPS work rules the contractors had difficulty controlling their employees.

On the other hand, the execution contractors who were retained by Alyeska to actually build the TAPS, had cost-plus contracts with the pipeline company. Therefore, the contractors didn't care how much they spent. The more they spent the more they made, thus contractors had no incentive to discourage worker featherbedding. In addition, Alyeska owned most of the construction equipment on the TAPS project and hence the contractors didn't have to worry about making cost efficient use of equipment, as they normally would with their own equipment under a fixed fee contract. (58, 59, 60)

And finally, Alyeska had a cost-plus contract with the consumers. The tariff for common carrier pipelines such as the TAPS (or Northern Tier) is set by the federal government based on the cost of the pipeline plus a fair return or investment, usually from about 7 to 18% of the total project cost. Hence, the oil companies, who own the oil in Prudhoe Bay and who own the Alyeska Pipeline, are paying themselves to move their own oil through their own pipeline. According to an agreement reached between former President Nixon and the oil companies (58), the oil companies are allowed to charge the free world market price for Prudhoe Bay oil; its price is not controlled by the U.S. government. With cost plus to the consumer, the oil companies could not lose.

Excerpts from the books on the pipeline provide further detail on these arrangements.

"This contract works altogether different from any other contract I've ever been involved in. This contract is a cost-plus-negotiated-fixed-fee." (58)

"The contractors' situation was thus very much like that of Alyeska's oil-company owners: costs and profit assured, they could not lose. It is evident also that, so controlled and protected, they had no strong motive for practicing economy." (58)

"In theory the contractor redid at his own expense any work judged substandard by Alyeska's Quality Control men or the government surveillance officers; but it does not seem that the auditors were well equipped to distinguish new work from work that was being redone. And at least toward the end of the project there were bonuses for contractors that met or exceeded their schedules...." (58)

"Defensively and late, Alyeska advanced reasons for these makeshifts: esentially, that its plans were so continually changed by government directives that no contractor could prudently relay on them in preparing a fixed bid. Even without that limitation, however, it appears that the plans were still incomplete when the time came to let contrcts and start construction: they were not in a biddable state. Once again, schedule, not cost, was the primary motive." (58)

"Even in this brief overview it seems obvious that saving money was not the prime purpose of Alyeska's contract system but rather completing the project as rapidly as possible. It was in fact the most economical or 'cost-effective' strategy to adopt: defensively, by completing the work and bringing the fixed costs to a stop; aggressively, by producing the field and turning the oil into income without further delay." (58)

"So, one of the most important and elusive questions becomes why Alyeska was willing to pay almost any price to get the Prudhoe Bay oil to market as soon as possible. State pipeline coordinator Charles (Chuck) Champion, himself a former oilman, told us in late 1976 that the failure to hold down costs was primarily due to the oil companies' attitude that the sooner they finished the pipeline the quicker they would begin to reap the profits from oil production. Said Champion:

'There is no amount of money you can spend in any given day on this project that will come anywhere near the profit to be made by completing it one day earlier....

They want to get their money out of this thing. So, in a project where you have billions of dollars on the table, you go as fast as you possibly can. That is the nature of the beast, that is the nature of any construction project: time is money, time equates to money, and especially at the end when you'll have ultimately probably some twenty-some-odd million dollars a day from the production at Prudhoe Bay. So in any given day on this project, you're spending probably ten million dollars to 12 million dollars a day. If you can spend that much and complete this thing one day earlier, you're still ahead....The stakes are extremely high, but the payoff is even higher.'

That explanation is true, at least as far as it goes. But it is too simplistic. Another--and one heard repeatedly in Alaska--is that the pipeline was one big cost-plus project. The pipeline subcontractors had cost-plus contracts with Alyeska and the owner oil companies have a cost-plus arrangement with the consumer.

The oil companies field tariff applications with the Interstate Commerce Commission in 1977. The requested tariffs consisted of the pipeline's cost--including any waste--and a "reasonable return on investment." Since the companies that own the oil also own the pipeline, they are essentially paying themselves for the right to use the pipeline." (61)

"A more realistic profit assessment was made by a Wall Street investment research analysis company in 1977. The firm, Wainright Securities, Inc., predicted in an eighty-five-page copyrighted industry review that the oil companies would earn $98 billion--net--through the year 2005, a return of almost $4 billion annually!" (61)

"But, regardless of which profit estimate is relied upon, as state Attorney General Avrum Gross told us: "The cost of the line ($10 billion) is peanuts compared to the staggering profits." (61)

The above estimate of a $98 billion net return to the oil companies from the Prudhoe Bay oil was made in 1977 when the world price per barrel of crude was approximately $15.00. Today that price is $30.00 per barrel or more, so now those oil companies stand to make around $200 billion net return on Alaska's oil.

4. Cost of Government Surveillance

"This is the place to consider what it cost...to hold Alyeska to the standards under which the pipeline was

built. All of these costs were borne, as we have noted, by Alyeska and therefore formed part of the total bill for construction. That bill, in turn, will ultimately be paid by whoever buys the oil--which is to say, by all of us. Apart from one's natural curiosity about what things cost, therefore, we have an immediate interest in knowing whether we got good value for our money.

Before the start of construction, the Department of the Interior spent more than $12 million on evaluation of alternative pipeline routes and of the TAPS proposal and on the mammoth undertaking represented by the Environmental Impact Statement. From the start of construction to the end of the 1975 fiscal year (June 30), it took about $15 million to operate Mr. Rollins's APO, and the budget continued at the same rate of $12 million per year. To the end of a construction in June 1977, therefore, the total came to $34.4 million, and allowing for continued monitoring of cleanup and operation to at least the end of the year, it looks as if the final amount would be around $40 million. The state effort came to about one tenth of this total. These figures cover direct expenses billed by the two pipeline offices but not what Alyeska provided in kind to the several sets of surveillance officers while they were on the line--room and board, office space, ground transportation, planes in and out of camp. In all probability, then, the entire cost of surveillance would be contained in the round sum of $50 million.

That is, of course, a great deal of money, as you and I judge such things. Measured against the $7.7 billion that the construction estimates had reached by mid-1976 (now $10 billion), it is less than 1 per cent and does not seem so grand; and it shrinks further as the costs tricle in and continue to swell. Without falling victim to the bureaucrats; inability to distinguish tens of millions from hundreds of millions of dollars, we might reasonably conclude, therefore, that the cost was not disproportionate to the job done and that, if the achievements were decidedly mixed, we at least got as much as we paid for." (58)

As of October 1978, the APO had calculated that the federal government surveillance on the TAPS cost a total of $52 million. (98) These government design review and semi-quality assurance efforts were of value to the pipeline company. As an MRI contracted study said,

"Indeed, the Authorized Officer/Technical Support Contractor organization contributed scientific and technical expertise which, in many cases, proved beneficial to the Permittees." (25)

5. Public Access to TAPS Information

Alyeska, with APO's approval, tightly controlled all access to the TAPS project. Members of the public or the press were not allowed on the project unless they were continuously accompanied by Alyeska public relations personnel or by a government official. APO was very restrictive in releasing documents requested by the public and APO never permitted the public to have access to APO's files. SPCO and JFWAT, on the other hand, were very open with project information and they allowed anyone to go through their files, with some minor restrictions, such as on personnel records.

> "After some early fumbling, Alyeska's policies became increasingly restrictive. Thus, visits to the work sites were allowed only in the company of an Alyeska representative (usually Beverly Ward) at times and places of its choosing, and only on condition that one refrain from talking to the men; to make sure this condition was adhered to and the time limited for direct observation, overnight stays in the camps are prohibited, though there were privileged exceptions." (58)

> "With all allowances made, however, it seems inescapable that the chief practical use of these policies was to restrict and control information about the project to what favored the company's view of itself." (58)

> "...(APO) had placed obstacles in the way of citizen access to data on pipeline construction.

> This last allegation was a serious one. G. M Zemansky, a board member of the Fairbanks Environmental Center, commented in August 1976 at the Twenty-seventy Alaska Science Conference that Rollins's office and Alyeska had effectively barred adequate surveillance of the pipeline construction by private environmental groups. As Zemansky reported, and as others told us, the private conservation groups generally did a poor job of monitoring the environmental impact of the pipeline while it was being constructed. Part of this, though, was no fault of theirs. For one thing, trying to monitor pipeline construction presented difficulties similar to those encountered by a journalist covering a war: the military decides what you see and when you see it. News reporters were always escorted by an Alyeska representative when doing stories at pipeline construction sites. Since access to the Haul Road was barred to private parties, those citizens wishing to see the pipeline had to go as guests of Alyeska or with one of the people from state and federal monitoring teams.

Early in 1974, a coalition of environmental groups, including the Sierra Club and the National Wildlife Federation, formed the Arctic Environmental Council, which was backed by the prestigious Arctic Institute of North America. Its purpose was to monitor pipeline construction. The Arctic Institute, in explaining early on the need for such a council, said that, 'it might be timely to attempt to bring together the environmentalists-conservationists with the pipeline owners to being serious discussions of their basic differences, looking toward finding solutions--or at least identifying areas of mutual concern. It must be said at the same time that a number of persons consulted felt that any such effort would likely be entirely fruitless.' Initial funding came from the Laurel Foundation and the Rockefeller Foundation.

The effort, from an environmental standpoint, was a disaster. For Alyeska it was a public relations coup. Although the council was set up with the aim of having no direct link with government or industry, it was disclosed after the group's first pipeline visit that Alyeska picked up the travel fare. Worse, the council didn't have the funds to publish a report on its trip; incredibly, the environmental group approached Alyeska and asked it to pay the publication costs. Apparently delighted, Alyeska agreed to print the report free of charge. In addition, the Atlantic Richfield Foundation provided a $10,000 grant to the Arctic Institute for the specific purpose of funding the council's activities. Arco, of course, is one of the major members of the Alyeska consortium.

Although the council's report contained some criticisms of Alyeska's performance, it generally gave the firm high marks for protecting the environment during pipeline construction. Alyeska then began quoting in its own publications those excerpts from the council's report which put Alyeska's environmental performance in a good light." (61)

"But the council's lone Alaskan member, David R. Klein, of the University of Alaska's Cooperative Wildlife Research Unit, as well as other environmentalists not associated with the council, didn't see it that way. In July 1976 Klein resigned from the council, complaining that the group's credibility was negligible since it had close ties with the organization it was supposed to be investigating and had failed to publish any report dealing with later stages of pipeline construction. Before he resigned, in a letter to the council's Armstrong, Klein protested that 'Alyeska has gained considerable public relations benefit from our previous trip by quoting, for their

own press releases and brochures, only those portions of the news releases which cast them in a favorable light and by stressing that the council was a group getting the true picture of the pipeline project out to the public. Frankly, I do not appreciate being part of such an image.' " (61)

"As important as that effort may be, it is indeed startling that the major environmental groups failed to monitor pipeline construction. After spending years and hundreds of thousands of dollars fighting against construction of the pipeline and for tough environmental stipulations, the major organizations failed even to set up a truly independent task force with a staff adequate to monitor construction and public reports. Granted, Alyeska and the federal Alaska Pipeline Office were blocking environmentalists' efforts. But such obstructions have not deterred these organizations in the past. Had the environmentalists taken their case to the public through the press and through lawsuits designed to give them access to the pipeline, they probably would have prevailed. Such monitoring not only might have headed off environmental problems but would have set an important precedent for citizen monitoring of future pipelines in the Arctic." (61)

A laborer who worked on TAPS summed this up by saying,

"The fact that the pipeline is something less than a total fiasco is due to the efforts of the much maligned environmentalists. Alyeska certainly cares no more about ecology (for all their public relations efforts) than they do about wasted time, money, or materials. Alyeska is ecologically concerned exactly to the extent that it is forced to be. We have the environmentalists to thank for making the pipeline construction less of a mess than it might have been." (58)

Mr. Hemming, the supervisor of the federal JFWAT biologists was correctly more optimistic when he concluded that,

"...considering the fact that it's a unique project and also a unique approach for industry, being involved with these types of control--I think its worked. We'd all say that it could be done a lot better and a hell of a lot less painfully. Industry has a long way to go. But this is a start...." (61)

6. Advantages of Checks and Balances

The U.S. Fish and Wildlife Service funded study of Fish and Wildlife Protection on the TAPS (42) made the following comments on the advantages

of the checks and balances that existed within the government's monitoring organizations of that project:

> "The assumption that government's interests, particularly in terms of early project completion, would best be served by centralizing responsibilities and authorities as much as possible was a foundational concept for APO, SPCO and JFWAT.
>
> The inter-governmental strategy of concentrating functions was, by and large, successful in decreasing inefficiencies inherent in situations with multi-agency responsibilities. It must be remembered, however, that it is precisely these 'inefficiencies' which provide checks and balances, and multiple points of access and authority, and thereby allow for the simultaneous pursuit of multiple, sometimes conflicting social goals. The coalescing of federal responsibilities in Interior and particularly APO meant that the multiple purposes of government and specifically the goals of timely project completion and environmental protection would be internalized in a single entity. It is worth noting, in this regard, that
>
> 'Studies of individual and organizational behavior have demonstrated that the alternative policies and programs that an individual or group considers relevant depend upon the experience and interest of the individual or group; an administrative agency dominated by individuals trained in a particular profession or influenced primarily by one interest group (such as the petroleum industry) will therefore tend not to view as relevant alternative programs that would be considered desirable by an agency dominated by another profession or another interest group.
>
> It is clear that an agency that is run primarily by engineers will have a quite different view of the seriousness of environmental effects and opinions on appropriate programs than an agency, for example, which is operated largely by biologists. Of equal importance, an agency with close ties to fish and game interests will view program possibilities quite differently from an agency with close ties to electric power generating companies.'
>
> Every key decision making staff position in the Alaska Pipeline Office (AO, AOR, construction coordinator, AOFR) was held by an engineer throughout the construction phase. (In the summer of 1977, three biologists were given AOFR authority, primarily for restoration activities following construction.)" (42)

B. ALASKA NATURAL GAS TRANSPORTATION SYSTEM

1. Organization - Federal

The Alaska Natural Gas Transportation Act, passed by Congress in 1976, created the position of Federal Inspector (FI) to oversee construction of the entire 4,000 plus miles of the project; the Alaska Segment, the Western leg and the Northern Border Pipeline. The Federal Inspector is responsible for all enforcement on the federally controlled portions of the gasline project. The Office of Federal Inspector is not within any Department of the Federal Government. The Federal Inspector reports directly to the Vice President of the United States. Within the Office of the Federal Inspector there are Authorized Officers (AO) from five government organizations: Department of Transportation, Environmental Protection Association, Department of Interior, Federal Energy Regulatory Commission, and the Army Corps of Engineers. These Authorized Officers work with the Federal Inspector to insure that the gasline project obtains the required federal permits and complies with all applicable federal laws and regulations. In the Federal Inspector's Office, there are Directors of Engineering and Environmental matters that oversee all segments of the gasline project. Geotechnical, biological, and engineering considerations have equal status and there is a strong interdisciplinary approach to the entire organization. For each segment of the project, there will be a supervisor for engineering and geotechnical matters and one for biological concerns. They will report directly to the Federal Inspector's Office. During actual construction there will also be a Federal Officer's Representative (FOR) for each construction segment. The Federal Officer's Representatives will be interdisciplinary positions and the FOR's may be either biologists, engineers, or other professionals so long as they meet basic requirements. The FOR's will be the final authority within each construction section and the FOR's will be assisted by interdisciplinary field staff. (99)

If one or more of the five Authorized Officers cannot reach agreement on any subject with the Federal Inspector, that dispute is taken to an Executive Policy Board which is composed of all five Authorized Officers plus a few other positions that have yet to be determined. Each member of the Executive Policy Board will have one vote and any matter will be finalized by a majority vote of the Board. If the Executive Policy Board cannot reach a decision, that matter will be forwarded directly to the President of the United States for his resolution. (99)

Federal surveillance of the gasline project has been modeled after the experience that was gained during construction of the Trans-Alaska Pipeline System (TAPS). (99) By comparing the organization of the Federal Inspector's Office and the organization of the federal government for TAPS monitoring, the structural differences within these two agencies can be seen. More federal departments have been incorporated into gasline surveillance and the Federal Inspector's Office has placed more emphasis on a broad multidisciplinary approach to monitoring that project. (99)

There are also two substantive differences between the old APO agency and the new Federal Inspector's Office. First, Congress has sought to insure

a cost efficient gasline project. Due to the huge cost overruns that were encountered during construction of the TAPS, Congress mandated that the gasline shall be built in a cost efficient manner. The Federal Energy Regulatory Commission (FERC) which sets pipeline tariff rates, has been included as part of the gasline surveillance team in order to enforce this mandate. FERC is expected to hire numerous auditors and attorneys to continuously and constantly review all aspects of gasline costs during the entire project. (99)

Secondly, the gasline project has a greater lead time than was available on the TAPS. The federal government (and Alaska) has had more input into the early design of the natural gas pipeline and has utilized this opportunity to effectively minimize the impacts of the project. The federal government (and Alaska) is working with the gasline companys to develop the preliminary design of the project. It is the opinion of personnel with the Alaska portion of the Federal Inspector's Office that it is critical for the government to input biological and engineering data directly into all phases of the project's design, development and review. (99) There are three working groups within the Northwest Alaska Gas Company; civil, biological and physical. Government representatives (federal and state) are meeting with these company groups to input and implement mitigating measures into the project basic design. (99)

2. Organization - State

To monitor construction of the gasline project within Alaska, the state has created a State Pipeline Coordinator's Office (SPCO) which is modeled after Alaska's experience on the TAPS. Alaska has modified the relationship of SPCO and other state agencies to remove some of the problems that were encountered on the oil pipeline. The final administrative order on SPCO has not yet been issued by the Governor's Office. However, an official of the Alaska Department of Fish and Game has stated that Alaska's surveillance of the gasline project will most probably have the following structure.

SPCO will have final authority for the enforcement of the right-of-way lease conditions and stipulations that are not addressed by normal statutory authority and regulations. Within SPCO, there will be representatives of the Alaska Departments of Environmental Conservation (ADEC), Fish and Game (ADFG), and Transportation (ADOT). SPCO will not have the power to override the permit or statutory requirements of ADEC, ADFG or ADOT, but these departments will coordinate their gasline permits through the SPCO. (54, 55) In each construction section within the state there will be a SPCO Field Surveillance Office (FSO), and representatives of ADEC, ADFG, and ADOT. The FSO will not be able to override ADFG, ADEC, or ADOT laws, regulations or permits. (54, 55)

The question of Alaska State jurisdiction on federal lands is yet to be resolved. ADEC will be the final authority for matters dealing with water quality, air quality or solid waste disposal on all lands--federal, state and private. This authority is based on federal statutes which cover these

subjects and say that, if the state's laws are more stringent than federal standards, state laws shall apply. (54, 55) Both the Northwest Gasline Company and the federal government maintain that State Fish and Game laws, especially the Anadromous Fish Stream Act A.S. 16.05.870, do not apply on federal land. In other words, they believe that the pipeline company does not need a Fish and Game permit for any river crossings or drainage structures on federal land. (54, 55) Alaska disagrees with this interpretation of the law and holds that all state laws apply on federal land unless specifically preempted by federal legislation. (54, 55) Recent TAPS court cases have decided this issue in favor of the state.

Under the Alaska Natural Gas Transportation Act, the President has determined that the federal government and the State of Alaska must enter into a cooperative agreement prior to gasline construction. (54) To date, no draft copy of any such Federal-State Corporative Agreement has been made available by Alaska or the U.S. government. (54)

3. Environmental Oversight

In an attempt to prevent the types of serious environment problems that were documented during construction of the TAPS, various local and national environmental and conservation organizations have proposed that they be allowed to conduct their own monitoring of the gasline project (82, 100). These environmental groups have requested complete and unrestricted access to all portions of the project. They have proposed that a Gasline Overview Committee be established which would be composed of one representative of any interested local or national conservation organization. To guarantee the Committee's independence, it has been proposed that this Committee should be funded by a grant from the federal government, which would be reimbursed by the pipeline company. (82, 100)

This volunteer committee would employ full-time paid staff who would oversee the design and construction of the gasline project on a day to day basis. If the Committee's staff identified a problem that they believed was not being adequately addressed by either the pipeline company or the government monitors, they would communicate their concern to the Federal Inspector or the SPCO. If the government surveillance organization disagreed with the Committee's staff, or if the monitoring team refused to correct a problem which had been brought to their attention, then the Committee's staff would present that matter to the full Overview Committee. If the Overview Committee agreed with their staff's evaluation of a critical problem and if the government surveillance organization still, after repeated consultations, refused to adequately correct the situation, then the Overview Committee could seek a solution via political or legal means. (82, 100)

The federal government has agreed in concept with the idea of public overview of the gasline project. The federal government has proposed that a Citizen Advisory Council be formed to monitor the gasline project. As viewed by the federal government, members of this Council would serve without compensation. Under the federal proposal, the Council would not have its own independent staff, but they could request the Federal Inspector

to lend staff to the Council. Any staff members that were loaned to the Council would be under the direct control of the Federal Inspector and would serve at his pleasure. (100)

This federal proposal is unacceptable to most of the major conservation organizations as they believe the Federal Inspector's control over the staff people selected for loan to the Council would not provide the independence that is necessary for the proper functioning of the Overview Committee. The conservation groups do not want a repeat of the TAPS Arctic Environmental Council that turned out to be a public relations coup for the Alyeska Pipeline Company. (61) This issue has yet to be resolved.

C. ENERGY FACILITIES SITE EVALUATION COUNCIL (EFSEC)

1. Process

Since 1970 the State of Washington has had a one stop site certification process for the construction, reconstruction and enlargement of major energy facilities within the state. This process is currently carried out through the state's Energy Facilities Site Evaluation Council (EFSEC). Any certification granted by EFSEC is binding on the state and each of its departments, agencies, bureaus, commissions, boards, and political subdivisions. EFSEC, in granting a certification, can preempt other state permit processes. To date, all major site certification agreements executed by EFSEC have been for fixed site electric generating facilities.

Any method or system of coordinated monitoring and surveillance of the Northern Tier Pipeline project, in order to comply with existing EFSEC legislation, will need to be approved and set in motion by EFSEC. It is therefore desirable to interpret the key steps in, and shortcomings of, the TAPS and other processes in light of EFSEC's powers and authorities. By doing so, one can design a pipeline monitoring process for the State of Washington that is appropriate in scale and content, and responsive to local circumstances.

Under the Revised Code of Washington, 80.50.071, an applicant, such as the NTPC, "shall pay reasonable costs as are actually and necessarily incurred...for inspection and determination of compliance...with the terms of the certification relative to monitoring the effects of construction and operation of the facility." The applicant initially pays the State Treasurer a deposit, against which monitoring costs are charged, and then makes quarterly payments to restore and maintain the deposit at its original level throughout construction and operation of the facility.

All monitoring of applicant activity is required to be done by state agencies through an interagency agreement with EFSEC. Yet, EFSEC retains authority for the determination of compliance with the site certification agreement. In practice, a monitoring committee of EFSEC and agency personnel meets at least monthly to review monitoring activity and the status of compliance.

EFSEC may revoke a certification if the holder thereof makes a material false statement in the application process, fails to comply with the certification terms and conditions, or violates the legislation creating EFSEC or orders by EFSEC. In addition, if field monitoring finds non-compliance with certification terms and conditions, the Chairman of EFSEC has emergency powers to stop work subject to review by the whole Council. This stop-work authority as currently interpreted under Chapter 463-54 WAC does not address socio-economic or certain environmental impacts (environmental degradation, non-imminent endangerments, etc.), and is not oriented to abating numerous small violations or effecting a dynamic, short-term, dispersed project.

2. Content

EFSEC site certifications to date have been patterned around six Articles. The first, Site Certification, sets out definitions, provides a physical site description, provides a project description, and authorizes the project subject to the terms and conditions of the certification. The second Article, General Conditions, describes legal relationships, enforcement, and inspection procedures.

The third Article, Project Construction, deals with construction schedule reporting and criteria for the construction of such items as access roads, erosion control works, transmission lines, water intake and discharge, and construction cleanup. Article Four, Operation of the Project, is concerned with the operating impacts of the plant due to water withdrawal and water discharge, as well as impacts on the air and ecosystem.

