

ALASKA LEGISLATURE COMMITTEE FILES, 1989-1990 8672
6459 SENATE RESOURCES

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Mr. James B. Herrmiller

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June 18, 1990

- The conservative estimate of 350 tons/yr of VOC emissions due to crude oil tank venting is not a "minor" source of VOC emissions by any standard or definition.
- The Department's permitting of storage tanks with overpressure vents can only be reasonably construed to indicate that some occasional venting during a true emergency episode was anticipated.
- It is clear that ADEC did not anticipate that "emergency" venting would become Alyeska's routine, day-to-day operating practice for the crude oil storage and vapor recovery system, and nothing in Alyeska's permit application and supporting documents suggests anything but that all excess vapors would be incinerated.

Based on that information, the Air Quality Control Permits to Operate issued to Alyeska have never allowed venting of VOC vapors from the crude oil storage tanks. According to Alyeska's venting reports, crude oil storage tank venting has been routine, particularly before the recent repairs to the waste gas incinerators.

Increase in Fuel Usage and Capacity of Waste Gas Incinerators

- A. In the 1974 air quality control permit application for the waste gas incinerators at the VMT, Alyeska listed the maximum combined waste gas usage for three waste gas incinerators as 1,800 thousand standard cubic feet per hour (December 15, 1988, Sec. 114 response, Vol. I, exh. 1). According to the results of the January 24-25, 1990, source tests conducted on the waste gas incinerators, the maximum combined waste gas flow rate for the three recently modified waste gas incinerators is equal to 2,160 thousand standard cubic feet per hour.
- When the NOx emissions from the waste incinerators using the 1974 fuel flow rate are compared with the NOx emissions at the 1990 waste gas fuel flow rate, the resulting NOx emissions increase due to the higher waste gas flow rate is equal to approximately 71 tons/yr per incinerator (see Attachment C for calculations).
- The increase in emissions of NOx per incinerator is greater than the 40 tons per year quantity listed in 18 AAC 50.300(a)(6)(C)(ii). Therefore, the increase in the waste gas flow rate to each incinerator due to recent modifications represents a modification as defined by 18 AAC 50.900(28), of a facility described in 18 AAC 50.300(a)(6)(C), and a permit application and review are required in accordance with 18 AAC 50.300(C) and 400(e)(3).
- B. The original design specifications for the waste gas incinerators state that the maximum heat rate of each incinerator is equal to 174 MMBtu/hr per incinerator with a maximum waste gas flow rate to each incinerator equal to 600 MSCF/hr (John Zinc incinerator spec. sheet, May 6, 1974, Case III). This waste gas flow

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rate corresponds to the waste gas flow rates listed in the 1974 air quality permit application for the waste gas incinerator. Therefore, the original 1974 permit application and Air Quality Control Permit to Operate were for waste gas incinerators with a maximum rated heat capacity of 174 MMBtu/hr per incinerator.

When questioned about the maximum rated capacity of the original incinerators installed at the VMT, Alyeska responded in the May 1, 1990, letter from Mr. Oscar E. Dickson of Alyeska to Mr. Bill H. Lamoreaux of ADEC that the waste gas incinerators originally built at the VMT were rated at 400 MMBtu/hr per incinerator and the maximum rated capacity of the recently modified incinerators has not changed from this original capacity. Furthermore, Alyeska argues that the operating parameters which remain constant and should be used to measure the rated capacity of the incinerators is the maximum heat rate of each incinerator in terms of MMBtu/hr and not the maximum waste gas flow rate to each incinerator. As a result, Alyeska goes on to argue that the recent modifications to the incinerators have not increased capacity. Alyeska claims that this is because the maximum waste gas flow rate to each incinerator will vary according to the heat content of the waste gas. According to Alyeska's May 1, 1990, letter, between 1985 and 1989, the quarterly average heat content of the waste gas has ranged from 307 BTU/lb to 910 BTU/lb.

When the NOx and SO₂ emissions from the waste incinerators using the permitted heat rate of 174 MMBtu/hr are compared with the NOx and SO₂ emissions at the heat rate of 440 MMBtu/hr actually installed, the resulting increase in NOx emissions from each incinerator due to the higher heat rate is equal to approximately 247 tons/yr per incinerator. The resulting increase in emissions of SO₂ from the three incinerators is equal to a total of 63 tons/yr (see Attachment D for calculations).

