

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

2646 SCOMM 118 HOUSE SPECIAL COMMITTEE OIL & GAS, 1999-2000

LNG Production Facility

◆ NOMINAL ANNUAL PRODUCTION

- MINIMUM**

10 MILLION GALLONS

- MAXIMUM**

36.5 MILLION GALLONS

MAXIMUM FEEDSTOCK RATE

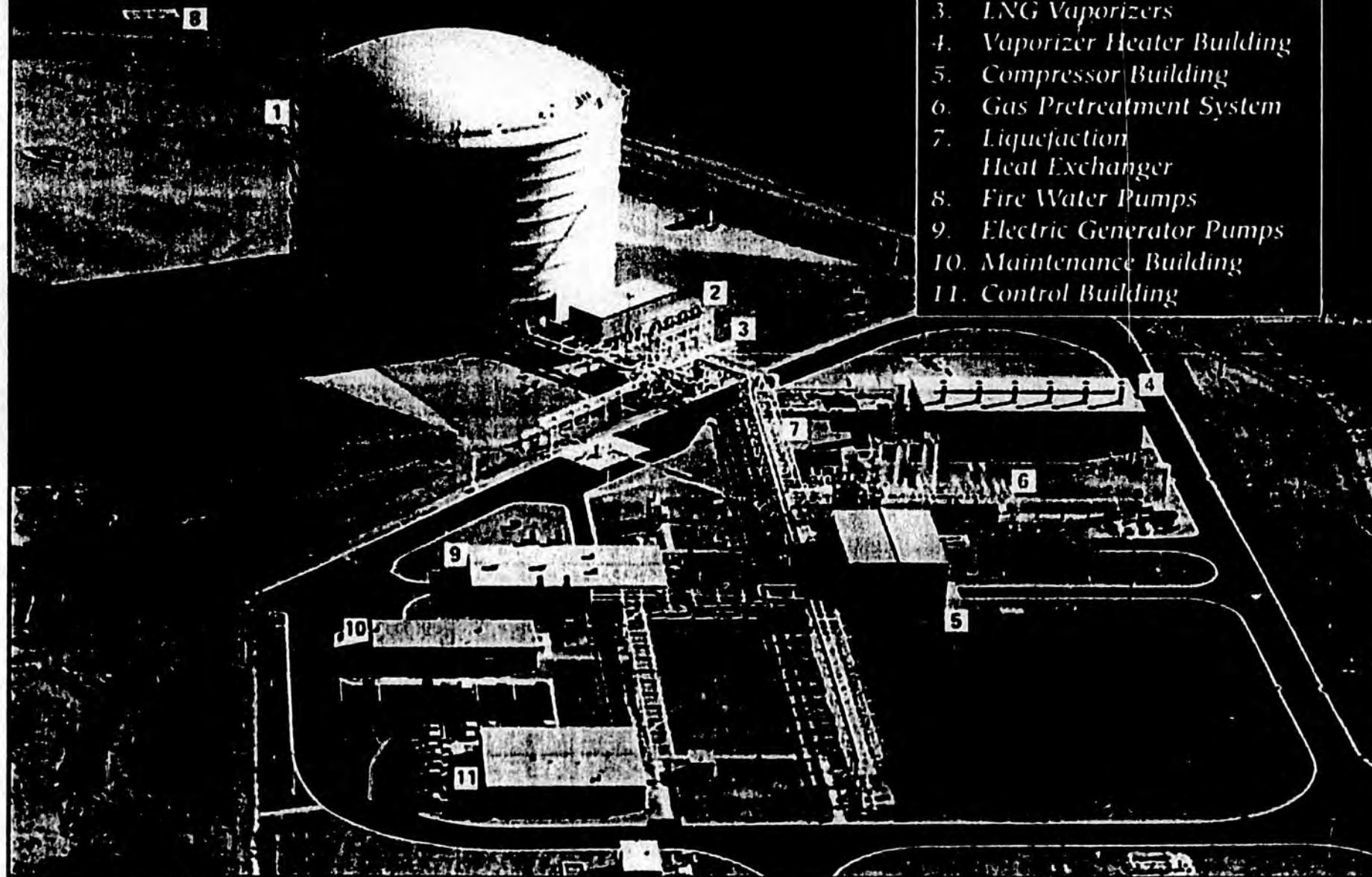
- 10 MMSCFD**

◆ FIRM PIPELINE CAPACITY IN PLACE

- 15+ MMSCFD**

LNG Facility

1. LNG Storage Tank
2. LNG Pumps
3. LNG Vaporizers
4. Vaporizer Heater Building
5. Compressor Building
6. Gas Pretreatment System
7. Liquefaction Heat Exchanger
8. Fire Water Pumps
9. Electric Generator Pumps
10. Maintenance Building
11. Control Building



Phase I

COMMUNITY INVESTMENT

LOCAL DISTRIBUTION CENTERS

- \$34 MILLION

PROPANE-AIR PLANTS/DOCKS

- \$11 MILLION

OTHER STARTUP COSTS

- \$8 MILLION

GROSS PLANT

- \$53 MILLION

Fuel Oil Versus Utility Gas Cost Comparison Per mmbtu

■ FUEL OIL

- RESIDENTIAL**
 - » \$8.60**
- SMALL COMMERCIAL**
 - » \$7.57**
- LARGE COMMERCIAL**
 - » \$6.81**

■ NATURAL GAS

- RESIDENTIAL**
 - » \$7.25**
- SMALL COMMERCIAL**
 - » \$6.89**
- LARGE COMMERCIAL**
 - » \$6.53**

Utility Gas Versus Propane Cost Comparison Per minbtu

■ BOTTLED PROPANE

- RESIDENTIAL- JUNEAU

» \$18.40

- RESIDENTIAL - KODIAK

» \$28.80

■ NATURAL GAS

» \$7.25

Utility Gas Versus Electric Cost Comparison Per mmbtu

■ **ELECTRIC (@ \$0.09/kWh)**

» **\$26.37**

■ **ELECTRIC (@ \$0.14/kWh)**

» **\$41.02**

■ **ELECTRIC (@\$0.20/kWh)**

» **\$58.60**

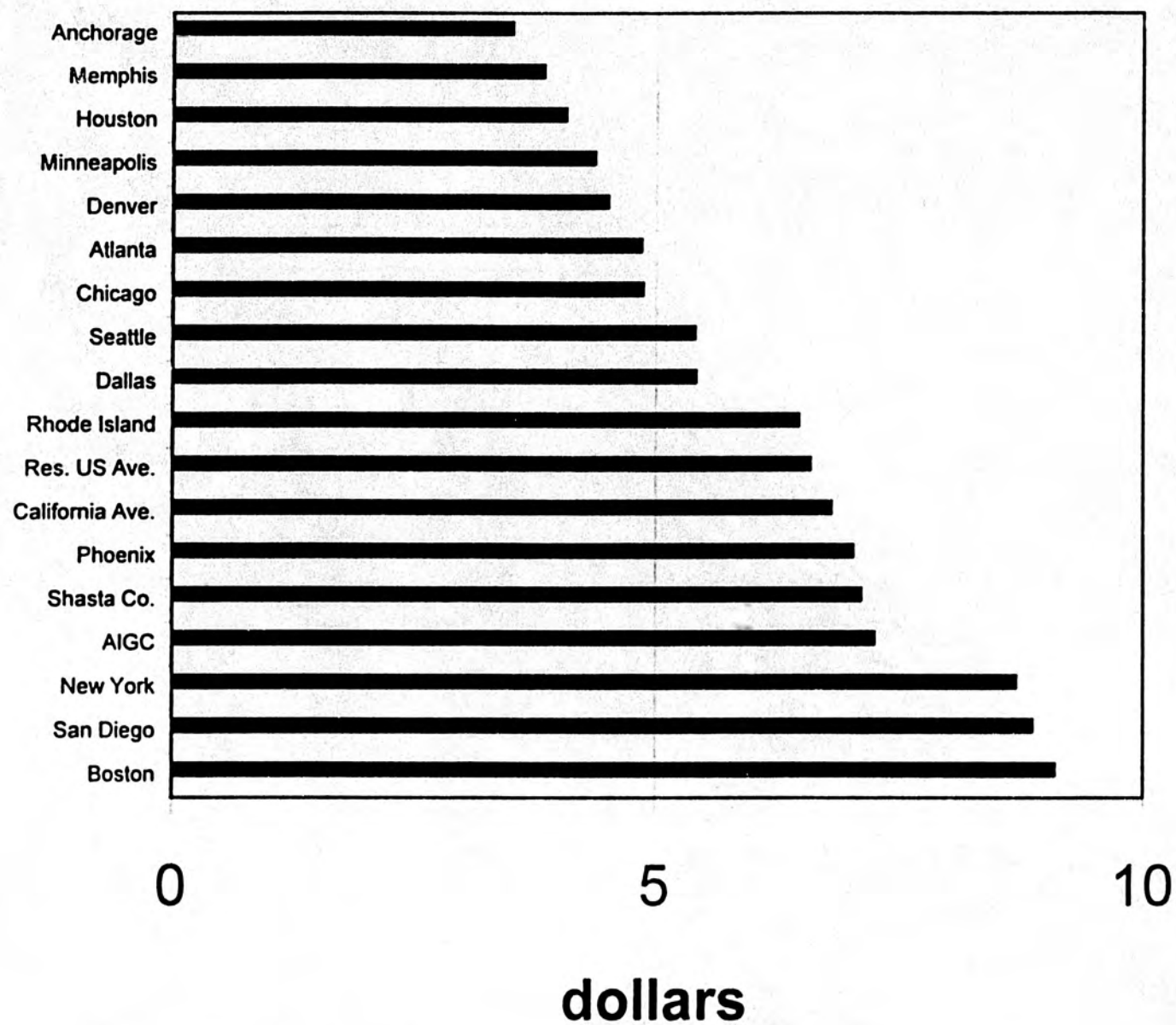
■ **NATURAL GAS**

» **\$7.25**

SEAGA Gas Project Summary

- ♦ **GAS UTILITY SERVICE IS COMPETITIVE WITH EXISTING FUEL OIL SERVICE IN RURAL ALASKAN COMMUNITIES**
- ♦ **GAS UTILITY SERVICE IS ENVIRONMENTALLY AND TECHNOLOGICALLY SUPERIOR TO FUEL OIL**
- ♦ **BULK FUEL BARGES SUPPORT GAS UTILITY SERVICE TO COMMUNITIES OVER DISTANCES OF >1,000 MILES FROM TIDEWATER PORT**
- ♦ **GAS UTILITY SERVICE CAN BE PROVIDED TO COMMUNITIES OF $\leq$ 500 RESIDENTS**
- ♦ **A MINIMUM ANNUAL SERVICE AREA LOAD OF 29 MILLION GALLONS(2.4 BCF) SUPPORTS PROJECT INFRASTRUCTURE FOR LNG BASED UTILITY OPERATIONS**

location



■ Series2
■ Series1

Figure 3.2 Summary of Various Fuel Costs within the Service Area.

<i>Fuel Type</i>	<i>\$/unit</i>	<i>\$/mmbtu</i>
Utility Gas	7.25/mcf	7.25
Fuel Oil	1.15 - 1.25/gal	8.50 - 9.00
Bottled Propane	1.68 - 2.65/gal	18.40 - 28.90
Electricity	0.09 - 0.339/kWh	26.38 - 99.35
Wood Pellets	210/ton	14.13
Firewood	150/cord	11.36

Table 4.1 Comparative Cost to Operate a Clothes Dryer

Electric Rate (\$/kWh)	Gas Rate (\$/mcf)	Cost/Load Electric (\$)	Cost/Load Gas (\$)	Annual Cost Electric (\$)	Annual Cost gas (\$)	Savings with Gas (\$)	Percent Savings (%)
0.09	3.5	0.2328	0.059	96.85	24.54	72.31	75
0.09	7.25	0.2328	0.1222	96.85	50.83	46.02	48
0.12	7.25	0.3097	0.1261	128.84	52.45	76.39	59
0.15	7.25	0.3871	0.1271	161.03	52.87	108.16	67
0.2	7.25	0.5162	0.1287	214.74	53.53	161.21	75
0.25	7.25	0.6452	0.1304	268.4	54.25	214.15	80

Table 4.2 Comparative Cost to Operate a Hot Water Heater

Electric Rate (\$/kWh)	Gas Rate (\$/mcf)	Cost/100 gal. Electric (\$)	Cost/100 gal. Gas (\$)	Annual Cost Electric (\$)	Annual Cost gas (\$)	Savings with Gas (\$)	Percent Savings (%)
0.09	3.5	2.31	0.5	575	124	451	78
0.09	7.25	2.31	1.04	575	259	316	55
0.12	7.25	3.07	1.04	764	259	505	66
0.15	7.25	3.84	1.04	956	259	697	73
0.2	7.25	5.12	1.04	1275	259	1016	80
0.25	7.25	6.4	1.04	1593	259	1334	84

Table 4.3 Comparative Cost for Home Heating and Hot Water

Gas Rate (\$/mcf)	Oil Rate (\$/gal)	Monthly Cost Gas	Monthly Cost Oil	Annual Cost Gas	Annual Cost Oil	Savings with Gas	Percent Savings
3.5	1	49	111	591	1331	739	56
7.25	1	102	111	1225	1331	106	8
7.25	1.1	102	122	1225	1464	239	16
7.25	1.2	102	133	1225	1597	372	23
7.25	1.3	102	144	1225	1730	505	29
7.25	1.4	102	155	1225	1863	638	34
7.25	1.5	102	166	1225	1996	771	39

House Special Committee on Oil and Gas
March 21, 2000
Presentation by the Alaska Intrastate Gas Company

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Senior V.P. of Marketing

Mr. Tom LeNeau
General Manager

SCOMM

118:18

House Special Committee on Oil and Gas
March 23, 2000
TAGS Permits
Yukon Pacific Corporation

Explanation of Supporting Documents:

DOE/FE Opinion and Order No. 350 - Order Granting authorization to Export Liquefied Natural Gas from Alaska

(excerpted) *Order: For the reasons set forth above, pursuant to section 3 of the natural gas act, it is ordered that:*

A. Yukon Pacific Corporation (Yukon Pacific) is authorized to export for sale to Japan, South Korea, and Taiwan a total of up to 14 million metric tons of liquefied natural gas (LNG) annually from the North Slope of Alaska, over a 25 year period beginning on the date of the first delivery, upon the conditions herein set forth.

C. With respect to the place of exportation for the LNG authorized in Ordering Paragraph A above, all locations other than Port Valdez, Alaska, are hereby rejected.

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED TRANS-ALASKA GAS SYSTEM

(Page S-2 of SUMMARY)

S.3 ALTERNATIVES TO THE PROJECT

Alternatives considered but eliminated on the basis of general feasibility included alternative modes for transporting natural gas, regional routes to western and southeastern Alaska, and transportation of natural gas or natural gas liquids in existing TAPS pipeline facilities.

-Land Use/Land Status: The Cook Inlet-Boulder Point alternative requires crossing of Minto flats, and important subsistence area; transit through a major national "conservation system unit" -- Denali National Park and Preserve; and crossing Susitna flats. The pipeline for the proposed Prince William sound-Anderson Bay route follows an existing utility corridor with a pipeline system already in place.

(Page 1-10 of SECTION 1.0 INTRODUCTION)

1.9.3 Regional Pipeline/LNG Plant Alternatives Screening

*The initial screening considered alternative pipeline routes and LNG plants in various regions of Alaska. This analysis concluded that only the Cook Inlet and Prince William sound areas provided feasible alternatives for the pipeline, LNG plant, and marine terminal (see appendix C... *of draft EIS)*

(Page 1-11 of SECTION 1.0 INTRODUCTION)

Figure 1.9.3-1 Summary of Criteria Evaluation for Statewide Route Options

(Page 1-13 and 1-14 of SECTION 1.0 INTRODUCTION)

Figure 1.9.4-1 Alternative Cook Inlet Site Locations

Figure 1.9.4-2 Proposed TAGS Anderson Bay Site Location and Alternative Prince William Sound Site Locations

(Page 1-15 of SECTION 1.0 INTRODUCTION)

Figure 1.9.4-3 Criteria Evaluation Matrix for Proposed TAGS Project and Alternative Locations

EVALUATION OF ALTERNATIVE PIPELINE ROUTES AND LNG PLANT/MARINE TERMINAL LOCATIONS TO THE TRANS-ALASKA GAS SYSTEM PROPOSAL FOR SOUTHCENTRAL ALASKA (Draft EIS)

*Referenced in Final EIS

¶ 70,259

Yukon Pacific Corporation (ERA Docket No. 87-68-LNG), November 16, 1989.

DOE/FE Opinion and Order No. 350

Order Granting Authorization to Export Liquefied Natural Gas from Alaska

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A. Application and Project Description	C State of Alaska
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* See, e.g., *Grand Valley Gas Company*, 1 FE ¶ 70,239 (August 25, 1989); *Potomac Energy Corporation*, 1 FE ¶ 70,237 (August 24, 1989); *Cascade Natural Gas Corporation*, 1 FE

¶ 70,225 (June 12, 1989), and *Wisconsin Public Service Corporation*, 1 FE ¶ 70,230 (June 19, 1989)

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Glossary of Abbreviations

ADNR—Alaska Department of Natural Resources
 AGA—American Gas Association
 AGCF—Alaska Gas Conditioning Facility
 Agreement on Principles—"Agreement Between the United States of America and Canada on Principles Applicable to a Northern Natural Gas Pipeline"
 Alaskan Northwest—Alaskan Northwest Natural Gas Transportation Company
 Alcan—Alcan Pipeline Company
 Alyeska—Alyeska Pipeline Service Company
 ANGTA—Alaska Natural Gas Transportation Act
 ANGTS—Alaska Natural Gas Transportation System
 ANGTS sponsors—Alaska Northwest Natural Gas Transportation Company and Foothills Pipe Lines (Yukon) Ltd.
 AOGCC—Alaska Oil and Gas Conservation Commission
 Argonne—Argonne National Laboratory
 bbls—Barrels

Bcf—Billion cubic feet
 BLM—Bureau of Land Management
 Btu—British thermal unit
 CERl—Canadian Energy Research Institute
 Decision—"Decision and Report to Congress on the Alaska Natural Gas Transportation System"
 D&M—Dames & Moore and Decision Focus, Inc.
 DOE—Department of Energy
 DOE Act—Department of Energy Organization Act
 DRI—Data Research Institute
 EIA—Energy Information Administration
 EIS—Environmental Impact Statement
 ERA—Economic Regulatory Administration
 Exxon—Exxon Corporation
 Exxon U.S.A.—Exxon Company, U.S.A.
 FEIS—Final Environmental Impact Statement
 FERC—Federal Energy Regulatory Commission
 Finding—"Presidential Finding Concerning Alaska Natural Gas"
 Foothills—Foothills Pipe Lines (Yukon) Ltd.
 FPC—Federal Power Commission
 GCF—Gas Conditioning Facility
 GRI—Gas Research Institute
 Jensen—Jensen Associates, Inc.
 LNG—Liquefied Natural Gas
 Mcf—Thousand cubic feet
 MMBtu—Million British thermal units
 NEB—Canadian National Energy Board
 NEPA—National Environmental Policy Act of 1979
 NGA—Natural Gas Act
 NGPA—Natural Gas Policy Act of 1978
 NPC—Northwest Pipeline Corporation
 OFI—Office of Federal Inspector
 OPEC—Organization of Petroleum Exporting Countries
 PG&E—Pacific Gas and Electric Company
 PGT—Pacific Gas Transmission Company
 quad—quadrillion British thermal units
 R/P ratio—Ratio of proved natural gas reserves to production
 Reorganization Plan—Reorganization Plan No. 1 of 1979
 Statoil—Statoil North America, Inc.