Article Five, Public and Environment Protection, covers emergency, security and monitoring plans. Monitoring is predominantly concerned with impacts on air, water and biota quality. Finally the sixth Article, Miscellaneous Provisions, deals with unique measures specific to the project and an assortment of other items including: project visitation, social and economic impacts, fire protection and solid waste plans, insurance, site retirement and certification compliance costs.

Overall, the terms and conditions of EFSEC site certifications are generally similar to those found within the pipeline industry. They differ in the level of detail cited; and in their responsiveness to fast moving, physically spread out construction projects, which effect many jurisdictions, hundreds of streams and rivers, and are designed as they are built.

D. RECOMMENDATIONS FOR PIPELINE MONITORING IN WASHINGTON STATE

Since Washington State has never been involved in a major pipeline project and because the TAPS was the first and only time a system of continuous, pipeline-builder reimbursed government surveillance has been employed on any large construction effort, the TAPS experience has been extensively utilized in formulating preliminary guidelines for State Surveillance of the Proposed Northern Tier Pipeline in the State of Washington. Because this report focuses on issues and problems, a generally critical tone is inherent in our analysis of the TAPS data. This should not obscure the fact, however, that the TAPS project represents a precedent-setting advancement in the art of integrating environmental values into a major development project (25, 31, 42).

> "Substantive accomplishments of the fish and wildlife agencies show up as part of the general advancements made in incorporating environmental stipulations and criteria into the basic rules governing the design and construction of the pipeline project. Particularly significant among the fish and wildlife-related elements of these new rules were the "construction windows" that specified permissible times for construction activity affecting particular habitats, standards for big game crossings, and stream-culvert velocity criteria. Notwithstanding the slippage between standards and performance, the formal incorporation and application of these new rules represents tangible progress in the state of the art, and they undoubtedly effected improvement in design review and construction monitoring process through the effort of JFWAT and other surveillance organizations." (42)

There were a great many things that worked well on the TAPS project, but due to limitations of time and resources these examples have not been explained in detail. Instead they have been incorporated into the Proposed Stipulations for the Northern Tier Pipeline (Appendix A). The TAPS Stipulations that proved in actual practice to be adequate and are apropos to a pipeline in Washington State, have been recommended verbatim while other stipulations have been modified in an attempt to alleviate some of the difficulties that were experienced on the Alaska Oil Pipeline.

1. TAPS and Northern Tier: Similarities and Differences

There are several similarities and differences between TAPS and the Proposed Northern Tier Pipeline which must be taken into account when comparing the two projects, and which must be given consideration when formulating any system of pipeline surveillance.

a. Political Climates

Construction of the Trans-Alaska Pipeline was authorized by Congress in the atmosphere of an acute, OPEC-induced, "energy crisis" (41). Congress determined that TAPS should be built as quickly as possible

because the project was deemed in the "national interest" and would also help the United States achieve "energy independence" (41, 64). Northern Tier has proclaimed that its pipeline would insure a "secure, embargo-proof" supply of crude oil for refineries from Washington to Ohio (93). The Northern Tier Company has also stated that its project would be an "All-American" pipeline. Northern Tier has also been sponsored in a climate of product shortages, curtailments, and possible gasoline rationing. This climate has changed with the recent appearance of a supply of crude oil in world markets. Hence the political conditions surrounding the proposed Northern Tier Pipeline are similar in many respects to the political circumstances that accompanied the construction of the TAPS.

b. Construction Methods

Due to permanently frozen ground or permafrost, more than half of the TAPS was built in an above-ground mode utilizing newly developed construction techniques. The Northern Tier States lack permafrost and Northern Tier, except possibly for a few aerial river crossings, will have no above-ground pipeline construction. However, almost one-half of the TAPS was buried using normal pipeline construction methods which are similar to the construction practices which have been outlined by the Northern Tier Company. Hence, much of the specific TAPS data is applicable to the Northern Tier Project (8, 15, 16, 43, 65, 72, 74, 83, 84, 85). In addition, the principles, theory, and practice of government monitoring, quality control, and construction management, as exemplified on TAPS, are applicable to any pipeline construction project.

The TAPS is 48 inches in diameter and 800 miles long while Northern Tier would be 40 to 42 inches in diameter and 1,491 miles long. Northern Tier witnesses have testified in hearings before EFSEC that Northern Tier would be the second longest initial pipeline construction project in the entire world, being surpassed only by a recently finished natural gas pipeline in the Soviet Union that was 56 inches in diameter and 1,662 miles long (91).

c. Planning Process

Since proper design and centerline selection are as important or more important than selection of the general route in terms of minimizing potential impacts of pipeline construction, governments must be actively and continuously involved in monitoring all phases of any pipeline construction project in order to adequately protect the public's resources (86). On the TAPS, the government was involved in design review and field monitoring because Alyeska had no final plans or design when the Company was authorized to construct their pipeline. Northern Tier does not now have and will not have any final designs, plans, or specifications until months after they have received their final permit or the final legal challenge to their project has been resolved (87, 88, 89). Hence, if Northern Tier is built, it must be closely monitored by government agencies to insure compliance with applicable laws and regulations so that the public's interests are protected.

d. State Financial Incentives

As documented in a previous chapter, Alaska had a tremendous financial incentive to push for the quickest possible construction of the TAPS because of the State's one-eighth royalty ownership of the Prudhoe Bay oil (42, 58, 59, 60, 61). Washington State does not stand to gain financially from the Northern Tier Project, except through construction employment and increased property taxes. Hence, one would assume that Washington State has no compelling financial reasons to exempt Northern Tier from applicable laws and regulations. Under the present proposal of no Puget Sound refinery hookups, Washington State receives all of the impacts but does not benefit from the Northern Tier Project, i.e., it receives no additional oil.

e. Type of Construction Contract

Alyeska had cost plus contracts with the execution contractors who actually built the TAPS. These cost plus arrangements led to some of the problems that were experienced during construction of that project (58, 59, 60, 61). Northern Tier has stated that their Company intends to negotiate fixed fee or lump sum contracts with the pipeline contractors who would build their project (92). Whether Northern Tier is successful in establishing fixed fee contracts is important, since the attitudes and cost-overruns that are encouraged under cost plus contracts exascerbate the impacts of pipeline construction.

f. Labor Contracts

The craft unions that were involved in TAPS are the same craft unions that would build the Northern Tier Pipeline. Alyeska agreed to union demands of high project wages and special work rules in exchange for pledges from the unions not to strike during construction of that project (58, 59, 60, 61). Northern Tier plans to build all 1,491 miles of its pipeline in just 10 months. Construction of the off-loading facilities and pump stations would take an additional 12 months. Because of this tight construction schedule and the large financial incentives that Northern Tier will have for quick completion once the project starts (see Item g below), it is extremely probable that Northern Tier will want to obtain no-strike contracts with all the unions that would be involved in their project. To obtain a no-strike contract, Northern Tier will most probably have to consent to the same general conditions that Alyeska agreed to on the TAPS, i.e., high project pay scales and special union work rules. These provisions can have a substantial impact on the actual effectiveness of many of Northern Tier's proposed mitigation measures.

For example, in the Montana Final EIS (86), Northern Tier claims that they will prohibit any of their employees from possessing firearms while they are actually working on the project. This would be done to reduce wildlife poaching and the killing of livestock, and to protect the public's safety. The Northern Tier Pipeline Company states that they would fire any employee that was caught violating this company rule. On the TAPS, Alyeska fired numerous people for various causes. However, under union rules, Alyeska

could not "black list" fired union personnel and Alyeska could not refuse to hire any member that the unions sent out in response to a company job call; even someone Alyeska had just fired. In actual practice, Alyeska would fire a union member for a violation of rules or regulations, the fired worker would then report back to his union hall, and often the very next day, that individual would be back on the project working for a different contractor in a different job. Under such union rules and practices, threat of termination or actual termination by a pipeline company is of very little practical value in controlling the offense that it was meant to eliminate.

g. Pipeline Company Financial Incentives

To quote Mr. Chuck Champion, former head of the Alaska State Pipeline Coordinator's Office, "...that is the nature of any construction project, time is money, time equates to money...." (61). As shown earlier, the oil companies who owned the Alyeska Pipeline Service Company had a huge financial incentive in completing that project in the absolutely shortest time. Time to them was more important than money, stipulations, or quality. Since the Northern Tier Pipeline Company does not presently own any of the oil that would potentially move through its steel conduit, Northern Tier does not have the same magnitude of financial incentive for swift construction that existed on the TAPS. However, Northern Tier still has a large financial incentive in completing their project in an absolutely minimal amount of time. A recent U.S. Department of Interior report predicts that Northern Tier would make over one million dollars a day if their pipeline is built and it operates at its maximum designed throughput capacity (57, 90). Hence, once Northern Tier begins construction, the pipeline company stands to lose over one million dollars a day for each day lost on construction schedules. If Northern Tier's Construction Schedule slipped 30 days that's a loss of 30 million dollars. If the project were behind schedule a year, that's over 360 million dollars lost. A million dollars a day of lost revenue is a very strong financial incentive. It is powerful enough to make Northern Tier, like Alyeska, finish their pipeline as quickly as possible regardless of the costs; economic, social or environmental.

This pressure will be present on the Northern Tier Project and any government surveillance system must be able to withstand that influence. The government must make it perfectly clear to the Northern Tier Pipeline Company, at the very start of the project, that the government mandated standards, specifications and stipulations will absolutely not be lowered should construction activities fall behind schedule. Northern Tier must agree to build their project in a certain specified manner before they begin any construction, and must be held to those commitments.

h. Land Ownership

As has been previously mentioned, the TAPS was built almost entirely on Federal or State land (less than 0.5% was constructed on private land). In Alaska, none of the few existing local governments were substantially involved in the TAPS project. This situation is

substantially reversed on the proposed Northern Tier Pipeline since 80-90% of that project will be built on private land. Northern Tier will also impact many county and city governments. Unless compliance authority is shifted, Northern Tier must comply with a variety of local laws, ordinances, and regulations in the State of Washington. These factors strongly argue for surveillance of the proposed pipeline by state government, using a process which incorporates private landowners, and local governments, and provides equal protection of the rights of all landowners and political sub-divisions.

2. Key Process Elements - Forcing Functions

Forcing functions are the elements within a system that control the functioning of that entire system. They are the key components that dictate how all the other portions of that system interact. If a forcing function is altered, that change effects the operation of the entire system. There are key elements within any system of pipeline monitoring done by an organization that are critical to the proper functioning of that surveillance organization. Hence, there are several critical forcing functions that are recommended as prerequisites for the proposed system of coordinated government surveillance for the Northern Tier Pipeline Project in the State of Washington. These are:

a. Reimbursement of Monitoring Costs

The cost of all government surveillance of the proposed Northern Tier Pipeline should be paid for by the pipeline company on a reimbursable services basis as is required by EFSEC enacting legislation, as was done on TAPS (41), as is presently being done by the federal government and Alaska on the Alaska Natural Gas Pipeline (52, 54, 55), as was proposed by the federal government for SOHIO's planned Pactex pipeline (40), and as the federal government is currently doing on the Northern Tier Project (53). (See Appendix A.) When the 1920 Mineral Leasing Act was amended to permit construction of the TAPS, Congress included the provision that monitoring of any pipeline project by the federal government would be paid for by the pipeline company that was constructing it (94).

Reasonable monitoring of the Northern Tier Pipeline should cover construction, operations and maintenance, and termination of the project. Under the 1920 Mineral Leasing Act, the federal government is reimbursed for all the costs that it incurs during the entire life of all pipeline projects (94) and as such, the federal government was reimbursed for all its surveillance of TAPS construction. The federal government is presently being reimbursed for its ongoing (at a very reduced level) monitoring of operations and maintenance of the TAPS (98).

In the state right-of-way lease, Alaska was to be reimbursed for all of its costs for monitoring the TAPS project during construction and termination, but not operations and maintenance. When TAPS construction officially ended in 1977, the state surveillance organizations, SPCO and JFWAT, were disbanded because funds were not available to continue them. This occurred

even though Alyeska had neither finished all the required restoration work, nor corrected all the environmental problems that had been documented by SPCO or JFWAT. The Alaska Department of Fish and Game, Habitat Protection Section, made a request to have $100,000 included in the Fish and Game Department's 1978 budget so that biologists could continue to monitor Alyeska's restoration work. This funding request by the Habitat Protection Section was deleted from the Department's budget because the Commissioner of Fish and Game did not believe that the state legislature, who must authorize all Fish and Game expenditures, would approve of the item (54, 95). In 1979, the Habitat Protection Section made a similar request since Alyeska still had not corrected all the identified environmental problems. This time the Commissioner of Fish and Game left the item in the Department's budget request to the state legislature. This request was not approved by the legislature (54, 95). Certain members of the legislature who represent the interests of the oil companies have been able to block all general fund appropriations for continuous state monitoring.

The State of Washington should require reimbursement of monitoring services during both construction and operation of any major new pipeline. This provision when coupled with other certification conditions, such as the state's right-to-perform and company bonding, will enable the state to deal with problems like oil spills. In effect the state could be guaranteed that any oil spill was cleaned up, and its effects monitored, to the satisfaction of the state, at no cost to the state. When there has been a mainline oil spill on TAPS, of which to date there have been seven major spills (96, 97), state monitoring efforts have been restricted because the agencies, especially the Department of Fish and Game, have not had money in their budgets to adequately monitor clean up activities (54, 55, 95).

If one is for strict state surveillance on the Northern Tier Pipeline but thinks that government monitoring of the project should be financed with general funds, one is in actuality eliminating state government surveillance of the pipeline. In all probability the legislature would not fund the state surveillance organization. This is especially true in the present political atmosphere of budget cutting, tax cuts, and balanced spending. If on the other hand, the legislature did fund a state monitoring program, it would probably not be at a level that was adequate for the job. Without pipeline company reimbursement for <u>all</u> government expenses, state and local, that will be incurred monitoring the Northern Tier project the chances are remote that the public's interests will be protected during pipeline construction.

b. <u>Co-Authority of Disciplines</u>

From the TAPS experience it is obvious that biologists must have co-authority with engineers if environmental matters are to be given equal consideration during pipeline construction. (8, 12, 15, 16, 29, 32, 42, 58, 61, 72, 73, 74, 77, 78, 79, 86) In addition, both should be on an equal footing with representatives of local government jurisdiction containing the terminal, and along the pipeline route. No group should be

able to override or disregard another, as was the case on the TAPS. There must be a system of checks and balances so that no one profession can dominate any other group. The relationship between engineers, biologists and local government should be one of understanding each others' concerns, of cooperation, and of compromise. All have to work together as co-equals if the quality of life, public water quality, fish and wildlife, and other resources are to be accorded the degree of protection that is necessary to minimize both the short and long term adverse impacts of any pipeline construction.

c. Approval of Plans

All the pipeline company's plans must be approved by the government prior to construction. The pipeline company must submit a preliminary design for review and approval before the company is allowed to apply for a "notice-to-proceed". In Northern Tier's case, EFSEC's initial review of the project may be considered to be a preliminary design review stage, depending upon the adequacy of preliminary plans. However, Northern Tier must not be allowed to begin any construction until it has received a further notice-to-proceed from the government based on final design and engineering of each component of the pipeline.

On TAPS, Alyeska obtained nearly 700 notices-to-proceed (42). Northern Tier's notice-to-proceed applications should include the items that were required on the TAPS, especially the provision that Northern Tier physically survey and stake the pipeline centerline and clearing limits prior to submitting a notice-to-proceed application. It is one thing to draw a centerline on a topographical map and from that line make recommendations to minimize pipeline impacts, but quite another realization to actually see where the pipeline is scheduled to be built. Often a minor realignment of the pipeline to avoid sensitive environmental area will be much less costly than the restoration of that disturbed habitat. Once a cooridor has been selected, government agencies must be closely involved in selecting specific alignments (31) if they are to minimize the effects of pipeline construction (86).

As discussed earlier on TAPS, Alyeska separated its government notice-to-proceed process from its execution contracts process. One study by the Alaska Pipeline Office concluded that the notice-to-proceed process should also have been part of Alyeska's execution contracts process so that pipeline integrity and environmental protection standards approved by the government were the ones to which the pipeline was actually constructed (25). Northern Tier's government notice-to-proceed process must be part of their execution contracts process.

d. Stop-Work Authority

The government must have stop-work authority. The government must have authority to stop work if the company is in violation of any approved plan, specification or stipulation. Without stop-work authority, in reality there is no actual government surveillance. Stop-work authority is absolutely mandatory.

e. Quality Control & Quality Assurance

Quality control will be one of the most important parts of the Northern Tier Pipeline Company's construction effort. It does no good to have the best environmental stipulations, best welding procedures, technical specifications and the like if these are not enforced by a quality control program. Without proper quality control procedures, adequate quality control staff, quality control independence, and quality control stop-work authority other regulations are ineffective. On the Northern Tier Pipeline it is recommended that there be:

i. Quality control & quality assurance lease conditions and stipulations similar to those on the TAPS, but with certain modifications including a specific provision for adequate environmental quality control. (See Appendix 1.)

ii. Government review and approval of a quality control & quality assurance manual, quality control & quality assurance personnel qualifications, and a quality control & quality assurance training program before any construction begins; with absolutely no exceptions.

iii. Quality control & quality assurance must be totally independent of the execution contractor's or construction management's control or supervision. They should report to the company at a higher level, and at "arm's length" from those doing the work.

iv. Quality control & quality assurance must have stop-work authority so that they are able to halt construction that is in non-compliance.

v. All government non-conformance reports (NCRs) to the pipeline company must be signed by their construction engineering and quality control people with double receipt signatures. The company must give the government copies of all quality control NCRs on the same day that they are written.

vi. All NCRs, issued by the government and by the Company's quality control group, must be corrected or resolved according to specified conditions and time limits.

vii. Within each construction section there must be at least a weekly meeting between the company and government personnel to discuss all NCRs. This meeting may be part of a weekly general coordination meeting.

viii. The company must not be allowed to change its approved quality control procedures without prior written governmental approval.

f. Public Information

The Public's access to project information must be assured. The government's monitoring files and reports must be open for public review. The government also must not prohibit responsible public access to actual construction sites. The proper government function is to insure

that the pipeline is built according to approved plans, specifications and stipulations in a manner that will minimize short and long term impacts to the public's resources.

The Alaska Department of Fish and Game has recently adopted a policy of public access to gasline project information that protects the company's right to its proprietary information. The company clearly identifies any material that it considers to be of a proprietary nature when it submits that information to the government. If the public requests a document that the company has marked as proprietary, the Fish and Game Department notifies the company. If the company objects in writing within 10 days, the Department will not release the item in question to the public. If the company does not respond or responds in the affirmative, the public obtains the information. If the company objects, the Department does not release the requested information, and the dispute is assumed to be between the company and the public, with the government not having to justify or defend in court the company's decision. This policy sidesteps the governments obligation to make an independent determination of the proprietary nature of the information sought and therefore is open to legal challenge. A similar process wherein the state made an independent determination on those requests denied by the company, after denial, is recommended for the Northern Tier project.

g. Right-to-Perform

Section 18 of the federal TAPS grant of right-of-way contained provisions that gave the United States the "right-to-perform". These provisions state that, if after proper written notification, the company does not perform certain work as directed by the government in compliance with specific lease provisions or stipulations, the government may perform the work and then bill the company for that work. This condition, in conjunction with the company performance bonding, as discussed in Appendix A, is another guarantee that the company will comply with all the conditions, specifications, and stipulations of a site certification and grant of right-of-way, particularly after construction of the project when stop-work authority loses its impact. Though this provision was never utilized on the TAPS project, it is necessary for the government to have this authority to insure the company's compliance.

3. Recommended State System of Monitoring

a. Assumptions - General Recommendations

Government surveillance should not be viewed as a police effort. The primary function of government surveillance is to insure project compliance by reviewing the company's plans prior to any construction and to approve those plans subject to whatever conditions are necessary to protect the public's resources. The most efficient and effective way to minimize both the short and long term impacts of any project is to adequately address all the important concerns during a comprehensive review of site specific plans. It is easier to insure the continued use of a valued resource through proper planning and foresignt than it is to change plans once construction begins or to properly restore a damaged area. The police power of any government surveillance organization should be used only as a last resort and only when the company is not complying with approved plans, specifications or stipulations.

The following recommendations for monitoring of the Northern Tier Pipeline are based upon several assumptions. They are: (1) Washington's environment will be accorded the same or a higher degree of protection than was given to Alaska's environment during construction of the TAPS. (2) The Northern Tier Pipeline Company will be required to have an independent quality control & quality assurance program approved by the government before the beginning of any construction. Therefore, government surveillance will have to be staffed only for spot checking Northern Tier's compliance. (If Northern Tier does not have an adequate quality control & quality assurance program, the number of government surveillance personnel will have to be increased to insure protection of Washington's resources.) (3) A system of combined state and local government coordination under one State Pipeline Coordinator's Office (SPCO) would best serve the interest of all parties; the company, the state, the local governments, the private landowners and the public. Many aspects of pipeline construction are quite technical and require specific engineering and environmental expertise. Since these levels of experience are not needed everywhere all the time, it is more efficient to have a system where all the state and local agencies can combine and share expertise, than to have each agency build its own staff and retain experts. (4) State surveillance will occur on state, private and federal lands. The state will not be able to enforce its right-of-way certification conditions or stipulations on federal land, but the state will have enforcement powers on federal lands where the state has legal statutory authority, such as fish and game, water quality, air quality, solid waste management and the like. The federal government will have the right to enforce the federal right-of-way grant on federal lands.

It is recommended that after the finalization of a site certification, right-of-way lease, and accompanying stipulations, the State of Washington establish a State Pipeline Coordinator's office to monitor the Northern Tier project. It is recommended that the Northern Tier Pipeline reimburse the state for all expenses that the state incurs monitoring the Northern Tier Pipeline during the life of that project. It is further recommended that the head of the State Pipeline Coordinator's Office be neither an engineer nor a biologist, but an administrator capable of taking advice from either side and acting upon that advice. This person should be selected on the basis of his qualifications. He should not be a political appointee. The State Pipeline Coordinator's Office (SPCO) and the State Pipeline Coordinator (SPC) should not have the authority to waive state or local laws, regulations or ordinances. This authority must remain with the state agency or local government having jurisdiction. However, all permits issued by state and local agencies involved with the Northern Tier project should be coordinated and issued through the the SPCO. The SPCO should be the final authority for all certification and right-of-way lease conditions and stipulations that are assigned by statute to other agencies.

It is strongly recommended that under the State Pipeline Coordiantor there be environmental, engineering, local government and administrative sections. The first three sections should be headed by section chiefs of equal authority. Each of these three should have a design review staff and a field monitoring component. Whenever the field surveillance personnel cannot

agree on a solution to a problem, that concern should automatically be taken to their respective superiors for resolution. If the environmental, engineering, or local government section chiefs cannot reach an acceptable compromise, the question should then be presented to the State Pipeline Coordinator who would be the final administrative authority. His decision would be appealed to a review board (EFSEC) and thence to the courts. If authority rests within an agency's statutory power, then that agency's representative within the SPCO, after consultation with his agency, would make the final decision. This decision would be forwarded to the company through the SPCO.

The design review staffs and the field monitors should all be hired at the start of state surveillance and at least 3 months before the beginning of any design review process. This would enable all surveillance personnel to participate in training sessions. The field monitors should assist in the design review process. In this manner, the field monitors would become familiar with the pipeline project that they will be regulating during construction.