The increases in emissions of NOx and SO₂ from the three incinerators are greater than the corresponding 40 tons/yr quantities modification as listed in 18 AAC 50.300(a)(6)(X)(I) and (II). The increased capacity of the waste gas incinerators represents a modification, as defined by 18 AAC 50.900(28), and a permit application review is required by 18 AAC 50.300(b) and (c) and 50.400(e)(3).

SUMMARY AND CONCLUSION

The Department of Environmental Conservation believes that the Alyeska Pipeline Service Co. made the modifications described in the preceding paragraphs without the prior review and approval required by 18 AAC 50.300(b) and (c) and 50.400(e), and applicable federal regulations. Therefore, Alyeska should, not later than September 1,

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1990, file applications for the Department's review and approval, for each of the modifications described in this letter, in accordance with the provisions of 18 AAC 50.300(b) and (c), or otherwise reach an agreement with ADEC on resolution of these issues.

If Alyseka does not submit the required applications, or if an agreement cannot be reached resolving these matters before September 1, 1990, the Department will refer these issues to Attorney General Douglas B. Baily for appropriate enforcement action.

The applications must include the following elements, in addition to all other elements required under 18 AAC 50.300(b) and 50.300(e):

- A determination of the net emissions increases at each facility due to the modifications, including any other change in emissions occurring during the five years prior to each modification.
- An assessment of best available control technology for each modified source including:

For rim cooling to combustion gas turbines

- dry NOx (combustion) controls
- water or steam injection
- selective catalytic reduction

For increase in fuel sulfur content

- use of lower sulfur content fuels

For storage tank venting operations

- operating practices to minimize the occurrence and magnitude of tank venting operations
- installation of a vapor recovery system to collect and control the vapors from all pressure relief valves
- installation of activated carbon canisters at each pressure relief valve

For increased capacity of waste gas incinerators

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- ammonia or urea injection
- selective catalytic reduction
- SO₂ scrubbing technology

An air quality impact analysis for each air contaminant and appropriate averaging periods: for SO₂, 3-hour, 24-hour and annual; for particulate matter (PM-10), 24-hour and annual; for oxides of nitrogen, annual.

Applications required pursuant to this letter should be submitted to the appropriate ADEC Regional Office: the Northern Regional Office, 1001 Noble Street, Suite 350, Fairbanks AK 99701 for all the pump stations, and the Southcentral Regional Office, 3601 C Street, Suite 1350, Anchorage AK 99503 for the Valdez Marine Terminal. A copy of each application should also be sent to Mr. S. W. Hungerford at the air program's central office, P.O. Box O, Juneau, AK 99811-1800.

I would appreciate your prompt review of these critical issues and a timely response. If you have any questions, please call Ms. Michele Brown at 563-6529.

Sincerely,


Larry Dietrick
Director

cc: Attorney General Douglas B. Bailly
Commissioner Dennis Kelso
Ann Postma, EPA Region X

ATTACHMENT A

CALCULATIONS FOR MAIN GAS TURBINES AT PUMP STATIONS

THIS EMISSION FACTORS FOR SOIL GAS TUBING) USING SOURCE TEST DATA

F FACTOR CALCULATION(1)

$$E = (0.91 \cdot 10^6 \cdot C_d \cdot F_d) \cdot (10.9438 \cdot Q - 0.0023)$$

Cd = pollutant concentration measured, dry (ppmv)
 Fd = f factor for soil, dry (lb-cf/1000cu)
 Q = percent O2 in exhaust measured
 E = emission factor (lb/1000cu)

MEASURED GAS AND EMISSION FACTORS

NAME:	Cd(2) (ppmv)	Fd(3) (lb-cf/1000cu)	Q(4)	E (lb/1000cu)
SOIL:	12.8	10049.89	15	0.10016

$$F_d = 10^{-6} [13.66(CO) + 1.53(CO_2) + 0.57(C_2H_6) + 0.14(C_3H_8) + 0.44(CH_4)] / GCV$$

CO = 86.67
 CO2 = 48.64
 C2H6 = 0
 C3H8 = 1.7
 CH4 = 28.99
 GCV = 13016.88 Btu/lb