State Department—United States
Department of State

TAGS—Trans-Alaska Gas System

TAPS—Trans-Alaska Pipeline System

TAPS Carriers—the seven companies
that own the Trans-Alaska Pipeline Sys-
tem

Tcf—Trillion cubic feet

USACE—United States Army Corps of
Engineers

USGS—United States Geological Survey

merce,⁸⁷ the exercise of that authority is subject to any terms or conditions attached by the DOE to the import or export approval.⁸⁸ In order to avoid overlap with enforcement of the "ANGTA condition" and to relieve the export from duplicative and unnecessary regulation, the DOE has decided to exercise its authority to limit any jurisdiction the FERC might otherwise acquire over the export project in the event TAGS and ANGTS share a facility that is subject to the FERC's interstate commerce jurisdiction, such as the Alaska Gas Conditioning Facility proposed by the ANGTS sponsors. The FERC shall only exercise such authority over the export project to the extent necessary to ensure that the shared facility is constructed and operated in accordance with FERC's regulations, including those concerning the environment. The FERC shall have no other authority over Yukon Pacific's export project, including its rates, except to the extent necessary to ensure that Yukon Pacific pays its part of the costs of any shared facility. The DOE intends this limitation on the FERC's authority to apply not only to the gas conditioning plant, but also to any other facility subject to the FERC's jurisdiction that the export project might utilize. This limitation does not apply to the FERC's section 3 authority over the liquefaction plant, marine terminal, and transportation of the LNG.

With respect to the liquefaction plant and marine terminal, the Secretary delegated to the FERC section 3 authority over the siting and construction of new import/export facilities. This delegation stipulates that the FERC cannot approve any site that the DOE disapproves. On the basis of its environmental review, the DOE has concluded that the Valdez export site is preferable to all other export sites that were considered in the FEIS, including the Cook Inlet site. Three factors discussed in the FEIS indicate that Port Valdez is environmentally preferable to the Cook Inlet alternative. First, the Cook Inlet alternative creates new disturbances in Minto Flats, an important sub-

sistence use area. By contrast, the impacts of the proposed project are in an existing transportation and utility corridor. Second, the Cook Inlet alternative crosses Denali National Park and Preserve, and would impact visitors traveling to and from the park. While the proposed project would impact visitors and travelers elsewhere, Denali has the greater concentration. Finally, the Cook Inlet alternative includes a 15-mile subsea crossing, an impact to an ecosystem that does not occur under the proposed project. Accordingly, the DOE disapproves all sites other than the Valdez site. This action should not be interpreted as approval of the Valdez site. As discussed previously in Section V.B.5 *supra*, the DOE is requiring as Departmental policy that the FERC conduct its own examination of the health, safety, and environmental impacts associated with Yukon Pacific's use of the Valdez site for its proposed export project, including the liquefaction plant, the marine terminal, the LNG tankers, and the LNG tanker routes, and that it impose all appropriate conditions to mitigate the environmental effects resulting from the construction and operation of those facilities.

VI. Conclusion

After taking into consideration all the information in the record of this proceeding, I find that granting Yukon Pacific authority to export up to 14 million metric tons annually of liquefied North Slope natural gas for sale to the Pacific Rim countries of Japan, South Korea, and Taiwan during a term of 25 years has not been shown to be inconsistent with the public interest.

ORDER

For the reasons set forth above, pursuant to section 3 of the Natural Gas Act, it is ordered that:

A. Yukon Pacific Corporation (Yukon Pacific) is authorized to export for sale to Japan, South Korea, and Taiwan a total of up to 14 million metric tons of liquefied natural gas (LNG) annually from the North Slope of Alaska over a 25-year

⁸⁷ See DOE Delegation Order No. 0204-112, *supra* note 79.

⁸⁸ In *TransCanada Pipelines v. FERC*, No. 87-1229, June 16, 1989, the D.C. Circuit Court of Appeals found "Congress specifically pre-

cluded FERC from exercising its general ratemaking authority over imported [and exported] gas except to the extent that the Secretary expressly delegates the task to FERC." *Slip op.*, at 11; see also *id.*, at 7-9.

period beginning on the date of the first delivery, upon the conditions herein set forth.

B. For purposes of this Order, the "export project" means the Trans-Alaska Gas System (TAGS) and all appurtenant facilities, including production facilities, gas conditioning facilities, liquefaction plant, marine terminal, and LNG tankers.

C. With respect to the place of exportation for the LNG authorized in Ordering Paragraph A above, all locations other than Port Valdez, Alaska, are hereby rejected.

D. No cost of the export project shall be recovered from U.S. consumers of natural gas except to the extent that the cost relates to facilities and natural gas used and useful for supplying North Slope natural gas to the U.S. consumers.

E. No action shall be taken in connection with the export project that would compel a change in the basic nature and general route of the Alaska Natural Gas Transportation System (ANGTS) or otherwise prevent or impair in any significant respect the expeditious construction and initial operation of ANGTS.

F. All aspects of the export project shall be implemented in accordance with all applicable environmental procedures and requirements and shall comply with all preventive and mitigative measures imposed by Federal and State agencies to protect the public health, safety and environment.

G. All contracts and other documents that underlie the acquisition, transportation, and sale of North Slope gas authorized herein shall be filed with the DOE within 30 days of their execution.

H. Within 48 hours after deliveries begin, Yukon Pacific shall notify the

Office of Fuels Programs, Fossil Energy, Room 3F-056, FE-50, 1000 Independence Avenue, S.W., Washington, D.C. 20585, in writing of the date that the first export of LNG authorized in Ordering Paragraph A above occurs

I. With respect to the exports authorized by this Order, Yukon Pacific shall file reports with the Office of Fuels Programs (1) after the first full calendar month of service, and (2) within thirty days following each calendar quarter, indicating, whether sales of exported natural gas have been made, and if so, giving by month, the total volume of exports in Mcf and the average price for exports per MMBtu delivered to each respective purchaser. The reports shall also provide the details of each export transaction, including the name(s) of the purchaser(s), LNG tankers utilized, volumes sold to each purchaser, and identification of markets served.

J. Except for the authority under DOE Delegation Order No. 0204-112 over the export site, including the liquefaction plant, marine terminal, and related transportation of LNG, the Federal Energy Regulatory Commission (FERC) shall exercise no authority over the export project except to the extent necessary to ensure that (1) any facility used for the provision of natural gas from Alaska to another state and thereby subject to the FERC's interstate commerce jurisdiction is constructed and operated in accordance with the FERC's regulations, including those concerning the environment, and (2) the export project pays its share of the costs of any such facility.

Issued in Washington, D.C., on November 16, 1989.

Bureau of Land Management
Department of the Interior
U.S. Army Corps of Engineers
Department of the Army

**FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROPOSED
TRANS-ALASKA GAS SYSTEM**

Prepared by
Bureau of Land Management
and
U.S. Army Corps of Engineers

Cooperating Agencies

Department of Agriculture
Forest Service

Department of Commerce
National Marine Fisheries Service

Department of Energy
Economic Regulatory Administration

Department of the Interior
Bureau of Indian Affairs
Bureau of Mines
Fish and Wildlife Service
Geological Survey
Minerals Management Service
National Park Service

Department of Transportation
Coast Guard

Federal Highway Administration
Office of Pipeline Safety

Environmental Protection Agency

Federal Energy Regulatory Commission

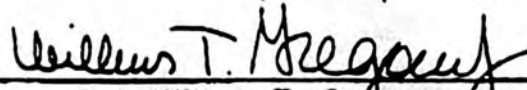
State of Alaska

Division of Governmental Coordination
Department of Fish and Game
Department of Natural Resources
Department of Transportation and Public
Facilities
Department of Environmental Conservation

JUNE 1988
BLM-AK-PT-88-003-1792-910



Michael J. Penfold, Alaska State Director, Bureau of Land Management



Col. Wilbur T. Gregory Jr., District Engineer, Alaska District,
U.S. Army Corps of Engineers

SUMMARY

operations and control center would be at the LNG marine terminal in Valdez.

In addition to the above facilities proposed for the TAGS project by Yukon Pacific Corporation, a gas conditioning plant, a ~~connected action~~, would be required in the Prudhoe Bay area. This gas conditioning plant would deliver to TAGS a natural gas of a quality suitable for subsequent conversion to LNG at Anderson Bay.

S.2 SCOPING AND DEIS REVIEW

The EIS scoping process provided the first step toward public and resource agency involvement in the environmental review process. The scoping process provides an opportunity for members of the public, special interest groups, and agencies to define environmental issues and concerns related to the project. Six scoping meetings were held in Alaska between December 8 and 13, 1986. Approximately 170 people attended these meetings. Additionally, written comments were received from federal, state, and local entities, industry, and the public. Issues identified during the TAGS scoping process are located in Appendix A.

Copies of the Draft EIS (DEIS) were distributed by mail to various organizations, government agencies, and individuals in mid-September 1987. During the public review period for the DEIS, which ended on November 20, 1987, eight formal public hearings were conducted in Alaska to solicit oral comments on the DEIS and the ANILCA 810 finding on subsistence. Approximately 20 individuals presented oral testimony. Additionally, prior to the close of the public review period, 29 written letters of comment to the DEIS were received. Section 7 of this FEIS presents a summary of the public hearing transcript and copies of each of the letters of comment with responses to all comments received. In addition to BLM and USACE, other cooperating agencies assisted in preparing responses to comments where their authorities or jurisdictions were involved, i.e., EPA, lower-48 states; impacts and end use; DOT. Part 193 of LNG standards, and State of

Alaska, subsistence, fisheries, recreation areas, and operation of the Prudhoe Bay field.

S.3 ALTERNATIVES TO THE PROJECT

Alternatives considered but eliminated on the basis of general feasibility included alternative modes for transporting natural gas, regional routes to western and southeastern Alaska, and transportation of natural gas or natural gas liquids in existing TAPS pipeline facilities.

One major regional pipeline route alternative and six alternative LNG plant and marine terminal locations were considered along with the main proposal. The Cook Inlet alternative alignments would deviate from the proposed project near Livengood (Milepost 395) and proceed south to the Cook Inlet area, where three alternative LNG plant and marine terminal locations at Harriet Point, Boulder Point, and Cape Starichkof were considered. Three other alternative LNG plant and marine terminal locations at Gravina, Gold Creek, and Robe Lake in the Prince William Sound-Valdez area were considered. The no-project alternative was also evaluated.

After screening the alternative tidewater sites and pipeline routes, the representative Cook Inlet-Boulder Point alternative emerged as a potentially viable and environmentally acceptable alternative to the proposed TAGS project to Anderson Bay.

Detailed comparison of the Cook Inlet-Boulder Point alternative with the proposed Prince William Sound-Anderson Bay project showed the following important differences in the two:

- Land Use/Land Status: The Cook Inlet-Boulder Point alternative requires crossing of Minto Flats, an important subsistence area; transit through a major national "conservation system unit"--Denali National Park and Preserve; and crossing Susitna Flats. The pipeline for the proposed Prince William Sound-Anderson Bay route follows an existing utility corridor with a pipeline system already in place.

SUMMARY

- Constructability: The Cook Inlet-Boulder Point alternative involves a major submarine pipeline crossing of Cook Inlet with concerns for constructability, safety, and environmental considerations.
- Environmental Disturbance: The Cook Inlet-Boulder Point alternative includes 178 miles of pipeline through areas with no current utility corridors or roads. The proposed Anderson Bay site minimizes new construction of access roads and campsites due to the presence of existing infrastructure along the entire route.
- Permit Acquisition: An Act of Congress would be required for the Cook Inlet-Boulder Point alternative to cross the Denali National Park and Preserve under provisions of the Alaska National Interest Lands and Conservation Act (ANILCA), Title XI. This action requires a finding by the National Park Service, the president, and Congress that there is no environmentally acceptable alternative. An existing utility corridor route is available to Anderson Bay.
- No-Action Alternative: The no-action alternative would result from the denial of any of the right-of-ways or permits required for construction and operation. Under this alternative, no construction related to the proposed action would take place. The environmental impacts associated with the project, access roads, work pads, 796.5 miles of pipeline, the LNG plant, and other project components would not occur.

5.4 ENVIRONMENTAL CONSEQUENCES

The potential environmental consequences of the proposed TAGS project may be characterized as having major, moderate, minor, or negligible on the physical, biological, and socioeconomic features of the existing environment, as defined in Table S-1. Table S-1 analyzes assumes that the TAGS project would be in compliance with all applicable laws,

regulations, and orders, and that the TAGS applicant would implement all proposed mitigation measures.

The gas conditioning facilities required in the Prudhoe Bay area to deliver pipeline quality gas are not part of the TAGS project as was the case for ANGTS. Assumptions used in the preparation of this EIS are that a potential site is available and the air quality impacts attendant to such additional facilities at Prudhoe Bay would not significantly affect the air quality of the area. The effects of additional conditioning plant capabilities are similar to those evaluated in the ANGTS conditioning plant prepared by FERC in FERC/EIS 0009, July, 1980. A summary of the environmental consequences for the proposed TAGS Prince William Sound-Anderson Bay preferred route and Cook Inlet-Boulder Point alternative is contained in Table S-2. Table S-2 summarizes and combines several distinct phases of TAGS for each resource category to provide an overview and comparison of impacts for the proposed Anderson Bay route and the representative Cook Inlet-Boulder Point alternative. Impacts associated with specific aspects of a resource within these groups are described in Section 4.0. In all instances "major" impacts can be considered significant. An exception is "subsistence" where a "moderate" or "major" impact can be considered significant.

The Conceptual Gas Conditioning Plant needed to supply LNG quality natural gas is not part of the TAGS project. The environmental effects, especially the air quality aspects, will be evaluated in detail at such time as the technology and plant configuration is more certain. This tiered NEPA evaluation has been coordinated with EPA and recognizes the fact that NEPA air quality evaluations and information in the expired PSD for the ANGTS Sales Gas Conditioning facility are for a plant configuration and technical operation that has been revised significantly.

5.5 FORMAT OF THE EIS

The general format of the EIS follows BLM and USACE regulations implementing NEPA (40 CFR 1502.1). Each section has a specific purpose and is required to include

SECTION 1.0 INTRODUCTION

gas (methane). Should the LPG Project be developed, it is probable that the operating pressures of existing TAPS facilities would be converted to a higher pressure system. The increased operating pressure of TAPS still would not handle two-phase flow. Therefore, this alternative is not considered a viable option to the proposed action.

1.9.2.2 Convert Natural Gas to a Liquid at Prudhoe Bay and Comingle with Crude Oil in TAPS

During the public scoping process and again during review of the DEIS, a suggestion was made to convert natural gas to a liquid at Prudhoe Bay and then use the existing TAPS to transport both oil and gas to Valdez.

This alternative is possible only to the extent the natural gas, as a liquid, would be compatible with the operating potentials of the TAPS crude oil delivery system.

Natural gas liquids (NGLs) comprise a group of hydrocarbons that occur naturally in gaseous form or in solution with oil in a reservoir. NGLs are recoverable as liquids by condensation or absorption processes.

The average composition of gas reinjected in the Prudhoe Bay reservoir is shown in Table 1.9.2-1.

TAPS was designed to transport large volumes of crude oil. The maximum temperature of the oil when injected into the pipeline is 145°F. The design operating pressure of the pipeline is 1180 psi.

Through addition of long chain polymers (which lower the viscosity and reduce the friction factor) and project modifications, Alyeska Pipeline Service Company has determined the present 145°F injection temperature for TAPS can be lowered to about 110° to 111°F. At this lowered temperature, and at atmospheric pressure, approximately 40,000 barrels more of NGLs (as a liquid) can be comingled daily with the crude oil in TAPS. Methane, the principal component of the feed gas for the proposed TAGS project, is a gas at these temperatures and pressures; and, therefore, is not compatible with the design of TAPS. At a temperature of -259°F, liquid natural gas (LNG) is not compatible with the TAPS design or operating requirements.

Table 1.9.2-1

Composition of Gases Reinjected in Prudhoe Bay Reservoir Since 1978

Constituent	Average Reinjected Since Percent volume) 1978 ¹
N ₂ (nitrogen)	.48
CO ₂ (carbon dioxide)	12.77
C ₁ (methane)	73.72
C ₂ (ethane)	6.97
C ₃ (propane)	3.56
iC ₄ (iso-butane)	.48
nC ₄ (normal butane)	1.15
iC ₅ (iso-pentane)	.23
nC ₅ (normal-pentane)	.29
C ₆ + (hexanes and heavier)	.37
	100.20% ²

¹ (Personal communication - R. Douglass, February 1987).

² Does not add to 100 percent because of rounding within constituent averages.

Accordingly, the option of converting natural gas to a liquid to be comingled with crude oil in TAPS is not considered a practicable alternative to TAGS.

1.9.3 Regional Pipeline/LNG Plant Alternatives Screening

The initial screening considered alternative pipeline routes and LNG plants in various regions of Alaska. This analysis concluded that only the Cook Inlet and Prince William Sound areas provided feasible alternatives for the pipeline, LNG plant, and marine terminal (see Appendix C).³ In western Alaska limited tanker access related to sea ice as well as other factors eliminated the region from further consideration. Pipeline distance to Yakutat or other southeast ports and the extensive mountainous terrain that would have to be crossed would be insurmountable obstacles to this project and eliminated the southeast region from further consideration. Figure 1.9.3-1 provides a summary of the criteria evaluation for the statewide route options.

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	<u>Western Alaska</u>		<u>Southcentral</u>		<u>Southeast Alaska</u>	
	<u>Norton Sound</u>	<u>Bristol Bay</u>	<u>Cook Inlet</u>	<u>Prince William Sound</u>	<u>Yakutat Bay</u>	<u>Lynn Canal/Chatham Strait</u>
Continuous Operation of a Marine Terminal	●	⊗	○	○	⊗	○
Minimize Length of Pipeline	○	●	○	○	●	●
Maximize Use of Existing Utility/Transportation Corridor	●	●	○	○	●	○
Maximize use of Existing Infrastructure	●	●	○	○	⊗	○
Avoidance of Environmentally Sensitive Area	●	●	⊗	○	●	●
Avoid Permitting Delays	●	●	●	○	●	●
○ = Favorable						
⊗ = Moderately Favorable						
⊗ = unfavorable						
● = Highly Unfavorable						

Figure 1.9.3-1 Summary of Criteria Evaluation for
Statewide Route Options

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1.9.4 Alternative Sites within Cook Inlet and Prince William Sound Region

Along with the applicant's proposed project and the Cook Inlet-Boulder Point alternative considered in this EIS, two additional Cook Inlet and three Prince William Sound alternative LNG plant/marine terminal sites were evaluated for project feasibility by FPC and evaluated in this FERS. These include Gold Creek, Rope Lake, and Gravina in Prince William Sound, and Cape Starichkof and Harriet Point in the Cook Inlet region (Figures 1.9.4-1 and 1.9.4-2). Other sites previously considered by FPC for the El Paso proposal as having LNG plant site potential in the Gravina area were Hawkins Island and Bidarka Point. Although Gravina was used as a representative site for Prince William Sound sites outside of Port Valdez, each of these three Prince William Sound sites had similar access problems as identified in subsection 1.9.4.3 and required difficult marine crossings. Eleven pipeline criteria, ten LNG plant site criteria, and seven criteria related to the marine terminal were used to consider the degree of favorability for each of the alternative sites. Results of this analysis are presented in Appendix C and summarized in Figure 1.9.4-3. Evaluation of the applicant's proposed project and the Cook Inlet-Boulder Point alternative are presented for comparison with the other sites on Figure 1.9.4-1 and in Section 2. The other Prince William Sound and Cook Inlet sites were inferior to the proposed project and Boulder Point sites, respectively, and were eliminated from further consideration. The existing Phillips-Marathon LNG site and the adjacent Nikiski site previously evaluated for the Pacific Alaska LNG Associates Projects (FERC, 1978) cannot accommodate the scale of facilities necessary for TAGS.