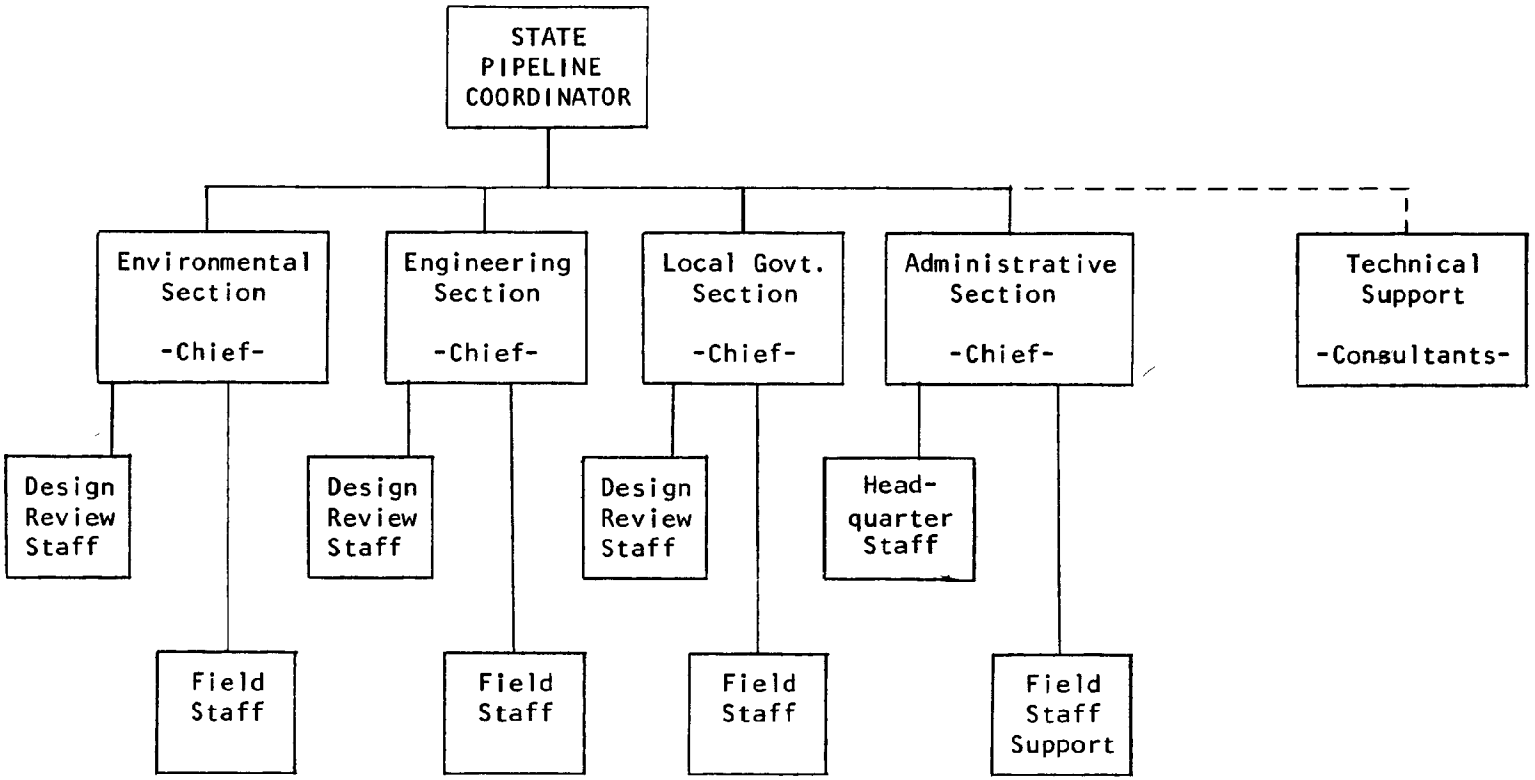
b. Personnel Requirements - Staffing

Based on Northern Tier Pipeline Company's plan for three construction sections within Washington plus off-loading facilities, tank farms, and submarine pipelines, it is recommended that the state respond with a monitoring program organized and staffed as follows (see Figure 4):

i. State Pipeline Coordinator - Expert administrator; not a biologist or an engineer.

ii. Environmental Section.

- Section Chief - an experienced biologist.
  - Design Review Staff - all credentialed experts
    - Wildlife Biologist
    - Fisheries Biologist
    - Fisheries Engineer
    - Revegetation/Reclamation Specialist
    - Archeologist
    - Environmental Specialist - water pollution/air pollution/solid waste/oil spill expert
    - Marine Biologist
  - Field Staff.
    - Field Monitor Coordinator - travels the entire project providing supervision and insuring consistent interpretation of stipulations and policy.
    - Field Monitors (8) - 2 for each of the three pipeline constructions sections (one wildlife biologist and one fisheries biologist); 2 for the off-loading facilities, tank farm and the submarine pipelines (one wildlife biologist and one marine biologist).



PROPOSED PIPELINE MONITORING ORGANIZATION

FIGURE 4

iii. Engineering Section.

- Section Chief - an experienced engineer.
  - Design Review Staff - all experts.
    - Pipeline Engineers (2) - with different areas of expertise.
    - Welding Expert
    - Submarine Pipeline Engineer
    - Civil Engineer
    - Hydrologist
    - Pump Station Engineer - mechanical and electrical expert (he would also assist on review of the off-loading facility and tank farm).
    - Soil Scientist - erosion control specialist
    - Geologist
  - Field Staff.
    - Field Monitor Coordinator - travels the entire project providing supervision and consistent interpretation of stipulations and policy.
    - Field Monitors (10) - 2 each for the three pipeline construction sections (civil or pipeline engineers); 3 for the oil port and submarine pipelines (one electrical, one mechanical and one submarine pipeline engineer); a pump station engineer who would assist the section engineers in monitoring the construction of pump stations.

iv. Local Government Section.

- Section Chief - experienced in local government.
  - Design Review Coordinator
  - Field Surveillance Coordinator
  - Socio-Economic Impact Analyst

The members of this Section should be selected and provided by the local governments affected by the project. These individuals should serve as a point of coordination between the SPCO and the local government. Since mainline pipeline construction is of relatively short duration in any one locality, a local government need only be active as long as the project is within its jurisdiction for design review and field construction. Participation should be at the option of the local government and all their costs should be reimbursed by the Northern Tier Pipeline Company.

Local governments that will be heavily impacted by the project for long periods of time such as Clallam County and the City of Port Angeles will require greater participation over the entire project. In particular, Clallam County and Port Angeles will require an individual to measure and analyze the socio-economic impacts of project development and the magnitude of net fiscal impacts.

v. Administrative Section.

- Administration Chief.
  - Headquarters Staff.
    - Administrative Assistants (2)
    - Accountants (2)
    - Legal Counsel
    - Computer Programmer/Operator
    - Public Informations Officer
    - Clerk-Typist - variable, depending on work load
  - Field Staff (8) - 2 clerk typists, to assist the field monitors in each of the 3 pipeline construction sections; 2 to assist the field monitors on the oil port, tank farms and submarine pipelines.

vi. Technical Support - a number of individuals may need to be retained to supplement major deficiencies that are identified in the present baseline data. They could be required for a number of different engineering, biological, or socio-economic studies.

In addition, it is recommended that an adequate amount of time be allowed at the end of the project for the SPCO, his staff, and technical evaluators to write reports based on their experience. These reports would be an account of what was tried in the field and why it was tried, which mitigating measures were successful, which were not, and the reasons why.

c. Selection of Personnel

It is also recommended that the following factors be considered during the actual selection of state surveillance personnel:

i. Priority should be given to the temporary transfer of people from state and local departments and agencies which have statutory or regulatory powers over the Northern Tier Pipeline. Included among these are:

- Department of Ecology
- Department of Fisheries
- Department of Game
- Department of Parks and Recreation
- Department of Social and Health Services
- State Energy Office
- Department of Commerce and Economic Development
- Utilities and Transportation Commission
- Office of Financial Management
- Department of Natural Resources
- Planning and Community Affairs Agency
- Department of Emergency Services
- Department of Agriculture
- Department of Highways
- Clallam County
- Port Angeles
- Other counties crossed by the pipeline
- Other incorporated areas crossed by the pipeline

ii. All members should have the desire and the temperament to work as a team. During the hiring process, the candidates should be made to understand that the decision to build the pipeline has already been made. The purpose of state surveillance is not to obstruct or prevent the completion of the pipeline. The purpose of state surveillance is to minimize short and long term environmental damage and to insure pipeline integrity through the enforcement of lease conditions, stipulations, specifications and applicable laws and regulations.

iii. Field monitors should be independent, mature, and confident. They must be capable of working in a team situation without constant supervision. They must be able to communicate effectively, both orally and in writing.

iv. People with experience in Washington or similar environments should be preferred.

v. Individuals with construction monitoring experience are obviously favored.

vi. Consultants may be retained to fill some of the state surveillance positions if those positions require a level of experience or expertise that is not available within existing state government, or if it is a more economical means of doing the job.

d. Procedural Recommendations

i. The government should provide detailed environmental and engineering criteria to the Northern Tier Pipeline at an early stage and require their inclusion in project specifications and designs.

ii. Biologists, engineers and local government representatives should participate in a joint training program designed to familiarize each group with basic problems, processes, and techniques of each other's disciplines and professional fields as applied to environmental monitoring of construction projects (e.g., construction at stream crossings and effects of construction-related disturbances on fish streams).

iii. Monitors should receive training in stipulations enforcement, which should include explanations of their rationales, representative case applications, methods of interpretation and uses of discretionary authority, and relationships between stipulations and applicable existing statutes, regulations and laws.

iv. Monitors should be trained in methods of data collection and analysis, including sampling and testing (e.g., water velocities, turbidity), necessary to demonstrate violations of environmental stipulations.

v. Monitors should be instructed in the methods that are utilized to contain and clean up oil spills. Field practice with containment booms, sorbants, and the like is highly recommended.

vi. Monitors should be trained in the state-of-the-art techniques of revegetation, restoration, reclamation and erosion control.

vii. Monitors should be trained in hydrology and hydrogeology so that they understand natural stream processes and they are cognizant of how manmade alterations effect areas above and below the actual construction disturbed area.

viii. Field manuals should be developed for all monitors. They should include basic information on mitigative techniques such as erosion control; types of soils; selection, uses and maintenance of material sites; fish passage structures; sampling and testing methods; monitoring procedures; documentation requirements; and background discussions of environmental concerns such as sensitivity of fish to blasting at different life stages, significance of culvert velocity criteria and sensitivity of nesting, lambing, spawning and other critical biological areas.

ix. Criteria and procedures should be established for determining the types of problems for which a non-conformance report (NCR) should be written, when or under what conditions a report should be written and what procedures and time frames should apply in obtaining remedies or otherwise clearing the report.

x. Monitors should be authorized to communicate directly and officially with execution contractors in the field to resolve immediate problems that, in the monitor's judgment, require such direct action.

xi. All field monitoring documents, including field logs, should include reference to specific stations and alignment sheets for each entry; all field monitors should keep logs; and NCR follow-up actions should be fully documented. An auditable system of tracking all government NCRs should be established.

xii. Selection, training, and organization of the state surveillance team will require a lead time of approximately two to three months before the anticipated beginning of the design review process.

xiii. To insure prompt communications and the timely flow of information the SPCO should be located near the Northern Tier Pipeline Company's state office. At the field level the government monitors should have their offices near the Northern Tier field offices. This permits the government to have immediate access to the people with which they must deal.

xiv. The state's surveillance effort should be coordinated with applicable federal government departments and organizations such as:

- Occupational Health and Safety Organization
- Federal Power Commission
- Environmental Protection Agency
- Fish and Wildlife Service

- Bureau of Land Management
- Forest Service
- Department of Transportation
- Coast Guard
- Army Corps of Engineers
- Soil Conservation Service
- Department of Defense.
- Any Northern Tier Pipeline surveillance office that may be established by the federal government.

e. Citizen's Advisory Council

It is recommended that a Citizen's Advisory Council (CAC) be established to oversee construction of any pipeline in the State of Washington. The Citizen's Advisory Council should have complete and unrestricted access to all portions of such a pipeline project. The CAC would serve to insure that the company and the government maintained the public's interests throughout the proposed project. The Citizen's Advisory Council should be constituted from conservation, civic or industry groups that express an interest in participating. The CAC members would serve without compensation. The CAC would retain its own full time paid staff who would monitor the design and construction of the Northern Tier Pipeline on a day to day basis. The CAC should be funded by a grant from the State of Washington which would then bill the pipeline company for that expense.

The CAC's staff would report all their concerns to the SPCO. If any differences of opinion could not be resolved by repeated consultations, then the staff would present that matter to the full Citizen's Advisory Council. If the Citizen's Advisory Council, Northern Tier, and the state could not resolve the issue, the CAC could then seek normal political or legal remedies. It is hoped that such public oversight will prevent the types of serious problems that were experienced during construction of the Trans-Alaska Pipeline.

f. Advantage of State Surveillance

There are several advantages of coordinated state and local government surveillance on the proposed Northern Tier Pipeline System for the Northern Tier Pipeline Company, the State of Washington, local governments, and the public.

i. Advantages to the Northern Tier Pipeline Company.

- Continuous government surveillance and compliance with site certification, lease conditions, and stipulations are a measure designed to mitigate the adverse environmental effects of the proposed pipeline construction. An adequate system of state monitoring and enforcement would, most probably, prevent environmentalists' legal challenges to the Northern Tier Pipeline. If environmentalists institute court action against the Northern Tier Pipeline Company or state permitting agencies, the construction of the proposed project would most assuredly be delayed

for years. It must be remembered that Native land claims and environmentalists' legal challenges delayed construction of the TAPS. The owner companies wanted to build the Alaska pipeline in 1969, but the native claims issue and environmental lawsuits delayed TAPS construction until 1974; a five year delay (58, 61, 64). After native land claims were settled by the federal government, the U.S. Congress attached the TAPS lease conditions, reimbursable government surveillance, and stipulations to the Federal TAPS Authorization Act; Public Law 93-153 (42, 58, 61). The U.S. Congress attached those provisions because of environmental pressure (42, 58, 61). The TAPS lease conditions, government surveillance, and stipulations were instituted specifically to reduce environmental resistance to the TAPS.

- Coordinated state monitoring of the Northern Tier Pipeline would provide for a responsive and systematic permit process without sacrificing environmental safeguards. Government surveillance and permit modification in the field can prevent construction delays and thus save the Northern Tier Pipeline Company time and money. With a State Pipeline Coordinator's Office with field monitors, permit modifications required by unforeseen field conditions can be solved on the spot while maintaining the required degree of environmental protection.

- Government surveillance is another layer of quality control (25). If state surveillance is done properly, it can prevent the types of major problems that occurred on the TAPS; such as the bad welds and the explosion and destruction of pump station #8. This, of course, could result in additional savings for Northern Tier. For instance, APSC's re-X-ray and repair of faulty welds cost an estimated 80 million dollars (24). If done correctly, the government monitoring of the Northern Tier Pipeline would most probably eliminate the Congressional and Government Accounting Office investigations that occurred on the TAPS (12, 37, 73, 74, 81). Before construction of the TAPS, most Alaskans supported that project and most Alaskans looked favorably on the Alyeska Pipeline Service Company. However, after three years of pipeline construction and all the associated social, environmental, and engineering problems that were constantly in the local and national news media, the vast majority of Alaskans became anti-pipeline, anti-Alyeska, and anti-uncontrolled development (56, 58, 60, 61).

ii. Advantages to the State of Washington

- Staffing-up the state's site certification process and providing a temporary pipeline office enables a comprehensive and unified response to the quick paced construction of the proposed project. The required expertise would be centrally located where everyone, government and company, could easily communicate and understand each other's concerns.

- A system of continouous state surveillance of the Northern Tier Pipeline would insure the adequate protection of Washington's environment as required by various state laws and regulations. The types of environmental damage such as occurred during construction of the TAPS could be prevented.

- Adequate governmental monitoring during all phases of the Northern Tier Project is the best method of minimizing or mitigating both short and long term environmental disturbances that are associated with the construction of any pipeline.

iii. Advantages to Local Governments.

- Through a system of coordinated state surveillance, local governments would retain their statutory authority and they would be able to obtain highly technical expertise through the SPCO staff that would not otherwise be readily available to them. By having input into the design review and notice-to-proceed process local governments would know exactly what Northern Tier planned to do within their jurisdictions and local governments would be able to express their concerns at a time when the company's plans could most easily be modified to reflect the wishes of the local governments.

- Since local government surveillance of the Northern Tier Project would also be paid for by the pipeline company, the local governments would not have to expend local funds or possibly raise taxes to monitor the proposed pipeline.

- By being part of a system of coordinated surveillance, each local government would not have to deal with Northern Tier by itself and Northern Tier would be required to provide equal protection and response to all local governments.

iv. Advantages to the Citizens of Washington.

- All the costs of state pipeline surveillance incurred by the State Pipeline Coordination Office would be reimbursed by the Northern Tier Pipeline Company and that state organization would be disbanded after restoration of the pipeline disturbed areas. There would be no accumulation of government bureaucracy and no expenditure of state funds. State pipeline surveillance would not cost Washington's taxpayers any additional money, since there would be no increase in taxes to cover the cost of state pipeline monitoring.

The cost of state government surveillance would be a cost of constructing the Northern Tier Pipeline and as such, it would be included in the total cost of the pipeline for the purpose of settling the pipeline tariff rate. As a common carrier, the Northern Tier Pipeline's tariff rate (what Northern Tier would charge to move oil through their pipeline) would be set by the Federal Energy Regulatory Commission based on the cost of building the pipeline plus an adequate return on investment. Therefore, the cost of state surveillance would cause a very slight increase (the cost of monitoring versus the cost of construction) in the Northern Tier Pipeline tariff rate. This small increase would actually be paid by those people (primarily in the Midwest) who will consume the oil transported through the Northern Tier Pipeline.

- State surveillance of permit conditions, stipulations, and reclamation-revegetation on private land would help protect the value and property rights of the private landowner. State surveillance on private land would be with the consent of the owner. State specifications such as restoration of disturbed areas, would be considered minimum requirements. Any reclamation above and beyond the State's requirements would be solely between the landowner and the Northern Tier Pipeline Company but could be enforced for the landowner by the state monitors if the landowner so requested.

- Continuous state surveillance of the Northern Tier Pipeline would insure Washington's citizens that their interests in their unique environment would be adequately safeguarded and protected. Alaska's environment was offered this degree of protection. Washington's environment is certainly as valuable as Alaska's and should be afforded a similar degree of protection.

4. Alternative Local Monitoring System

The Northern Tier Pipeline Company proposes to build a tanker off-loading facility on Ediz Hook which would be connected to their Green Point Tank Farm via a submarine pipeline under the Port Angeles harbor. In addition, 17 miles of mainline pipe would be located in Clallam County. Hence, Port Angeles and Clallam County would be the areas most heavily impacted by the proposed Northern Tier Project. As was pointed out earlier, the most efficient and effective way to mitigate the impacts of the Northern Tier Pipeline would be through a State Pipeline Coordinator's Office where all state agencies and local governments work together to achieve a common goal. However, if a State Pipeline Coordinator's Office is not formed along the proposed guidelines, it is recommended that Port Angeles and Clallam County create a separate monitoring organization.

All the examples from previous pipeline projects that have been presented to support our recommendations for a coordinated system of state surveillance are also applicable to the formation of a Port Angeles-Clallam County Pipeline Coordinator's Office. The principles of quality control & quality assurance, stop-work authority, bonding, right-to-perform, co-authority of disciplines, and the like, are applicable to any pipeline surveillance system; state, city or county. Therefore, the recommendations of this report could be implemented in a scaled-down version to create a Port Angeles/Clallam County Pipeline Coordinator's Office. Our recommendations remain unchanged except for the level of staffing that would be required.

Since only a small portion of the pipeline part of the Northern Tier Project would be located in Clallam County, fewer pipeline engineers and surveillance monitors would be required. In addition, a local government section would no longer be required at this scale. Since the sites for the off-loading facility, tank farm, and submarine pipeline construction are concentrated in small areas on the shore, their impacts are similar to fixed site impacts. Consequently, review and field monitoring staffs may be combined to serve both functions.

If a Port Angeles-Clallam County Pipeline Coordinator's Office is formed, it is recommended that it be staffed at the following level:

i. Pipeline Coordinator - Expert administrator; not a biologist or an engineer. Coordinates all permit and monitoring activity, and enforces stipulations.

ii. Engineering Section.

- Section Chief - an experienced oil terminal engineer.
- Pipeline Engineer
- Welding Expert
- Civil Engineer
- Tank Farm-Pump Station Engineer - mechanical and electrical expert
- Geologist/Soil Scientist - on contract, as required.
- Submarine Pipeline Engineer - on contract, as required.
- Hydrologist - on contract, as required.

iii. Environmental Section.

- Section Chief - an experienced biologist
- Environmental Specialist - water pollution/air pollution/solid waste; oil spill expert.
- Marine Biologist
- Fisheries Biologist
- Wildlife Biologist - on contract, as required.
- Archeologist - on contract, as required

iv. Local Government/Administrative Staff.

- Administrative Chief/Local Government Coordinator - runs administrative staff and coordinates with all city and county agencies.
- Administrative Assistant - computer programmer
- Socio-Economic Impact Analyst
- Accountant - on contract, as required.
- Legal Counsel - on contract, as required.
- Public Informations Officer
- Clerk/Typist - number variable, depending on workload.

III. THE MONITORING CONTENT

A. CERTIFICATION CONDITIONS AND STIPULATIONS

In formulating a set of draft certification conditions and stipulations for the proposed Northern Tier Pipeline an analysis was conducted of stipulations and conditions under which other pipeline projects were proposed and constructed, or are proposed to be built. Seven sets of stipulations for four different large diameter pipeline projects were compared and evaluated, and are presented here and in an annotated version in Appendix A. Conditions and stipulations were reviewed from the following pipeline projects: (1) Trans-Alaska Pipeline System, (2) Alaska Natural Gas Transportation System, (3) SOHIO-Pactex Pipeline, and (4) Northern Tier Pipeline.

1. Trans-Alaska Pipeline System (TAPS)

The TAPS was the first and to date only large-diameter pipeline that has actually been built under a set of comprehensive lease conditions and project stipulations. (41) The Alaska Pipeline Office (APO) Trans-Alaska Pipeline Overview Study that was prepared by Mechanics Research, Inc. concluded that:

> "Stipulations for future projects should reflect the experience concerning mitigation of environmental impact gained during the construction and early operational phases of the Trans-Alaska Pipeline System. Experience gained in such potential problem areas as revegetation and rehabilitation, slope failures, icing due to disturbance of water flow, protection of wildlife, erosion control, etc., should be incorporated into the environmental and technical sections of the Stipulations." (25)

This APO report went on to say,

> "The concept of preparing unique stipulations for each project with specific provisions for selective design reviews and spot check monitoring is a sound and effective procedure for protecting the public interest when a major resource development is to be undertaken on federal land in remote and environmentally sensitive areas. If the procedure is accepted as a fact of life by the Permittees (the Company) in planning the project, it will not appreciably affect the cost and time for execution of a project." (25)

> "The TAPS Agreement-Stipulations concept should be used as a model for the terms and conditions for future Grants of Right-of-Way across federal land for pipeline systems or other major resource developments." (25)

"The Design Review/Notice to Proceed procedure of the Stipulations should be modified to place more emphasis on implementing the intent of the agreement into the project criteria and basic designs. This is the logical place to introduce the Stipulation requirements for environmental protection, socio-economic considerations, and pipeline integrity. Particularly, a broad range of environmental criteria must form an integral part of the project design criteria, so that the most effective technical solutions and construction methods for environmental impact abatement can be integrated into the project design." (25)

"The design review phase should include the collection and development of environmental data and a ranking of environmental concerns, in such a way as to indicate the inherent value of each of the resources which may be affected and their sensitivity to disturbance." (25)

The Trans-Alaska Pipeline critique session sponsored by the U.S. Department of Interior and held at the University of Alaska in August 1977 noted a similar conclusion in its report:

"It was generally agreed that in retrospect the stipulations were satisfactory, and that they are basically acceptable for other projects, subject to adjustments for special areas and problems. It was also agreed that they could be improved to reflect technological advances...." (31)

The stipulations for the Trans-Alaska Pipeline were written in very general terms because (1) when they were compiled no one knew exactly where the pipeline would be located; (2) historically pipelines had been engineered as they were built and as such lacked site specific plans far enough in advance to write detailed project stipulations; and (3) at best, very little was known about the environment that could be affected by the pipeline because baseline data was often non-existent. (42) These circumstances were noted in a U.S. Fish and Wildlife Service funded report which stated:

"Initially, BLM's intention was to write rather specific stipulations that would guide and restrict pipeline construction affecting the land, water, and 'living resources' of the corridor, but, as pointed out by the BLM official who was then the leader of this effort, this was impractical because 'we didn't know what we were dealing with.' What he meant was that, first, pipeline alignment, design, and construction modes and procedures were not developed in sufficient detail to permit anything approaching specific stipulations. A major problem in writing the stipulations, then, was that TAPS provided too little to go on; 'they said they would design it as they went.' Second, information about the environment potentially affected

> by the pipeline was sparse at best, and certainly not adequate to assess specific sites along an alignment that was itself still subject to significant shifts. So the stipulations had to be very general, taking the form of broad standards rather than a specific set of 'do's and don'ts.' And this, in turn, meant that substantial discretion would need to be allowed the officials who would ultimately enforce them." (42)

This Fish and Wildlife Service document concluded,

> "Those who were directly involved in these efforts tend now to concede, at least in retrospect and with some qualifications, that more specific and restrictive stipulations might have been very difficult to apply, given the many uncertainties involved in the construction process and the lack of site-specific environmental information. Thus, their major concern was with how effectively the stipulations would be enforced and who would exercise the extensive discretionary authority built into them." (42)

The Alaska Natural Gasline System, SOHIO-Pactex Pipeline, and BLM Northern Tier stipulations, to various degrees, were all modeled after the Trans-Alaska Pipeline stipulations and experience. The Alaska State stipulations for the TAPS were nearly identical to the federal stipulations except for a few wording differences.