SOIL GAS EMISSION FACTOR

Fd = 10049.89 lb-cf/1000cu

NAME:	Cd(4) (ppmv)	Fd(5) (lb-cf/1000cu)	Q(6)	E (lb/1000cu)
SOIL:	150.9	9130	15	0.58647

FOOTNOTES:

- (1) F FACTOR CALCULATIONS FROM 40 CFR, Part 60, APPENDIX A, METHOD 20, EQUATION 20-6
- (2) FROM TABLE 5, OVERLAP SOURCE TEST ON SOIL GAS TUBING WITH TYPICAL SOIL CONDITIONS, PUMP STATION 3, TRENCH @ 7,850 FEET
- (3) CALCULATED FROM MEASURED GAS ANALYSIS INCLUDED IN OVERLAP SOURCE TEST, ASSUMED MAXIMUM GAS MASS PERCENT OF GAS DRAVE FROM EMISSIONS 47, 10/22/89 114 LETTER RESPONSE
- (4) FROM TABLE 4, 05/01/89 SOURCE TEST ON SOIL GAS TUBING WITH TYPICAL SOIL CONDITIONS, PUMP STATION 3, TRENCH @ 7,796 FEET
- (5) FROM TABLE 19-1, 40 CFR, Part 60, APPENDIX A, F-FACTOR FOR SOIL GAS

30359582619
 CCITT 63:11:
 5:11:13
 2:37PM
 507: 255-3588
 9-10-90
 10:10:14:24
 01-POLLUTANT & PART

EMISSION CALCULATIONS FOR PUMP STATIONS 1-6 (For 1978 Model Gas Turbines)

EQUIP.	TYPE	FUEL	FUEL WEIGHT PER HOUR (2)		EMISSION FACTOR	EMISSION RATE	CORRECTION FACTOR	EMISSION RATE (1)
			NET WEIGHT	NET WEIGHT (2)				
Gas Turbine	ICE	NA	143.8	0.016	0.004	0.310	0.010	0.310
Gas Turbine	ICE	NA	143.8	0.014	0.001	0.310	0.010	0.310
Gas Turbine	ICE	NA	143.8	0.006	0.011	0.310	0.009	0.310
Gas Turbine	ICE	NA	143.8	0.017	0.004	0.310	0.013	0.310
Gas Turbine	ICE	NA	143.8	0.017	0.004	0.310	0.013	0.310
Gas Turbine	ICE	NA	143.8	0.017	0.004	0.310	0.013	0.310

EMISSION CALCULATIONS FOR PUMP STATIONS 1-6 (For 2000 Model Gas Turbines)

EQUIP.	TYPE	FUEL	FUEL WEIGHT PER HOUR (2)		EMISSION FACTOR	EMISSION RATE	CORRECTION FACTOR	EMISSION RATE (1)
			NET WEIGHT	NET WEIGHT (2)				
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310
Gas Turbine	ICE	NA	178.4	0.016	0.011	0.310	0.010	0.310

NET EMISSION CORRECTED (GRAMS/HOUR)

Station	Model	Year	CO	HC	NOx	PM	SO2
Gas Turbine	ICE	2000	20.32	2.42	1.66	49.43	2.47
Gas Turbine	ICE	1978	20.32	2.42	1.66	49.43	2.47
Gas Turbine	ICE	2000	20.32	2.42	1.66	49.43	2.47

NOTES:

(1) GAS TURBINE MODEL 501/502 DIVISION BY HOUR GAS WEIGHTS, FROM PUMP STATION APPLICATION FOR PUMP STATION 1

(2) READ CORRECTED OF GROSS GAS FUEL WEIGHT AT 10/27/00 114 LETTER RESPONSE

(3) PM, NOx, CO, AND SO2 EMISSION FACTORS FROM 10/27/00 114 LETTER RESPONSE, TABLE 3.1-2, ASSUMED 653 IMPACT

(4) THE GROSS FACTOR CORRECTION FROM OPERATIONAL DATA ON GROSS GAS WEIGHTS AT PUMP STATION NUMBER 1, SEE EXHIBIT 44, 10/27/00 114 LETTER RESPONSE

(5) THE FUEL RATE FROM 12/25/00 114 LETTER RESPONSE, PAGE 20, TABLE 3 FROM OPERATIONAL DATA AFTER 1140 CORRECTION

ATTACHMENT B

CALCULATIONS FOR CRUDE OIL STORAGE TANK VENTING

ATTACHMENT C

CALCULATIONS FOR VMT WASTE GAS INCINERATORS
(Using Waste Gas Flow Rate as Capacity Limiting Factor)