1.9.4.1 Cape Starichkof

Cape Starichkof, which shares a common alignment with the Boulder Point site as far as Boulder Point, has one distinct disadvantage--the extra pipeline length and additional compressor station required to transport the gas 59 more miles would have

many implications for construction time and associated increase in impacts to the environment and costs. The LNG site characteristics are similar to those for Boulder Point except that land availability would be more of an issue and the environment around Cape Starichkof is more sensitive with respect to fish and shellfish, the fisheries (as economic entity), and recreational use of the area. Marine terminal site characteristics are also similar to those for Boulder Point with the exception that navigational hazards, uncharted submerged boulders and outcrops, and potential sea-ice problems would be less of a factor at Cape Starichkof. The same permitting problems associated with Denali National Park and Preserve exist. Cape Starichkof was rated as less favorable than Boulder Point and eliminated from further consideration.

1.9.4.2 Harriet Point

The pipeline alignment to Harriet Point poses problems over the Boulder Point and Cape Starichkof alignments. Like Starichkof, Harriet Point would require a longer pipeline and an additional compressor station. Most of the route along the western shore of Cook Inlet is away from available infrastructure to support construction. Few data exist for environmental impact assessment and engineering design analyses. The route also passes through areas of sensitive environments for wildlife and fisheries. The LNG plant site has advantages of land availability and little potential impact to public safety from an accident or spill should one occur. One distinct disadvantage for the LNG plant site is the lack of any infrastructure. Facility construction and operation would be much more difficult and costly since there is no community or commercial base in the immediate vicinity to support the project. The potential for any secondary development would be curtailed. Along with the permitting issue associated with the crossing of Denali National Park and Preserve, Harriet Point would be rated as less favorable than Boulder Point and eliminated from further consideration.

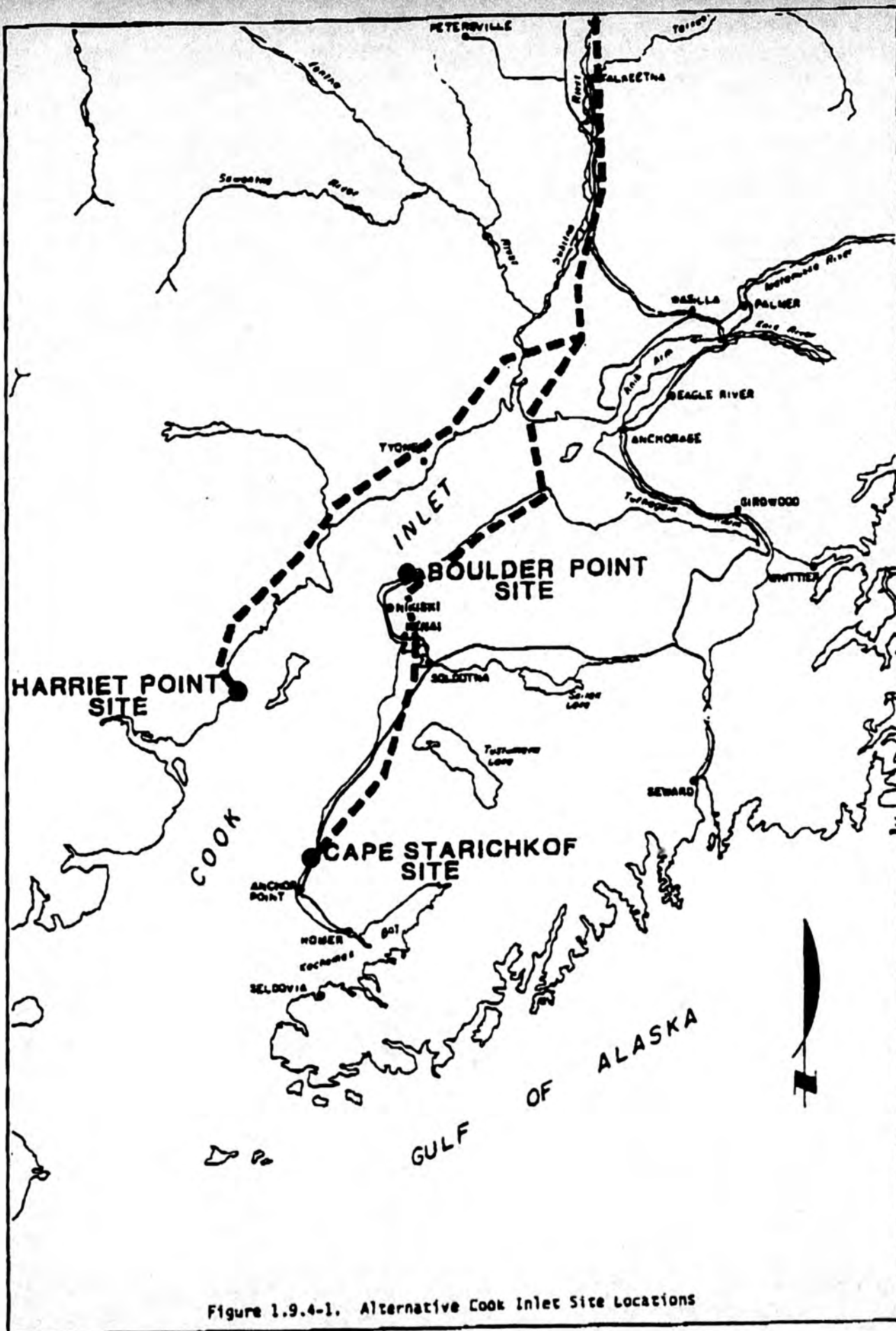


Figure 1.9.4-1. Alternative Cook Inlet Site Locations

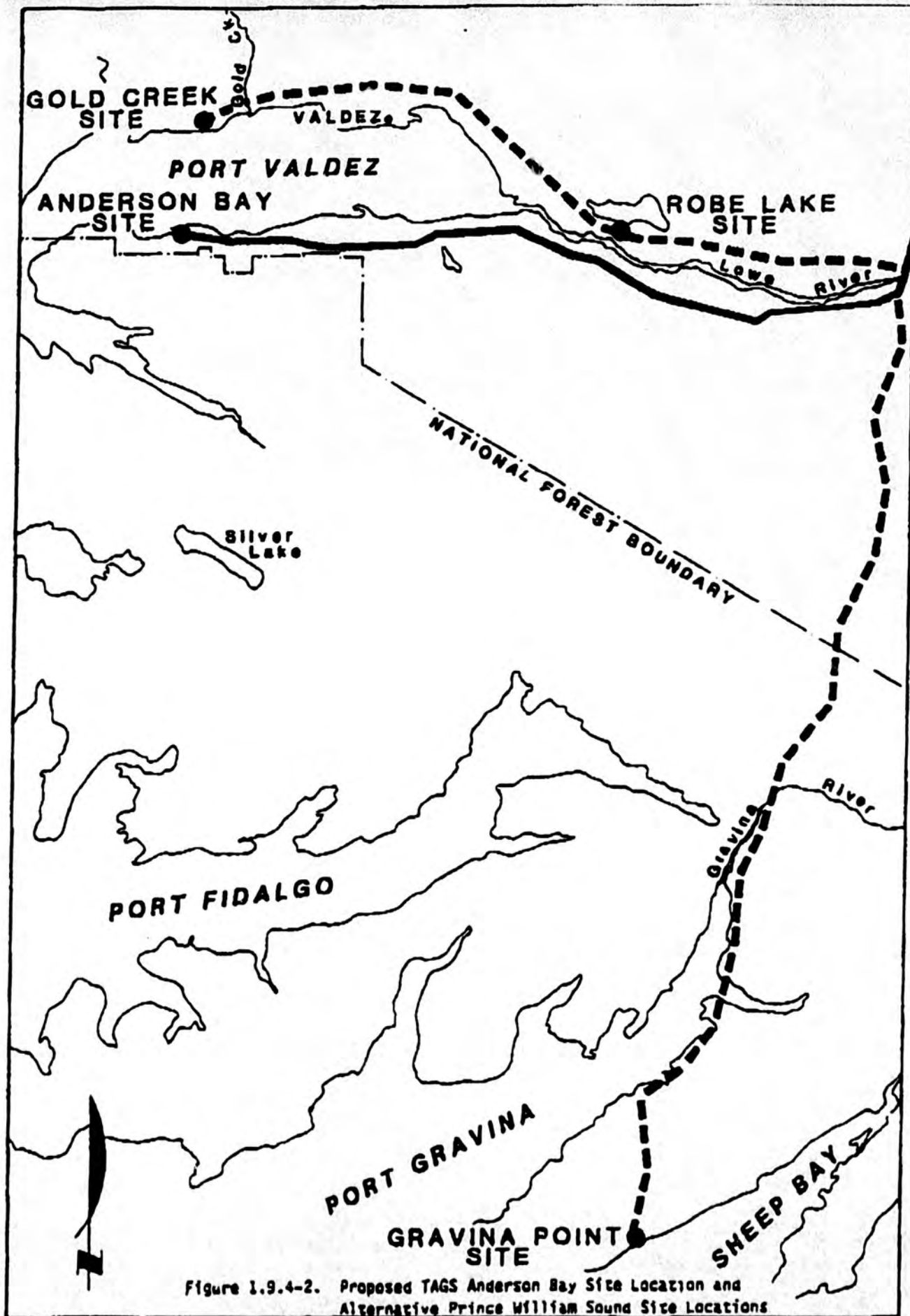


Figure 1.9.4-3 Criteria Evaluation Matrix for Proposed TAGS Project and Alternative locations

	Prince William Sound				Cook Inlet		
	Proposed Project to:	Alternatives			Alternatives		
	Anderson Bay	Gravina	Gold Creek	Robe Lake	Boulder Point	Cape Starichkof	Harriet Point
Pipeline Criteria							
- Minimize length of pipeline	○	●	○	○	○	●	●
- Maximize use of existing infrastructure	○	●	○	○	○	●	●
- Maximize use of proven construction techniques	○	●	○	○	○	●	●
- Maximize opportunity for parallel construction techniques	○	●	○	○	○	●	●
- Avoid areas of potential geohazards	○	●	○	○	○	●	●
- Minimize potential conflicts with sensitive environments	○	●	○	○	○	●	●
- Maximize compatibility with current and planned land use	○	●	○	○	○	●	●
- Minimize the number of water crossings	○	●	○	○	○	●	●
- Avoid permitting delays	○	●	○	○	○	●	●
- Minimize potential threat to national security	○	●	○	○	○	●	○
- Maximize availability of gas to Alaska consumers	○	●	○	○	○	○	○
LNG Plant Criteria							
- Adequacy of available land	○	○	○	●	○	●	○
- Avoid areas with poor foundation characteristics	○	○	○	○	○	●	○
- Avoid areas with faults	○	○	○	○	○	○	○
- Avoid sites potentially exposed to seismic sea waves	○	○	○	○	○	○	○
- Minimize length of pipeline to marine terminal	○	○	○	○	○	○	○
- Maximize use of existing community infrastructure	○	○	○	○	○	○	○
- Avoid sensitive environmental habitat	○	○	○	○	○	○	○
- Public safety considerations	○	○	○	○	○	○	○
- Maximize value added industrial opportunities	○	○	○	○	○	○	○
- Minimize site preparation requirements	○	○	○	○	○	○	○
Marine Terminal Criteria							
- Minimize exposure to extreme oceanographic conditions	○	○	○	○	○	○	○
- Minimize distance from shore to 60' MLW depth	○	○	○	○	○	○	○
- Maximize suitability of tanker maneuvering and anchorage area	○	○	○	○	○	○	○
- Minimize potential hazards to navigation	○	○	○	○	○	○	○
- Minimize potential problems related to soils and geohazards	○	○	○	○	○	○	○
- Minimize threat to national security	○	○	○	○	○	○	○

○ Favorable
 ● Moderately favorable
 ● Unfavorable
 ● Highly Unfavorable

Draft EIS - Appendix C
(Referenced in final E.I.S.)

APPENDIX C

EVALUATION OF ALTERNATIVE PIPELINE ROUTES AND
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Section VI.B summarizes important aspects of rating each alternative for each criterion and provides the rationale for the ratings listed in Figure VI-1. Section VI.C. includes an evaluation of each alternative with respect to the criteria established.

Results summarized in Figure VI-1 indicate the degree of favorability of the proposed project alternatives considered for each specific criterion under discussion. Categories are defined as follows.

Favorable - based on this criterion, the site/alignment offers no impediments to construction and operation of the proposed facility.

Moderately Favorable - the site/alignment has negative conditions that could be mitigated with a reasonable effort and expense within a reasonable time frame and with a high probability of success.

Unfavorable - the site/alignment has major negative conditions that could probably be mitigated but with unreasonably high expense, time frame, and/or uncertainty of success.

Highly Unfavorable - the site/alignment has major negative conditions that could not be adequately mitigated with a reasonable effort and expense, within a reasonable time frame, and/or with a high probability of success.

B. Evaluation of Pipeline Criteria

1. Minimize Length of Pipeline

The distance to Boulder Point is similar to the proposed action and is also favorable. The magnitude of additional

pipeline length for both Cape Starichkof at Harriet Point (of 59 to 29 miles, respectively), however, would require one more compressor station with attendant increases in costs for construction and operations and environmental impacts associated with the presence of the facility and would be rated unfavorable.

The total length of the pipeline right-of-way from Prudhoe to Anderson Bay would be 796.5 miles. With a maximum variance in pipeline length of only 14 miles from the proposed route, the Prince William Sound alternative alignments are not significantly different from each other or from the proposed route. In general, such difference in length alone would not be expected to greatly affect cost, time of construction, or total area disturbed by the pipeline and would therefore be rated favorable. Gravena pipeline would be approximately 10 miles longer than that proposed for Anderson Bay and would rate moderately favorable.

2. Maximize Use of Existing Infrastructure

Along the Cook Inlet regional alignments, available infrastructure is variable and discontinuous. From Livengood through Minto Flats and again from north of Willow through the Susitna Flats, there would be no infrastructure to support construction. For the Harriet Point site, there would be little supporting infrastructure for the more than 100 miles of alignment from Willow beyond the minimum amount associated with the power lines to the Chugach Electric Association Beluga generating facility and the Susitna to Tyonek road system. More than 100 miles of workpad and access roads would be required to construct the pipeline segment between

Figure VI-1 Criteria Evaluation Matrix for Proposed IAGS Project and Alternative Evaluations

	Prince William Sound				Cook Inlet		
	Proposed Project to:	Alternatives			Alternatives		
	Anderson Bay	Gravina	Gold Creek	Roba Lake	Boulder Point	Cape Starichkof	Harriet Point
Pipeline Criteria							
- Minimize length of pipeline	○	●	○	○	○	●	●
- Maximize use of existing infrastructure	○	●	○	○	○	●	●
- Maximize use of proven construction techniques	○	●	○	○	○	●	●
- Maximize opportunity for parallel construction techniques	○	●	○	○	○	●	●
- Avoid areas of potential geohazards	○	●	○	○	○	●	●
- Minimize potential conflicts with sensitive environments	○	●	○	○	○	●	●
- Maximize compatibility with current and planned land use	○	●	○	○	○	●	●
- Minimize the number of water crossings	○	●	○	○	○	●	●
- Avoid permitting delays	○	●	○	○	○	●	●
- Minimize potential threat to national security	○	●	○	○	○	●	●
- Maximize availability of gas to Alaska consumers	○	●	○	○	○	●	○
LNG Plant Criteria							
- Adequacy of available land	○	○	○	●	○	●	○
- Avoid areas with poor foundation characteristics	○	○	○	○	○	●	○
- Avoid areas with faults	○	○	○	○	○	●	○
- Avoid sites potentially exposed to seismic sea waves	○	○	○	○	○	●	○
- Minimize length of pipeline to marine terminal	○	○	○	○	○	●	○
- Maximize use of existing community infrastructure	○	○	○	○	○	●	○
- Avoid sensitive environmental habitat	○	○	○	○	○	●	○
- Public safety considerations	○	○	○	○	○	●	○
- Maximize value added industrial opportunities	○	○	○	○	○	●	○
- Minimize site preparation requirements	○	○	○	○	○	●	○
Marine Terminal Criteria							
- Minimize exposure to extreme oceanographic conditions	○	○	○	○	○	●	○
- Minimize distance from shore to 60' MLW depth	○	○	○	○	○	●	○
- Maximize suitability of tanker maneuvering and anchorage area	○	○	○	○	○	●	○
- Minimize potential hazards to navigation	○	○	○	○	○	●	○
- Minimize potential problems related to soils and geohazards	○	○	○	○	○	●	○
- Minimize threat to national security	○	○	○	○	○	●	○

Note: Individual criterion cannot be weighted on an equal basis.

○ Favorable
 ○ Moderately favorable
 ○ Unfavorable
 ● Highly Unfavorable

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Willow and Harriet Point, making this alternative unfavorable with regard to infrastructure requirements.

In addition to the infrastructure requirements for Minto Flats and Susitna Flats, the Boulder Point route would require infrastructure support for a 15-mile subsea pipeline from the north shore of the Cook Inlet near the mouth of the Susitna River to Point Possession on the Kenai Peninsula and about 15 more miles of road construction along a roadless pipeline right-of-way from Point Possession to the first existing road access to that right-of-way. Overall, the existence of suitable infrastructure along much of the route, including a parallel railroad and highway system and population and commercial centers in the Railbelt and Kenai areas, would be somewhat counterbalanced by a lack of infrastructure in specific areas to yield Boulder Point a rating of moderately favorable.

From near Boulder Point the route to Cape Starichkof would be accessible to the Sterling Highway and, thus, to the full support capabilities of the Kenai Peninsula. This route is also considered to be moderately favorable.

From Livengood southward the proposed project alignment to Anderson Bay generally follows the existing TAPS utility pipeline corridor and benefits directly from the potential use of a number of existing access roads and camp pads used for TAPS construction used for TAPS construction. The route also makes maximum use of the existing highway systems, airports and airstrips, and population centers that have supported similar construction and operations activities in the past. The route variations for Gold Creek and Robe Lake are insignificant as related to available infrastructure, and these routes

are also considered to be favorable in this regard.

The Gravina alignment is the same as for Anderson Bay, Gold Creek, and Robe Lake to the vicinity of Keystone Canyon near Valdez. From Keystone Canyon to the terminus at Gravina the alignment has no infrastructural support. Construction requirements would include roads and camps for most of the 32 miles of mountainous terrain between Keystone Canyon and Gravina. Similarly, operation of this segment of pipeline would rely on infrastructure support from Valdez and Cordova by marine or air service. Even with consideration of the highly favorable infrastructure of the route to Keystone Canyon, the overall Gravina route infrastructure would be considered unfavorable.

3. Maximize Use of Proven Construction Techniques

Constructability for the Cook Inlet alternative routes from Livengood to Cook Inlet in general would not be expected to pose greater problems than for the proposed TAGS alignments. The much smaller existing data base for engineering design could lead to construction delay as problems are found along the route (e.g., a complicated aerial crossing of Hurricane Gulch), potentially less suitable soils and drainage conditions in the Susitna Flats, and difficulties with the subsea pipeline crossing of the Cook Inlet.

For Boulder Point the need for a 15-mile subsea pipeline across Cook Inlet represents an important additional constructability consideration. Extension of the pipeline route to Cape Starichkof adds crossings of several heavily utilized sport-fishing streams, including the Kenai

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River. It also traverses extensive areas of poor drainage and areas where there was extensive ground breaking as the result of the 1964 earthquake that might be expected to have a similar response to future seismic events. On the basis of these factors, both the Boulder Point and Cape Starichkof sites are considered unfavorable in terms of constructability.

Constructability considerations for the route to Harriet Point—in addition to those mentioned for the route from Livengood to Cook Inlet excluding the subsea Cook Inlet crossing—are seismic activities, crossing extensive wetlands, and the potential for flooding by the Drift and Chakachnatna rivers due to bursting of glacial lake dams or glacial melt. Volcanic activity is also severe in the area. Seismic considerations include a crossing of the Castle Mountain Fault, extensive ground breaking and cracking, and seismic activity associated with several nearby active volcanoes. Overall these factors would be considered to be unfavorable for this route.