2. Alaska Natural Gas Transportation System

The Alaska Natural Gas Transportation Act which was passed by the U.S. Congress in October of 1976 (P.L. 94-586 15 USC 719) authorized the construction of a large-diameter high pressure natural gas pipeline from Prudhoe Bay down the Trans-Alaska Oil Pipeline corridor to Delta Junction, Alaska and then eastward into Canada along the Alcan Highway. This gasline would fork in northern British Columbia with one branch going through southern British Columbia, Washington State and Oregon before reaching its destination in California. The other segment of this gasline project would cross Alberta, Montana, and the Dakotas before ending in Iowa. The Alaska portion of this gasline system is being sponsored by the Alaska Northwest Natural Gas Transportation Company, the western leg is sponsored by the Pacific Gas and Electric Company, and the segment through Montana on into the Midwest is scheduled to be built by the Northern Border Pipeline Company.

The State of Alaska and the federal government, working together, using the TAPS experience developed a set of draft stipulations for the gasline project which was published in June of 1978. (51) These first draft stipulations were forwarded to the federal bureaucracy in Washington, D.C. where they were substantially rewritten and released for public comment in May of 1979. (52) The federal government developed three separate sets of stipulations; one for the Alaskan portion of the gasline, another for the

western leg and a third for the Northern Border Project. Though generally similar, there are regional variations between these three sets of stipulations; these differences are identified in Appendix A. In general, the stipulations for the Alaskan section of the gasline are more detailed and stringent than either those for the western leg or Northern Border Project. All three sets of stipulations are weaker than the original draft gasline stipulations that were developed jointly by the State of Alaska and the federal government.

The federal government and the Northwest Gasline Company have been pressuring the State of Alaska to drop the State's more stringent environmental standards and to adopt the weaker federal stipulations. (54, 55) The federal gasline stipulations were supposed to be finalized in the fall of 1979 but as of April 1980, they have not been released. (54) If the federal stipulations are not revised to the satisfaction of the state, Alaska is prepared to abandon its attempt at formulating joint gasline stipulations and to require a set of stipulations that are even more stringent than those contained in the original June 1978 draft report. (54)

The position of the federal government (Department of Interior) for weakening environmental safeguards and pipeline construction standards is best exemplified by the socioeconomic stipulations that were first proposed in the June 1978 draft document. There were no socio-economic stipulations on the TAPS project and the State of Alaska proposed new socio-economic stipulations in an attempt to minimize or mitigate the types of severe social and economic impacts that were associated with the Trans-Alaska Pipeline. (56, 58, 59, 60, 61) The federal government and the Northwest Gasline Company have been opposed to any socio-economic stipulations and none were included in the May 1979 federal draft stipulations. (52) Alaska's position is that socio-economic stipulations will definitely be a part of the State's agreement with the Gasline Company. (54)

3. SOHIO-Pactex Pipeline

Standard Oil of Ohio (SOHIO) proposed to build a tanker off-loading facility at Long Beach, California and to construct a crude oil pipeline system across the Southwest terminating at Midland, Texas, where it would connect with the existing pipeline network. The Bureau of Land Management, through the California State Director, issued SOHIO a grant of right-of-way for the Pactex pipeline in the summer of 1978. (40) This BLM grant and its accompanying stipulations are patterned after the TAPS document (41) but they are less detailed and stringent. This grant of right-of-way was never utilized because SOHIO abandoned its proposed Pactex pipeline in 1979. (57)

4. BLM Northern Tier Final Grant of Right-of-Way

BLM has written a final Grant of Right-of-Way for the proposed Northern Tier Project. Though the BLM grant conditions and stipulations are modeled after portions of the SOHIO, federal Natural Gasline, and TAPS documents; the BLM standards, as a whole, are the least detailed and least stringent of all the stipulations reviewed. BLM's Northern Tier Grant of Right-of-Way formulation process has not been open to public review or comment.

B. PROPOSED NORTHERN TIER STIPULATIONS

The proposed stipulations for the Northern Tier Pipeline, or any other applicant, in the State of Washington are adapted from the TAPS and Alaska State Gasline stipulations, and evaluated on the basis of the authors' TAPS surveillance experience and the characteristics of Washington State. These proposed standards include all standards for which there exists a precedent and offer the degree of protection required to safeguard the public's rights and resources should a pipeline be built. The socio-economic stipulations are based on prior experience in Washington State, and requirements on other pipelines. They were formulated after consultation with state and local government officials and other knowledgeable persons.

These proposed Washington State stipulations are only in draft form as they must be reviewed by legal and technical experts, government agencies and the public to adapt them more thoroughly and completely to Northern Tier, or other Washington State projects. In particular, standards for the oil-port, off-loading facilities, tank farm and submarine pipeline portions of the Northern Tier System require site specific mitigation measures and technical specifications that are best formulated by experts in those respective fields. In addition, the proposed socio-economic stipulations must be reviewed by various state and local jurisdictions to insure that they adequately address all their specific concerns.

When critiquing these proposed Northern Tier stipulations, it must be remembered that (1) they must be viewed as a single entity since the various stipulations and conditions form an interlocking monitoring and surveillance system; (2) they must remain general, to a degree, because Northern Tier's exact construction plans and route have not been finalized; (3) site specific stipulations can only be written if the exact pipeline location is known and pipelines are usually "designed as they are built" (42); and (4) in some cases, though not to the extent encountered in Alaska, existing baseline data in Washington State is not sufficient to predict, judge, and measure, and therefore minimize, all pipeline impacts.

These proposed Northern Tier stipulations are divided into five groups: (1) Certification, Lease, or Grant Conditions, (2) General Stipulations, (3) Environmental Stipulations, (4) Technical Stipulations, and (5) Socio-economic Stipulations. The Certification, Lease, or Grant Conditions deal mostly with legal and procedural matters though some environmental and technical considerations are included. They are derived from the content of previously executed grants and leases.

The General Stipulations discuss matters such as government monitoring organization, authority, quality control, public access to the project, health and safety, and surveillance and maintenance. These stipulations, as well as the environmental and technical ones, are parallel in format and structure to sets of stipulations conventionally found in pipeline grants and leases. They are presented in this form to show precedence and completeness. The Environmental Stipulations deal with erosion, pollution control, fish and wildlife protection, restoration, oil discharges and oil spill

contingency plans. The Technical Stipulations deal with considerations such as pipeline system standards, construction requirements, earthquakes, river and floodplain crossings, pipeline corrosion and the like.

The Socio-Economic Stipulations discuss labor, housing, transportation, law enforcement, and other items. The precedent for this set of stipulations is found in proposed stipulations for the Alaska Natural Gas Pipeline and the Yukon and Foothills Pipelines, documentation submitted by the applicant, and experience with fixed site projects in Washington State. The trend in pipeline certifications and leases is toward including socio-economic stipulations as a standard part of the stipulations package, along with general, environmental and technical.

The preponderance of stipulations are general, environmental and technical and these have been presented in full detail. This is not to discount the socio-economic stipulations which have a later evolution, but rather an attempt to provide documentation of precedent to as fine a level of detail as possible. The socio-economic stipulations presented herein are the most comprehensive of any published to date for a mainland pipeline in the United States.

1.
2.

1. Certification, Lease, or Grant Conditions

PROPOSED

1. Purpose of Grant; Limitation of Use to the Company.

A. The Right-of-Way is granted for the purpose of the construction, operation, and maintenance of one (1) Oil transportation pipeline, consisting of one (1) line of forth-two (42)-inch diameter pipe and its Related Facilities (such pipeline and Related Facilities being herein referred to as the "Pipeline").

B. The Company, their agents, contractors, and subcontractors (at any tier) shall not use the Right-of-Way or the land subject thereto for any other purpose and shall not locate or construct any other pipelines (including looping lines) or other improvements within the Right-of-Way without the prior written approval of the State of Washington.

C. The Pipeline shall be used for only the transportation of Oil, and it shall not be used for any other purpose.

D. The Company shall not allow or suffer any Person or Business Entity to use the Right-of-Way for the purpose set forth in subsection A of this Section.

E. Nothing above in subsection D of this Section is intended to: (1) excuse or preclude the Company from complying with their obligations under Section 25 of this Agreement, or (2) preclude the Company from employing agents, contractors, or subcontractors (at any tier) to effect construction, operation, maintenance or termination of the Pipeline System.

2. Width of Right-of-Way.

The width of the Right-of-Way, in terms of surface measurement, is fifty (50) feet plus the ground occupied by the Pipeline; provided, however, The Company may apply for, and the State Pipeline Coordinator may direct or authorize, increases in the width of the Right-of-Way at specified points if he finds, and records the reasons for his finding in writing, that in his judgment a wider Right-of-Way is necessary for operation and maintenance of the Pipeline after construction, or to protect the environment or public safety.

PROPOSED

3. Duration of Grant.

A. The grant hereby made shall terminate thirty (30) years from the effective date hereof, at noon, Washington State time, unless prior thereto it is relinquished, abandoned, or otherwise terminated pursuant to the provisions of this grant or of any applicable law or regulation.

B. Notwithstanding the expiration of this grant or any renewal grant of the right-of-way, or its earlier relinquishment, abandonment, or other termination, the provisions of this grant, to the extent applicalbe, shall continue in effect and shall be binding on the Company, its successors or assigns, until they have fully performed their respective obligations and liabilities accruing before or on account of the expiration, or the prior termination, of the grant.

C. The right-of-way grant may be renewed, subject to and in accordance with the provisions of applicable laws and regulations.

D. Any subsequent conveyance, transfer, or other disposition of any right, title, or interest in lands or any part thereto, burdened by and subservient to the right-of-way, shall, to the extent allowed by law, be subject to the right-of-way, including Company's right to apply for renewal of the right-of-way grant.

4. Use Charge for Right-of-Way.

The Company shall pay each landowner an annual rental, payable in advance. Until a specific location has been established for the Right-of-Way, the amount of said payment shall be _____. This is estimated fair market rental value for one year. Upon establishment of the actual location of the Right-of-Way, an appraisal of the fair market rental value shall be made and the Company shall be billed for additional rental or credited in the amount of the overpayment, whichever is appropriate. The rental for each year shall be subject to adjustment from time-to-time to reflect current fair market rental value.

PROPOSED

5. Reservation of Certain Rights to the State of Washington and local governments.

A. The State of Washington and local governments reserve and shall have a continuing right of access to any part of the lands (including the subsurface of, and the air space above, such lands) that are subject to the right-of-way, and a continuing right of physical entry to any part of the pipeline, for inspection or monitoring purposes and for any other purpose or reason that is reasonably consistent with any right or obligation of the State of Washington and local governments under any law, regulation, grant, or other authorization relating in whole or in part to all or any part of the pipeline.

B. At construction sites during construction, during operations, maintenance or termination, the rights of access and entry reserved to the United States shall be limited to (1) the State Pipeline Coordinator, (2) representatives of the State Pipeline Coordinator, (3) representatives of State and local agencies on official business related to the pipeline system, (4) contractors and subcontractors of the State of Washington and local governments and such other persons as may be designated from time to time in writing by the State Pipeline Coordinator.

C. There is reserved to the State of Washington and local governments the right to issue additional use authorizations to third parties for compatible uses on, or adjacent to, the lands subject to the right-of-way. Before the State of Washington and local governments issue an additional use authorization to a third party, the State of Washington will notify the Company of its intentions and shall consult with the Company before taking final action in that regard.

D. The Company may request that any individual who purports to act on behalf of the State of Washington and local governments, pursuant to Subsection B of this section, furnish it with written authorization from the State Pipeline Coordinator or other appropriate State or local government officer.

6. Reimbursement of State and Local Government Expenses.

(See REMARKS under this proposed stipulation in Appendix A.)

7. Termination or Suspension of Right-of-Way.

(See REMARKS under this proposed stipulation in Appendix A.)

PROPOSED

8. Right of the State of Washington or Local Governments to Perform. If, after thirty (30) days, or in an emergency such shorter period as shall not be unreasonable, following the making of a demand therefor by the State Pipeline Coordinator in the manner that is provided in Stipulation 1.4. for giving written notices, the Company or their respective agents, employees, contractors or subcontractors (at any tier), shall fail or refuse to perform any of the actions required in this Grant and Stipulations the State and/or local governments shall have the right, but not the obligation, to perform any or all of such actions at the sole expense of the Company. Prior to the delivery of any such demand, the State Pipeline Coordinator shall confer with the Company if he deems it practicable to do so, regarding the required action or actions that are included in the demand. The State Pipeline Coordinator, following the procedure outlined in Subsection F of Section 6 hereof, shall submit to the Company a statement of the expenses incurred by the State or local governments during the preceding quarter in the performance by the State or local governments of any required action and the amounts shown to be due on each such statement shall be paid by the Company in accordance with the provisions of the said last mentioned subsection. If the Company shall dispute the amount of any item in any statement that shall be rendered in accordance with the provisions of this Section, the procedures outlined in subsection J of Section 6 shall apply with equal force and effect to any such dispute. The Company may dispute whether the work involved in action required by a provision of this Grant and Stipulations, whether the Company's failure or refusal to perform any such action was justified, as well as the reasonableness of the specifications for, and the cost of, such work.

9. Liens.

(See REMARKS under this proposed stipulation in Appendix A.)

10. Insolvency.

(See REMARKS under this proposed stipulation in Appendix A.)

11. Breach; Extent of Liability of the Company.

(See REMARKS under this proposed stipulation in Appendix A.)

12. Transfer.

(See REMARKS under this proposed stipulation in Appendix A.)

PROPOSED

13. Duty of the Company To Abate.

A. The Company promptly shall abate, either completely or, as the case may be, as completely as possible using their best efforts, any physical or mechanical procedure, activity, event or condition, existing or occurring at any time: (1) that is susceptible to abatement by the Company, (2) which arises out of, or could affect adversely, the construction, operation, maintenance or termination of all or any part of the Pipeline System, and (3) that causes or threatens to cause: (a) a hazard to the safety of workers or to public health or safety (including but not limited to personal injury or loss of life with respect to any Person or Persons), or (b) harm or damage to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, or their habitats, or any other natural resource).

B. The Company shall cause their respective agents, employees, contractors and subcontractors (at any tier) to observe and comply with the foregoing provisions of this Section.

(See REMARKS under this proposed stipulation in Appendix A.)

14. Temporary Suspension Orders of the State Pipeline Coordinator.

(See REMARKS under this proposed stipulation in Appendix A.)

15. Nondiscrimination and Equal Employment Opportunity.

(See REMARKS under this proposed stipulation in Appendix A.)

16. Release of Right-of-Way.

(See REMARKS under this proposed stipulation in Appendix A.)

17. Partial Invalidity.

(See REMARKS under this proposed stipulation in Appendix A.)

18. Rights of Third Parties.

Nothing in the lease shall be construed to affect any right or course of action that otherwise would be available to the Company against any person. Any and all conditions of this lease may be enforced by third parties for their own benefit or for the benefit of others through normal legal procedures.

19. Covenants Independent.

(See REMARKS under this proposed stipulation in Appendix A.)

20. Waiver Not Continuing.

(See REMARKS under this proposed stipulation in Appendix A.)

PROPOSED

21. Authority to Enter Agreement.

(See REMARKS under this proposed stipulation in Appendix A.)

22. Section Headings.
The section headings in this Agreement are for convenience only, and do not purport to, and shall not be deemed to, define, limit or extend the scope or intent of the section to which they pertain.

23. Compliance.

(See REMARKS under this proposed stipulation in Appendix A.)

24. Transport of Oil - Common Carrier.

(See REMARKS under this proposed stipulation in Appendix A.)

25. Indemnification.

(See REMARKS under this proposed stipulation in Appendix A.)

26. Federal, State, and Local Laws and Regulations.
The Company shall comply with applicable Federal, State, and local laws and all regulations issued thereunder, existing or hereafter enacted or promulgated, affecting in any manner construction, operation, maintenance, or termination of the pipeline system.

27. Bonding.

A. Immediately upon issuance of this Agreement, the Company shall furnish the State of Washington a surety bond in the principal amount of $10,000,000. Said bond shall at all times be maintained in force and effect in the full principal amount during construction, operation, maintenance, and termination of the pipeline system and until released in writing by the State of Washington.

B. Said bond shall have the purpose of: (1) ensuring the performance by the Company of each and every obligation of the Company under the terms and conditions of this Grant and Stipulations; (2) providing for immediate payment to the State of Washington or local governments of any cost or obligation of which, in the judgment of the State of Washington or local governments the Company has not performed satisfactorily.

C. These bonding requirements are in addition to, and are not intended to affect, all other requirements of law, nor are they intended to limit in any way the Company's liability under any provision of law.

D. See Section 8 for payment and appeal procedures.

PROPOSED

28. Remedies Cumulative; Equitable Relief.

(See REMARKS under this proposed stipulation in Appendix A.)

29. Public Disclosure.

(See REMARKS under this proposed stipulation in Appendix A.)

30. Port and Offloading Facilities, Tank Farm and Submarine Pipeline.

(See REMARKS under this proposed stipulation in Appendix A.)

31. Repair, Replacement or Claim for Damages.

(See REMARKS under this proposed stipulation in Appendix A.)

32. Location of Right-of-Way.

(See REMARKS under this proposed stipulation in Appendix A.)

33. Compliance with Federal and State Law.
The Company shall comply with and be bound by State, Local and Federal statutes and regulations applicable to construction, operation or maintenance of the pipeline system that are in force on the effective date of this Grant or that are thereafter promulgated during the term of this Grant.

34. Coast Guard Facilities.

(See REMARKS under this proposed stipulation in Appendix A.)

35. Puget Sound Refineries.

(See REMARKS under this proposed stipulation in Appendix A.)

36. Dungeness Spit.

(See REMARKS under this proposed stipulation in Appendix A.)

2. General Stipulations

PROPOSED

1.	GENERAL
1.1.	DEFINITIONS
1.1.1.	The following definitions apply to terms used in these Stipulations. They shall also apply to terms used in documents to which these Stipulations are attached unless specifically provided otherwise in such documents.
1.1.1.1.	"Access Roads" means roads, other than State or public highways, that are constructed or used by the Company in connection with the construction, operation, maintenance or termination of the Pipeline System.
1.1.1.2.	"State Pipeline Coordinator" means.... (See REMARKS under this proposed stipulation in Appendix A.)
1.1.1.3.	"Federal Lands" means all lands owned by the United States except lands in the National Park System, lands held in trust for an Indian or Indian tribe, and lands on the Outer Continental Shelf.
1.1.1.4.	"State Lands" means... (See REMARKS under this proposed stipulation in Appendix A.)
1.1.1.5.	"Private Lands" means... (See REMARKS under this proposed stipulation in Appendix A.)
1.1.1.6.	"Construction Mode" means the type of construction to be employed generally with regard to the Pipeline (e.g., whether the pipe will be buried or elevated).
1.1.1.7.	"Construction" means the pipeline construction including all items of work required from survey and staking of the line to and including, but not limited to, the installation of the pipe and appurtenances, hydrostatic testing, cathodic protection system, cleanup, and restoration.
1.1.1.8.	"Construction Segment" means a portion of the Pipeline System, as agreed upon by the Company and the State Pipeline Coordinator, that constitutes a complete physical entity or stage, in and of itself, which can be constructed, independently of any other portion or stage of the Pipeline System in a designated area or between two given geographical points.

PROPOSED

1.1.1.9. "Final Design" means completed design documents suitable for bid advertisement, including contract plans and specifications; proposed Construction Modes; operational requirements necessary to justify designs; design analysis (including calculations for each particular design feature); all functional and engineering criteria; summaries of engineering tests conducted and their results; and other considerations pertinent to design and project life expectancy.

1.1.1.10. "Notice to Proceed" means a written permission to initiate Pipeline System construction that is issued in accordance with Stipulation 1.7.

1.1.1.11. "Oil" means oil of any kind or any form, including but not limited to fuel oil, sludge, oil refuse, and oil mixed with waste.

1.1.1.12. "Hazardous Substances" means oil, toxic, or hazardous substances as defined by the Environmental Protection Agency...

1.1.1.13. "Company" means: Northern Tier Pipeline Company, a Delaware corporation, its successors and assigns.

1.1.1.14. The "Pipeline" or "Pipeline System" means all facilities on which are constructed or used by the Company in connection with the construction, operation, maintenance or termination of the Pipeline. The term includes the Pipeline and its Related Facilities. The term also includes temporary facilities and temporary use areas used by the Company for the construction, operation, maintenance, or termination of the Pipeline. It does not include facilities, such as urban administrative offices, which are only indirectly involved.

1.1.1.15. "Preliminary Design" means the establishment of project criteria (i.e., construction, including design, and operational concepts) necessary to delineate the project to be constructed. As a minimum, it includes the following: criteria to be used for the Final Design and project concepts; evaluation of field data used to establish the design criteria; drawings showing functional and technical requirements; reports of all test data compiled during the data collection, and Preliminary Design evaluation; standard drawings (if applicable) or drawings to support structural design concepts of each typical facility or structure; proposed Construction Modes; outline of project specifications; sample computations to support the design; and concepts and bases for project siting.

PROPOSED

1.1.1.16. "Related Facilities" means those structures, devices, improvements, and sites, the substantially continuous use of which is necessary for the operation or maintenance of the Oil transportation pipeline, including:

(1) line pipe and supporting structures;
(2) pump stations, including associated buildings, heliports, structures, yards and fences;
(3) valves and other control devices, and structures housing them;
(4) monitoring and communications devices, and structures housing them;
(5) surge and storage tanks, and related containment structures;
(6) bridges;
(7) terminals, including associated buildings, heliports, structures, yards, docks, and fences;
(8) electrical power lines necessary to serve the Pipeline;
(9) retaining walls, berms, dikes, ditches, cuts and fills, including hydraulic control structures;
(10) storage buildings and structures, and areas for storage of supplies and equipment;
(11) administrative buildings;
(12) cathodic protection devices;
(13) such other facilities as the State Pipeline Coordinator shall determine to be Related Facilities.

"Related Facilities" also means those structures, devices, improvements, sites, facilities or areas, the use of which is temporary in nature such as those used only for construction purposes. Among such are: temporary camps, temporary landing strips; temporary bridges; temporary Access Roads; temporary communications sites; temporary storage sites; disposal sites; and construction use areas.

1.1.1.17. "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

PROPOSED

1.2. Applicability

1.2.1. These Stipulations set forth the general standards of environmental and construction performance, and the procedures for the submission and approval of construction plans and environmental safeguards, that are required by the State of Washington.

1.2.2. During the construction, operation, maintenance and termination of the Pipeline System, the Company shall comply with these Stipulations.

1.2.3. The authority and obligations of the State of Washington, as provided in these Stipulations, shall be exercised and met by the State Pipeline Coordinate and other appropriate State and local agencies as indicated in these Stipulations.