ATTACHMENT D

**CALCULATIONS FOR VMT WASTE GAS INCINERATORS
(Using Heat Rate as Capacity Limiting Factor)**

EMISSION CALCULATIONS FOR THERMAL (For 1974 Incinerators)

EMPF. NAME	FUEL TYPE	FUEL USE(1) (GALLONS)	FUEL HEAT(2) (BTU/HR)	FUELS NAME	EMISSION FACTOR(3) (LB/1000BTU)					EMISSION RATE(4) (TONS/YR)				
					PM	SO2	NOx	HC	CO	PM	SO2	NOx	HC	CO
LARGE GAS INCINERATORS														
Gas Incinerator	Waste Gas	0.000	200	174.0	0.005	0.020	0.236	0.001	0.005	3.01	15.30	179.51	0.90	2.10
Gas Incinerator	Waste Gas	0.000	200	174.0	0.005	0.020	0.236	0.001	0.005	3.01	15.30	179.51	0.90	2.10
Gas Incinerator	Waste Gas	0.000	200	174.0	0.005	0.020	0.236	0.001	0.005	3.01	15.30	179.51	0.90	2.10

EMISSION CALCULATIONS FOR THERMAL (For 1970 Incinerators)

EMPF. NAME	EMPF. NUMBER	FUEL TYPE	FUEL USE(1) (GALLONS)	FUEL HEAT(2) (BTU/HR)	FUELS NAME	EMISSION FACTOR(3) (LB/1000BTU)					EMISSION RATE(4) (TONS/YR)				
						PM	SO2	NOx	HC	CO	PM	SO2	NOx	HC	CO
LARGE GAS INCINERATORS															
Gas Incinerator	53-10-1A	Waste Gas	0.700	575.5	414.4	0.005	0.020	0.236	0.001	0.005	9.07	36.62	427.60	2.15	4.99
Gas Incinerator	53-00-1B	Waste Gas	0.700	575.5	414.4	0.005	0.020	0.236	0.001	0.005	9.07	36.62	427.60	2.15	4.99
Gas Incinerator	53-00-1C	Waste Gas	0.700	575.5	414.4	0.005	0.020	0.236	0.001	0.005	9.07	36.62	427.60	2.15	4.99

NET EMISSIONS CHANGE DUE TO MODIFICATION

EMPF. NAME	EMPF. NUMBER	NET EMISSIONS CHANGE (TONS/YR)				
		PM	SO2	NOx	HC	CO
LARGE GAS INCINERATORS						
Gas Incinerator	53-10-1A	5.26	21.24	247.90	1.25	2.90
Gas Incinerator	53-00-1B	5.26	21.24	247.90	1.25	2.90
Gas Incinerator	53-00-1C	5.26	21.24	247.90	1.25	2.90

FOOTNOTES:
 (1) GAS FLOW RATE SHOULD BE 1,000 SCF/YR DIVIDED BY LARGE INCINERATORS, FROM 200% PEAKY APPLICATION FOR DESIGN.
 (2) HEAT CONTENT OF WASTE GAS CALCULATED FROM LARGE INCINERATOR DESIGN SPEC. 200-107, JUNE 20, 1973, TABLE NUMBER 1, CASE 3
 (3) PM, SO2, CO, AND SPEC NUMBER FACTORS CALCULATED BY ANALYZING 3 SAMPLE TEST RESULTS FROM INCINERATOR 'A' @ 1950 DEG. F FOR EMISSION FACTOR TABLE FROM AP-42 PER NATIONAL GAS COMMISSION FOR DESIGN > 100 BHP/HR, TABLE 3.4-1, APPROX 1000 BTU/SCF
 (4) TONS PER YEAR EMISSION RATES CALCULATED BY ASSUMING 24 HRS PER DAY, 365 DAYS PER YEAR OPERATION PER INCINERATOR
 (5) GAS FLOW RATE (GALLONS) SHOULD BE 3 SAMPLE MIXT RESULTS FROM INCINERATOR 'A' @ 1950 DEG. F DESIGN (IN 1974)

SENT BY ROUTING SLIP
 JUN 13 1980 11:15
 9-18-80 2:42PM
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 CCITT G3:R15