Construction of the TAGS pipeline from Livengood to Anderson Bay would rely on engineering designs and construction techniques proven during construction of TAPS along the same corridor as well as with the authorized ANGTGS gas pipelines, which has an approved design for basically the same system as the proposed TAGS through Delta Junction. Pipeline routes to alternative sites at Robe Lake and Gold Creek would similarly rely on proven construction techniques in known geological and geotechnical environments. Robe Lake would be considered as favorable. However, because the last 3 miles of pipeline alignment to Gold Creek would be located on steep sideslope, this route would be rated as moderately favorable. The pipeline route to Gravina would require routing through 32 miles of glaciated mountainous terrain

through the Chugach National Forest and a 2.1-mile mountain tunnel. In terms of constructability, this route alternative would have to be considered as unfavorable.

4. Maximize Opportunity for Parallel Construction Techniques Along Existing Facilities

Each of the three Cook Inlet alternatives also has lengthy stretches with no parallel access. These include lengths through Minto Flats for approximately 70 miles and Susitna Flats for approximately 50 miles, Cook Inlet submarine crossings, and that portion of the route to Boulder Point and Cape Starichkof on the northern part of the Kenai Peninsula prior to convergence with an existing pipeline corridor. Boulder Point and Cape Starichkof would be moderately favorable.

The Harriet Point alternative route along the west side of Cook Inlet partially parallels an existing small-diameter gas pipeline and an existing oil pipeline near Drift River and is rated as moderately favorable.

Construction efficiency would be maximized and environmental impacts minimized for the routes that closely follow existing pipeline and transportation corridor. The proposed route to the Prince William Sound sites in Port Valdez all benefit from a close association with TAPS and its existing access roads and have been rated favorable for this criterion.

Gravina departs from the TAPS line at Keystone Canyon and then proceeds through the Chugach Mountains and the Chugach National Forest for approximately 32 miles—an area with no existing access from which to utilize parallel construction—and is rated as moderately favorable.

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5. Avoid Areas of Potential Geologic Hazards

Alignments to Cook Inlet must pass through a similar range of geohazardous conditions as the proposed alignment, including crossings of the Minto Fault and the McKinley strand of the Denali fault system, marshlands, and the Tanana River with its multiple shifting channels. The Boulder Point and Starichkof alignments must cross the inlet with a 15-mile subsea pipeline as well as the Castle Mountain fault system. The Cape Starichkof alignment further traverses 15 miles of terrain susceptible to seismically induced failure. As geohazards are much less well-known along both the Boulder Point and the Starichkof alternatives, these routes are rated unfavorable for geohazards.

The Harriet Point alignment runs parallel to the Basin Bay Fault, which intersects the Castle Mountain Fault. The Castle Mountain Fault has been the site of many earthquakes. This route also transits areas which could be susceptible to seismically induced cracking and ground breakage and is located within the vicinity of two active volcanoes. Harriet Point is rated as unfavorable.

Geologic hazards are natural or man-made geologic conditions that potentially endanger life and property. Geologic hazards that TAGS may encounter during its design life include mass wasting, ground subsidence or heave, earthquake-induced ground failure, glaciating, snow avalanche, erosion, flooding, and tsunamis or seiche. As TAPS demonstrated, technology is available to identify these hazards, determine their probable severity, and to mitigate their effects in siting, design, and construction.

Geohazards are considered as moderately favorable for the proposed alignment because the hazards have been identified and taken into consideration in the siting and design of TAPS.

The difference in geohazards between routes to Robe Lake and Gold Creek differ from the proposed alignment in passing through some additional avalanche and landslide areas but overall are not considered to present major differences in engineering design requirements. These are also rated as moderately favorable.

The 32 miles of alignment, unique to Gravina alternative, pass through the heavily glaciated Chugach Mountains, through areas with avalanches and landslides near tunnel entrances, and crosses the Jack Bay and Gravina faults. This alignment is considered to be unfavorable.

6. Minimize Potential Conflicts with Sensitive Environments

Cook Inlet alternatives impinge on several sensitive areas avoided by the proposed project. South of Livengood to Tanana the Cook Inlet pipeline traverses Minto Flats, an important waterfowl and subsistence use area for Alaska Natives. A compressor station and an access road would also be required in this general area for the life of the project. The alternative pipeline route passes through the eastern edge of Denali National Park and Preserve, which, aside from any question of obtaining congressional approval for this part of the right-of-way, is the most heavily visited park in Alaska. Pipeline construction activities could directly interfere with park traffic and disturb the aesthetics and scenic qualities for park visitors from north of the park on through Broad Pass and south through Denali State Park. South of

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Willow, the Cook Inlet route passes through the Susitna Flats, which are characterized by high waterfowl use, several highly productive anadromous fish streams, and associated high recreational use. Whether potentially increased access is considered as positive in promoting use and development or as negative in disturbing the ecosystem and changing the character of this area for recreational use, it is quite likely that construction of a pipeline through this area would produce changes in the Susitna Flats. A compressor station and access road would be required there for the life of the project.

In addition, the Boulder Point route crosses a small part of the Captain Cook State Recreation Area. The Cape Starichkof route would cross the Kenai River Management Zone, which is heavily used by both sport and commercial salmon fishermen.

The Harriet Point route passes through critical waterfowl habitat, including nesting areas of the rare tule goose and the Trading Bay State Game Refuge with critical moose, brown bear, and other large mammal habitat and significant salmon streams.

Boulder Point and Cape Starichkof were considered as moderately favorable and Harriet Point unfavorable due to these factors.

The proposed TAGS route follows existing utility corridors for its entire length and poses minimal change in character or use of environments along the 800-mile corridor. A few specific areas are near places known to be used by threatened or endangered species, mainly peregrine falcons near Sagwon Bluffs, Grapefruit Rocks, and along the Tanana River and bald eagles south of Keystone Canyon. Minor routing adjustments and other mitigation such as timing of construction should effectively avoid any potential impacts. The routes to

Anderson Bay, Gold Creek, and Robe Lake are considered as favorable. The route to Gravina must continue across 15 miles of undeveloped Chugach National Forest land. With the linear aspect of the intrusion, the low potential for postconstruction impacts of a buried pipeline, and the absence of conflict with current use of this forest land, this route is considered as moderately favorable.

7. Maximize Compatibility With Current and Planned Land Use

The Cook Inlet alternative alignment (from Livengood to Cook Inlet) traverses the eastern end of Denali National Park and Preserve, which would pose a major potential land-use conflict due to the Alaska National Interest Lands and Conservation Act (ANILCA). Aside from problems related to permits and approvals with ANILCA Title XI (see Section VI.A.9 discussion), pipeline construction activities would interfere with the current use by visitors to the park in terms of both aesthetics and traffic flow. The pipeline also would cross approximately 70 miles of roadless fish and wildlife subsistence habitat in the vicinity of Minto Flats; would traverse highly utilized fishing and recreational areas along the Alaska Railroad/Parks Highway corridor, including McKinley Village, Denali State Park, and the Nancy Lakes Recreation Area; and would cross approximately 50 miles of undeveloped area in the Susitna Flats area. The alignment to Boulder Point would traverse 17 miles of the Susitna Flats State Game Refuge, the edge of the Kenai National Wildlife Refuge, and the Captain Cook State Recreation area. From Boulder Point to Cape Starichkof the alignment crosses several heavily utilized sport salmon fishing streams and the Kenai National Wildlife

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Refuge. The route to Harriet Point on the west side of Cook Inlet is largely undeveloped, but it is undergoing significant change. In addition to an established timber harvest area, a major coal export program is beginning. It also would cross more than 20 miles of the Susitna State Game Refuge. All three of the Cook Inlet routes are considered unfavorable because of land-use conflicts at Minto and Denali National Park and Preserve.

The proposed alignment from Livengood to Anderson Bay follows a designated transportation and utility corridor through the Prince William Sound area. The proposed alignment traverses a portion of Blueberry Lake SRS. The alignments to Robe Lake and Gold Creek alternative sites pass near several existing or proposed recreational sites in the vicinity of Robe Lake, including the Salmonberry Ridge Ski Hill and the proposed bike trail extension No. 3. Beyond Robe Lake, the route to Gold Creek passes near the Robe River Neighborhood Park and the proposed Robe River Fishing Platform (Valdez CDD 1986). The Gold Creek route would also pass through state lands proximate to the city of Valdez, the Valdez Airport, and the proposed Gold Creek Trail (CDD 1986). Because the final pipeline segment represents such a small proportion of the total alignments and nearly any impacts on these existing and planned land uses would be due to construction only, the Gold Creek and Robe Lake alignment has been rated overall as favorable and similar to the proposed Anderson Bay route.

The pipeline alignment to Gravina transits approximately 15 miles of the Chugach National Forest. The Forest Service has defined a management direction for the Gravina Management Area that includes maintenance of landscape character and

"dispersed recreational opportunities" as well as enhancement of marine-oriented recreational opportunities and fish habitat. Installation of 36-inch gas pipeline would not necessarily interfere with these objectives. This alternative is considered as moderately unfavorable on the basis of its potential conflict with the Chugach National Forest Plan (USFS 1984).

8. Minimize the Number of Surface Water Crossings

Approximately 100 streams are crossed by Cook Inlet regional pipeline alignments between Livengood and Cook Inlet. Though total stream crossings are fewer for the Cook Inlet routings to Boulder Point and Cape Starichkof, many of these are heavily utilized by anadromous fish and receive much heavier recreational use than the streams along the proposed route south of Livengood. By comparison with streams crossed by the proposed alignment, the Boulder Point and Starichkof are considered to be favorable and Harriet Point to be moderately favorable due to the sensitivity of those streams crossed.

The pipeline route from Livengood to Valdez would have to cross approximately 150 streams and rivers. Most of these streams were also crossed by the TAPS pipeline and would be crossed by ANGTs to Delta Junction. The difference in total stream crossings between Gold Creek, Robe Lake, and the proposed Anderson Bay project site is two less for Robe Lake, two more for Gold Creek. Each of these three alignments is considered to be favorable with respect to stream crossings. The alignment to Gravina has approximately six additional streams, plus it crosses Charter Bay and Comfort Cove

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on Prince William Sound and would therefore rate unfavorable.

9. Avoid Permitting Delays

The Livengood to Cook Inlet alternative alignment passes through several areas that pose major issues related to permits and approvals. Subsistence use in the Minto Flats area, heavily used anadromous fish streams, and crossing the Denali State Park and Susitna Flats State Wildlife Refuge make obtaining permits through these areas potentially difficult. The most problematic segment to permit along the Cook Inlet alignments would be through the Denali National Park and Preserve.

On the basis of the requirement of ANILCA, Title XI, congressional approval would be required for a right-of-way through Denali National Park and Preserve and a suitable alternative to that alignment designated, namely the action proposed to construct the TAGS project to Anderson Bay. All three Cook Inlet alternatives are considered to be highly unfavorable due to the project time delays that would be involved in any attempt to secure congressional approval when the proposed route to Anderson Bay would avoid the Denali National Park and Preserve entirely.

The procedure under 43 CFR 36 for authorizing a pipeline through Denali National Park and Preserve would require among other things:

No federal approvals for any part of the proposed pipeline system until all the provisions of 43 CFR 36 are met.

A determination that there are no other alternative modes of access or any

economically feasible and prudent alternative.

Since the National Park Service lacks authority to issue rights-of-way for pipelines under Section 28 of the Minerals Leasing Act of 1920 (30 USC 185), approval of the proposed TAGS project through a portion of the Denali National Park and Preserve therefore would require:

A specific determination that "... there is no economically feasible and prudent alternative route for the system."

A recommendation by the National Park Service to the president that the TAGS should cross a portion of the Denali National Park and Preserve.

A presidential recommendation to Congress supporting legislation to authorize construction of the TAGS project through Denali National Park and Preserve.

An act of Congress approving a TAGS alignment through Denali National Park and Preserve.

Several route options around Denali National Park and Preserve have been considered. These include following the general route of the Anchorage-Fairbanks Intertie and along the eastern bench above the Nenana River. The former was deleted because of severe engineering problems associated with crossing steep, deeply incised terrain (the intertie required helicopters to install its facilities in this area). The latter has severe conflict

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with expanding commercial lodging establishment supporting visitors to Denali National Park and Preserve and to the scenic setting now afforded park visitors.

Since an acceptable environmental and cost-effective alternative has previously been reviewed and approved as discussed in Appendix J of the DEIS, the Cook Inlet alternatives are unfavorable from a permit standpoint.

Number and type of permits discussed in the DEIS generally apply to both routes. However, the process and timing to obtain these permits is quite different. The proposed alignment from Livengood to Anderson Bay generally follows existing transportation and designated utility corridors and probably has less potential permitting delays since it is basically adjacent to constructed TAPS and authorized ANGTS to Delta Junction.

Additional technical reviews would be necessary whenever TAGS would lie close to authorized ANGTS or to TAPS. Routings to Prince William Sound would have more proximity reviews than those to Cook Inlet.

Both Cook Inlet and Prince William Sound routes involve military installations. Cook Inlet has one, and Prince William Sound has two. Cook Inlet routings would require permits from the Alaska Railroad; Prince William Sound would not.

Air quality permitting for the LNG plant near Valdez would probably require a monitoring program, as discussed in Subsection 4...J in the DEIS. Preliminary emissions calculations indicate no major air emission increase from the facility as identified in Subsection 4.2.6 in the DEIS. The route alignments to Anderson Bay, Roeb Lake, and Gold Creek would differ only in permits related to land use near Valdez. Though they might elicit a different response from local agencies relative to

current land use plans, there is no current information to suggest that either of these sites would be less favorable in terms of securing necessary permits, and all are considered favorable. The alignment to Gravina would pass through approximately 15 miles of the Chugach National Forest.

The forest is managed for multiple use, and there are no specific provisions for a utility right-of-way. On the basis of potential permitting problems which could delay or halt the proposed project, the Gravina alignment would have to be considered moderately favorable.

10. Minimize Potential Threat to National Security

Three questions must be answered with regard to pipeline alternative alignments and potential national security impacts. First, would any of the alignments potentially affect U.S. dependence on foreign energy supplies during a time of international conflict when supplies might be curtailed? Secondly, do any of the proposed alternative alignments pose a greater risk to the security of the supply from an action of war or terrorism? Finally, do the alignments pose any greater or lesser ability to establish effective security measures to protect them?

No matter which alignments were selected, 800 miles of pipeline always carries the potential for terrorism. None of the alignments offers any greater or lesser exposure to disruption. The only obvious potential difference vis-a-vis national security rests in the proximity of the TAGS pipeline to the existing TAPS and the authorized ANGTS systems. Should it ever become necessary to attempt to protect the TAGS line from possible terrorist

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actions, it would seem that security measures to protect a single TAPS, TAGS, and ANGTS corridor would have a greater potential for success than trying to secure two separate alignments through uninhabited areas. On this basis the proposed alignment to Anderson Bay and the alternatives to Robe Lake and Gold Creek are all considered favorable, and the Gravina and three Cook Inlet alignments are considered as moderately favorable.

11. Maximize Availability of Gas to Alaska Consumers

Though there is no specific plan to provide access lines to tap natural gas flowing through the proposed TAGS for use by public or commercial facilities along the route, this criterion considers the possibility of greater access to potential future uses as a favorable characteristic.

Cook Inlet alternative alignments also pass near Fairbanks, and potential future gas use would be considered favorable. In addition, the route parallels the Railbelt from Fairbanks through the Matanuska-Susitna Borough, providing potential direct future gas supplies to the population along this corridor. The Boulder Point and Cape Starichkof alignments provide a potential future gas supply to an area (Kenai/Soldotna) with the population and industrial infrastructure to maximize the potential for any possible future uses. The Harriet Point alignment, though it veers away from the prime population and infrastructure areas as it heads to the west side of the Inlet, would pass through an area that has current industrial facilities (Beluga Power Plant, Drift River petroleum facility) and is proposed for future development (expansion of Beluga Power Plant and development of Diamond Chuitna coal mine

and export terminal). On the basis of this overall analysis, all Cook Inlet alignments are considered to be favorable.

The proposed alignment from Livengood to Anderson Bay passes close to the Fairbanks area, affording potential access to the second-largest population center in the state. With the recent completion of the Anchorage-Fairbanks electrical intertie and with the presence of the Alaska Railroad line from Fairbanks through Anchorage to Seward, both future public and commercial uses for natural gas are potentially favorable. Other than the Fairbanks area, the route passes through only small population centers through the remainder of the route to the Valdez terminus, where additional future possibilities may exist for use of natural gas.

The Robe Lake and Gold Creek alignments are essentially the same as the proposed project for this criterion and would be moderately favorable. Gravina differs mainly in that the alignment does not pass as close to Valdez, where existing infrastructure and resident population provide greater potential for wanting a gas supply or value-added industries than does Gravina. Therefore, the Gravina route would be rated unfavorable.

C. LNG Plant Site

1. Adequacy of Available Land

Adequate land is available at both Boulder Point and Cape Starichkof to construct the LNG plant and probably to provide an adequate buffer. The lands at the LNG plant site and for the buffer zone are, however, under private individual and Native corporation ownership, and development would be uncertain. The site at Cape Starichkof is privately owned and

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located adjacent to several residences and a recreational use area. The Boulder Point site is owned by individuals and a Native corporation and is rated as moderately favorable. The Cape Starichkof site has been given a rating of unfavorable. The Harriet Point site, located on state lands, is isolated from any other use and has adequate acreage for the construction of the LNG plant site and an adequate buffer zone. This site is rated as favorable.

The proposed LNG site at Anderson Bay contains approximately 300 acres of developable land with a 3,000-acre uninhabited buffer zone surrounding the shore side of the site which provides an adequate zone to ensure public safety. The site itself would be located on state-owned land, and the buffer zone is within both state and federal lands. The Gold Creek and the Gravina sites would be located on state-owned and possibly the Chugach Natives' corporation land and have adequate land area suitable for the development of an LNG plant site and buffer zone. All three of these sites are rated as favorable. The Robe Lake site, though located on state lands with adequate acreage for the construction of the LNG plant, abuts to privately owned land proximate to existing residential development and a high recreational use area. This site is considered highly unfavorable.

2. Avoid Areas with Poor Foundation Characteristics

The three Cook Inlet sites have an abundance of glacial till, gravel outwash, and alluvial material. Each site appears to contain foundation materials which are acceptable though not as desirable as the bedrock base found at the four Prince William Sound area sites and therefore would

be considered as moderately favorable in this evaluation.

The Anderson Bay site is composed of a series of bedrock ridges mantled with glacial till, presenting a good base for facility foundations. Robe Lake, Gold Creek, and Gravina sites are similar in structure, presenting similarly favorable foundation conditions.

3. Avoid Areas With Faults

None of the sites considered has active faults identified that could pose design and safety problems, although all of Alaska is potentially active. Therefore, the proposed Anderson Bay site and all alternatives would be considered as moderately favorable with regard to this criterion.

4. Avoid Sites Potentially Exposed to Seismic Sea Waves

Boulder Point and Cape Starichkof would be well above historical high water levels. Harriet Point site would be elevated high enough to withstand waves from seismic or volcanic events. On the basis of potential exposure to seismic sea waves, all Cook Inlet alternative sites were considered favorable.

The configuration and orientation of Port Valdez minimizes the potential that any major tsunami generated in Prince William Sound would have a major impact in the port. The proposed facility at the Anderson Bay site would be located above the highest anticipated seiche that might be expected to develop through submarine landslides such as occurred in Shoup Bay during the 1964 earthquake when the site was exposed to a maximum wave run-up of 78 feet (FPC 1976a). The Gold Creek site, at 300 to 500 feet,

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would be well above any potential seismic seawave, even though the 1964 run-up was 124 feet. The Robe Lake site (at 200 to 400 feet above sea level) would be both well away from the port and above the critical height.

The Gravina site would be located well above the predicted 10- to 16-foot wave height and 30- to 40-foot wave run-up elevation (FPC 1976a). All sites were evaluated to be favorable.

5. Minimize Length of Piping to Marine Terminal

The required loading line length is a factor of the distance from the LNG plant to the shore and the shore to the marine berth. All three of the alternative Cook Inlet sites have marine terminals located between 4,000 and 5,000 feet from shore. The length of the loading lines would be within 2.5 miles, and each would be considered moderately favorable.