1.3. Responsibilities

1.3.1. Except where the approval of the State Pipeline Coordinator is required before the Company may commence a particular operation, neither the State of Washington nor any of its agents or employees agrees, or is in any way obligated, to examine or review any plan, design, specification, or other document which may be filed with the State Pipeline Coordinator by the Company pursuant to these Stipulations.

1.3.2. The absence of any comment by the State Pipeline Coordinator or any other agent or employee or contractor of the State of Washington with respect to any plan, design, specification, or other document which may be filed by the Company with the State Pipeline Coordinator shall not be deemed to represent in any way whatever any assent to, approval of, or concurrence in such plan, design, specification, or other document or of any action proposed therein.

PROPOSED

1.3.3. With regard to the construction, operation, maintenance and termination of the Pipeline System: (1) The Company shall ensure full compliance with the provisions of this Agreement, including these Stipulations, by their agents, employees and contractors (including subcontractors of any tier), and the employees of each of them. (2) Unless clearly inapplicable, the requirements and prohibitions imposed upon the Company by these Stipulations are also imposed upon each agents, employees, contractors, and subcontractors, and the employees of each of them. (3) Failure or refusal of a Company agents, employees, contractors, subcontractors, or their employees to comply with these Stipulations shall be deemed to be the failure or refusal of the Company. (4) The Company shall require its agents, contractors and subcontractors to include these Stipulations in all contracts and subcontracts which are entered into by any of them, together with a provision that the other contracting party, together with its agents, employees, contractors and subcontractors, and the employees of each of them, shall likewise be bound to comply with these Stipulations.

1.3.4. Prior to beginning work on any aspect of The Northern Tier Pipeline System, the Company will furnish all supervisory-level employees of the Company, their agents, contractors and subcontractors, down to the craft foreman level, with copies of these Stipulations and will explain the limitations imposed by these Stipulations.

1.3.5. In the implementation of the authorization of which these Stipulations are a part, the following principles shall apply:

(1) In the construction, operation, maintenance (including but not limited to a continuing and reasonable program of preventive maintenance) and termination of the Pipeline System, the Company shall employ all practicable means and measures to preserve and protect the environment, as provided in these Stipulations.

(2) The Company shall manage, supervise and implement the construction, operation, maintenance and termination of the Pipeline System in accordance with safe and proven engineering practice, to the extent allowed by the state of the art and the development of technology. In the exercise of these functions, the Company consents and shall submit to such review, inspection and compliance procedures relating to construction, operation, maintenance and termination of the Pipeline System as are provided for these Stipulations and applicable authorizations.

These Stipulations are not intended in any way to derogate from, or be construed as being inconsistent with, applicable provisions of law or regulations.

PROPOSED

1.3.6. Nothing in these Stipulations shall be construed as applying to activities of the Company that have no relation to the Pipeline System.

1.3.7. Nothing in these Stipulations shall be construed to affect any right or cause of action that otherwise would be available to the Company against any person.

1.3.8. The State Pipeline Coordinator may require the Company at any time to furnish any or all data related to construction, operation, maintenance, and termination activities undertaken in connection with the Pipeline System as may be reasonably relevant to the State Pipeline Coordinator's responsibilities in connection with construction, operation, maintenance, and termination of the Pipeline System.

1.3.9. The State Pipeline Coordinator may require the Company to make such modification of the Pipeline System, without liability or expense to the State of Washington, as he deems necessary to: protect or maintain stability of geologic materials; protect or maintain integrity of the Pipeline System; prevent harm to the environment (including but not limited to fish or wildlife populations, or their habitats); or remove hazards to public health and safety.

1.3.10. Prior to beginning construction the Company shall designate an employee who shall be empowered on behalf of the Company to communicate with, and to receive and comply with, all communications and orders of the State Pipeline Coordinator. The Company shall also designate field representatives and cooperate with field representatives of the State Pipeline Coordinator. The Company shall keep the State Pipeline Coordinator informed of any change of the Company's representatives during the construction, operation, maintenance, and termination of the Pipeline.

1.3.11. No order or notice given to the Company on behalf of the State Pipeline Coordinator shall be effective as to the Company unless prior written notice of the delegation of authority to issue such order or notice has been given to the Company.

PROPOSED

1.4. Communications

1.4.1. During the period of construction and initial operation of the Pipeline System, all formal written communications between the Company and the State Pipeline Coordinator involving construction, operation, maintenance, or termination of the Pipeline System shall be transmitted through the State Pipeline Coordinator or as he may direct. However, documents required by statute or State or Local Agency regulation to be filed with the State or Local Agency shall be filed as so required, provided that a copy (or copies) thereof is concurrently filed with the State Pipeline Coordinator.

1.4.2. All orders or approvals of the State Pipeline Coordinator shall be in writing, but in emergencies may be issued orally, with subsequent confirmation in writing as soon as possible thereafter, but not later than 24 hours.

1.4.3. Any written notice or communication, including any telegram, relating to any subject, addressed to the State Pipeline Coordinator from the Company, shall be deemed to have been delivered to and received by the State Pipeline Coordinator when the notice or communication has been delivered either by messenger during normal business hours, or by means of registered or certified United States mail, postage prepaid, return receipt requested, to the Office of the State Pipeline Coordinator.

1.4.4. Any written order, notice, or other written communication, including any telegram, relating to any subject, that is addressed to the Company from the State Pipeline Coordinator shall be deemed to have been delivered to and received by the Company when the order, notice or other communication has been delivered either by messenger during normal business hours, or by means of registered or certified United States mail, postage prepaid, return receipt requested to the office of the representative designated by the Company pursuant to Stipulation 1.3.10.

PROPOSED

1.5. Summary Network Analysis Diagrams

1.5.1. As a part of the Preliminary Design, the Company shall submit a summary network analysis diagram for the project to the State Pipeline Coordinator for review and approval. The summary network analysis diagram shall be time scaled and shall include all engineering and construction-related activities and contingencies which reasonably may be anticipated in connection with the project. The summary network analysis diagram shall include or address:

(1) data collection activities;
(2) submittal and approval activities;
(3) construction and post construction activities;
(4) schedule control techniques; and
(5) other pertinent data.

The summary network analysis diagram shall be prepared employing techniques normal to the industry in sufficient detail and scope to permit the State Pipeline Coordinator to determine if the management approach shown or inferred by the network analysis will facilitate the cost-effective and environmentally sound construction of the project.

1.5.2. The summary network analysis diagram shall be initially prepared and updated to reflect major changes at intervals mutually agreeable to the Company and the State Pipeline Coordinator.

PROPOSED

1.6. Plans and Programs

1.6.1. The Company shall submit a Preliminary Design to the State Pipeline Coordinator. It shall also submit comprehensive plans and/or programs which shall include but not be limited to the following:

1. Environmental briefings
2. Oil and Hazardous Substances discharges
3. Air quality
4. Pesticides, herbicides, chemicals
5. solid waste management
6. Liquid waste management
7. Erosion control
8. Stream crossings
9. Material extraction
10. Overburden and excess material disposal
11. Clearіang
12. Visual Resources
13. Blasting
14. Restoration
15. Pipeline contingency
16. Quality assurance/quality control
17. Surveillance and maintenance
18. Cultural resource preservation
19. Fire control
20. Wetland construction

These plans and programs may be combined as appropriate.

1.6.2. The Preliminary Design and the plans and programs specified in Stipulation 1.6.1. shall be approved in writing by the State Pipeline Coordinator and shall be complied with by the Company. The State Pipeline Coordinator shall set the scope and content of the required plans, and programs must be approved by the State Pipeline Coordinator prior to any construction.

1.6.3. The Company shall furnish detailed and/or site-specific plans or programs to the State Pipeline Coordinator as needed as the basis for requesting a Notice to Proceed in accordance with Stipulation 1.7.

PROPOSED

1.7. Notice to Proceed

1.7.1. The Company shall not initiate any field activity pursuant to the authorization of which these Stipulations are a part without the prior specific permission of the State Pipeline Coordinator. Such permission for construction activities shall be given solely by a written Notice to Proceed issued by the State Pipeline Coordinator. Any Notice to Proceed shall permit field activities only as therein expressly stated and only for the particular field activities therein described. A Notice to Proceed may contain such site-specific terms and conditions as the State Pipeline Coordinator deems necessary. All applicable State and local permits shall be incorporated into the Notice to Proceed by the State Pipeline Coordinator.

1.7.2. The State Pipeline Coordinator shall issue a Notice to Proceed only when, in his judgment, applicable Final Designs and other submissions required by Stipulations 1.6.1., 1.6.3., and 1.7.8. conform to these Stipulations.

1.7.3. By written order, the State Pipeline Coordinator may revoke or suspend in whole or in part any Notice to Proceed which has been issued when in his judgment unforeseen conditions later arising require alterations in the Notice to Proceed in order to: protect or maintain stability of foundation and earth materials; protect or maintain integrity of the Pipeline System; control or prevent damage to the environment (including but not limited to fish or wildlife populations or their habitats); or remove hazards to public health and safety. The State Pipeline Coordinator shall expeditiously follow his revocation or suspension order with a more detailed written statement of the reason for the action.

1.7.4. Prior to submission of any applications for NOTICES TO PROCEED, the COMPANY and the State Pipeline Coordinator shall agree to a schedule for the submission, review and approval of such applications and on the scope of information to be contained therein. The schedule shall allow the State Pipeline Coordinator at least 120 days for review of each complete application for a NOTICE TO PROCEED. The schedule may be revised by mutual agreement, if necessary.

PROPOSED

1.7.5. The Company may apply for a Notice to Proceed for only those Construction Segments for which the Preliminary Design has been approved in writing by the State Pipeline Coordinator.

1.7.6. Before applying for a Notice to Proceed, the Company shall, in such manner as shall be acceptable to the State Pipeline Coordinator, by survey, locate and clearly mark on the ground the proposed centerline of the line of pipe, the location of all Related Facilities and, where applicable, clearing limits and the location of temporary use areas in the proposed work area.

1.7.7. During review of an application for a Notice to Proceed, the relevant portion of the route of the Pipeline may be modified by the State Pipeline Coordinator, if, in his judgment, environmental conditions or new technological developments warrant the modifications. If, during construction, adverse physical conditions are encountered that were not known to exist, or that were known to exist but their significance was not fully appreciated when the State Pipeline Coordinator issued a Notice to Proceed for the portion of the Pipeline System in which the physical conditions are encountered, the State Pipeline Coordinator may authorize deviations from the initially approved location of the Pipeline to another location along the same general route of the Pipeline at the point or points where the physical conditions are encountered, including adequate room for structurally sound transition. A deviation shall not be constructed without the prior written approval of the State Pipeline Coordinator and, if so approved, shall conform in all respects to the provisions of the approval.

PROPOSED

1.7.8. Each application for a Notice to Proceed shall be supported by:

(1) A Final Design.
(2) All applicable reports and results of environmental studies.
(3) All data necessary to demonstrate compliance with all Stipulations related to the particular activity.
(4) A detailed network analysis diagram for the Construction Segment or Segments including: the Company's work schedules, applicable permits required by State and Federal agencies, design and review periods, data collection activities, and construction sequencing. The detailed network analysis diagram shall be updated as required to reflect current status of the project.
(5) A quality assurance program as specified in Stipulation 1.8.
(6) A map or maps, prepared in such manner as shall be acceptable to the State Pipeline Coordinator, depicting the proposed location of: (1) the boundaries of all associated temporary use areas, and (2) all improvements, buried or aboveground, that are to be constructed. The State Pipeline Coordinator shall not issue a Notice to Proceed until all relevant locations on the ground have been approved by the State Pipeline Coordinator and temporary boundary markers have been set by the Company to the satisfaction of the State Pipeline Coordinator.
(7) Detailed and/or site specific plans as specified in Stipulation 1.6.3.

1.7.9. The State Pipeline Coordinator shall review each application for a Notice to Proceed and all data submitted in connection therewith in accordance with schedules as agreed upon pursuant to Stipulation 1.7.4.

1.7.10. If the State Pipeline Coordinator requires the Company to submit additional data on one or more occasions, the review period shall begin from the date of receipt by the State Pipeline Coordinator of the last submittal.

PROPOSED

1.8. Quality Assurance and Control

1.8.1. The quality assurance and quality control programs shall be comprehensive and designed to assure that the applicable requirements of 49 CFR, Part 195 and environmental and technical Stipulations will be complied with throughout all phases of construction, operation, maintenance and termination of the Pipeline System. The Company shall provide for continuous inspection of Pipeline construction to ensure compliance with the approved design specifications and these Stipulations. The term "continuous inspection" as used in this Stipulation means that at least one inspector is observing each Pipeline construction operation where Pipeline integrity is involved (e.g., the pipe gang, backend welders, weld nondestructive testing, coating and wrapping, bedding, lowering-in, padding and backfill) at all times while that construction is being performed. The Company shall submit a quality assurance, quality control, program, and other related documents, for review and approval prior to issuing Notices to Proceed.

1.8.2. At a minimum, the following shall be included in the quality assurance program:

1.8.2.1. Procedures for the detection and prompt abatement of any actual or potential condition that is susceptible to abatement by the Company, that could reasonably be expected to arise out of, or affect adversely, construction, operation, maintenance, or termination of all or any part of the Pipeline System, and that at any time may cause or threaten to cause (a) a hazard to the safety of workers or to public health or safety, including but not limited to personal injury or loss of life of any persons, or (b) harm or damage to the environment, including but not limited to areas of vegetation or timber, fish or other wildlife populations or their habitats, or any other natural resource.

1.8.2.2. Procedures for the repair and replacement of improved or tangible property and the rehabilitation of natural resources (including but not limited to Revegetation, restocking fish or other wildlife populations, and reestablishing their habitats) that shall be seriously damaged or destroyed if the immediate cause of the damage or destruction arose in connection with, or results from, construction, operation, maintenance, or termination of all or any part of the Pipeline System.

1.8.2.3. Methods and procedures for achieving component and subsystems quality through proper design and specification.

PROPOSED

1.8.2.4. Methods for incorporating quality assurance and quality control criteria in the selection of the Company's contractors, subcontractors, and contract purchases of materials and services.

1.8.2.5. A plan for collecting, recording, storing, retrieving and reviewing data to assure that quality has been attained, including procedures for maintaining adequate records of inspections, identification of deviations and completion of corrective actions.

1.8.2.6. Specific methods of detecting deviations from designs, plans, regulations, specifications, stipulations and permits, as the basis for initiating corrective action to preclude or rectify the hazards, harm or damage referenced in Sections 1.8.2.1. and 1.8.2.2. of these Stipulations.

1.8.2.7. Inspection, test and acceptance of components, sub-systems and sub-assemblies.

1.8.2.8. A plan for conducting surveys and field inspections of all facilities, processes and procedures of the Company, its contractors, subcontractors, vendors and suppliers critical to the achievement of quality.

1.8.2.9. The Company's Quality Control-Quality Assurance Inspectors must have Stop Work Authority. This includes the Company's environmental inspectors.

1.8.3. The Company shall submit reports to the State Pipeline Coordinator to demonstrate that it is complying with the quality assurance and control program as approved. Such reports shall be submitted quarterly unless otherwise requested by the State Pipeline Coordinator.

1.8.4. The Company's Quality Control-Quality Assurance Organization, personnel and inspectors must be totally independent of the Company's Construction Management or Construction Engineering structures.

PROPOSED

1.9. Changes in Conditions

1.9.1. Unforeseen conditions arising during construction, operation, maintenance or termination of the Pipeline System may make it necessary to revise or amend these Stipulations to control or prevent damage to the environment or hazards to public health and safety. In that event, the Company and the State Pipeline Coordinator shall agree as to what revisions or amendments shall be made. The revision process shall be open to public review and comment.

1.10. Completion of Use

1.10.1. Upon completion of the use of all, or a very substantial part, of the Right-of-Way or other portion of the Pipeline System, the Company shall promptly remove all improvements and equipment, except as otherwise approved in writing by the State Pipeline Coordinator and shall restore the land to a condition that is satisfactory to the State Pipeline Coordinator. The satisfaction of the State Pipeline Coordinator shall be stated in writing. Where approved in writing by the State Pipeline Coordinator, buried pipe may be left in place, provided all oil and residue are removed from the pipe and the ends are suitably capped.

1.10.2. All areas that do not constitute all, or a very substantial part of the Right-of-Way or other portion of the Pipeline System, utilized pursuant to authorizations issued in connection with the Pipeline System, shall be Put-to-Bed by the Company upon completion of their use unless otherwise directed by the State Pipeline Coordinator. Put-to-Bed is used herein to mean that Access Roads, material sites and other areas shall be lert in such stabilized condition that erosion will be minimized through the use of adequately designed and constructed waterbars, and revegetation; that culverts and bridges shall be removed by the Company in a manner satisfactory to the State Pipeline Coordinator, and that such roads, sites and areas shall be closed to use. The Company's rehabilitation plans shall be approved in writing by the State Pipeline Coordinator prior to termination of use of any such road, or any part thereof, in accordance with Stipulation 2.12.

PROPOSED

1.11. Conduct of Operations

1.11.1. The Company shall perform Pipeline System operations in a safe and workmanlike manner so as to ensure protection of the environment and the safety and integrity of the Pipeline and shall at all times employ qualified personnel and maintain equipment sufficient for that purpose. The Company shall immediately notify the State Pipeline Coordinator of any condition, problem, malfunction, or other occurrence which in any way threatens the safety or integrity of the Pipeline, or harm to the environment.

1.12. **Surveillance and Maintenance**

1.12.1. During the construction, operation, maintenance and termination phases of the Pipeline System, the Company shall conduct a surveillance and maintenance program. At minimum, this program shall, with respect to the Company's activities, be designed to: (1) provide for public health and safety; (2) control or prevent damage to natural resources; (3) control or prevent erosion; (4) maintain Pipeline integrity; and (5) control or prevent damage to public and private property.

1.12.2. The Company shall have a communication system that ensures the transmission of information required for the safe operation of the Pipeline System.

1.12.3. The Company shall maintain complete and up-to-date records on construction, operation, maintenance, and termination activities performed in connection with the Pipeline. Such records shall include surveillance data, leak and failure records, necessary operational data, modification records, and such other data as may be required by 49 CFR, Part 195, and other applicable State and Federal statutes and regulations.

1.12.4. The Company shall provide and maintain sufficient access roads as approved by the State Pipeline Coordinator to ensure that its maintenance crews and State and local governmental representatives shall have continuing access to the Pipeline System.

PROPOSED

1.13. Health and Safety

1.13.1. The Company shall take all measures necessary to protect the health and safety of all persons affected by its activities performed in connection with the construction, operation, maintenance, and termination of the Pipeline. The Company shall immediately notify the State Pipeline Coordinator of all serious accidents which occur in connection with such activities.

1.14. Public and Private Improvements

1.14.1. The Company shall provide reasonable protection to existing public or private improvements which may be adversely affected by its activities during construction, operation, maintenance, and termination of the Pipeline System. If it is determined that the Company has caused damage to such public and private improvements, and if the owner so requires, then the Company shall promptly repair the property to a condition which is satisfactory to the owner but not to exceed its condition prior to damage. In heavily impacted areas the Company shall pay the local governments to conduct pre-construction surveys of all public improvements that may be adversely affected by the Company's activities so that the local governments may make proper claims for damages.

1.14.2. All fences or access roads crossed by the Pipeline shall have gates or cattle guards that are acceptable to the landowner.

1.15. Survey Monuments

1.15.1. The Company shall mark and protect all geodetic survey monuments encountered during construction, operation, maintenance, and termination of the Pipeline System. These monuments are not to be disturbed; however, if such a distrubance occurs, the State Pipeline Coordinator shall be immediately notified thereof in writing.

1.15.2. If any public land survey monuments, corners, or accessories (excluding geodetic survey monuments) of the United States are destroyed or damaged during the construction, operation, maintenance, or termination of the Pipeline System, the Company shall employ a qualified land surveyor to reestablish or restore same in accordance with the "Manual of Instructions for the Survey of Public Lands" of the Bureau of Land Management and shall record such survey in the appropriate records. Additional requirements for the protection of monuments, corners, and bearing trees may be prescribed by the State Pipeline Coordinator.

PROPOSED

1.16. Fire Prevention and Suppression

1.16.1. The Company shall promptly notify the State Pipeline Coordinator of any fires on, or which may threaten any portion of, the Pipeline System and shall take all measures necessary or appropriate for the prevention and suppression of fires in accordance with applicable law. The Company shall comply with the instructions and directions of the State Pipeline Coordinator concerning the use, prevention and suppression of fires. Use of open fires in connection with construction, operation, maintenance and termination of the Pipeline System is prohibited unless authorized in writing by the State Pipeline Coordinator.

1.17. Electronically Operated Devices

1.17.1. The Company shall, as necessary, screen, filter, or otherwise suppress any electronically operated devices installed as part of the Pipeline System which are capable of producing electromagnetic interference radiations so that such devices will not adversely affect the functioning of existing communications systems or navigational aids. In the event that structures such as towers or buildings are to be erected as parts of the Pipeline System, their positioning shall be such that they will not obstruct radiation patterns of existing line-of-sight communications systems, navigational aids, or similar systems.

1.18. Housing and Quarters

1.18.1. Where adequate meals, living quarters, office space, communications systems, and reasonable surface and air transportation are not reasonably available on a commercial basis, the Company shall furnish representatives of the State of Washington designated by the State Pipeline Coordinator all or some of these facilities or services on a reimbursable basis during construction, operation, maintenance, and termination of the Pipeline System. Prior to the start of construction in any location where the COMPANY will be required to make these facilities and services available, the State Pipeline Coordinator shall furnish the Company, for planning purposes only, an estimate of the total number of persons for whom these facilities and services may be required. Except for emergencies or where the presence of State representatives is needed to resolve problems affecting the expeditious construction and operation of the Pipeline System, the State Pipeline Coordinator shall give the Company advance written notice of the need for such facilities and services required. Such notification shall also briefly describe the purpose of the visit.

PROPOSED

1.19. Regulation of Public Access

1.19.1. The Company shall permit free and unrestricted public access to and upon Access Roads; except that with the written consent of the State Pipeline Coordinator and local governments, the Company may regulate or prohibit public access and vehicular traffic on Access Roads as required to facilitate operations or to protect the public, wildlife and livestock from hazards associated with operation and maintenance of the Pipeline. The Company shall provide appropriate warnings, flagmen, barricades, and other safety measures when the Company is using Roads or regulating public access to or upon Roads.

1.19.2. During construction of the Pipeline, the Company shall provide alternative routes for existing roads and trails at locations and to standards as determined by the State Pipeline Coordinator and local governments whether or not these roads or trails are recorded.

1.19.3. The Company shall make provisions for suitable permanent crossings for the public at locations and to standards approved in writing by the State Pipeline Coordinator and local governments where the right-of-way crosses existing roads, foot-trails, or other rights-of-way.

1.20. Use of Existing Facilities

1.20.1. The Company shall use existing facilities to the maximum extent practicable and economically justifiable in all construction, operation, maintenance, and termination activities associated with the Pipeline System.

3. Environmental Stipulations

PROPOSED	
2.	Environmental
2.1.	Briefings
2.1.1.	Environmental Briefings. Prior to, and during, construction, maintenance, operation, and termination of the Pipeline System, the Company shall develop and provide environmental and other pertinent briefings for all personnel directly related to the project and any other persons as may be designated by the State Pipeline Coordinator. The Environmental Briefing program must be submitted for review and approved by the State Pipeline Coordinator prior to implementation.
2.1.2.	Pre-Construction Meetings. Prior to,and during construction, maintenance, operation, and termination of the Pipeline System, the State Pipeline Coordinator may request a meeting of any of the Company's personnel including but not limited to: Design and Field Engineers, Quality Control, Execution Contractors and Construction management to discuss and coordinate any specific activity of the Company, as determined by the State Pipeline Coordinator.
2.2.	Pollution Control
2.2.1.	General
2.2.1.1.	The Company shall conduct all activities associated with the Pipeline System in a manner that will avoid or minimize degradation of air, land and water quality. The Company shall comply with all local State and Federal laws, all applicable standards, guidelines and permit requirements, and all regulations issued through order, existing or hereafter if specifically mandated by regulation.
2.2.2.	Water and Land Pollution
2.2.2.1.	The Company shall comply with applicable "Water Quality Standards" of the State of Washington as approved by the Environmental Protection Agency, and with requirements of the Environmental Protection Agency's National Pollutant Discharge Elimination System waste discharge permit program.