EXHIBIT B TO COMPLIANCE ORDER BY CONSENT - LIQUID FUEL FIRED GENERATORS

1) Pump station # 6

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	26,800
40 - 59 deg F	28,400
20 - 39 deg F	29,800
0 - 19 deg F	31,200
-20 - -1 deg F	32,400
-40 - -21 deg F	33,600
less than -40 deg F	greater than 33,600

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

2) Pump station # 7

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	26,800
40 - 59 deg F	28,400
20 - 39 deg F	29,800
0 - 19 deg F	31,200
-20 - -1 deg F	32,400
-40 - -21 deg F	33,600
less than -40 deg F	greater than 33,600

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to

DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

3) Pump station # 8

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	26,800
40 - 59 deg F	28,200
20 - 39 deg F	29,600
0 - 19 deg F	31,000
-20 - -1 deg F	32,200
-40 - -21 deg F	33,400
less than -40 deg F	greater than 33,400

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

4) Pump station # 9

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	26,200
40 - 59 deg F	27,800
20 - 39 deg F	29,100
0 - 19 deg F	30,400
-20 - -1 deg F	31,700
-40 - -21 deg F	32,800
less than -40 deg F	greater than 32,800

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to

DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

5) Pump station # 10

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	25,500
40 - 59 deg F	26,800
20 - 39 deg F	28,200
0 - 19 deg F	29,400
-20 - -1 deg F	30,700
-40 - -21 deg F	31,800
less than -40 deg F	greater than 31,800

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

6) Pump station # 12

Based on a lower heating value of 126,125 British Thermal Units per gallon of fuel oil, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Gallons total per day
greater than 59 deg F	26,000
40 - 59 deg F	27,800
20 - 39 deg F	28,800
0 - 19 deg F	30,100
-20 - -1 deg F	31,300
-40 - -21 deg F	32,400
less than -40 deg F	greater than 32,400

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total

quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and quantity of fuel burned for the date with the highest fuel burning rate during the month.

EXHIBIT C TO COMPLIANCE ORDER BY CONSENT - GAS FUELED
GENERATORS

1) Pump station # 1

Based on a lower heating value of 863 British Thermal Units per cubic foot of gas, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Thousands of cubic feet total per day
greater than 59 deg F	4,056
40 - 59 deg F	4,296
20 - 39 deg F	4,512
0 - 19 deg F	4,704
-20 - -1 deg F	4,896
-40 - -21 deg F	5,040
less than -40 deg F	greater than 5,040

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel consumption, and the date, temperature and fuel burned for the date with the highest fuel burning rate during the month.

2) Pump station # 2

Based on a lower heating value of 863 British Thermal Units per cubic foot of gas, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Thousands of cubic feet total per day
greater than 59 deg F	3,984
40 - 59 deg F	4,200
20 - 39 deg F	4,392
0 - 19 deg F	4,608
-20 - -1 deg F	4,800
-40 - -21 deg F	4,944
less than -40 deg F	greater than 4,944

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator, the previous month's total fuel

consumption, and the date, temperature and fuel burned for the date with the highest fuel burning rate during the month.

3) Pump station # 3

Based on a lower heating value of 863 British Thermal Units per cubic foot of gas, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Thousands of cubic feet total per day
greater than 59 deg F	3,840
40 - 59 deg F	4,080
20 - 39 deg F	4,296
0 - 19 deg F	4,488
-20 - -1 deg F	4,656
-40 - -21 deg F	4,800
less than -40 deg F	greater than 4,800

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the 10th day of each month, Alyeska shall report to DEC, for each gas generator the previous month's total fuel consumption, and the date, temperature and fuel burned for the date with the highest fuel burning rate during the month.

4) Pump station # 4

Based on a lower heating value of 863 British Thermal Units per cubic foot of gas, Alyeska shall burn as fuel in any Avon gas generator not more than the indicated total quantity of fuel on any day for which the average ambient temperature is within the indicated temperature range:

Ambient Temperature daily average	Thousands of cubic feet total per day
greater than 59 deg F	3,672
40 - 59 deg F	3,840
20 - 39 deg F	4,056
0 - 19 deg F	4,248
-20 - -1 deg F	4,416
-40 - -21 deg F	4,584
less than -40 deg F	greater than 4,584

Alyeska shall record, and maintain the record at the office of the pump station, the average daily ambient temperature and the total quantity of fuel burned in each Avon gas generator for each day. On or before the tenth day of each month, Alyeska shall report to DEC, for each gas generator the previous month's total fuel

consumption, and the date, temperature and fuel burned for the date with the highest fuel burning rate during the month.