At the proposed Anderson Bay and Gold Creek sites the distance from shore to marine terminal would be approximately 500 feet as is Gold Creek, and Gravina would be about 1,500 feet. All of these sites are rated as favorable for this characteristic since LNG storage tank facilities are close to the shoreline, and a minimal length of loading line would be required. The Robe Lake site would require approximately 5 miles of loading line between the LNG plant and the marine terminal since the LNG plant site would be situated a considerable distance from the marine terminal. This site would receive an unfavorable rating; in fact, this length of cryogenic loading line would be sufficiently beyond the 2.5-mile limit set by the FPC (1976a) that the site would be eliminated from further consideration.

6. Maximize Use of Existing Community Infrastructure

Of the three Cook Inlet sites, the two on the Kenai Peninsula, Boulder Point, and Cape Starichkof, would have excellent infrastructural support, including highway access, a commercial airport, available support industry, population base, and communities oriented toward expansion. These are considered as highly favorable for this criterion. Harriet Point, on the other hand, has no infrastructural base and would be considered as unfavorable.

The Robe Lake, Gold Creek, and proposed Anderson Bay LNG facility site have the advantage of being close to Valdez and its developed marine harbor area. Other advantages include a population base, housing, schools, airport, and highway access. Undoubtedly, these would require some expansion, but there is an excellent infrastructure base to develop. Anderson Bay, however, would require a 1,700-person camp during construction, and operation crews would be ferried to the site. Smaller camps would be required at both Robe Lake and Gold Creek during construction. All three of these would be considered moderately favorable.

Gravina offers no existing infrastructure from which to expand. All roads, airports, housing, and services would have to be built. All support services would either be developed or imported by air or water. Gravina would be rated as highly unfavorable by this criterion.

7. Avoid Sensitive Environmental Habitat

Among the Cook Inlet sites considered, Boulder Point has the least potential for impact on critical habitat. All three sites

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have various amounts of spruce woodland and mixed wetlands used by moose, bear, and other small mammals. Separating Cape Starichkof is the site's proximity to important anadromous fish streams, beach set net sites, important salmon migratory travel route to upper Cook Inlet, and clamming areas with attendant high recreational use. Harriet Point is distinguished by designation as critical habitat for moose, Harriet Creek is an anadromous stream, and the coastal intertidal zone is considered critical for razor clams and harbor seals. Boulder Point is considered moderately favorable, and Harriet Point and Cape Starichkof are rated as unfavorable with respect to potential impacts to sensitive environments.

The proposed Anderson Bay site is similar to much of the land surrounding Port Valdez and Prince William Sound in general. It does not have any particularly high concentrations of shorebirds or waterfowl and is not noted for use by marine mammals. An active bald eagle nest has been spotted to the west and outside of the buffer zone. Of two streams that cross the site, one is utilized by anadromous fish. Assuming that disturbance to the eagle nest can be minimized, the site is considered to be moderately favorable with respect to this criterion.

The Gold Creek site is similar to Anderson Bay with the exception that there is important waterfowl use of nearby Island Flats. There is an active bald eagle nest within 0.5 miles of the site and an anadromous fish stream crosses just north of the site.

The Robe Lake site is upland of an important salmon spawning area and migratory pathway but is itself not of major

importance as a sensitive environment. Gold Creek and Robe Lake sites are considered moderately favorable on the basis of limited potential to impact sensitive environments.

Sensitive aspects of Gravina include the presence of numerous bald eagle nests and utilization of the area by sea otters, harbor seals, and sea lions (FPC 1975). Gravina is rated as unfavorable on this basis.

8. Public Safety Considerations

Of the Cook Inlet sites, Boulder Point and Cape Starichkof both have a small number of nearby residences, some recreational use, and are considered as moderately favorable. Large areas of privately held land in the vicinity could be developed in the future. At Boulder Point residences in the vicinity of the LNG plant site could be required to be relocated, depending on the need for a specified exclusion zone. Harriet Point is well away from any population and would be rated as favorable.

The Anderson Bay site is well away from residential and commercial areas, airports, and the Alyeska marine terminal. In the event of a major accident or spill (as discussed in Subsection 4.2.19 of the DEIS) the Anderson Bay site would be considered as favorable in terms of public safety. The Gold Creek site is away from residential or commercial areas but in a heavy recreational use area. The Robe Lake site is surrounded by residences and is also heavily used for recreation. Gold Creek would be considered as moderately favorable and Robe Lake highly unfavorable from the standpoint of public safety in the event of a major accident or spill. Gravina would be well away from any population and is rated favorable.

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9. Maximize "Value-added" Industrial Opportunities

Of the Cook Inlet alternatives, those sites with access to the strong infrastructural base of the Kenai Peninsula, Boulder Point, and Cape Starichkof are rated as favorable. For Harriet Point, potential secondary development would have to wait additional infrastructure to support the expansion, so this site would be considered as unfavorable.

The proposed Anderson Bay site, as well as the other two sites on Port Valdez, offer some potential for development of secondary industries in that the requisite infrastructure and economic base are extant in Valdez. With the presence of the TAPS terminal operation and the proposed Alaska Pacific Refinery, it could be expected that future expansion would be limited only by space and the community's ability to absorb additional population. The potential for industrial value-added opportunities for these sites would be considered as moderately favorable. With virtually no infrastructural development, Gravina would be considered as highly unfavorable with respect to this criterion.

10. Minimize Site Preparation Requirements

Boulder Point, Cape Starichkof, and Harriet Point sites would require the least site work for LNG plant construction and are considered as favorable.

The proposed Anderson Bay site would require a substantial amount of earthwork before construction. Soils are of good quality overlaying bedrock, and site preparation would not pose major difficulties. Excess material could be used to develop the construction wharf,

off-loading area, construction support, and laydown area. The situation is similar for the Robe Lake and Gravina sites, and all are considered as moderately favorable. The Gold Creek site would require extensive earthwork with the added problem of spoil disposal for the vast amount of excess material created during site preparation. Gold Creek would be rated as unfavorable for this criterion.

D. Marine Terminal

1. Minimize Exposure to Extreme Oceanographic Conditions

Each of the three Cook Inlet sites must deal with high currents and waves, sea ice that can include solid iced-up conditions at Boulder Point, common occurrence of floating ice "pancakes" in the range of 6 to 18 inches thick, and the possibility of seismic sea waves. Tsunami risk is perhaps greatest at Harriet Point due to the presence of active volcanoes near the site. Currents and sea ice are greatest at Boulder Point. Overall oceanographic conditions that could affect daily operations and safety would be considered to be unfavorable at all three sites.

The proposed marine terminal site at Anderson Bay is in an area with low currents and waves of less than 1 foot about 90 percent of the time, very little sea ice, and a less than average potential impact from seismic sea waves. This situation would be similar at the other three alternative Prince William Sound sites considered in this analysis. The presence of icebergs calved from Columbia Glacier in ship channels of Prince William Sound is closely monitored by the U.S. Coast Guard and reported through the Valdez Vessel Traffic Service and is not considered an

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obstacle to operations. All Prince William Sound sites evaluated would be considered favorable with respect to oceanographic conditions that would be encountered in Alaska coastal waters.

2. Minimize Distance to 60-Foot Depth Isobath

At Boulder Point, Harriet Point, and Cape Starichkof, the 60-foot isobath is between 4,000 and 5,000 feet offshore. Boulder Point, Harriet Point, and Cape Starichkof are classified as moderately favorable.

The 60-foot isobath is located within 500 feet of the shoreline for the proposed Anderson Bay site as well as for alternative Gold Creek. The alternative Robe Lake site 60-foot isobath is approximately 2,500 feet offshore but several miles from the LNG plant site. The berthing area for the Gravina alternative lies about 1,000 feet offshore. On the basis of the distance to tanker berthing depth from the shoreline, Anderson Bay, Gold Creek, and Gravina would be considered favorable, but Robe Lake would be ranked as unfavorable.

3. Maximize Suitability of Tanker Maneuvering and Anchoring Areas

Each of the three Cook Inlet sites has adequate room for maneuvering and anchoring, however, at Cape Starichkof there are areas of significant longshore drift and shoaling which could require dredging. Boulder Point and Harriet Point rate favorably, and Cape Starichkof is moderately favorable.

The area for anchoring and maneuvering vessels is excellent at the proposed Anderson Bay marine terminal location and for alternatives Gold Creek and Gravina due to the broad expanse of open water with

excellent anchorage depth of less than 200 feet (FPC 1976a). These three locations would be rated as favorable. The terminal facility location with the alternative Robe Lake site would be proximate to the main aggregation of Valdez recreational and commercial vessels and located at the head of the Port Valdez, which would restrict maneuvering room and limit anchorage areas. The Robe Lake location would be considered unfavorable with respect to this criterion.

4. Minimize Potential Hazards to Navigation

All three of the Cook Inlet sites benefit from a good system of navigational aids and the requirement for vessels to be accompanied by a state licensed coastal pilot north of Kachemak Bay. All three of these sites must contend with problems associated with winter sea ice, shoaling, and submerged outcrops. The Cape Starichkof site in particular could require dredging to remove shoals. Uncharted submerged outcrops and boulders at Boulder Point pose definite hazard. With major consideration to navigation safety, Cape Starichkof and Harriet Point sites are considered as moderately favorable, and the Boulder Point site is rated as unfavorable.

The automated vessel traffic service (VTS) already in place for the Valdez Arm, Valdez Narrows, and Port Valdez and the limited potential navigational hazards (except for icebergs from Columbia Glacier and those related to shoaling and rock outcrops) make the proposed Anderson Bay site and alternative Gold Creek site favorable from a navigability standpoint. The alternative Robe Lake marine terminal site located near the main aggregation of Valdez recreation and commercial vessels and in the general vicinity of a sunken wreck

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would be rated as unfavorable. Gravina does not have the benefit of the automated VTS but otherwise has favorable navigation conditions and would be rated moderately favorable.

5. Minimize Potential Problems
Related to Soils and Geohazards

Cook Inlet marine terminal sites would all be subject to erosion and accretion problems associated with the high current regime and documented movement of large-scale mobile bedforms. Proximity to active volcanoes would expose facility operations to added risk of seismic sea wave. General engineering soil characteristics related to shear strength and liquefaction potential are considered to be favorable, and the Cook Inlet terminal sites are rated overall as favorable.

At the proposed Anderson Bay site there is minimal probability of a major submarine slide in the area of the marine terminal. The situation is similar in most respects to the Alyeska marine terminal site. A slide elsewhere in the harbor, such as occurred in Shoup Bay during the 1964 earthquake, would be expected to generate a sea wave that could affect any terminal site in Port Valdez. Such conditions would be incorporated into facility engineering design. At the Robe Lake terminal site there is some degree of sediment instability as evidenced by recurring submarine slides. Also, there is considerable potential for soil liquefaction and ground failure during a seismic event. Little information exists regarding submarine soils at Gold Creek; however, the submarine slopes along the front of the alluvial fan at the mouth of the creek are probably similar to those that underwent failure in Shoup Bay during the 1964 earthquake. The Gravina site has

favorable subsurface conditions with minimal probability of submarine slides (FPC 1976a). On this basis, the Anderson Bay and Gravina sites are considered to be favorable, but the Robe Lake terminal site is considered as unfavorable because marine-specific information on potential hazards for the Gold Creek site was not available. However, based on the fact that the sites similarity to Shoup Bay, the Gold Creek site should probably be classed as unfavorable until site-specific information could be developed to suggest otherwise.

6. Minimize Threat to National
Security

None of the sites considered poses any major advantage or disadvantage to national security from an economic point of view. The proposed TAGS LNG terminal and the Alyeska marine terminal are located within 3.5 miles of one another. Operations to secure and protect the two facilities in time of national crisis would be facilitated by their proximity. Due to the balance between these two factors, the proposed Anderson Bay site and all alternatives considered would be rated as moderately favorable with respect to this criterion.

E. Evaluation of Proposed TAGS Project and
Alternatives Considered

1. Introduction

The summary of evaluation criteria analyses (Table VI-1) provides a matrix for comparing the proposed action and the alternatives considered. The overall results of the criteria evaluation for the proposed project at Anderson Bay are summarized below, followed by a synopsis of the evaluation of each of the alternatives.

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2. Proposed Project - Anderson Bay

Evaluation criteria considered for the proposed TAGS project was rated either favorable or moderately favorable for each criterion.

Among criteria for the Livengood to proposed Anderson Bay route, only the number of water crossings and the potential access of the pipeline to possible future uses along the right-of-way were rated higher than for other alternatives.

LNG siting criteria for the Anderson Bay site were all favorable or moderately favorable.

3. Boulder Point

Evaluation of the pipeline route from Livengood to the Boulder Point site identifies numerous criteria for which this alternative is less desirable to the applicant's proposed project, including a 15-mile subsea crossing of Cook Inlet. Most significant are those factors ranked as unfavorable. These include use of proven construction technology, geohazards, and land-use incompatibility. Permitting is rated as highly unfavorable, largely on the basis of the passage through Denali National Park and Preserve. As discussed under evaluation of individual criteria (Section V.B.9), this alignment for this routing would require congressional approval.

For all criteria related to siting of the LNG plant, the Boulder Point site rated at favorable or moderately favorable. The Boulder Point ratings exceeded those for the proposed Anderson Bay site only for infrastructure, value-added development, and site preparation. For all other criteria, Anderson Bay was rated equal to or better. Public safety and marine terminal acceptability are superior at Anderson Bay.

The existing Kenai Peninsula infrastructure would be better able to support construction and operation of the facility with existing community resources. The Kenai Peninsula would probably be better situated to support expanded ancillary projects should they be possible. Third, site preparation at the Boulder Point site would require less construction terrain disturbance. For land availability, soil foundation characteristics (presence of bedrock), and the distance from the LNG plant to the marine terminal, the advantage lies with the proposed project.

Though characteristics of the marine terminal also all favor selection of the Anderson Bay site, the Boulder Point site is generally favorable. Rated as less favorable were two criteria for a Boulder Point marine terminal--the distance from shore to water deep enough for maneuvering and berthing is more than 4,000 feet and navigational hazards, including shoaling, submerged boulders, outcrops, ice conditions, and excessive currents. Despite these constraints the Boulder Point site appears to be a feasible alternative.

4. Cape Starichkof

Cape Starichkof, which shares a common alignment with the Boulder Point site as far as Boulder Point, has one distinct disadvantage--the extra pipeline length and additional compressor station required to transport the gas 59 more miles would have many implications for construction time and associated increase in impacts to the environment and costs. The LNG site characteristics are similar to those for Boulder Point except that land availability would be more of an issue and the environment in the Cape Starichkof vicinity is more sensitive with respect to

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fisheries, and recreational use of the area. Marine terminal site characteristics are also similar to those for Boulder Point except that navigational hazards, uncharted submerged boulders and outcrops, and potential sea-ice problems would be less of a factor at Cape Strickhof. The same permitting problems associated with Denali National Park and Preserve exist. Cape Strickhof was rated as less favorable than Boulder Point and eliminated from further consideration.

5. Harriet Point

The pipeline alignment to Harriet Point poses problems over the Boulder Point and Cape Strickhof alignments. Like Strickhof, Harriet Point would require a longer pipeline and an additional compressor station. Most of the route along the western shore of Cook Inlet is away from available infrastructure to support construction. Few data exist for environmental impact assessment and engineering design analyses. The route also passes through areas of sensitive environments for wildlife and fisheries. The LNG plant site has advantages of land availability and little potential impact to public safety from an accident or spill should one occur. One distinct disadvantage for the LNG plant site is the lack of any infrastructure. Facility construction and operation would be much more difficult and costly since there is no community or commercial base in the immediate vicinity to support the project. The potential for any secondary development would be curtailed. Along with the permitting issue associated with the crossing of Denali National Park and Preserve, Harriet Point would be rated as less favorable than Boulder Point and eliminated from further consideration.

5. Gravina

For the pipeline from Livengood to the site, Gravina was rated as unfavorable for use of proven technology, geohazards, land-use compatibility, and permitting. All of these factors were related to the segment of the route from Keystone Canyon through the Chugach Mountains, including 15 miles of routing through the Chugach National Forest. Though operation of a marine terminal at the site had no serious drawbacks for the LNG facility, Gravina was considered to be highly unfavorable infrastructure for construction and operation of the facility and with regard to potential benefits that might be derived from secondary developments in the vicinity of the plant. The Gravina site has numerous distinct disadvantages compared to the proposed Anderson Bay site and eliminated from consideration.

7. Gold Creek

The Gold Creek site rated as favorable or moderately favorable for nearly all evaluation criteria. The final segment of the pipeline alignment, near Robe Lake and around the outskirts of the city, was not as favorable as that of the proposed project. The last 3 miles along the west shore of Port Valdez would be located in steep-sided hills, which would result in difficult construction, movement of large volumes of material, and a broad visual scar along the mountainside. The LNG plant site would require extensive excavation and would pose the added problem of disposing of large volume of spoil from the site. Use of the Gold Creek site would negatively affect potential expansion of the city and recreational use of the Gold Creek area.

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and would require major site work and spoil disposal. Although the rating of the Gold Creek site was similar to the proposed Anderson Bay site, it did not appear to have any substantive advantages over the proposed TAGS project and was eliminated from further consideration.

8. Robe Lake

Though the Robe Lake alternative would result in the shortest pipeline among Prince William Sound alternatives, consideration of the LNG site and the associated marine terminal facility immediately highlight the major concerns with this alternative. Land that would be needed for the LNG facility is in the midst of residential and recreational use areas. Major site work would be required, and resultant impacts on aesthetics, interference with recreational use, and even removal of the parcel of land from that available for residences or recreation would be major drawbacks. Though the safety record for LNG plants is excellent, should a catastrophic accident or spill occur, this site would be the worst among the TAGS alternatives in terms of potential impact to public safety. Further, the distance from the LNG plant site to the shoreline and the distance from shore to water deep enough for tanker maneuvering and berthing combine to require a 5-mile cryogenic loading pipeline from the plant to the LNG tanker loading area. The engineering and cost of such a line would make it nearly infeasible. The location of the berthing and maneuvering area within the harbor has disadvantages with respect to navigational safety, and the submarine soils in this region of the harbor are not favorable for development. Overall, the Robe Lake site should be eliminated from consideration.

F. Summary

Neither of the Cook Inlet alternatives to Cape Starichkof nor Harriet Point offers engineering, environmental, cost, or safety advantages over location of a facility at Boulder Point. The cost, time, and additional impacted area associated with the Cape Starichkof and Harriet Point sites make them less desirable options and therefore they have been eliminated from further consideration.

Of the three alternatives considered for the Prince William Sound region, Gold Creek is the only one that appears comparable to the proposed Anderson Bay site. However, due to the extensive earthwork required for the LNG plant site, routing through an area of expansion for the city of Valdez, the associated spoil disposal requirements, the difficult pipeline constructability for the last 3 miles to the site, and the greater negative impacts on Valdez recreational use and potential future expansion, this alternative offered no overriding advantage over the proposed project at Anderson Bay.

Note: For cited references, see References of DEIS pages ____ to ____.

Yukon Pacific Corporation

Trans-Alaska Gas System (TAGS) Permits

1. What are "YPC's Permits?"

During its sixteen-year history, using a unique, but now unavailable, process known as "tiered permitting," YPC has constructed a portfolio of twelve "permits" which represent a very significant portion of the efforts necessary to "permit" a North Slope natural gas export project. The term "permit" is used here in the generic sense because the actual document may be a "Presidential finding," an environmental impact statement (EIS), a Federal Energy Regulatory Commission (FERC) order, or a right-of-way (ROW) lease. Following is a list of these twelve "permits," in the order in which they were received, each accompanied by a short description. They are described in detail later in Section 5 below (YPC's individual permits and authorizations).