PROPOSED

2.2.2.2. Mobile ground equipment shall not be operated in lakes, streams, wetlands or rivers unless such operation is approved in writing by the State Pipeline Coordinator, the Washington Departments of Fisheries and Game, and local governments.

2.2.3. Thermal Pollution

2.2.3.1. The Company shall comply with the standards for thermal pollution in the State of Washington's "Water Quality Standards," as approved by the Environmental Protection Agency.

2.2.4. Air Quality

2.2.4.1. The Company shall utilize and operate all facilities and devices used in connection with the Pipeline System so as to avoid or minimize air pollution.

2.2.4.2. Emissions from equipment, installations and burning materials shall meet applicable Federal, State and local government emission and performance standards. Access road watering and grading shall be implemented on lands where powdery soil conditions exist or where there is intensive construction activity.

2.2.5. Pesticides, Herbicides and Other Chemicals.

2.2.5.1. The Company shall use only non-persistent and immobile types of pesticides, herbicides and other chemicals. Only those pesticides and herbicides registered by the Environmental Protection Agency pursuant to the Federal Insecticide, Fungicide and Rodenticide Act shall be applied. Applications of pesticides and herbicides shall be in accordance with applicable regulations of the State of Washington, local governments, and the U.S. Environmental Protection Agency. Each chemical to be used and its application constraint shall be approved in writing by the State Pipeline Coordinator. Aerial application of pesticides, herbicides and other chemicals to the Right-of-Way is prohibited. Herbicides are not the preferred means of right-of-way maintenance.

2.2.6. Sanitation and Waste Disposal

2.2.6.1. "Waste" means all discarded matter, including but not limited to human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and equipment.

PROPOSED

2.2.6.2. All waste generated in construction, operation, maintenance and termination of the Pipeline System shall be removed or otherwise disposed of in a manner acceptable to the State Pipeline Coordinator in accordance with the approved plan required in Stipulation 1.6. All applicable standards, regulations, and guidelines of the State of Washington, the United States Public Health Service, the Environmental Protection Agency, local governments and other Federal and State agencies shall be adhered to by Permittees.

2.3. Buffer Strips

2.3.1. Public Interest Areas

2.3.1.1. No construction activity in connection with the Pipeline System shall be conducted within one-half (½) mile of any officially designated Federal, State or municipal park, wildlife refuge, research natural area, recreation area, recreation site, or any registered National Historic Site or National Landmark, unless such activity is approved in writing by the State Pipeline Coordinator and the Director of the effected agency after public review and comment.

2.3.2. Vegetative Screen

2.3.2.1. The Company shall not cut or remove any vegetative cover within a minimum five hundred (500) foot strip between State highways and material sites unless approved by the State Pipeline Coordinator, the local government, and the landowner.

2.3.2.2. Where the Right-of-Way crosses State highways, a screen of vegetation native to the adjacent areas shall be established over distrubed areas unless approved by the State Pipeline Coordinator, the local government, and the landowner.

2.3.3. Streams, Lakes and Wetlands.

2.3.3.1. The Pipeline System shall be located so as to provide five hundred (500) foot minimum bugger strips of undisturbed land along streams, lakes, and wetlands important to the integrity of said water bodies, unless otherwise approved in writing by the State Pipeline Coordinator, Washington Departments of Game and Fisheries, the local government, and the landowner.

PROPOSED

2.4. Erosion and Sedimentation Control.

2.4.1. General

2.4.1.1. The Company shall perform all Pipeline System pre-construction, construction, operation, maintenance and termination activities so as to minimize disturbance to all surface areas.

2.4.1.2. The design of the Pipeline System shall provide for the control of erosion and reduction of sediment production or transport.

2.4.1.3. Erosion control measures, including structures, shall be implemented to the satisfaction of the State Pipeline Coordinator to: avoid induced and accelerated erosion; reduce sediment production, transport and deposit; and lessen the possibility of forming new drainage channels resulting from Pipeline System activities. The structures and measures shall be designed and operations conducted in such a way as to minimize disturbance to the natural environment. Erosion control structures shall be designed to accommodate the occurrence of a 100-year design flood.

2.4.1.4. Surface materials suitable for use in restoration taken from disturbed areas shall be stockpiled and utilized during restoration. Erosion and Sediment Control practices as determined by the needs for specific sites, shall include but shall not be limited to revegetation, mulching, and placement of mat binders, soil binders, rock or gravel blankets or structures.

2.4.1.5. All disturbed areas shall be left in a stabalized condition satisfactory to the State Pipeline Coordinator as stated in writing.

2.4.2. Crossing of Streams, Rivers or Flood Plains.

2.4.2.1. The Company shall minimize erosion and sedimentation at streams, wetlands and river crossings and those parts of the Pipeline System within flood plains as provided in Stipulation 3.6.

2.4.2.2. Temporary access over stream banks shall be made through use of fill ramps rather than by cutting through stream banks. All temporary or permanent fills shall be made using materials of low fine content to minimize siltation. The Company shall remove such ramps upon termination of seasonal or final use. Ramp materials shall be disposed of in a manner approved in writing by the State Pipeline Coordinator.

PROPOSED

2.4.2.3. Excavated materials shall not be stockpiled in rivers, stream flood plains, wetlands, or on ice unless approved in writing by the State Pipeline Coordinator and Washington Departments of Fisheries and Game.

2.4.3. Revegetation

2.4.3.1. Revegetation means the establishment of a plant cover on disturbed lands through seed bed preparation, seeding, planting, fertilizing, mulching, and watering.

2.4.3.2. Revegetation of all disturbed areas shall be accomplished as soon as practicable in accordance with schedules approved by the State Pipeline Coordinator. The results of revegetation must be to the satisfaction of the State Pipeline Coordinator as stated in writing. All other restoration shall be completed as soon as possible. Where technically feasible, native species shall be utilized for all revegetation. On areas of critical wildlife habitat or game ranges as identified by State Biologists, native plant communities shall be established to the satisfaction of the Washington Department of Game.

2.4.4. Excavated Material

2.4.4.1. Excavated material in excess of that required to backfill around any structure, including the pipe, shall be disposed of in a manner approved in writing by the State Pipeline Coordinator as required in Stipulation 1.6.

2.4.4.2. Where required by the State Pipeline Coordinator, local governments, or landowners, the Company shall practice double-ditching during pipeline construction. The top layer of soil to be the assigned depth will be windrowed and stockpiled separately to one side. This soil shall then be redistributed evenly over the disturbed area after backfilling is complete.

PROPOSED

2.5. Fish and Wildlife Protection

2.5.1. Passage of Fish

2.5.1.1. The Company shall provide for the uninterrupted movement and safe passage of fish. Any artificial structure or any stream channel change that would cause a blockage to fish shall be provided with a fish passage structure or facility as required by Federal and State statutes, regulations and requirements. The proposed design shall be submitted to the State Pipeline Coordinator in accordance with Stipulation 1.7.

2.5.1.2. Pump intakes shall be screened to prevent harm to fish in accordance with screening criteria set by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game. Removal of water, timing, and withdrawal site shall be subject to approval by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game.

2.5.1.3. When abandoned, water diversion structures shall be removed, or plugged and stabilized unless approved in writing by the State Pipeline Coordinator and the Washington Departments of Game and Fisheries.

2.5.1.4. If material sites are approved adjacent to or in lakes, rivers, streams, or wetlands, the State Pipeline Coordinator shall require Company to construct levees, berms or other suitable means to protect fish and fish passage and to prevent siltation.

2.5.2. Fish Spawning Beds, Rearing Areas, and Overwintering Areas.

2.5.2.1. "Fish Spawning Beds" means those areas where anadromous and resident fish deposit their eggs.

2.5.2.2. "Fish Rearing Areas" means those areas inhabited by fish during all life stages between hatching and maturity.

2.5.2.3. "Overwintering Areas" means those areas inhabited by fish between freezeup and breakup.

PROPOSED

2.5.2.4. The Company shall avoid alterations in those Fish Spawning Beds, Rearing and Overwintering Areas designated by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game; however, where alterations cannot be avoided, proposed modifications shall be designed by the Company and approved in writing by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game.

2.5.2.5. Fish Spawning Beds, Rearing and Overwintering Areas shall be protected from sediment where soil material is expected to be suspended in water as a result of construction activities. Settling basins or other sediment control structures shall be constructed to intercept silt before it reaches rivers, streams, lakes, or wetlands.

2.5.2.6. The Company shall comply with any special requirements made by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game to protect Fish Spawning Beds, Rearing, and Overwintering Areas. The Company shall repair damages to Fish Spawning Beds, Rearing and Overwintering Areas caused by preconstruction activities, construction, operation/maintenance or termination of the Pipeline System to the satisfaction of the State Pipeline Coordinator and the Washington Departments of Fisheries and Game as stated in writing.

2.5.3. Zones of Restricted Activities

2.5.3.1. Threatened and Endangered Species. Before the start of pipeline construction, the Company in conjunction with appropriate State agencies shall conduct a field search of the Right-of-Way along the surveyed centerline in those areas identified by appropriate State agencies as habitat for threatened and endangered plants and animals. The results of the survey shall be submitted to the State Pipeline Coordinator and all appropriate State,Federal and local agencies prior to applications for Notices to Proceed under Stipulation 1.7. If any such species or their habitats are encountered, the Company shall comply with the mitigation measures as directed in writing by the State Pipeline Coordinator after consultation with all appropriate State, Federal, and local agencies.

PROPOSED

2.5.3.2. The Company's activities in connection with pre-construction or construction, operation/maintenance and termination of the Pipeline System in key fish and wildlife areas, and in specific areas where threatened or endangered species of animals are found, shall be restricted by the State Pipeline Coordinator and the Washington Department of Fisheries and Game during periods of fish and wildlife breeding, nesting, spawning, lambing and calving activity, overwintering, and during major migrations of fish and wildlife. The State shall provide the Company written notice of such restrictive action. At least annually, and as soon as possible prior to such restrictions, the State shall furnish Permittees an updated list of areas where such actions may be required, together with anticipated dates of restriction.

2.5.4. Big Game Movements

2.5.4.1. The Company shall design, construct and maintain the Pipeline so as to assure free passage and movement of big game animals and livestock. Skip section in the excavated pipe ditch shall be required by the State Pipeline Coordinator, Washington Department of Game, local governments and landowners to allow passage of vehicles, livestock, or wildlife. The maximum amount of open ditch in one pipeline section at any one time shall be limited to 10 miles.

2.6. Materials Sites

2.6.1. Purchase of Materials

2.6.1.1. If the Company requires materials from State lands, the Company shall make application to purchase such materials in accordance with State laws and regulations. No materials may be removed by the Company without the written approval of the State Pipeline Coordinator.

2.6.1.2. Insofar as possible, use of existing materials sites will be authorized in preference to new sites, provided that the existing material sites are in compliance with all applicable State and local laws and regulations.

2.6.1.3. Gravel and other construction materials shall not be taken from stream beds, river beds or lake shores unless approved in writing by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game. Selection and mining of all material sites shall follow the recommendations of JFWAT Special Report No. 13, as modified by the Washington Departments of Fisheries and Game.

PROPOSED

2.6.2. Layout of Materials Sites

2.6.2.1. Materials site boundaries shall be shaped in such a manner as to blend with surrounding natural land patterns. Regardless of the layout of materials sites, primary emphasis shall be placed on prevention of soil erosion, damage to vegetation, and damage to wildlife.

2.7. Clearing

2.7.1. Boundaries

2.7.1.1. Permittees shall identify approved clearing boundaries on the ground prior to beginning clearing operations. All timber and other vegetative material outside clearing boundaries and all blazed, painted or posted trees which are on or mark clearing boundaries are reserved from cutting and removal with the exception of danger trees or snags designated as such by the State Pipeline Coordinator.

2.7.2. Clearing Procedures

2.7.2.1. All trees, snags, and other wood material cut in connection with clearing operations shall be cut so that the resulting stumps shall not be higher than six (6) inches measured from the ground on the uphill side.

2.7.2.2. All trees, snags and other wood material cut in connection with clearing operations shall be felled into the area within the clearing boundaries and away from water courses.

2.7.2.3. Hand clearing shall be used in areas where the State Pipeline Coordinator determines that use of heavy equipment would be detrimental to existing conditions.

2.7.2.4. All debris resulting from clearing operations and construction that may block stream flow, delay fish passage, contribute to flood damage, or result in stream bed scour or erosion shall be removed.

2.7.2.5. Logs shall not be skidded or yarded across any stream.

PROPOSED

2.7.3. Timber

2.7.3.1. The State hereby sells to the Company and the Company hereby buys from the State, under the terms and conditions of this Agreement and Grant of Right-of-Way, all merchantable timber, within the approved clearing boundaries, which shall be cut, removed, or disposed of in a manner as approved in writing by the State Pipeline Coordinator. Prior to initiating clearing operations, the Company shall pay the State in advance of such activity, such sum of money as the State Pipeline Coordinator determines to be the full stumpage value of the merchantable timber.

2.7.4. Disposal of Clearing Debris

2.7.4.1. Vegetation, non-merchantable timber, overburden and other materials removed during clearing operations shall be disposed of by the Company in a manner approved in writing by the State Pipeline Coordinator.

2.8. Disturbance of Natural Water and Irrigation Facilities.

2.8.1. All activities of the Company in connection with the Pipeline System that may create new lakes, drain existing lakes, significantly divert natural drainages and surface runoff, permanently alter stream or ground water hydraulics, or disturb significant areas of stream beds are prohibited unless such activities along with necessary mitigation measures are approved in writing by the State Pipeline Coordinator and Appropriate State and local government agencies.

2.8.2. The Company shall not develop wells or utilize surface water sources on State or private lands for construction, operation, maintenance or termination without the prior written approval of the State Pipeline Coordinator. The Company shall comply with all State water utilization and rights laws.

2.8.3. The Company shall avoid or minimize all disturbance to irrigation systems. If disturbed during pipeline construction, operation, maintenance or termination, the Company shall repair or reconstruct all water diversion, containment levees and ditches to the satisfaction of the State Pipeline Coordinator, local governments and landowners.

2.9. Off Right-of-Way Traffic

2.9.1. The Company shall not operate mobile ground equipment off the Right-of-Way, Access Roads, State highways, or authorized areas, unless approved in writing by the State Pipeline Coordinator and the landowner or when necessary to prevent harm to any Person.

PROPOSED

2.10. Aesthetics

2.10.1. The Company shall consider aesthetic values in planning, construction, operation and termination of the Pipeline System. Where the Right-of Way crosses a State highway in forested terrain, the straight length of the Pipeline Right-of-Way visible from the highway shall not exceed six hundred (600) feet in length, unless otherwise approved in writing by the State Pipeline Coordinator. The State Pipeline Coordinator may impose such other requirements as he deems necessary to protect aesthetic values in accordance with Stipulation 1.6.

2.11. Use of Explosives

2.11.1. The Company shall submit a plan for storage and use of explosives, including but not limited to blasting techniques, timing, and locations, to the State Pipeline Coordinator for approval in accordance with Stipulation 1.6.

2.11.2. No blasting shall be done under water or within one quarter ($\frac{1}{4}$) mile of streams or lakes with identified fisheries resources without written approval of the State Pipeline Coordinator and the Washington Department of Fisheries and Game.

2.12. Restoration

2.12.1. Areas disturbed by the Company shall be restored by the Company in accordance with an approved schedule to the Satisfaction of the State Pipeline Coordinator as stated in writing.

2.12.2. Restoration includes erosion and sediment control, Revegetation, reestablishment of native species, stabilization and visual amelioration. Unless otherwise directed by the State Pipeline Coordinator, all disturbed areas shall be put-to-bed. "Put-to-bed" means that the areas shall be left in such stabilized condition that erosion will be minimized through the use of adequately designed and constructed waterbars and revegetation, that culverts and bridges shall be removed, unless otherwise approved in writing by the State Pipeline Coordinator, and slopes restored by the Company in a manner satisfactory to the State Pipeline Coordinator and that use of such areas by the Company shall cease.

2.12.3. The Company shall dispose of all materials from roads, haul ramps, berms, dikes, and other earthen structures in accordance with approved restoration plans.

PROPOSED

2.12.4. Pending restoration of a disturbed area, the Company shall maintain the area in a stabilized condition satisfactory to the State Pipeline Coordinator.

2.12.5. Upon completion of restoration of an area, the COMPANY shall remove all equipment and supplies from that area in accordance with approved restoration plans unless otherwise directed by the State Pipeline Coordinator.

2.12.6. The Company shall maintain all restored areas in accordance with approved plans required under Stipulation 1.6.

2.13. Reporting, Prevention, Control, Cleanup and Disposal of Oil and Hazardous Substances Discharges

2.13.1. A discharge of oil and other hazardous substances by the Company into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone in violation of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1319 et seq. and the regulations issued thereunder, or in violation of applicable laws of the State of Washington and regulations issued thereunder, is prohibited.

2.13.2. Reporting of Oil Discharges. In accordance with applicable law, the Company shall give notice of any spill, leakage, or discharge of oil or other hazardous substances in connection with the construction, operation, maintenance or termination of the Pipeline to: (1) the State Pipeline Coordinator; and (2) such other Federal and State officials as are required by law to be given such notice. Any oral notice to the State Pipeline Coordinator shall be confirmed in writing as soon as possible. Reports to the State Pipeline Coordinator shall be made as follows:

(1) Spillage of less than 50 gallons during one incident shall be cumulatively reported every seven (7) days.
(2) Spillage of 50 gallons to five hundred (500) gallons during one incident shall be reported within twenty-four (24) hours.
(3) Spillage of over five hundred (500) gallons during one incident or any oil spill that enters water shall be reported immediately.

2.13.3. The Company shall submit plans and procedures for transportation, storage and distribution of fuel or other hazardous substances to the State Pipeline Coordinator for approval prior to handling those substances in the field.

PROPOSED

2.13.4. The Company shall submit their contingency plans for construction to the State Pipeline Coordinator within sixty (60) days after issuance of the Agreement and Grant of Right-of-Way. The plans shall conform to this Stipulation and the National Oil Hazardous Substances Pollution Contingency Plan, 36 F.R. 16215, August 20, 1971, and shall: (1) include provisions for Oil or other Hazardous Substances Spill Control; (2) specify that the action agencies responsible for contingency plans in Washington shall be among the first to be notified for any event resulting in an oil or hazardous substances spill; (3) provide for immediate corrective action including Oil or other Hazardous Substances Spill Control and restoration of the affected resource: (4) provide that the State Pipeline Coordinator shall approve any materials or devices used for Oil or other Hazardous Substances Spill Control and shall approve any disposal sites or techniques selected to handle oily or other hazardous substances; and (5) include separate and specific techniques and schedules for cleanup of oil or other hazardous substances spills on land, lakes, rivers, streams, wetlands, sea, and estuaries. Oil Spill equipment should be readily available and should be sufficient to handle the maximum expected spill; 10,000 gallons during construction. Oil spill equipment should be inspected at regular frequent intervals to assure that it is in proper working condition.

2.14. Contingency Plans

2.14.1. It is the policy of the State of Washington that there should be no discharge of oil and other hazardous substances into or upon lands or waters. The Company must therefore recognize their prime responsibility for the protection of the public and environment from the effects of spillage.

2.14.2. At least 180 days prior to the commissioning of the Pipeline and related facilities, the Company shall submit to the State Pipeline Coordinator a plan outlining the steps to be taken in the event of a break, leak, or explosion in the pipeline or related facilities. This plan shall include items one (1) through five (5) of Stipulation 2.13.4. Prior to Pipeline start-up, such plan shall be approved in writing by the Authorized Officer, and the Company shall demonstrate their capability and readiness to execute the plan. The Company shall update as appropriate the plan and the methods of implementation thereof, which shall be submitted annually to the State Pipeline Coordinator for his written approval.

PROPOSED

2.14.3. If during any phase of the construction operation, maintenance, or termination of the Pipeline, any oil or hazardous substances should be discharged from the Pipeline System, the control, removal, disposal and cleaning up of such oil and hazardous substances, to the satisfaction of the State Pipeline Coordinator and the appropriate State and Federal agencies shall be the responsibility of the Company regardless of fault. Upon failure of the Company to control, dispose of, or clean up such discharge, the State Pipeline Coordinator may take such measures as he deems necessary to control and clean up the discharge at the full expense of the Company. Such action by the State Pipeline Coordinator shall not relieve the Company of any responsibility as provided herein.

2.14.4. The Company shall provide oil spill containment dikes or other structures around storage tanks at pump stations, the off loading facility, the Green Point Tank Farm, and at other related facilities for the Pipeline. The volume of the containment structures shall be at least: (1) one-hundred ten (110) percent of the total storage volume of the storage tanks in the relevant area, plus (2) a volume sufficient for maximum trapped precipitation and runoff which might be impounded at the time of the spill. Such structures shall be constructed to withstand failure from earthquakes in accordance with Stipulation 3.3. and shall be impervious so as to provide seepage-free storage until disposal of their contents can be effected safely without contamination of the surrounding area.

2.14.5. The Company shall provide containment dikes or other structures around any permanent or temporary point of storage, transfer or handling of fuel or lubricants and shall also provide containment dikes or other structures around permanent or temporary points of storage, transfer or handling of other substances.

2.14.6. The Company shall install and employ a commercially proven state of the art leak detection system for the automatic remote detection of oil leaks along the pipeline. The system shall include a line balance component and the system shall be able to detect leaks as least as small as 0.5% of pipeline throughput volume. A comprehensive plan for such a system shall be submitted to the State Pipeline Coordinator as a separate Notice to Proceed under Stipulation 1.7 and must be approved prior to any construction. As part of the Company's plan to minimize oil spills, the Company shall employ and refine the device known as a super pig to detect unacceptable deformation in the pipe due to external forces during operation of the pipeline.

PROPOSED

2.15. Cultural Resources

2.15.1. The Company shall undertake the affirmative responsibility to identify, protect and preserve cultural, historic, prehistoric and archeological resources that may be impacted by the Pipeline System consistent with the National Historic Preservation Act of 1966, as amended, and the implementing procedures of the Advisory Council on Historic Preservation, 36 CFR Part 800. This responsibility will be conducted in a manner consistent with the terms of a Memorandum of Agreement, under Section 106 of the National Historic Preservation Act of 1966, 16 U.S.C. 470f, 80 Stat. 915, between the Advisory Council on Historic Preservation, the State Historic Preservation Officer, and appropriate Federal and State officials. Additional protection responsibilities established by the Archeological and Historic Preservation responsibilities established by the Archeological and Historic Preservation Act shall be implemented in the manner provided by the Statement of Program Approach for this Act as published at 44 Fed. Reg. 18117 et seq., March 26, 1979.

2.15.2. Prior to initiating any ground disturbing activities related to this project, the Company under the direction of the State Pipeline Coordinator will conduct a cultural (archaeological and historical) and paleontological resources inventory of the area of potential impact, supply the inventory results to the State Pipeline Coordinator and other appropriate agencies, and carry out the cultural and paleontological resource avoidance or mitigation actions directed by the State Pipeline Coordinator and other appropriate agencies.

2.15.3. Cultural and paleontological resource inventory reports submitted to the State Pipeline Coordinator and other appropriate agencies by the Company shall detail the findings of the inventory and make recommendations for cultural and paleontological resource protection. The Company shall provide the State Pipeline Coordinator and other appropriate agencies with an acceptable report on the results of the cultural and paleontological resource data recovery effort related to the mitigation actions directed by the State Pipeline Coordinator and other appropriate agencies.

2.15.4. During project implementation, the Company shall employ Project Archaeologists to inspect the areas of surface disturbance for subsurface cultural materials. If such materials are discovered, the Company must report the find to the State Pipeline Coordinator and other appropriate agencies and leave the find intact until clearance to proceed is granted by the State Pipeline Coordinator and other appropriate agencies.