North Slope Gas Pipeline Overview

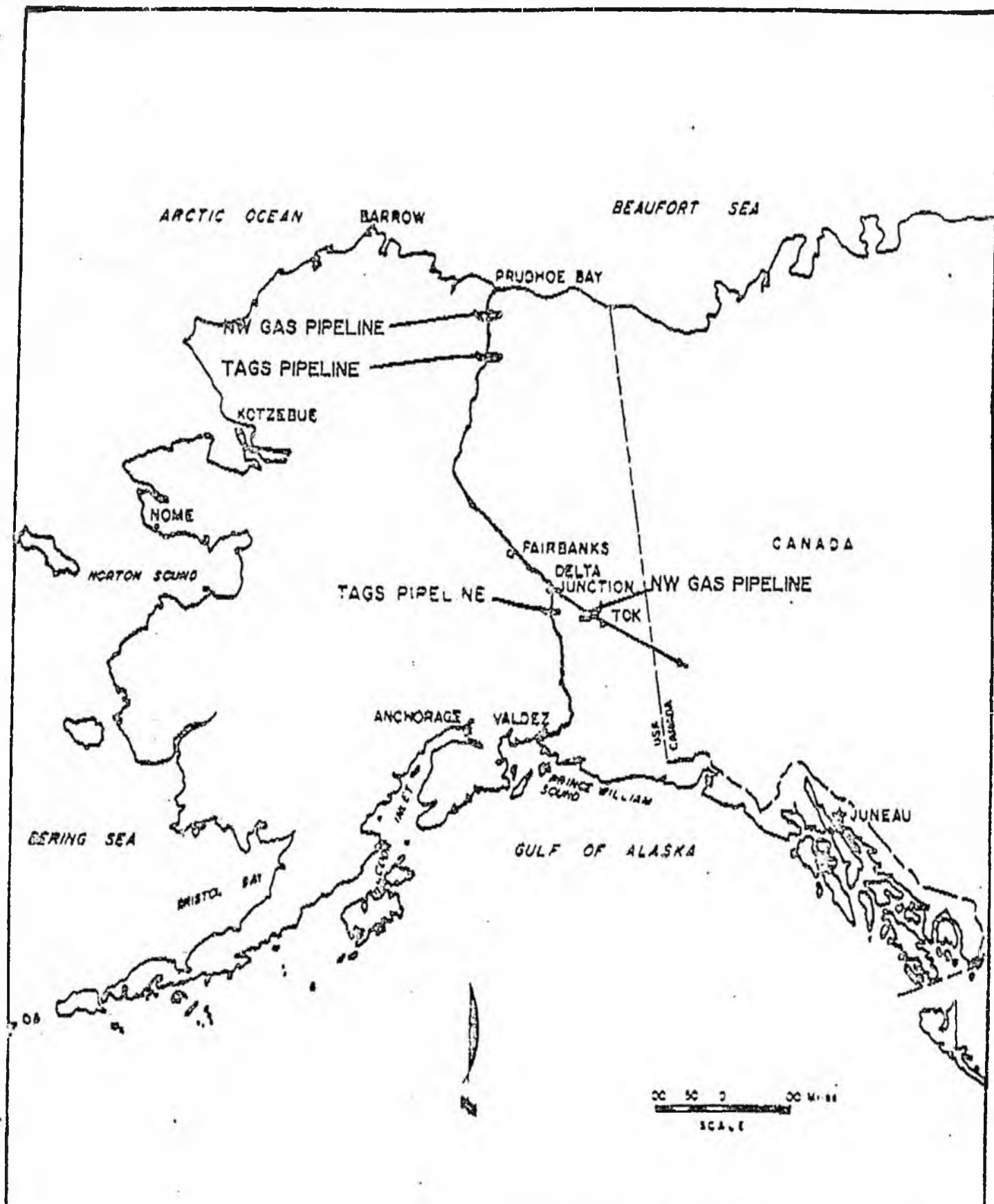
NORTH SLOPE GAS BRIEFING AGENDA

Department of Natural Resources

- I. IntroductionJerry Brossia
Division of Land and Water Management

- II. Location & Status of Proposed Gas Pipelines.....Jerry Brossia

- III. Location & Estimated Quantities of Gas Reserves....Bill Van Dyke
Division of Oil and Gas