1. ***FERC Declaratory Order Regarding its TAGS Jurisdiction*** (May 27, 1987). FERC has no National Gas Act (NGA) Section 7 authority over any aspect of the TAGS project, including a TAGS-specific, stand-alone, gas conditioning facility (GCF) at Prudhoe Bay. FERC does, however, have limited Section 3 authority over the siting, construction, and operation of the LNG/MT at Anderson Bay.
2. ***Presidential Finding Approving Export of Alaska Natural Gas*** (January 12, 1988). Found that Alaska natural gas will not be needed domestically and may be exported.
3. ***Coastal Zone Consistency Determination*** (January 20, 1988). The State adopted a "tiered consistency review" process for coastal zone consistency review of each of four discrete phases of TAGS development (see Section 5 below). It found TAGS Phase 1 consistent with the standards of the Alaska Coastal Management Program (ACMP), and the North Slope Borough and City of Valdez coastal management programs.
4. ***TAGS Project-wide Final EIS*** (June 1988). The EIS served as the National Environmental Policy Act (NEPA) compliance document on which all federal agencies based their permit application decisions. In it the agencies adopted a unique "tiered" permitting process.
5. ***Ahtna Corporation Right of Way Agreement*** (October 14, 1988). Grants YPC the right to designate and acquire easements, rights of way, and other rights in land, including gravel, for a natural gas pipeline and associated facilities, across Ahtna Native lands.

6. **Federal Pipeline ROW Grant** (October 17, 1988). A ROW across federal lands in the Trans-Alaska Pipeline System (TAPS) Corridor for the construction, operation and termination of one natural gas pipeline and related facilities.
7. **State of Alaska Conditional ROW Lease** (December 10, 1988). A Conditional ROW Lease that contains the text and stipulations of the Final ROW Lease that become effective when the Conditional ROW Lease requirements are met. It addresses the pipeline on state lands from the North Slope to Anderson Bay, within the TAPS corridor, in a manner consistent with the federal ROW grant.
8. **DOE/OFE Authorization for Export of Natural Gas** (Order 350) (Nov. 16, 1989). Authorized YPC to export up to 14 million metric tons of LNG annually for 25 years to Japan, South Korea and Taiwan, and limited FERC's jurisdiction on the place of export site to Anderson Bay.
9. **DOE/OFE Confirmation of Order 350** (March 8, 1990). Denied the application for rehearing of Order 350 filed by Alaskan Northwest Natural Gas Transportation Company and Foothills Pipe Lines (Yukon), Ltd., and clarified the limitations placed on the jurisdiction of its sister agency, FERC.
10. **FERC Anderson Bay Final EIS** (March 1995). Fulfilled NEPA administrative review requirements and allowed FERC to issue place of export authorization.
11. **FERC Authorization for Siting LNG/MT Facility** (May 22, 1995). Grants YPC approval for the place of export and authorizes it to construct and operate the Anderson Bay LNG plant and marine terminal (LNG/MT) facilities. This approval confirms that the proposed LNG/MT facilities meet the CFR 193 safety criteria, as well as all other siting criteria.
12. **Anderson Bay LNG/MT Facility Air Quality (PSD) Permit** (August 5, 1997). The prevention of significant deterioration (PSD) air quality permit that authorizes YPC's emissions from the Anderson Bay LNG/MT facility.

2. Summary of YPC's history and acquisition of major permits

By the early 1980s several proposed, and competing, projects to move Alaska's vast North Slope natural gas reserves to domestic markets had failed (El Paso, Arctic Gas, Alaska Natural Gas Transportation System [ANGTS]). Frustrated, Governor Jay Hammond asked two of his predecessors, former governors Walter Hickel and William Egan, to investigate the prospects for developing alternate markets for this huge resource.

Egan and Hickel appointed a committee to study the issue. The appointees concluded that transporting North Slope natural gas to a southern Alaska ice-free port, liquefying it, and transshipping it to Pacific rim markets in LNG tankers was the only viable

chance of commercializing this gas (see *Trans Alaska Gas System: Economics of an Alternative for North Slope Natural Gas*, January 1983). In 1982 Egan and Hickel decided to start a company, YPC, dedicated to pursue such a project, and named the Trans-Alaska Gas System (TAGS).

Early on, YPC's critics considered the idea overly ambitious and unrealistic. This did not deter YPC, however, from pursuing several key permits aimed at demonstrating to the Asian markets that the United States would allow the export of North Slope gas to Asia and that the project could be built. Potential buyers were wary of the litigation surrounding permitting of the TAPS, were skeptical whether the TAGS project could be permitted from an environmental perspective, and were very concerned whether "America first" interests would argue successfully against exporting natural gas from national security and lower-48 energy supply perspectives. Thus, YPC decided to initiate a permitting process to address these questions and concerns.

In May of 1984 YPC filed a federal pipeline ROW application for a route to Cook Inlet with the United States Department of Interior (DOI), Bureau of Land Management (BLM). YPC also began actively to address natural gas supply, transportation and marketing issues, and was a sponsor of the *Alaska Asian Gas Study* (AAGS), published in June of 1986. ARCO was the AAGS U.S. representative/operator, with the State of Alaska as an observer. The Institute of Energy and Economics was the Japanese representative, with 10 other large Japanese corporate sponsors. That study concluded that a very large LNG project – one with an annual production capacity of about 14 million metric tons – would be necessary to offer a competitive price in the Asian marketplace and to insure an adequate return to investors. Because Japan, the only market considered, was expected to have only 7 million metric tons of new demand by the turn of the century, all but YPC abandoned the project.

YPC, however, believed strongly that the study properly should have included projections of future LNG demand in the emerging LNG markets in both South Korea and the Republic of China on Taiwan. At about the same time that the AAGS study was completed, Texas Gas Company, a business unit of CSX Corporation, purchased a minority interest in YPC. Later, after spinning off Texas Gas, CSX itself accumulated additional shares in YPC, and in 1988 gained sufficient control for YPC to become a business unit of the company.

In May 1984 YPC made application to the President pursuant to Section 12 of the Alaska Natural Gas Transportation Act (ANGTA) requesting a finding that Alaska North Slope gas was not needed domestically and could be exported. In January 1988, after almost four years of lobbying and working with several national security agencies, a Presidential finding was issued that determined that export of Alaska natural gas would comply with Section 12 of ANGTA, and that TAGS would not hinder completion of the previously authorized ANGTS to transport North Slope natural gas to the lower-48 states (Fig.1, Issue #2).

Ultimately anticipating a favorable Presidential finding, in December 1986 YPC petitioned FERC, an agency within the Department of Energy (DOE), for a declaratory order limiting the Commission's jurisdiction over the TAGS project under the NGA. That order was granted in May 1987, when FERC declared that it only had the authority to approve or disapprove the place of export (LNG plant and marine terminal site) for TAGS and did not have jurisdiction over the construction and operation or rates of the TAGS pipeline itself (Fig. 1, Issue #1).

In November of 1986, anticipating YPC's applications, BLM and the U.S. Army Corps of Engineers (COE) commenced development of a project-wide *Trans-Alaska Gas System Environmental Impact Statement* (Fig. 1, Issue #4) along with 20 other federal and state agencies.

The following month (December 1986), YPC produced the *Trans-Alaska Gas System Project Description*, and then amended its federal ROW application to reflect a route paralleling the TAPS ROW to Anderson Bay in Port Valdez. YPC also applied to the COE for Clean Water Act Section 10 and Section 404 permits (Fig. 1, Issue #6). In March 1987, YPC applied for a ROW permit to cross state lands (Fig. 1, Issue #7), and convinced the federal and state governments to coordinate their ROW application review and public involvement processes.

In January 1988, the Alaska Division of Governmental Coordination (ADGC) adopted a "tiered process" for consistency review for each of four discrete phases of TAGS development (Fig. 1, Issue #3). This provided a mechanism for YPC to advance permitting without having to put a tremendous amount of money at risk. Phase 1 was found consistent with the standards of the ACMP.

In December 1987, YPC filed an application with the Economic Regulatory Administration (ERA) in the DOE (precursor to DOE's current Office of Fossil Energy) for authority to export up to 14 million metric tons of LNG annually for 25 years to Japan, South Korea, and Taiwan (Fig. 1, Issue #8). At the same time YPC filed an application for place of export site approval with ERA's sister agency, FERC (Fig. 1, Issues #8, 10 & 11).

The TAGS draft EIS was published in September 1987, and the final EIS in June 1988 (Fig. 1, Issue #4). The lead and cooperating agencies agreed to a "tiered" permitting process using an initial overview EIS of the entire project from its North Slope GCF to tanker transport of the LNG. The EIS examined alternative terminal locations and accompanying pipeline route variations. It was understood that additional detailed environmental work would be required on specific elements of the project when permits and approvals were requested and acquired.

Based on its record of decision (ROD) following publication of the final EIS, the BLM issued YPC a *Grant of Right-of-Way for the Trans Alaska Gas System* across federal lands in October 1988 (Fig. 1, Issue #6). The State of Alaska issued YPC a *Condi-*

tional Right-of-Way Lease for the Trans-Alaska Gas System in December 1988 (Fig. 1, Issue #7).

Pursuant a contract between DOI and Ahtna, Inc., prior to receiving a federal ROW across Ahtna Native corporation lands in the TAPS corridor, a prospective federal ROW grantee must have an agreement in place with Ahtna, Inc. Thus, in October 1988, YPC entered into an agreement with Ahtna that granted YPC the right to designate and acquire easements, rights of way, and other rights in land, including gravel, for a natural gas pipeline and associated facilities, across lands selected or acquired by Ahtna under the terms of the Alaska Native Claims Settlement Act (ANCSA) for fair and equitable consideration (Fig. 1, Issue #5).

Also based on the final EIS, the DOE Office of Fossil Energy (DOE/OFE) granted YPC authorization for the annual export of 14 million metric tons of LNG for 25 years under Section 3 of the NGA in November 1989 (Fig. 1, Issue #8). The DOE Order No. 350 also concluded: "Except for the authority under DOE Delegation Order 0204-112 over the export site, ...the FERC shall exercise no authority over the export project...."

In 1990, following an appeal of its order by Alaska Northwest Natural Gas Transportation Company and Foothills Pipe Lines (Yukon), Ltd., the DOE/OFE issued Opinion and Order No. 350-A denying requests for a rehearing and modifying of Order 350 (Fig. 1, Issue #9). The unsuccessful challenges to Order 350 by Alaska Northwest and Foothills strengthened the export authorization granted.

In January 1992, four years after YPC's initial application for approval of a place of export, FERC commenced preparation of the place of export (Anderson Bay) EIS (Fig. 1, Issue #10). The draft EIS was completed and published 16 months later in May of 1993, and the final EIS was published another 22 months later in March 1995, a full seven years after the initial applications to FERC and ERA.

In May 1995, on the basis of the EIS, FERC issued an order granting YPC NGA Section 3 place of export authorization for the siting, construction and operation of an LNG/MT facility at Anderson Bay (Fig. 1, Issue #11).

In the summer of 1994, YPC constructed a 40-meter tower and commenced a second round of meteorological data collection at the Anderson Bay site. In August 1996 YPC made application to the Alaska Department of Environmental Conservation (ADEC) for an Air Quality Control Permit to Operate with PSD review for the Anderson Bay LNG/MT facility (Fig. 1, Issue #12). The permit was issued to YPC in August 1997.

On June 18, 1998 YPC applied for renewal of its state Conditional ROW Lease. Following two periods of agency review and public comment, the lease was renewed on December 11, 1998 for another 10-year period (Fig. 1, Issue #7). The renewed Conditional ROW Lease now expires in December 2008.

These assets are exclusive property rights of Yukon Pacific Corporation currently held through its interest in Yukon Pacific Company L.P. and represent over 16 years of effort. It is important to note that the majority of these property rights were obtained before the *Exxon Valdez* oil spill and it is highly unlikely that they could be duplicated in a reasonable period of time, if ever.

Taken together, these authorizations and agreements give YPC the exclusive right to construct TAGS and export Alaska's North Slope natural gas to Asia.

Figure 1 of 5

This figure presents the entire export project permitting "pie," and shows the relative percentages of effort among the eight permits. Note that the COE Section 404 (wetlands) permit, which constitutes the single largest effort at 27 percent, is still underway. Approximately 16 percent of the 27 percent has been completed, with the 11 percent ongoing.

Figure 2 of 5

This figure presents a breakdown of efforts expended for federal permits (83 percent) versus state permits (17 percent).

Figure 3 of 5

This figure presents a breakdown of efforts expended for permits under Federal/State Joint Pipeline Office (JPO) jurisdiction (21 percent) versus non-JPO jurisdiction (79 percent).

Figure 4 of 5

This figure presents a breakdown of efforts expended to obtain the three unique federal permits, i.e., YPC is the only entity ever to have obtained these three permits.

Figure 5 of 5

This figure presents a timeline showing the duration of each permit's process, its location on the timeline, and its temporal relationship to the other permits because certain permits must be obtained in a particular sequence.

The FERC Place of Export Permit and the COE 404 Wetlands Permit show breaks where neither YPC nor the agency was actively pursuing the permit. In the case of the FERC Permit, the gap was due to the *Exxon Valdez* oil spill that caused a 22-month suspension to assess the spill's effects on the permitting process. This is an excellent example of the real world risk of outside events significantly delaying a permitting process.

The "data acquisition" period shown for the PSD Permit represents another real world risk (but it is not included in the 40 months total). After spending almost 5 years obtaining and modeling data under an agency-approved plan, the agency changed its mind and required an entirely new program.

Comparative Percentages of Total Permitting Time (effort) Expended by Yukon Pacific Corporation for each of Eight Major TAGS LNG Export Project "Permits"

DISCUSSION

February 2000

Because a liquefied natural gas (LNG) export project has not been developed in the United States in over 30 years (when virtually all relevant environmental and safety laws and regulations have been adopted), there are very few sources of factual information that comprehend the entire scope of export project permitting, i.e., the whole "permitting pie." Specific agencies and individuals may be able to accurately describe their particular permitting process, or slice of the pie, but they simply, and understandably, do not appreciate other aspects of the entire export permitting pie because it has never been done.

Note that the term "permit" is used here in a generic sense to represent all eight major actions discussed. The term thus includes those actions that are technically a finding, license, grant, or authorization in addition to an actual permit.

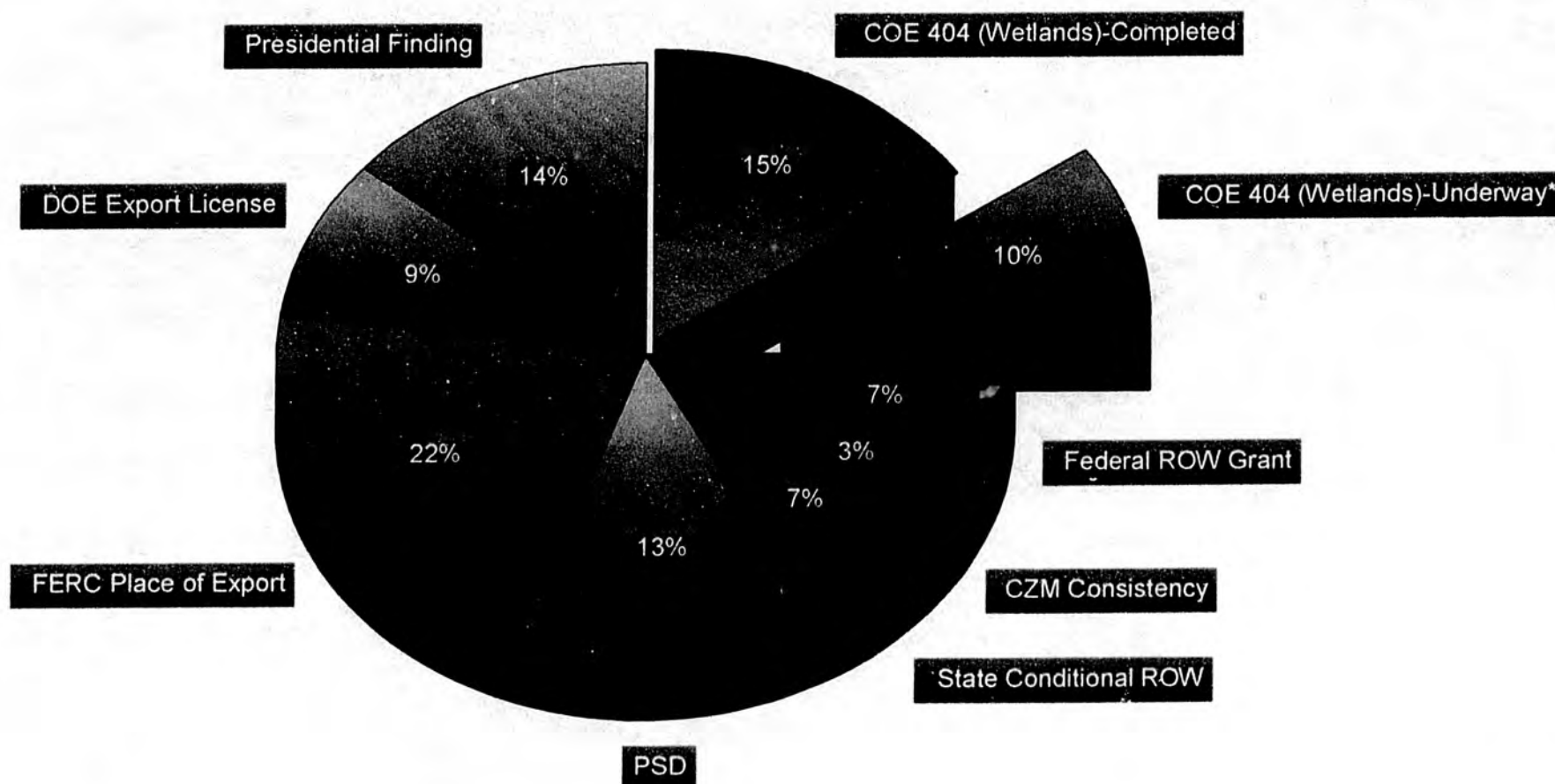
The purpose of the attached figures is to graphically present the entire export project permitting pie to demonstrate the relative scope of individual permits within that pie. While each permit is important and is required before an LNG export project may proceed, it must be realized that that any particular permit represents only a small portion of the entire permitting effort.

Concomitantly, it must be understood that when pursuing a particular permit or when asking questions of a particular agency or representative, that source may be knowledgeable about its own area of expertise, but an understanding of the entire—or even much of the remaining—export project permitting picture is highly unlikely. To gain a full understanding requires significant interaction with each of the eight permitting agencies, from the State Pipeline Coordinator's Office to the Department of Energy to the President.

Figures

The actual number of months, and percentages, of time spent by Yukon Pacific Corporation (YPC) and the respective agencies pursuing each of the eight major permits has been used as a measure of the effort necessary to obtain each permit. Only time during which YPC and/or a particular agency were actively working on a permit has been counted. Therefore, unless otherwise indicated, periods of inactivity are excluded. Thus, the figures and percentages present a fair representation of the relative efforts expended during the entire permitting process.