2.15.5. During the construction phase, the Company shall provide a project archaeologist, who shall ensure compliance with avoidance stipulations by construction activities, vehicles, and other equipment. All Project Archaeologists shall be approved by the State Pipeline Coordinator and other appropriate agencies.

PROPOSED	
2.16.	Hunting, Fishing and Trapping
2.16.1.	The Company shall post the Right-of-Way against hunting, fishing and trapping. The Company shall inform its employees, agents, contractors, subcontractors and their employees of applicable laws and regulations relating to hunting, fishing, and trapping. The Company shall prohibit its employees, agents, contractors, subcontractors and their employees from possessing any firearms during working hours on Company property or Right-of-Way. Firearms shall be prohibited in project vehicles at all times except for the Company's authorized security personnel.
2.17.	**Small Craft Passage**
2.17.1.	The creation of any permanent obstruction to the passage of small craft in streams is prohibited.

4. Technical Stipulations

PROPOSED	
3.	Technical
3.1.	The following standards shall be complied with in design, construction, operation and termination of the Pipeline System.
3.2.	Pipeline System Standards
3.2.1.	General Standards
3.2.1.1.	All design, material and construction, operation, maintenance and termination practices employed in the Pipeline System shall be in accordance with safe and proven engineering practice and shall meet or exceed the Department of Transportation Regulations, 49 CFR, Part 195, "Transportation of Liquids by Pipeline."
3.2.1.2.	Requirements in addition to those set forth in Stipulation 3.2.1.1. may be imposed by the State Pipeline Coordinator to insure the integrity of the Pipeline System and to minimize damage to the environment.
3.2.2.	Special Standards
3.2.2.1.	The design shall also provide for remotely controlled shutoff valves at each pump station; remotely controlled mainline block valves (intended to control spills); and additional valves located with the best judment regarding wildlife habitat, fish habitat, and potentially hazardous areas.
3.2.2.2.	Prior to placing the Pipeline System in operation, the Company shall inspect all new mainline girth welds using radiographic techniques.
3.2.2.3.	The Company shall provide for continuous inspection of Pipeline System construction to ensure compliance with the approved design specifications and these Stipulations. The term "continuous inspection" as used in this Stipulation means that at least one inspector is observing each pipeline construction operation where pipeline integrity is involved (e.g. pipe gang back-end welders, weld non-destructive testing, coating and wrapping, bedding, lowering-in, padding and back fill), at all times while that construction operation is being performed.
3.2.2.4.	Welder qualification tests shall be by destructive means, except that operators of automatic welding equipment for girth welding of tank seams shall be tested by radiography in accordance with ASME Boiler and Pressure Vessel Code, Section 9, Subsection Q-21 (b).

PROPOSED

3.2.2.5. The design shall provide for minimum maintenance.

3.2.2.6. Lightning protection shall conform to the requirements of ANSI C5.1--1969, "Lightning Protection Code--1968."

3.2.3. Standards for Access Roads

3.2.3.1. Design, materials and construction practices employed for Access Roads shall be in accordance with safe and proven engineering practice and in accordance with the principles of construction for secondary roads.

3.2.3.2. The Company shall submit a layout of each proposed access Road for approval by the State Pipeline Coordinator in accordance with Stipulation 1.7.

3.2.3.3. Access Roads shall be constructed to widths suitable for safe operation of equipment at the travel speeds proposed by the Company.

3.2.3.4. The maximum allowable grade shall be 12 percent unless otherwise approved in writing by the State Pipeline Coordinator.

3.2.3.5. The Company shall use existing roads in all areas unless disapproved in writing by the State Pipeline Coordinator. The Company shall maintain or share in prorata maintenance of all existing roads utilized by the Company during construction as approved by the State and local governments.

3.3. Earthquakes and Fault Displacements

3.3.1. Earthquakes

3.3.1.1. The Company's route design and construction plan shall specify that the line of pipe shall cross active seismic faults at angles that are between seventy (70) degrees and ninety (90) degrees when and where possible, subject to the approval of the State Pipeline Coordinator. The Company shall design the Pipeline to withstand, without rupture, the maximum probably expected earthquake that may occur during the lifetime of the project based upon consideration of regional tectonics within the existing geological framework.

3.3.1.2. The Company shall provide the State Pipeline Coordinator data from existing monitoring systems mainteained by the United States Geological Survey, the California Division of Mines and Geology, and the University of California. A determination by the State Pipeline Coordinator will be made on what other systems are necessary to ensure there are adequate procedures for safe shutdown of the Pipeline under severe seismic conditions.

PROPOSED

3.3.2. Fault Displacements

3.3.2.1. Prior to applying for a Notice to Proceed for any construction segment, the Company shall satisfy the State Pipeline Coordinator that all recognizable or reasonably inferred faults or fault zones along the alignment within the segment have been identified and delineated and any risk of Pipeline System damage resulting from fault movement and ground deformation has been adequately assessed and provided for in the design of the Pipeline for the segment. Evaluation of said risk shall be based on geologic, geomorphic, geodetic, seismic, and other appropriate scientific evidence of past or present fault behavior and shall be compatible with the design earthquakes and with observed relationships between earthquake magnitude and extent and amount of deformation and fault slip within the fault zone.

3.3.2.2. Minimum design criteria for a segment of the Pipeline traversing a fault zone that is reasonably interpreted as active, shall be: (1) that the Pipeline resist failure resulting in leakage from two feet of horizontal and/or vertical displacement in the foundation material anywhere within the fault zone; and (2) that no storage tank or pump station be located within the fault zone.

3.3.2.3. Where the Pipeline crosses a fault or lies within a fault zone that is reasonably interpreted as active, the Company shall monitor crustal deformation in the vicinity of the Pipeline. Such monitoring shall include annual geodetic observation of permanent reference marks established on stable ground. Said reference marks shall be positioned so as to form closed figures and to provide for detection of relative horizontal and vertical displacements as small as 0.10 ft. across principal individual faults within the fault zone and to provide for monitoring of crustal strain with an absolute error of two parts per million within the fault zone. Further, where annual slip on a fault exceeds 0.10 ft. for two successive years, the Company shall install recording or telemetering slip-meters. Data obtained from the monitoring shall be provided to the State Pipeline Coordinator at specified regular intervals throughout the operational life of the Pipeline. Said data shall be used by the Company to aid in the initiation of corrective measures to protect the Pipeline from failure caused by tectonic deformation that would result in leakage.

PROPOSED

3.4.	Slope Stability
3.4.1.	Areas subject to mudflows, landslides, avalanches, rock falls and other types of mass movements shall be avoided where practicable in locating the Pipeline System. Where such avoidance is not practicable, the Pipeline System design, based upon detailed field investigations and analysis, shall provide measures to prevent the occurrence of, or protect the Pipeline System against, the effects of mass movements.
3.5.	Stream and Flood Plain Crossings and Erosion.
3.5.1.	General.
3.5.1.1.	The Pipeline System shall be designed so as to both minimize the number of steam crossings, and to include but not limited to consideration of erosion and sedimentation, restriction of natural meander or alteration of the physical or chemical nature of the water body.
3.5.1.2.	For each region through which the Pipeline passes, the Pipeline shall be designed to withstand or accommodate the effects (including runoff, stream and flood plain erosion, meander cutoffs, lateral migration, ice-jams, and icings) of those meterologic, hydrologic (including surface and subsurface) and hydraulic conditions considered reasonably possible for the region. For stream crossings and portions of the Pipeline within the flood plain, the following standards shall apply to such Pipeline design:
3.5.1.2.1.	Where technically feasible all rivers will be crossed by directional drilling methods. Aerial pipeline river crossings may be required by the Washington Departments of Game and Fisheries and State Pipeline Coordinator's office to reduce impacts on aquatic resources that would occur by open trenched pipeline river crossings.
3.5.1.2.2.	The design flood shall be based on the concept of the "Standard Project Flood" as defined in Corps of Engineers Bulletin 52-8, Part 1.
3.5.1.2.3.	The depth of channel scour shall be established by appropriate field investigations and theoretical calculations using those combinations of water velocity and depth during a 100 year flood occurrence. The cover over the pipe will be equal to the computed scour based on a 100 year flood occurrence plus four (4) feet unless solid rock is encountered in the streambed, in which case the cover may be reduced to eighteen (18) inches.

PROPOSED

3.5.1.2.4. For overhead crossings comparable analysis shall be made to ensure that support structures are adequately protected from the effects of scour, channel migration, undercutting, ice forces and other external and internal loads.

3.5.1.2.5. In flood plains, appropriate construction procedures shall be used wherever there is potential channelization along the pipe. Deep pipe burial shall be preferred over the construction of river training structures, the latter which are necessary to protect a normal buried pipeline.

3.5.1.2.6. Method of constructing stream crossings, including excavation and back fill of pipe trench near and through stream banks, shall be approved in writing by the State Pipeline Coordinator and the Washington Departments of Fisheries and Game.

3.5.1.2.7. The pipe trench excavation shall stop an adequate distance from the water crossing to leave a protective plug (unexcavated material) at each bank. These plugs shall be left in place until the stream bed excavation is complete and the pipe laying operation is begun. The plugs shall not be completely removed until absolutely necessary. The trench shall be backfilled with stable material as soon as the pipe is laid.

3.5.1.3. Culverts and Bridges

3.5.1.3.1. Culverts and bridges necessary for maintenance of the Pipeline shall be designed as a minimum to accommodate a fifty (50)-year flood in accordance with criteria established by the American Association of State Highway Officials and the Federal Highway Administration and endorsed by the State of Washington Department of Transportation. Bridges or adequately-sized, properly set, and armored culverts shall be utilized during construction, operation, maintenance and termination on all fish streams as identified by the Washington Departments of Game and Fisheries. All culverts and bridges, temporary or permanent, shall be designed and constructed to pass the Q5 discharge at less than five (5) feet per second water velocity and to provide a minimum of 6 inches of water depth at low flows to ensure the safe passage and uninterrupted movement of fish.

PROPOSED

3.5.1.3.2. Culverts necessary for construction or operation of the pipeline system shall be installed six (6) inches below the bottom of fish streams. If the stream gradient exceeds 1% a bridge or greatly over-sized culverts which shall be buried well below the stream bed shall be installed on all fish streams. All culverts on fish streams shall be as short as possible, restricting traffic to only one essential lane to reduce the distance of potential excessive water velocities and to minimize disturbance to the streams. All culverts shall be installed in the dry by by-pass pumping, fluming, or diverting the streams. Culverts shall not be installed in the wet or in flowing water.

3.5.1.3.3. Low water stream crossings are defined as fords across streams or rivers on which any mobile ground equipment is moved on the stream bed. Low water crossings shall not be utilized during construction or termination. Low water crossings may be used during operations and maintenance if approved in writing by the Washington Departments of Fisheries and Game. Design and construction of any low water crossings shall follow the recommendations of JFWAT Special Report No. 16.

3.5.2. Erosion

3.5.2.1. Where necessary because of outfall erosion, stilling basins shall be constructed at the outflow end of culverts. To prevent erosion the pool sides shall be stabilized by appropriate methods; e.g., by the use of riprap.

3.5.2.2. Slopes of cuts through stream banks shall be designed and constructed to minimize erosion and prevent slides.

3.5.2.3. Erosion control procedures shall accommodate and be based on the runoff produced by the maximum rainfall rate and snow melt rate combination reasonably characteristic of the region.

PROPOSED

3.6. Construction and Operation.

3.6.1. All construction, operation, maintenance, and termination activities in connection with the Pipeline System shall be conducted so as to avoid or minimize environmental changes and to provide maximum protection to fish and wildlife and their habitat, and people. All working platforms, pads, fills and other surface modifications shall be planned and executed in such a way that any resulting alteration will not jeopardize the Pipeline System integrity and the surrounding environment.

3.6.2. **Acceptable plans, procedures and quality control that ensure compliance with Stipulation 3.6.1. shall be submitted and approved in accordance** with Stipulation 1.6.

3.7. Pipeline Corrosion

3.7.1. The Company shall provide detailed plans for corrosion resistant design and methods for early detection of corrosion. These shall include: (1) pipe material and welding techniques to be used and information on their particular suitability for the environment involved; (2) details on the external pipe protection to be provided (coating, wrapping, etc.), including information on variation of the coating process to cope with variations in environmental factors along the Pipeline route; (3) plans for cathodic protection including details of impressed current sources and controls to ensure continuous maintenance of adequate protection over the entire surface of the pipe; (4) details of plans for monitoring cathodic protection current including spacing of current monitors; (5) provision for periodic intensive surveys of trouble spots, regular preventive maintenance surveys and special provisions for periodic intensive surveys of trouble spots, regular preventive maintenance surveys and special provisions for abnormal potential patterns resulting from the crossing of the Pipeline by other pipelines or cables; and (6) information on precautions to be taken to prevent internal corrosion of the Pipeline. The Company shall also provide for periodic internal pitting surveys by electro-magnetic or other means.

5. Socio-Economic Stipulations

PROPOSED	
4.	SOCIOECONOMIC
4.1.	MONITORING
4.1.1.	The Company agrees to monitor primary and secondary socioeconomic impacts of the project during construction in close cooperation with Clallam County, Port Angeles and other affected counties and governmental units, and to make information available, on a regular basis, to the State Pipeline Coordinator relating to the project in the socioeconomic planning effort.
4.1.2.	Specific data to be reported and a schedule for reporting socioeconomic effects of construction shall be determined following consultation between the Company, Clallam County, Port Angeles and the State Pipeline Coordinator no later than three months after the effective date of this agreement. At minimum this data will include the items required in 4.1.2.1., 4.1.2.2., and 4.1.2.3. In addition, all parties will jointly agree upon definitions of primary and secondary impacts, and jointly agree upon methods of measurement of impacts no later than three months after the effective date of this agreement.
4.1.2.1.	The Company will provide, at the end of each quarter, projections of future manpower levels for each remaining quarter of the project by site (within the County).
4.1.2.2.	The Company will obtain from each of its employees and from each employee of its contractors and subcontractors a completed survey form covering worker characteristics. The form shall be approved by the State Pipeline Coordinator prior to use. The results will be summarized quarterly by the Company and given to the State Pipeline Coordinator along with the projections required in 4.1.2.1.
4.1.2.3.	The Company will analyze its workforce data and provide quarterly reports on actual in-migration of workers and the extent of their impacts on Clallam County, including secondary population growth and its impact.
4.2.	WORKFORCE
4.2.1.	The Company agrees to take steps to minimize the impact of its workforce.
4.2.1.1.	The Company will schedule its construction peak during the tourist off-season, i.e., after August and before June.
4.2.1.2.	The Company will hire and retain qualified Clallam County residents on a priority bases on the construction and operation/maintenance phases of the project.

PROPOSED

4.2.1.3.	Nonlocal workers will be encouraged to relocate to high population areas and away from the small, rural cities and towns. In instances where there are no large cities and towns in the area, NTPC will encourage nonlocal workers to distribute themselves and not to concentrate in any one location.
4.2.1.4.	Construction schedules and/or personnel requirements will be adjusted to the extent possible to decrease peak personnel requirements.
4.3.	HOUSING
4.3.1.	The Company will undertake careful planning to ensure that housing for its permanent employees and temporary employees is provided with a minimum of disruption to local housing markets.
4.3.1.1.	The Company will conduct a detailed housing availability study and a temporary housing plan will be developed for construction workers prior to the beginning of construction.
4.3.1.2	Temporary housing will be supplied by the Company for construction workers if the housing availability study indicates vacancy rates during construction will go below one-half of the desired rates as indicated by HUD Guidelines.
4.4.	TRANSPORTATION
4.4.1.	The Company will take measures to mitigate project impacts on local highways and transportation systems.

PROPOSED

4.4.1.1.	Measures applicable to all NTPC operations
4.4.1.1.1.	NTPC shall provide a full time liaison officer with sufficient authority to make immediate, binding, decisions regarding county road problems. This officer or his designate will be available to the County Engineering Department through a 24 hour, 7 day per week answering system. The duration of this shall be from one month prior to the start of any construction in Clallam County to three months after the completion of all construction work in Clallam County.
4.4.1.1.2.	NTPC shall compensate Clallam County Engineering Department for the wages of one supervisory employee to act as a liaison officer. NTPC shall compensate the county for all costs incurred in providing a 24 hour, 7 day per week call system. The duration of this shall be from one month prior to the start of any construction in Clallam County to 3 months after the completion of all construction work in Clallam County.
4.4.1.2.3.	All materials being hauled to a construction or stockpile site shall be hauled between the hours of 6:30 A.M. and 9:00 P.M. This provision shall be included in all NTPC contracts and all contractor/ sub-contractor contracts.
4.4.1.1.4.	All roads crossed by the pipeline (or any utilities serving NTPC) which are presently surfaced with asphaltic concrete pavement shall be bored and cased (per local utilities requirements).
4.4.1.2.5.	NTPC and its assigns shall be required to comply with all local road restrictions and shall be required to obtain permits for the movement of materials and/or machinery which exceed legal limitations.
4.4.1.2.6.	NTPC shall provide to Clallam County Engineering, on the first working day of each month, an updated progress chart (utilizing PERT or a similar method). These charts shall be made from one month prior to the start of construction, to the completion of all construction within Clallam County.
4.4.1.2.7.	NTPC shall provide, prior to commencing construction, a photo-logging (35 mm, including suitable viewing equipment) of all roads east of Port Angeles and Airport, Place, Black Diamond, and Benson Roads. Any other roads which are anticipated to become haul routes will also be photo-logged. All roads will again be photo-logged within one month following the completion of construction in Clallam County.

4.4.1.2.8. NTPC shall provide a comprehensive traffic count of east end county roads (as determined by the engineering office). The count will require two full time employees and 30 traffic counters. The count shall take place from six months prior to the initiation of construction and shall continue to six months after all construction is completed.

4.4.1.2. Measures to mitigate the impacts on haul and primary access roads.

4.4.1.2.1. NTPC will finance construction of the Old Olympic Highway (No. 94120) from SR 101 to Sequim-Dungeness Road and Port Williams Road (No. 54300) from Sequim Dungeness Road to Sequim Bay to present design standards, with sufficient additional surfacing to handle the anticipated truck traffic. The Burlingame Bridge over the Dungeness River must be rebuilt to HS-20 capacity or all loads must comply with the present HS-15 rating.

A major realignment of the Old Olympic Highway between Gasman and Lewis Roads will be necessary to allow the construction of a safe approach to the tank farm site. Estimated funds for this construction shall be placed in the Clallam County Road Fund not less than nine months prior to the beginning of construction.

4.4.1.2.2. NTPC shall install a railroad siding at the tank farm site. All structural steel, pipe, reinforcing steel, oversize or overweight machinery, and raw cement with origins outside of Clallam County shall be delivered to the site by rail. A concrete plant to supply the tank farm needs shall be erected on site.

4.4.1.2.3. Prior to the use of any haul road* by NTPC or its assigns, the Company shall obtain a haul road agreement from the county. As a minimum requirement, NTPC shall be required to repair or reconstruct the haul road to the standard shown in the initial photo-logging. If the haul road is geometrically or structurally inadequate (in the opinion of the engineer), NTPC will be required to use an alternate route or reconstruct the road to present design standards prior to use.

*Haul Road - A road over which 5 or more trucks specifically associated with the NTPC project, travel.

4.4.1.2.4. On a weekly basis, NTPC or its assigns shall submit a list of anticipated haul routes to the engineer. Should NTPC desire the use of any additional haul route, it shall notify the engineer prior to its use.

4.4.1.3. Measures to mitigate the impacts due to pupulation and general traffic increases.

4.4.1.3.1. NTPC shall provide three parking areas--near Port Angeles, Carlsborg, and Sequim--for workers' private vehicles. The Company shall provide shuttle bus service from these areas to working areas. The use of private vehicles to drive workers to the job site shall not be allowed.

4.4.1.3.2. NTPC shall fund a comprehensive signing program to equip all roads east of Port Angeles with excellent cautionary and road name signing (road name signs at all intersections, cautionary signs per MUTCD) to compensate for an increased non-resident population.

4.4.1.3.3. NTPC shall compensate Clallam County for increased maintenance costs on roads due to traffic increases (see Section A.8). The amount of compensation paid on a monthly basis shall be determined as follows:

The present month's traffic count shall be compared with the ADT for the six month period preceding construction. If the present month's count is lower than the six month average, no compensation will be necessary. If the present count is greater, the difference in counts divided by the six month average shall be considered the percentage increase. The average monthly maintenance cost (obtained from county records over the 24 months prior to construction) multiplied by the percentage increase shall be the month's compensation.

4.4.1.3.4. A floating escrow fund of not less than $25,000.00 shall be maintained for reimbursing the county for increased maintenance work.

4.4.2. The Company will take steps to minimize the impact of construction related air traffic on the local traveling public.

4.5. LOCAL ECONOMY

4.5.1. The Company will strive to prevent or mitigate disruptions in local economies.

4.5.1.1. The Company, in order to minimize the project's impact on the tourist industry, will confer with the City of Port Angeles, Clallam County, the National Parks Service and other designated organizations towards developing plans and schedules least disruptive to tourism.

4.5.1.2. The Company will utilize project activities for the encouragement of local business ventures while at the same time taking steps to minimize disruption of supplies normally available to local communities. The Company will assist local business people in identifying and planning for optimum utilization of new business opportunities. The Company will let contracts to local businesses in so far as they possess, or can obtain or develop, the capacity to supply specific project needs cost-effectively.

PROPOSED

4.6.	LAND USE
4.6.1.	The Company will mitigate impacts on existing land uses and adjacent water uses.
4.6.1.1.	The Company will provide for continued operation of recreational boating facilities and replace any displaced facilities at another location, mutually agreeable to local authorities and harbor users, with facilities of equal or better size and attractiveness.
4.6.1.2.	The Company will provide for the continued operation of the Puget Sount Pilots Association and provide for relocation of facilities to another site in the area, mutually agreeable to the Pilots Association and local authorities, with facilities of at least equal size.
4.7.	POLICE/SECURITY
4.7.1.	The Company will provide a security program for its facilities approved by local law enforcement officers.
4.7.1.1.	The Company will provide security personnel for all sites during construction.
4.7.1.2.	The Company will provide security fencing, lighting and alarms at the tanker unloading facilities, the onshore storage facilities and the pump and pressure reducing stations.
4.7.1.3.	The Company will provide a security force and security procedures, at the level and to the extent recommended by local law enforcement officers, during project operation.
4.7.1.4.	The Company will compensate local law enforcement authorities for all costs of adding additional capacity which is needed during project construction and as a result of primary and induced population increases attributable to the project.
4.7.1.5.	The Company will prohibit the possession of privately held firearms on all property or in any vehicles under its control.
4.7.1.6.	The Company will use inventory control and identification methods which deter theft and facilitate the recovery of lost and stolen property.

PROPOSED

4.8.	HEALTH/MEDICAL
4.8.1.	The Company shall take all measures necessary to protect the health and safety of all persons affected by its activities performed in connection with the construction, operation, maintenance, and termination of the PIPELINE. The Company shall immediately notify the State Pipeline Coordinator of all serious accidents which occur in connection with such activities.
4.8.1.1.	The Company shall make arrangements for emergency evacuation of injured workers from its fixed sites prior to beginning construction.
4.8.1.2.	The Company will compensate the local Health Department for personal and environmental health services shown to be related to the project or the population growth induced by the project.
4.9.	AESTHETICS
4.9.1.	The Company shall consider aesthetic values in planning construction and operation of the Pipeline. The State Pipeline Coordinator may impose those requirements he deems necessary to aesthetic values.
4.9.2.	In order to minimize visual impacts, the Company shall retain a landscape architect to recommend detailed mitigation measures and shall submit landscaping plans to the State Pipeline Coordinator for approval prior to construction and implementation.
4.10.	PUBLIC RELATIONS/ORIENTATION
4.10.1.	The Company shall make available to the public all available information on the project.
4.10.1.1.	The Company shall cooperate with State, local and regional agencies in the establishment of pipeline impact coordination centers. The centers will be designed to 1) collect, organize and disseminate information on company activities, and on community social and economic change and; 2) serve as a location for channeling to the Company and the Pipeline Coordinator the pipeline impact concerns expressed by citizens. The centers will have advisory boards composed of local citizens, a representative of the State Pipeline Coordinator, and the Company. These centers shall be financed by the Company.