PROPOSED GAS PIPELINES

COMPARISON OF ANGS AND TAGS NATURAL GAS TRANSPORTATION PIPELINES

DNR/DLMM
March 1, 1989

COMPARISON	ANGS	TAGS
nat gas destination	domestic use to lower 48 states	export to Pacific Rim countries
transportation method	interstate gas pipeline	intrastate gas pipeline + LNG tanker transport
transportation route in Alaska	Prudhoe Bay to Alaska-Canada border	Prudhoe Bay to Anderson Bay in Port Valdez
major project components	48 inch chilled, buried pipeline 15 compressor stations gas conditioning facility	36 inch chilled, buried pipeline 10 compressor stations LNG Plant + marine terminal
pipeline length	745 miles (Alaska segment)	797 miles
quantity of gas/day transported	2.4 billion cubic feet/day	2.3 billion cubic feet/day
estimated cost to construct	\$11.5 billion	\$8 billion
projected revenue to the state	not available	<i>ANNUAL</i> - \$477 million over the life of the project
jobs created	not available	10,000 peak, 6,000 average during construction

project status on state land	RW Lease application pending	Conditional RW Lease issued
project status on federal land	RW Grant issued	RW Grant issued

ALASKA TELETYPE 250 3-5-89; 5:08 PM; 6:42 PM; 4/9 3244 *
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Developed North Slope Oil and Gas Fields
(As of October 1988)

<u>Field Name</u>	<u>Discovery Date</u>	<u>Estimated Original Recoverable Reserves</u>	<u>Remaining Reserves</u>
Prudhoe Bay	12/67	25,000 BCF 10,800 MMBO	23,000 BCF 4700 MMBO
Kuparuk River	4/69	640 BCF 1340 MMBO	570 BCF 845 MMBO
Prudhoe Bay (Lisburne Pool)	12/67	900 BCF 190 MMBO	890 BCF 150 MMBO
Milne Point	10/69	60 MMBO	55 MMBO
Endicott	3/78	800 BCF 375 MMBO	790 BCF 330 MMBO
S. Barrow	4/49	25.2 BCF	8 BCF
E. Barrow	5/74	12.4 BCF	9 BCF
Totals		27,400 BCF 12,800 MMBO	25,267 BCF 6080 MMBO

BCF - Billion Cubic Feet of Gas
MMBO - Million Barrels of Oil

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Figure 4

Undeveloped North Slope Oil and Gas Discoveries
(As of October 1988)

<u>Name</u>	<u>Discovery Date</u>	<u>Estimated Recoverable Reserves</u>
Umlat	12/46	50 MMBO
Gubik	8/51	600 BCF
E. Umiat	3/63	?
West Sak	4/69	0 - 3000 MMBO
Kavik	11/69	?
Kemik	6/72	?
Flaxman Island	9/75	?
Pt. Thomson	10/77	5000 BCF 300 MMBO
Mikkelson	1978	?
Gwydyr Bay	1981	<10 MMBO
Tern Island	5/83	?
Seal Island	1/84	150 MMBO
Colville Delta	1985	?
Hammerhead	2/86	?
Sandpiper Island	1986	?
Niasuk Discovery	4/85	60 MMBO

BCF - Billion Cubic Feet of Gas
MMBO - Million Barrels of Oil

Totals

1060 MMBO
5600 BCF

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Figure 5

DRAFT 3/8/89

ORAL REMARKS OF
CUBA WADLINGTON JR., VICE PRESIDENT FOR REGULATORY AFFAIRS
NORTHWEST ALASKAN PIPELINE COMPANY

ALASKA STATE LEGISLATURE,
SENATE SPECIAL COMMITTEE ON OIL & GAS
AND SENATE RESOURCES COMMITTEE
MARCH 10, 1989

I AM CUBA WADLINGTON JR., VICE PRESIDENT FOR REGULATORY AFFAIRS, NORTHWEST ALASKAN PIPELINE COMPANY, THE AGENT AND OPERATING PARTNER FOR ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY, THE SPONSORS OF THE ALASKAN SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM. ACCOMPANYING ME IS OUR GENERAL COUNSEL, WILLIAM J. MOSES.