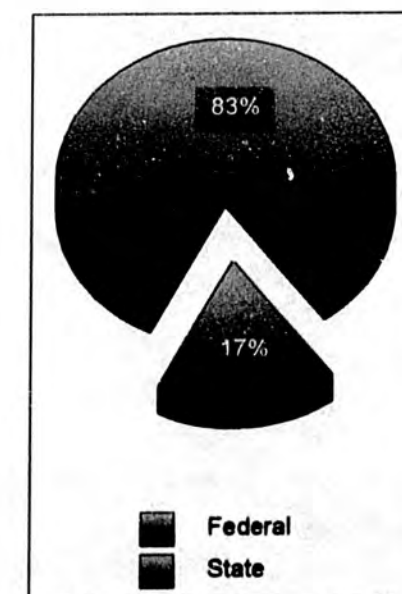
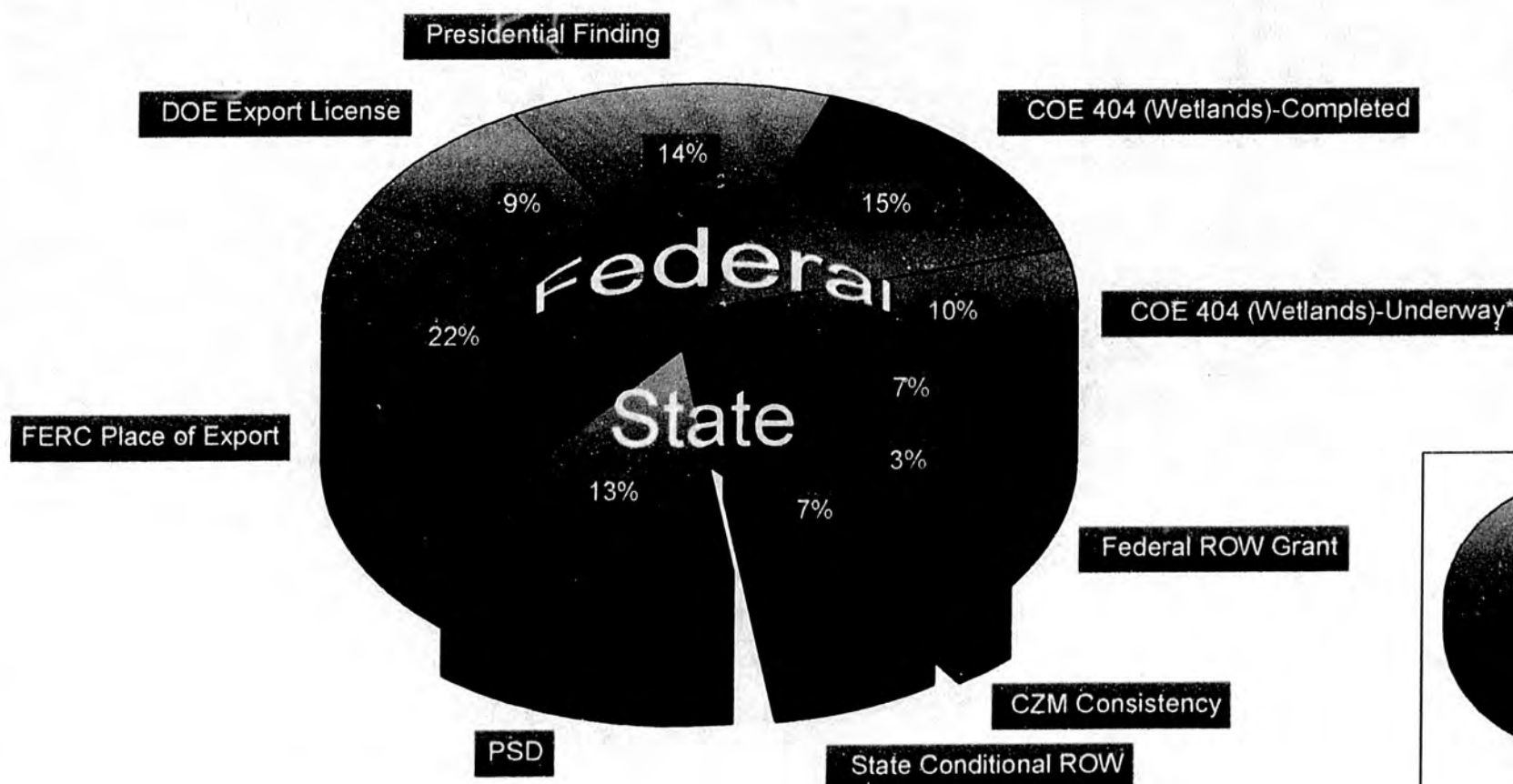
Comparative Percentages of Total Permitting Time (Effort) Expended by Yukon Pacific Corporation for Each of the Eight Major TAGS LNG Export Project "Permits"



*Future ("underway") COE 404 effort is estimated

FEDERAL vs. STATE

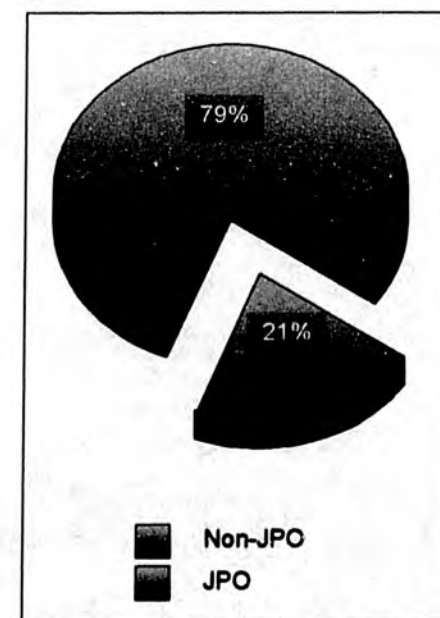
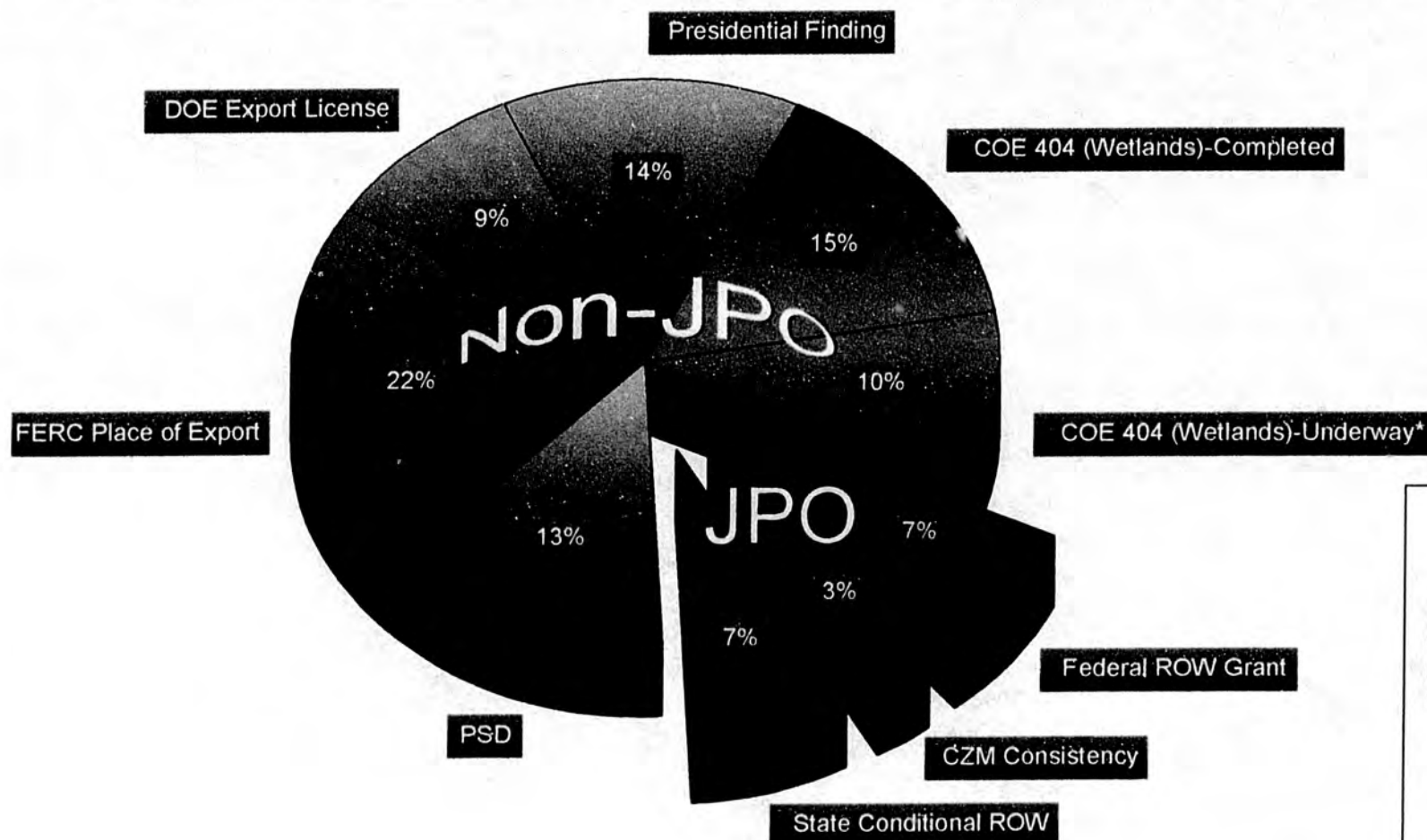
**Comparative Percentages of Total Permitting Time (Effort)
Expended by Yukon Pacific Corporation for Each of the Eight Major
TAGS LNG Export Project "Permits"**



*Future ("underway") COE 404 effort is estimated

JPO¹ vs. Non-JPO

Comparative Percentages of Total Permitting Time (Effort) Expended by Yukon Pacific Corporation for Each of the Eight Major TAGS LNG Export Project "Permits"

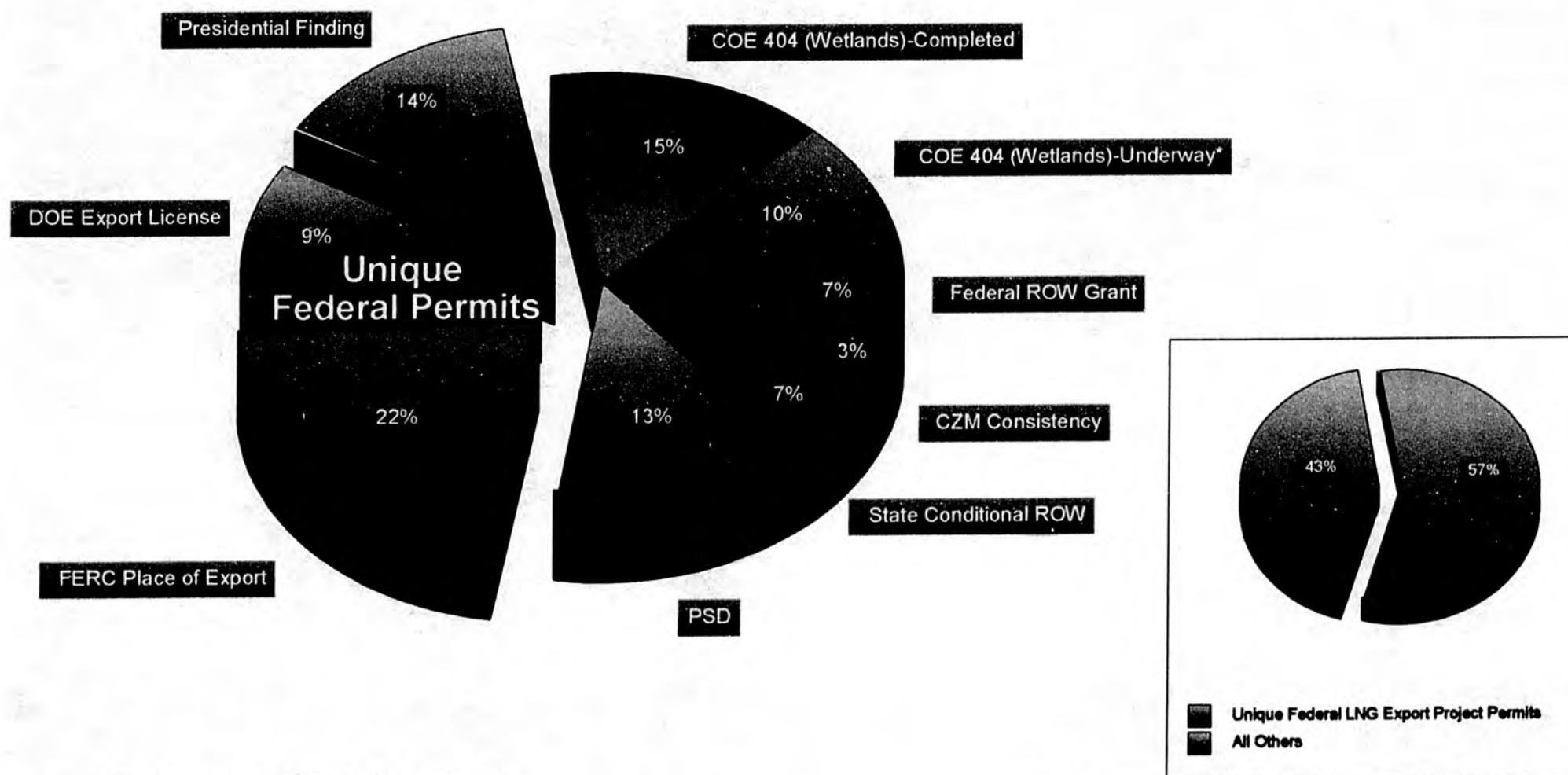


¹Federal/State Joint Pipeline Office

*Future ("underway") COE 404 effort is estimated

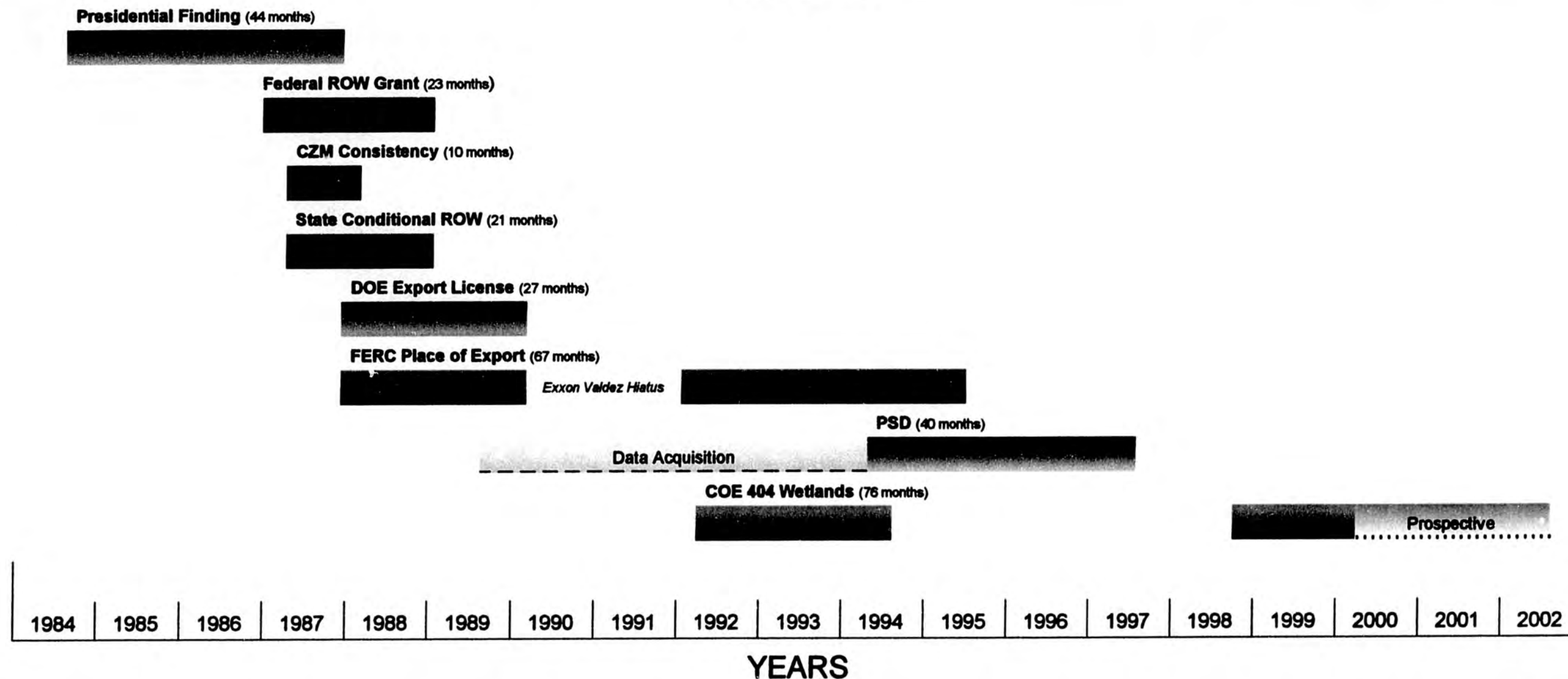
YPC's UNIQUE FEDERAL "PERMITS": REQUIRED ONLY FOR AN LNG EXPORT PROJECT

**Comparative Percentages of Total Permitting Time (Effort)
Expended by Yukon Pacific Corporation for Each of the Eight Major
TAGS LNG Export Project "Permits"**



Actual Permitting Time Expended by Yukon Pacific Corporation for Each of the Eight Major TAGS LNG Export Project "Permits"

TIMELINE



STATE OF ALASKA

STATE PIPELINE COORDINATOR'S OFFICE

- ☐ Department of Environmental Conservation
- ☐ Department of Natural Resources
- ☐ Department of Fish and Game

TONY KNOWLES, GOVERNOR

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March 15, 2000

Letter No.: 00-016-JS
File No.: (30)1.3
DD.: N/A

Representative Jim Whitaker
Alaska State Legislature
State Capitol, Room 13
Juneau, Alaska 99801-1182

Re: Alaska North Slope Natural Gas Proposals

Dear Representative Whitaker,

I appreciate the opportunity to assist you with your efforts getting Alaska North Slope Natural Gas to market. The Alaska Department of Natural Resources (ADNR), State Pipeline Coordinator's Office (SPCO) is the lead state agency for the Joint Pipeline Office (JPO). I coordinated with my federal counterpart at JPO, the Bureau of Land Management (BLM) Authorized Officer, in preparing this response.

I solicited comments from the sponsors of Alaska North Slope natural gas proposals identified in your letter. Two responses were received and are enclosed. In addition, I am enclosing a matrix summarizing federal and state agency permitting authorities related to the Trans Alaska Pipeline System (TAPS). The majority of the requirements are applicable to natural gas pipelines; those that reference the Trans Alaska Pipeline Authorization Act (TAPAA) and oil pipelines do not apply.

Numerous authorizations will be required to construct a large diameter gas pipeline, including rights-of-way to cross state and federal land. Two projects currently have partially completed the right-of-way process. Yukon Pacific Corporation (YPC) has a federal right-of-way grant and a conditional right-of-way lease from the state for the project referred to as the Trans Alaska Gas System (TAGS). The Alaska Natural Gas Transportation System (ANGTS) has a federal right-of-way grant, and has submitted an application for a right-of-way from the state.

Federal grants of right-of-way are issued by BLM, and they and other federal agencies are required to follow the National Environmental Policy Act (NEPA) in their processing of applications. This could require preparation of an Environmental Impact Statement (EIS). EISs have been completed for the TAGS and ANGTS projects. The state right-of-way lease would be issued by ADNR. The provisions of the Alaska Coastal Management Program and other applicable state laws and regulations would apply to any gas project.

"Develop, Conserve and Enhance Natural Resources for Present and Future Alaskans"

March 15, 2000

You referenced four proposals in your recent letter. Summaries follow of the status of rights-of-way for each.

Prudhoe Bay to Valdez. As mentioned above, YPC has a federal grant of right-of-way from BLM and a conditional state lease from SPCO for TAGS. The conditional lease requires the submittal and approval of 27 plans and programs, and approval of an additional 6 reports for protection of the public interest. The federal right-of-way grant was also conditioned upon submittal and approval of 28 comprehensive plans and programs before the project could proceed.

You asked that I address spur lines to transport natural gas to Cook Inlet. There are two logical routes for such a line. The first route is from Fairbanks south along the Alaska Railroad corridor to Anchorage, continuing to Nikiski. The second would be from Glennallen following the Glenn highway to the vicinity of Palmer/Wasilla, then following the existing ENSTAR natural gas network. Each route would have its own unique permitting challenges, and neither has been permitted

Prudhoe Bay to Cook Inlet. Permitting action has not been undertaken for this proposal. Several studies related to possible routes and locating a terminal on Cook Inlet have been performed.

Prudhoe Bay to the lower 48, through Alaska and Canada. As mentioned above, BLM has issued a grant of right-of-way through interior Alaska to Canada for the Alaska segment of ANGTS. The SPCO has an inactive application for a right-of-way across the state-owned lands for ANGTS.