PROPOSED

4.10.1.2. The Company shall cooperate with local communities to ensure that adverse socioeconomic impacts are minimized, and positive impacts of the project are enhanced. Areas of potential Company/community interaction will be identified, consultation teams will be established, and periodic meetings will be held with communities.

4.10.1.3. The Company will provide ongoing coordination and supervision of the activities of its prime contractors and their subcontractors with local communities and governments.

4.10.1.4. The Company will ensure access to all relevant information and activities to the State Pipeline Coordinator and authorized monitoring personnel.

4.10.2. The Company will orient its employees and employees of its contractors and subcontractors to their obligations under the site certification agreement and provide them with an understanding of the certification's stipulations.

4.10.2.1. The Company shall in entering into any contract for the construction, operation and maintenance of the Pipeline require as a condition of such a contract that the contracting party or any subcontractor respect these Stipulations. The Company shall be responsible for any breach of the Stipulations by the contracting party or any subcontractor as if the breach had been committed by the Company itself.

4.10.2.2. The Company shall present to each employee referenced in 4.10.2. above any orientation program. This program should include, at least, the following items.

- An introduction to and description of the project.
- A review of the socioeconomic characteristics of the construction area.
- A review of the relationship of the Pipeline to the community and community concerns.
- A description of the physical environment.
- A description of the biological environment.
- An introduction to archeological and other sites of cultural significance.
- A description of the environmental inspection and monitoring process, including environmental rules and regulations, the role of Company and government inspectors and enforcement mechanisms.
- A review of safety and security practices including medical evacuation plans, fire control, and control of hazardous substances.
- A review of legislation governing the project as it relates to the worker's responsibilities and the monitoring of performance.

PROPOSED

4.11. FINANCIAL RESPONSIBILITY

4.11.1. The Company agrees to pay any valid claims filed against it by the state or by any agency or political subdivision of the state, including but not limited to counties, cities and school districts, arising out of an actually incurred or clearly anticipated net financial burden or deficiency substantially caused by primary or secondary socio-economic or environmental impacts from construction or operation of the project. Any such net financial burden or deficiency shall be calculated by allowing as a credit or offset against the total financial burden or deficiency so caused any revenues to the claimant reasonably attributable to construction or operation of the project. With respect to any clearly anticipated net financial burden or deficiency, payment of such claim shall be made to the claimant no later than the time such burden or deficiency is actually incurred. The burden of establishing the validity of any such claim shall be upon the claimant.

4.11.2. INSURANCE. The Company shall provide to the State Pipeline Coordinator evidence of adequate insurance against legal liability for injury to persons or damage to property of any kind whatsoever occurring on or off properties and pipeline right-of-ways.

4.11.3. GRANTSMANSHIP. The Company will provide advice and assistance to local governments to identify and, where necessary, apply for federal and state grants and loans under programs such as the Economic Development Administration's Title X Program. This measure could help provide funds to pay for increased local services needed to serve construction workers during the period before the project would generate sufficient local tax revenues to pay for the services.

IV. LITERATURE CITED

1. Breuninger, R. and L. Thompson. 1979. The Effects of Large-Diameter Underground Crude-Oil Pipelines on Soils and Vegetation. Northern Tier Report No. 1. Montana Department of Natural Resources and Conservation. Helena, MT. 54 pages.

2. Olson-Elliott and Associates. 1979. Environmental Impact of the Northern Tier Pipeline in Montana: Terrestrial Flora. Report prepared for Montana Department of Natural Resources and Conservation. Helena, MT. 91 pages.

3. Olson-Elliott and Associates. 1979. Environmental Impact of the Northern Tier Pipeline in Montana: Aquatic Resources. Report prepared for Montana Department of Natural Resources and Conservation. Helena, MT. 194 pages.

4. Robinson, Fred. August 1979. The Effects of Large-Diameter Underground Crude-Oil Pipelines on Aquatic Life and Habitats. Northern Tier Report No. 3. Montana Department of Natural Resources and Conservation Energy Division, 32 South Ewing, Helena, MT 59501. 68 pages.

5. Carson, Al. 1976. Environmental Problems Caused By Construction of a Fuel Gas Line From Prudhoe Bay to Pump Station No. 4. Paper presented at the 27th Alaska Science Conference, August 8th at the University of Alaska. Fairbanks, Alaska.

6. Carson, Al. 1977. JFWAT, State Surveillance Supervisor's Statement Before the President's Council on Environmental Quality, Hearings on Natural Gas Pipeline from Prudhoe Bay, Alaska. May 16, 1977.

7. Carson, Al. April 21, 1977. Memo to Woodrow Johansen, Alaska Department of Highways, Fairbanks. Mitigation Measures for the White Spruce Reroute. 6 pages.

8. Gustason, J. 1977. An Evaluation of Low Water Crossings at Fish Streams along the Trans-Alaska Pipeline System. JFWAT Special Report No. 16. 39 pages.

9. Haddix, M. 1977. Summary of TAPS'S Haul Road Fish Stream Crossing Problems. Report to Al Carson, JFWAT Supervisor. 22 pages.

10. Joint Fish and Wildlife Advisory Team. 1974-1977. Surveillance Reports for TAPS Construction Section 1, 2, 3, 4, 5, 6, and Terminal. Approximately 4,000 pages.

11. Kay, C. E. September 21, 1977. Memo to Al Carson, JFWAT Supervisor. Environmental and Fisheries Problems Associated with the Haul Road. 5 pages, 28 photographs, 3 figures, 3 appendices.

12. Zemansky, G. M. 1976. Environmental Non-Compliance and the Public Interest during Construction of the Trans-Alaska Pipeline. Fairbanks Environmental Center, Fairbanks, Alaska, 99708. 111 pages and 6 appendices. 323 references cited. 206 total pages.

13. Joint Fish and Wildlife Advisory Team. 1977. Interim Report on Zones of Restricted Activity for Fish and Wildlife Along the Trans-Alaska Pipeline. JFWAT, Anchorage, Alaska 99501. February 16. 35 pages.

14. Johnson, R. L. and J. Rockwell, Jr. 1979. List of Streams and Other Waterbodies Along the Proposed Trans-Alaska Pipeline Route. 4th Revision. 300+ pages.

15. Burger, C. and L. Swenson. 1977. Environmental Surveillance of Gravel Removal on the Trans-Alaska Pipeline System with Recommendations for Future Gravel Mining. JFWAT Special Report No. 13. 35 pages.

16. Kavanagh, N. and A. Townsend. 1977. Construction-Related Oil Spills Along the Trans-Alaska Pipeline. JFWAT Special Report No. 15. 16 pages.

17. CH2M Hill. 1979. Draft Environmental Impact System on the Northern Tier Pipeline System: Washington Segment. Washington Energy Facility Site Evaluation Council.

18. Northern Tier Pipeline Company. 1980. An open Letter from Mr. William Sage to the Citizens of Clallam County on Proposed Mitigating Measures. February 15th. 20 pages.

19. BLM. 1979. Final Environmental Impact Statement. Crude Oil Transportation Systems. 4 Volumes.

20. U.S. Comptroller General, General Accounting Office, Trans-Alaska Oil Pipeline - Progress of Construction, November, 1975. February 17, 1976.

21. U.S. Comptroller General, General Accounting Office. Trans-Alaska Oil Pipeline--Information on Construction, Technical, and Environmental Matters through Spring, 1977. August 23, 1977. EMD-74-44. B-180 224. 32 pages.

22. U.S. Congress Subcommittee Staff Report to Representative John D. Dingell. Alyeska Pipeline - Preliminary Report. September 9, 1976.

23. Price, Waterhouse and Company. 1976. Recommendations for Improving the Effectiveness of the Systems Designed to Monitor Alyeska's Compliance with the Right-of-Way Agreement. Report prepared for Alaska Pipeline Office. Anchorage, Alaska. October, 1976.

24. Lenzner, T. G. 1977. The Management, Planning, and Construction of the Trans-Alaska Pipeline System. Report to the Alaska Pipeline Commission, 338 Denali Street, Anchorage, Alaska 99501.

25. Skinnarland, E. 1977. Trans-Alaska Pipeline on Overview Study. Prepared for the Alaska Pipeline Office under the supervision of Mechanics Research, Inc. by Terminus Limited, Toronto, Canada. Approximately 150 pages.

26. U.S. Department of the Interior, Office of Audit and Investigation. Study of the Alaska Pipeline Office Monitoring of Quality Assurance and Control by the Alyeska Pipeline Service Company. September 10, 1976.

27. Mechanics Research, Inc. April 30, 1974. Review and Critique of Alaska Pipeline Construction Phase Quality Assurance Manuals. Report 3210-01/1 to the Alaska Pipeline Office, Anchorage, Alaska.

28. Milke, G. 1977. Animal Feeding: Problems and Solutions. JFWAT Special Report Number 14. 11 pages.

29. Kavanagh, N.L. 1977. The Interagency Approach to Environmental Surveillance: A History and Evaluation of the Joint State/Federal Fish and Wildlife Team. JFWAT Special Report #12. 47 pages.

30. Kay, C. E. May 6, 1977. Memo to Al Carson, JFWAT Supervisor. Alyeska's Write-Off of Environmental Quality Non-Conformance Reports. 9 pages and 7 appendices. 70 total pages.

31. Alaska Pipeline Office. 1977. Summary of Trans-Alaska Oil Pipeline System Critique Session held August 18-19, 1977 at the University of Alaska, Anchorage. U.S. Department of Interior. 70 pages.

32. Carson, Al. September 10, 1975. "An Analysis of Environmental Stipulation Compliance on the Trans-Alaska Oil Pipeline." JFWAT State Supervisor, Anchorage, Alaska.

33. Cornman, D. 1977. A Historical Perspective on Bechtel's Role in Environmental Compliance on the Alyeska Project. A Report to Bechtel Management. 16 pages.

34. Rockwell, J. Alaska Pipeline Office. September 9, 1975. Memo to Al Carson, JFWAT Supervisor. Oil-Fired Culvert Heaters. 33 pages.

35. Rockwell, J. January 22, 1976. Memo on Oil-Fired Culvert Heaters. 15 pages.

36. Rockwell, J. 1977. Additional photographs of culvert heaters. JFWAT Report. 1/7/77. 60 pages.

37. Finberg, R. A. 1977. Oil Spills: Achilles Heel in Alyeska Media Campaign. All-Alaska Weekly. Fairbanks, Alaska, February 17, 1977. Pages 14-15.

38. Kay, C. D. October 7, 1976. Memo to Al Carson, JFWAT Supervisor. Summary of Sediment Analysis Data of Water Samples Collected from Little Globe Creek, A.S. 66, During Low Water Crossing (LWC) Construction. 3 pages, 12 figures, 1 table, 1 appendix. 21 total pages.

39. Kay, C. E. January 25, 1979. Letter to Mr. Dave Janis, Montana Department of Natural Resources and Conservation. Helena, MT. Review of the Northern Tier Pipeline Company's Proposed Quality Control Program.

40. BLM. 1978. Grant of Right-of-Way to the SOHIO Transportation Company (a subsidiary of The Standard Oil Company of Ohio) for the proposed Long Beach to Midland Crude Oil Transportation Pipeline (Pactex Pipeline). Serial Number: CA 3242. 21 pages.

41. Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline. 1974. U.S. Government Printing Office. Number 530-013.

42. Morehouse, T. A., R. A. Childers, and L. E. Leash. 1978. Fish and Wildlife Protection in the Planning and Construction of the Trans-Alaska Oil Pipeline. U.S. Fish and Wildlife Service. Report Number FWS/OBS-78/70. October 1978. 131 pages.

43. Pamplin, W. L. 1979. Construction-Related Impacts of the Trans-Alaska Pipeline System on Terrestrial Wildlife Habitats. Joint Fish and Wildlife Advisory Team Special Report No. 24. 132 pages.

44. Montana Department of Natural Resources and Conservation. Draft EIS on the Proposed Northern Tier Pipeline System. November 1979. Energy Division, 32 South Ewing, Helena, MT 59601. 151 pages.

45. Janis, D. 1979. The Effects of Large-Diameter Underground Crude-Oil Pipelines on Land Use. Northern Tier Report No. 5. Montana Department of Natural Resources and Conservation. Helena, MT. 35 pages.

46. Olson-Elliott and Associates. 1979. Environmental Impact of the Northern Tier Pipeline in Montana: Erosion and Reclamation of Soils. Report Prepared for Montana Department of Natural Resources and Conservation. Helena, MT. 45 pages.

47. Qamar, A. and R. Breuninger. 1979. Earthquake Hazard to the Proposed Northern Tier Pipeline in Montana. Northern Tier Report No. 4. Montana Department of Natural Resources and Conservation. Helena, MT. 54 pages.

48. Olson-Elliott and Associates. 1979. Environment Impact of the Northern Tier Pipeline in Montana: Terrestrial Fauna. Report Prepared for Montana Department of Natural Resources and Conservation. Helena, MT. 193 pages.

49. Thompson, Larry. August 1979. The Effects of Large-Diameter Underground Crude-Oil Pipelines on Wildlife. Northern Tier Report No. 2. Montana Department of Natural Resources and Conservation, Energy Division, 32 South Ewing, Helena, MT 59601. 55 pages.

50. Nordell, L. 1979. Social and Economic Impacts of the Proposed Northern Tier Pipeline in Montana. Northern Tier Report No. 6. Montana Deparrment of Natural Resources and Conservation. Helena, MT. 198 pages.

51. Alaska Executive Coordination Committee. June 30, 1978. Proposed Alaska Gas Transportation System Stipulations for Alaska. 40 pages.

52. U.S. Department of Interior. 1979. Stipulations for the Alaska Natural Gas Transportation System. May 7th. Washington, D.C.

53. BLM. 1980. Grant of Right-of-Way for the Northern Tier Pipeline. Serial Number: M-36936, 4/21/80. BLM. Montana State Office, Billings, MT. 59107.

54. Glaspell, Jim. 1980. Personal Communication. Assistant Supervisor, Alaska Department of Fish and Game Gasline Surveillance. Anchorage, Alaska.

55. Dietrich, Larry. 1980. Personal Communication. Supervisor, Alaska Department of Environmental Conservation Gasline Surveillance. Fairbanks, Alaska.

56. Dixon, Mim. 1978. What Happened to Fairbanks? The Effects of the Trans-Alaska Oil Pipeline on the Community of Fairbanks, Alaska. Westview Press, Boulder, Colorado. 337 pages.

57. U.S. Department of Interior. 1979. Report to the President: West to East Crude Oil Transportation Systems. Office of the Secretary. October 15th. 189 pages.

58. Mead, R. D. 1978. Journeys Down the Line--Building the Trans-Alaska Pipeline. Doubleday and Company, Garden City, New York. 609 pages.

59. Wickware, P. 1979. Crazy Money--Nine Months on the Trans-Alaska Pipeline. Random House, New York. 228 pages.

60. McGrath, E. 1977. Inside the Alaska Pipeline. Celestial Arts, Millbrane, California. 182 pages.

61. Hanraban, J. and P. Gruenstein. 1977. Lost Frontier: The Marketing of Alaska. W. W. Norton and Company, New York, New York. 363 pages.

62. McCracken, D. R. 1976. Pipeline on the Permafrost. Platen Press, Deer Lodge, MT. 92 pages.

63. Roscow, J. P. 1977. 800 Miles to Valdez: The Building of the Alaska Pipeline. Prentice-Hall, Inc., Englewood Cliffs, N. J. 227 pages.

64. Berry, M. C. 1975. The Alaska Pipeline: The Politics of Oil and Native Land Claims. Indiana University Press, Bloomington, Indiana. 302 pages.

65. Brink, K. L. 1978. The Effects of the Trans-Alaska Oil Pipeline on Breeding Bird and Microtine Rodent Populations at Franklin Bluffs, Alaska. M.S. Thesis. University of Montana, Missoula. 108 pages.

66. Allen, L. J. 1975. The Trans-Alaska Pipeline: The Beginning. Scribe Publishing Corporation. Seattle, WA. Volume 1. 152 pages.

67. Allen, L. J. 1976. The Trans-Alaska Pipeline: South to Valdez. Scribe Publishing Corporation, Seattle, WA. Volume 2. 152 pages.

68. U.S. House of Representative, Committee on Interior and Insular Affairs. 1973. Hearings on Oil and Natural Gas Pipeline Rights-of-Way, before the Subcommittee on Public Lands. 93 Congress, 1st Session. Serial No. 93-12.

69. U.S. Senate, Committee on Interior and Insular Affairs. 1973. Hearings on Rights-of-Way Across Federal Lands. 93 Congress, 1st Session
Part 1. Right-of-Way Across Federal Lands.
Part 2. Right-of-Way Across Federal Lands.
Part 3. Right-of-Way Across Federal Lands: Transportation of Alaska's North Slope Oil.
Part 4. Right-of-Way Across Federal Lands: Transportation of Alaska's North Slope Oil.

70. Brew, D. L. 1974. Environmental Impact Analysis: The Example of the Proposed Trans-Alaska Pipeline. Geological Survey Circular 695. U.S. Geological Survey, Reston, Virginia. 16 pages.

71. Myers, H. R. 1975. "Federal Decision-making and the Trans-Alaska Pipeline." Ecology Law Quarterly. Vol. 4:915 (1975). 948 ff.

72. Townsend, A. H. 1976. Pipeline History of Million Dollar Creek. 27th Alaska Science Conference. University of Alaska, Fairbanks, Alaska. 23 pages. 5 figures. 28 total pages.

73. James, R. D. 1977. Price of Progress? Alaska Pipeline Opens on Time but Shortcuts Scar the Environment. Wall Street Journal, June 20, 1977. Page 1 and 14.

74. Fineberg, R. A. 1977. Promises and Betrayals: The Trans-Alaska Pipeline. The Nation. October 1, 1977. Pages 293-297 and cover.

75. U.S. Senate, Committee on Interior and Insular Affairs. 1976. The Construction of the Trans-Alaska Pipeline System - Hearing. 94 Congress, 2nd Session. July 21, 1976. Serial No. 94-41. 159 pages.

76. U.S. House of Representatives, Committee on Interior and Insular Affairs. 1975-1977. Oversight Hearings on Construction of Trans-Alaska Pipeline, before the Subcommittee on Public Lands, 94 Congress, 1st Session, Serial No. 94-5.
Part 1. Oversight Hearings on Construction on Trans-Alaska Pipeline. 544 pages.
Part 2. Trans-Alaska Pipeline Welds. 531 pages.
Part 3. Alaskan Crude Oil. 578 pages.

77. State of Alaska, Department of Fish and Game vs. Alyeska Pipeline Service Company. District Court for the State of Alaska, Fourth Judicial District at Fairbanks, Alaska. Case No. 76-2773 cr. Memorandum Opinion and Order. March 16, 1978.

78. State of Alaska vs. Alyeska Pipeline Service Company et al. Case No. 75-889.

79. State of Alaska vs. Alyeska Pipeline Service Company et al. Case No. 75-946.

80. Public Law 93-153. Title I, Section 101 (0) (1).

81. Gilbert, B. 1975. The Devaluation of Alaska. Audubon. Volume 77(3): 64-80.

82. Tileston, Peg. 1978. Personal Communication. Executive Director, Alaska Center for the Environment. Anchorage, Alaska.

83. Wendling, F. L. 1978. Final Report on Gravel Porosity Studies along the Trans-Alaska Pipeline. JFWAT Special Report No. 18. 77 pages.

84. Schallock, E. W. 1978. Preliminary results and conclusions derived from the Chatanika River Alyeska Oil Pipeline Crossing Project. EPA Water Quality Laboratory, University of Alaska, Fairbanks, Alaska. 35 pages.

85. Francisco, K. and W. B. Dinneford. 1977. Third Interim Report of the Commercial Fish - Technical Evaluation Study: Salcha River. JFWAT Special Report No. 17. JFWAT, Anchorage, Alaska.

86. Montana Department of Natural Resources and Conservation. Final EIS for the Proposed Northern Tier Pipeline. Facility Siting Division. 32 South Ewing, Helena, MT 59601. April 23, 1980. 69 pages.

87. No Oil Port et al. vs. United States. Civil Action No. C80-360. Filed in United States District Court, Western District of Washington. March 27, 1980.

88. Lower Elwha Band of Klallam Indians et al. vs. United States. Civil Action No. C80-369. Filed in United States District Court, Western District of Washington. March 28, 1980.

89. Northern Tier Information Committee vs. Northern Tier Pipeline Company. Civil Suit filed in Montana State District Court, First Judicial District on March 4, 1980.

90. U.S. Department of Interior. 1979. West to East Crude Oil Transportation System: Findings based on criteria required by Title V, Public 95-617. July 1979. 153 pages.

91. Sandmeyer, R. H., Jr. 1980. Prefiled Testimony of the Northern Tier Pipeline Company. Washington State Energy Facility Site Evaluation Council (EFSEC) Hearings. Testimony filed on January 15, 1980.

92. Beasley, J. R. 1979. Prefiled Testimony of the Northern Tier Pipeline Company. Washington State EFSEC Hearings. Testimony filed on November 19, 1979.

93. Hodge, J. R. 1979. Prefiled Testimony of the Northern Tier Pipeline Company. Washington State EFSEC Hearings. Testimony filed on November 19, 1979.

94. Section 28 of the Mineral Leasing Act of 1920 as amended 30 USC S. 181-191.

95. Townsend, A. 1979 and 1980. Personal Communication. Habitat Protection Section. Alaska Department of Fish and Game. Fairbanks, Alaska.

96. Kay, C. 1979. A so-called "little" oil spill can be a major disaster. Missoulian. December 6. Page 4.

97. Kay, C. 1980. Environmental Impacts of the Purposed Northern Tier Pipeline in Montana. Montana Magazine, June-July issue. In press.

98. Mr. Kinney, L. 1980. Personal Communication. BLM Office of Special Projects (formerly APO). Anchorage, Alaska.

99. Pamplin, L. 1980. Personal Communication. U.S. Fish and Wildlife Service, Alaska Natural Busline Coordinator. Federal Inspector's Office. Anchorage, Alaska.

100. Adams, J. 1980. Personal Communication. Executive Director, Fairbanks Center for the Environment. Fairbanks, Alaska.

101. Northern Pipeline Agency, October 1978, Yukon Socio-Economic Terms and Conditions, Alaska Highway Pipeline, Draft II, Ottawa, Ontario. 123 pages.

102. Leech, Robert. Clallam County Engineering, Mitigating Measures expected from N.T.P.C., Port Angeles. 3 pages.

103. Oil Port Task Force. 1979. BLM DEIS Comments, Port Angeles. 639 pages.

104. Department of Transportation, Washington State. 11/14/79. Pre-Hearing Conference Proceedings, 1:30 P.M., 11/14/79. 53 pages.

105. Energy Facility Site Evaluation Council. October 27, 1976. Site Certification Agreement: WPPSS Nos. 3 & 5, Olympia. 36 pages and attachments.

106. Oil Port Task Force. 1979. EFSEC DEIS Comments, Port Angeles. 521 pages and attachments.

107. Northern Tier Pipeline Company. August 1978, March 30 and June 15. Application for Site Certification. Five volumes.

108. Washington State Legislature. August 1978. Laws Relating to Siting Energy Facilities (Chapter 80.50, RCW), Olympia. 18 pages.

109. Energy Facility Site Evaluation Council. August 8, 1975. Site Certification Agreement: WNP 1 & 4, Olympia. 22 pages and attachments.

110. Energy Facility Site Evaluation Council. January 5, 1977. Site Certification Agreement: PSP&L Units 1 and 2, Olympia. 37 pages and attachments.

111. U.S. Army Corps of Engineers, Seattle District. December 1978. Chief Joseph Dam: Community Impact Report, Update III, Conditions at Peak Impact, Seattle. 50 pages.

112. Traub, Ronald M. An Investigation on the Socio-Economic Impact of Nuclear Power Plants on Small Communities, Prepared for the Ohio Power Siting Commission, Columbus, Ohio. 41 pages.

113. Grays Harbor Regional Planning Commission. December 1979. The Second Year of the Satsop Construction Project and Socio-Economic Change in Grays Harbor County, Aberdeen, Washington. 123 pages.