Prudhoe Bay to the lower 48, offshore through Canada. I am unaware of any permitting activities or studies that have been completed of this proposed route.

In summary, there are two routes with substantial approvals, TAGS and ANGTS. Permitting within the JPO for the other two routes, and the Cook Inlet spurs from the Prudhoe Bay to Valdez route, has not begun. The JPO is prepared to support permitting efforts for any of the proposed projects, and will assist the companies when decisions are made to proceed.

Please feel free to contact me if you have any questions or comments.

Sincerely,



William G. Britt, Jr.
State Pipeline Coordinator
Alaska Department of Natural Resources

Attachments:

Matrix of TAPS Roles of federal and State Agencies
Yukon Pacific Corporation correspondence
Cook Inlet Pipeline Terminus Group correspondence

SUMMARY OF TAPS ROLES OF FEDERAL AGENCIES AND STATE OF ALASKA

AGENCY	AUTHORITY FOR INVOLVEMENT	RELATED REGULATORY RESPONSIBILITIES	RESPONSIBILITIES DURING CONSTRUCTION
DEPARTMENT OF THE INTERIOR			
Authorized Officer (AO) [Delegated to BLM] conditions, and	• TAPS Act • Secretarial Order No. 2960 & 3006 • Agreement and Grant of Right-of-Way for Trans-Alaska Pipeline	• None	• Ensure compliance by permittees with the terms stipulations of the Agreement and related statutes
Bureau of Land Management	• TAPS Act • Mineral Leasing Act	• Issue land use permits and mineral material sales	• Issue Land Use Permits
Geological Survey	• None	• None	• Provide personnel and/or expertise to AO covering such skills as geologic, hydrologic, mapping seismic, etc
US Fish and Wildlife Service	• Fish and Wildlife Coordination Act • Endangered Species Act • Migratory Bird Treaty Act	• None	• Provide personnel &/or expertise to AO covering fish and wildlife conservation, habitats, etc. • Review permits affecting fish and and wildlife
DEPARTMENT OF TRANSPORTATION			
Coast Guard Valdez	• Ports and Waterways Act • Federal Water Pollution Control Act • Rivers and Harbors Act • Oil Pollution Act	• Issue permits for bridge construction over navigable waterways • Approve navigation aids and operation of vessels in	• Monitor construction of Terminal • Ensure adequate ship-loading methods • Monitor on- and off-loading of hazardous materials in Port of
Valdez		• In port areas • Establish traffic lanes in Port of Valdez • Monitor Oil Pollution	• Monitor water pollution
Office of Pipeline Safety regulations	• Hazardous material regulations	• Monitor pipeline construction and operations	• Ensure compliance with for design, construction operation and maintenance of the pipeline

SUMMARY OF TAPS ROLES OF FEDERAL AGENCIES AND STATE OF ALASKA ... (Continued)

AGENCY	AUTHORITY FOR INVOLVEMENT	RELATED REGULATORY RESPONSIBILITIES	RESPONSIBILITIES DURING CONSTRUCTION
DEPARTMENT OF COMMERCE			
National Marine Fishery Service	• Fish and Wildlife Coordination Act • Endangered Species Act	• None	• Monitor effects of pipeline construction on ocean environment • Provide advice and guidance to AO on anadromous fish
DEPARTMENT OF DEFENSE			
Corps of Engineers	• Rivers and Harbors Act (Section 10) • Clean Water Act (Section 404)	• Issue permits for construction under streams and at the Valdez Terminal site • Provide advisory service to AO on construction matters • Wetlands	• Surveillance of construction at Valdez harbor
ENVIRONMENTAL PROTECTION AGENCY	• Federal Water Pollution Control Act • Solid Waste Act • Clean Air Act • Pesticide, Fungicide Rodenticide Act • Marine Sanctuary Act	• Issue permits for discharge of hazardous materials • Approve ocean/water pollution control measures • Issue permits for solid waste disposal	• Monitor discharge of hazardous materials and oil • Check shore-to-offshore dumping • Monitor solid waste refuse • Monitor use of pesticides, herbicides, and rodenticides and compliance with labeling instructions • Provide clean-air guidelines
STATE OF ALASKA	• State legislation and regulations	• Land use and regulatory permits over State lands • Pollution control • Fish and wildlife management • Roads • Safety	• Protect the environment • Ensure compliance by permittees with the terms, conditions and stipulations of State right-of-way agreements and land use permits • Protect Fish and wildlife • Construct State highways and airports

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF AGRICULTURE				
Forest Service	Antiquities Permit for Cultural Resources	Examination of ruins, excavation of archaeological sites, and the collection of objects of antiquity from National Forest system lands. May be needed for Impact Statements.	16 USC 431 - 433 16 USC 551 43 CFR 3	Antiquities Act of 1906 Organic Act of 1897 Preservation of American Antiquities
	Mineral material Permit - National Forests.	Removal of a common variety of materials (sand, gravel, rock and the like) from a National Forest	36 CFR 251 .4	Disposal of materials.
	Special Use Permit - National Forests.	Occupation of National Forest land for other than casual use.	36 CFR 251	Land Uses.
	Permission to Cross Lands and Easements Owned by the U S and Administered by the Forest Service.	Right-of-way across National Forests	36 CFR 212	
DEPARTMENT OF DEFENSE				
Corps of Engineers	Discharge of Dredged or Fill Material into U S waters Department of the Army Permit. (See 404)	Discharge into all tidal influenced waters shoreward to the extreme high tide line and their adjacent wetlands, and all other waters of the U.S landward to the ordinary high water line and their adjacent wetlands.	33 USC 1344	Permits for Dredged or Fill material.

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY
DEPARTMENT OF DEFENSE (Continued)			
Corps of Engineers	Structures or Work in or Affecting Navigable Waters of the U S - Department of the Army Permit (Section 10)	Construction of any structure in or over a navigable water of the U S , excavation of material in such waters, or the accomplishment of any other work affecting the course, location, conditions or capacity of such waters.	33 USC 403 Obstruction of Navigable Waters, Generally: Wharves, Piers, etc ; Excavation and Filling in
	General Permits for Wet Tundra Areas on the North Slope	Discharge of dredged or fill material onto "Wetlands" of the North Slope	Section 404 Federal Water Pollution Control Act as amended by The Clean Water Act of 1977
Department of the Army		Rights-of-Way across Army installations (Fort Wainwright and Fort Greely, etc.) under BLM jurisdiction.	
Department of the Air Force		Rights-of-Way across Air Force installations (Eielson AFB, etc.) under BLM jurisdiction	
DEPARTMENT OF ENERGY			
Federal Energy Regulatory Commission (FERC)	Natural Gas Certificate of Public Convenience and Necessity	Natural GAS pipeline companies which are engaged in the transportation of natural gas in interstate commerce, sale of natural gas in interstate commerce for resale, and the construction, acquisition or operation of facilities for such operations.	15 USC 717 18 CFR Natural Gas Act Chapter I Subchapter E Regulations Under the Natural Gas Act

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY
DEPARTMENT OF THE INTERIOR			
Bureau of Indian Affairs	Rights-of-Way (Indian Land)	Easement- for rights-of-way over Indian Lands	25 USC 323 Rights-of-Way for any Purpose Across Indian Land.
			25 CFR 161 Rights-of-Way over Indian land.
Bureau of Land Management	Airport Leases	Leasing any contiguous, unreserved and unappropriated public land, not to exceed 2,500 acres, for the use as a public airport.	Act of May 24, 1928, as amended (45 Stat. 728; 49 USC 211-214). 43 CFR 291 Airport Leases.
	Antiquities Permit	Examination of ruins, excavation of archaeological sites, and gathering objects of antiquity on Bureau of Land Management administered land.	Antiquities Act of 1906. 43 CFR 3 Preservation of American Antiquities.
	Purchase of Vegetative or mineral material.	The purchase of vegetative or mineral materials, such as gravel, sand, rock or timber that is located on public lands.	43 CFR 3600 Mineral Materials Disposal; General Act of July 31, 1947
	Rights-of-Way for BLM Lands.	Access to or through Federal lands under the jurisdiction of the BLM.	Act of October 21, 1976, PL 94-579 (Federal Land Policy & Management Act). Section 28 of the Mineral and Leasing Act of February 25, 1920, as amended Title 23 USC Federal Aid Highways TAPS Act
	Temporary Use Permit		Mineral Leasing Act of February 25, 1920 (43 CFR 2880).
BLM .. Authorized Officer	Notice to Proceed		
	Field Memos.		
	Engineering Approvals		
	Cost and Contracting Approvals		

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY
DEPARTMENT OF THE INTERIOR (Continued)			
U.S. Fish and Wildlife Service	National Wildlife Refuge Lands - Special Use Permit.	Use of lands or facilities of and National Wildlife Refuge for such activities as Rights- of-Way, easements for pipelines, roads, utilities, structures, research projects, entry for geologic reconnaissance or similar projects, mining and so forth	50 CFR 25 50 CFR 26 50 CFR 29 The National Wildlife Refuge System adminis- trative Provisions. The National Wildlife System, Public Entry and Use. The National Wildlife System Land Use Mgmt
	Endangered Plants Permit		16 USC 668cc-1 50 CFR 17 62 50 CFR 13 General Procedures
	Endangered Wildlife Permit	Import / Export Take, OK for Research, Etc.	50 CFR 17 22 50 CFR 13 General Procedures
	Threatened Wildlife Permit Migratory Bird Permit		16 USC 668cc-1 50 CFR 17 32 50 CFR 13 16 USC 703 50 CFR 21 General Procedures
	DEPARTMENT OF THE TREASURY		
Bureau of Alcohol, Tobacco and Firearms	Use of Explosives - Permit and License.	<u>License</u> : manufacturers, im- porters or dealers in explo- sive materials. <u>Permit</u> : obtaining explosives from outside the users state and for the users own use.	18 USC Chapter 40 Importation, Manufacture, Distribution and Storage of Explosive Materials

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF TRANSPORTATION				
U S. Coast Guard	Permit for Bridges over Navigable waters.	Construction or alteration of bridges across navigable waters of the U.S.	33 CFR 1 - 124	Bridges, General.
			33 CFR 118	Bridge Locations and Clearance; Administrative Procedures.
			33 USC 1321	Oil and Hazardous Substance liability
			Federal Water Pollution Control Act	
Federal Aviation Administration	Airport Operating Certificate.	Airports serving scheduled CAB certified air carriers, or limited airports serving only unscheduled operations, or operations with small aircraft.	14 CFR 139	Certification and Operations: Land airports Serving CAB Certified Air Carriers.
	Notice of Intent to Establish or Change an Airport Landing Area.	Construction, alteration, activation, deactivation or otherwise change a civil joint-use (civil / military) airport	14 CFR 157	Notice of Construction alteration, Activation and Deactivation of airports
	Structures which may Interfere with airplane Flight Paths - Notice of Proposed Construction or Alteration.	Construction or alteration of any structure (building, tower, roadway, overhead wires and their supporting structures and so forth) which may interfere with airplane flight	14 CFR 77.13	Construction or Alteration Requiring Notice.
	Waiver to Federal Aviation Regulations.	Waiver of Federal Aviation Regulations for such activities as patrolling pipelines, etc.	14 CFR 91.63	Waiver to Federal Aviation Regulations.
		Air safety and transportation of hazardous materials,		
		Air navigation communications equipment.		

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY
DEPARTMENT OF TRANSPORTATION (Continued)			
Office of Pipeline Safety		Safe operation of pipelines	49 CFR 190 Legal Definitions 191 Legal Definitions 192 Hazardous Gas Pipelines 193 LNG Facilities 194 Spill Plans 195 Hazardous Liquid Pipelines 199 Drug Testing
Council on Environmental Quality	Environmental Impact Statements	Proposals for legislation and other major federal actions significantly affecting the quality of the human environment	National Environmental Policy Act, Section 102(2)(c), (PL 91-190, 42 USC 4321, et. seq). 40 CFR 1500 Preparation of Environmental Statements and Guidelines
Environmental			
Environmental Protection Agency	Clean Air act - Prevention of Significant Deterioration of Air Quality Program	Construction or modification of certain designated sources (Industries or production facilities) of air emissions which will emit more than 100 tons per year of any air pollutant and all other sources which will emit more than 250 tons per year of any air pollutant.	Clean Air Act, Sections 160 to 169, as amended in 1977. 40 CFR Part 8 Requirements for Preparation, Adoption and Submittal of Implementation Plans 40 CFR Part 52 Approval and Promulgation of State Implementation Plans 1977 Clean Air Act Amendments to Prevent Significant Deterioration
	New Source Performance Standards (Air)	Emission limitations which apply to construction or modification of any source (Industry, production facility) of air pollution for which standards have been issued	Clean Air act, as Amended in 1977, Section III.

TAPS FEDERAL PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF TRANSPORTATION (Continued)				
Environmental Protection Agency (Continued)	Oil Storage Facilities - Oil Spill Prevention, Con- tainment and Countermeasure (SPCC) Plans.	Any onshore and offshore non- transportation-related oil storage facilities which stores in excess of 660 gallons in a single container above ground, 1,320 gallons in aggregate in tanks above ground or 42,000 gallons below ground	Section 311 (PL 92-500). 40 CFR 112	Federal Water Pollution Control Act Amendments of 1972 Oil Pollution Prevention
	Permit to Discharge into Water - National Pollutant Discharge Elimination System.	Activities or wastewater systems which discharge from one or more points sources	PL 92-500. 40 CFR 125	Section 402 Federal Water Pollu- tion Control Act amendments of 1977 (see Sections 306, 502, 511) National Pollutant Discharge Elimination System
			Water use.	
Federal Communications Commission	Radio and Wire Communications Construction Permits and Licenses.	Construction, Installation or engagement in communications by wire and / or radio.	Communications Act of 1934, as Amended 47 USC 154 303	Telephones, telegraphs and radio-telegraphs
DEPARTMENT OF LABOR				
Occupational Safety and Health Administration		Employee safety in construction operations.		

STATE OF ALASKA PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT				
	Alaska Public Utilities Commission	Public Utilities - Certificate of Public Convenience and Necessity.	Every entity which owns, operates, manages, or controls a public utility.	AS 42 05 3 AAC 48 Alaska Public Utilities Commission Act. Alaska Public Utilities Commission Regulations
	Alaska Transportation Commission	Air Commerce Certificate	Operations involving carriage by aircraft of persons or property for hire or compensation in intrastate commerce. (Contract Carrier)	AS 42 07 AS 02 05 3 AAC 68 Alaska Transportation Commission Act. Alaska Air Commerce Act of 1960 Air
DEPARTMENT OF ENVIRONMENTAL CONSERVATION				
	Air Quality Control Permit to Open Burn.	Open burning for the disposal of oils, oily wastes, asphalt, tars etc.	AS 46 03 020 18 AAC 15 18 AAC 50 030 18 AAC 50.120	Powers of the Department Administrative Procedures Open Burning Permit to Operate
	Air Quality Control Permit to Operate.	Emission of any air contaminant which may be injurious to human health or welfare, property, animal or plant life or which may unreasonably interfere with the enjoyment of life or property.	AS 46 03 010 AS 46 03 140 AS 46 03 150 AS 46 03 160 AS 46.03.170 18 AAC 15 18 AAC 50 010 - 900 Control.	Declaration of Policy Emission Control Requirements Classification and Reporting Additional Contaminant Control Measures. Variances. Administrative Procedures Air Quality
	Hazardous Waste Hazardous Waste Disposal Drinking Water		18 AAC 62 18 AAC 63 18 AAC 80 010 - 900	Rules for Handling Plan Siting Review Plan Review

STATE OF ALASKA PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY
DEPARTMENT OF ENVIRONMENTAL CONSERVATION (Continued)	Discharge into Navigable Waters - Certificate of Reasonable Assurance.	Activities which may result in a discharge into navigable waters.	Clean Water Act of 1977, Section 4 18 AAC 15 18 AAC 70 010 - 110 Administrative Procedures. Water Quality Standards.
	Pesticide Permit.	Application of a pesticide to any waters of the State or by an airplane or a helicopter.	AS 46.03.320 18 AAC 15 18 AAC 90 Pesticide Control Authority. Administrative Procedures. Pesticide Control
	Solid Waste Disposal Permit.	Establishment, modification or operation of a solid waste disposal facility.	AS 46.03.020 AS 46.03.100 18 AAC 15 18 AAC 60 010 - 910 Powers of the Department. Waste Disposal Permit. Administrative Procedures. Solid Waste Management.
	Surface Oiling Permit	Discharge of oil asphalt bitumen or a residuary product of petroleum onto lands of the State.	AS 46.03.020 AS 46.03.740 18 AAC 15 18 AAC 75 Powers of the Department Oil Pollution. Administrative Procedures. Oil and Hazardous Substances Pollution Control
	Waste Water Disposal Permit.	Disposal of wastewater into or upon the waters or surface of the land or into a publicly operated sewage system.	AS 46.03.100 AS 46.03.090 AS 46.03.110 & 720 18 AAC 15 18 AAC 70 010 - 110 18 AAC 72.010 - 990 Waste Disposal Permit Plans for Pollution Disposal Waste Disposal Permit Administrative Procedures. Water Quality Standard. Wastewater Disposal

STATE OF ALASKA PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF FISH AND GAME				
Division of Wildlife Conservation) Division of Sport Fish)	Scientific, Educational, or Propagative Collecting Permit.	The taking, possessing or holding of live birds or their eggs, mammals, and fish and their eggs for scientific, educational, or propagative purposes.	AS 16.05.250(10) AS 16.05.920(a) 5 AAC 81.130	Department Regulations Certain Acts made unlawful Nests, eggs and live game.
Division of Habitat and Restoration	Fish Habitat Permit	Actions which affect the natural flow or bed of a specified anadro- mous river, lake, or stream, or use, obstruction, diversion, pollution, or use equipment in such waters.	AS 16.05.870 5 AAC 95.010	Protection of Fish and Game. Waters Important to
	Special Area Permit.	Work or development within a State Critical Habitat Area.	AS 16.20.500- 690	Fish and Game Critical Habitat Areas
	Fishways for Obstruction to Fish Passage.	Dams or other obstructions built across a stream frequented by salmon or other fish.	AS 16.05.840	Fish Passage Required
	Special Area Permit	Work or development within a State Game Refuge.	AS 16.20.010 - 080	State Game Refuge
DEPARTMENT OF HEALTH AND SOCIAL SERVICES				
Division of Public Health	Approval by Environmental Health Section, Department of Health and Social Services.	Operation of any public service establishment (i.e., Food Service, Camps, etc)	AS 17 AS 18 7 AAC	Food and Drugs. Health and Safety. Health and Social Services.

STATE OF ALASKA PERMIT REQUIREMENTS

AGENCY	PERMIT	JURISDICTION	AUTHORITY	
DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT	Certificate and Permit for Tourist Accommodations.	Establishment, operation, or maintenance of accommodations to be occupied by transient or permanent guests.	AS 18 05.040	Department of Health and Social Services, Regulations.
			AS 18 35 010 - 090	Tourist and Trailer Camps, Motor Courts and Hotels.
			7 AAC 20.110	Permits
	Food Service Permit	All permanent, temporary and mobile food service activities.	AS 18 05 040	Department of Health and Social Services, Regulations
			7 AAC 25 003	Eating and Drinking Establishments.
			AS 18 20 060 7 AAC 09 030	Health Care Facilities
DEPARTMENT OF LABOR	Fired and Unfired Pressure Vessels - Certificate of Inspection	Construction, installation, condition and operation of pressure vessels which are in business or apartment complexes .	AS 18 60.180 - 395 8 AAC 80	Boilers Boilers and Pressure Vessel Construction Code.
		Blasting variances.		
		Compliance and Enforcement of Codes and Standards	AS 18 60 850 AS 18.60.380 8 AAC 70 010 - 090 AS 18 60.705 8 AAC 43 010 -030 AS 5.20 010 AS 16 60.670	Piping Electrical Safety Uniform Plumbing Code
				Recreational Devices Hi Voltage Lines