MADAM CHAIRMAN, THANK YOU FOR THE OPPORTUNITY TO BE HERE TODAY TO GIVE AN UPDATE ON THE A-N-G-T-S PROJECT. VERNON JONES, WHO IS CHAIRMAN OF THE BOARD OF OUR SPONSORING CONSORTIUM, APPEARED HERE BEFORE THE JOINT COMMITTEE ON OIL AND GAS IN MARCH 1984. CONDITIONS HAVE CHANGED IN SEVERAL SIGNIFICANT WAYS OVER THE PAST FIVE YEARS. I'LL EXPLAIN WHY WE NOW HAVE A STRONGLY STRENGTHENED CONVICTION THAT THE PRUDHOE BAY GAS IS NEEDED DOMESTICALLY BY THE UNITED STATES. AND I'LL EXPLAIN WHY WE HAVE RENEWED OPTIMISM THAT TIME IS BRINGING US CLOSER TO PROJECT REMOBILIZATION.

ON JANUARY 24TH OF THIS YEAR, WE APPEARED IN ANCHORAGE BEFORE A PUBLIC CONFERENCE HELD BY THE ECONOMIC REGULATORY

ADMINISTRATION OF THE U.S. DEPARTMENT OF ENERGY. OUR PREPARED STATEMENTS AT THAT CONFERENCE PROVIDE AN UP-TO-DATE ELABORATION OF OUR OUTLOOK FOR THE ANGTS PROJECT. THEY ARE BY VERNON JONES, MYSELF, AND BY MR. JAMES JENSEN WHO IS A RECOGNIZED AUTHORITY ON OIL AND GAS ECONOMICS AND DEVELOPMENT. IN ADDITION, WE LATER FILED SUPPLEMENTAL COMMENTS WITH THE ECONOMIC REGULATORY ADMINISTRATION WHICH, I BELIEVE, ALSO PROVIDE VALUABLE BACKGROUND INFORMATION.

WITH YOUR CONCURRENCE, I WOULD LIKE TO PLACE THESE FOUR DOCUMENTS IN THE RECORD AND THEN MAKE A BRIEF ORAL STATEMENT. I HAVE EXTRA COPIES WITH ME FOR COMMITTEE MEMBERS AND STAFFS.

THE U.S. SPONSORS OF THE ALASKAN SEGMENT OF ANGTS HAVE INVESTED ABOUT \$ 1.5 BILLION JUST ON THE ALASKAN SEGMENT OF THE SYSTEM. THIS INVESTMENT IS IN DESIGN, PRELIMINARY ENGINEERING, SATISFYING GOVERNMENT REQUIREMENTS, AND CONSTRUCTION PLANNING. WE MADE THIS EXPENDITURE IN GOOD FAITH, BASED ON A FRAMEWORK OF FEDERAL LAW. THIS INCLUDED EXPLICIT COMMITMENTS TO AN OVERLAND TRANSPORTATION SYSTEM TO BRING THE 26 TRILLION CUBIC FEET OF PROVED PRUDHOE BAY GAS RESERVES TO THE LOWER 48 STATES.

WE REMAIN DEDICATED TO COMPLETING THIS PROJECT AT THE EARLIEST FEASIBLE DATE WHEN THE GAS CAN BE SOLD WITHOUT GOVERNMENT SUBSIDY, AT MARKET CLEARING-PRICES. THAT DATE IS APPROACHING MUCH FASTER THAN IS GENERALLY REALIZED.

THE FIRST KEY ISSUE THAT I'LL DISCUSS IS "NEED." IS THERE A DOMESTIC REQUIREMENT FOR THE GAS DURING THE PERIOD STARTING ABOUT 1996?

OUR CONCEPT OF DOMESTIC "NEED" FOR THE ALASKAN GAS IS BASED ON AN ECONOMIC TEST. IF THE GAS IS REASONABLY EXPECTED TO BE SALEABLE ON A FREE-MARKET BASIS IN THE LOWER-48 STATES, WITHOUT GOVERNMENT SUBSIDY, THEN IT MEETS THIS PRIMA FACIE TEST. BY DEFINITION, IF COMPETITIVELY-PRICED ALASKAN GAS IS NOT AVAILABLE, DEMAND FOR THAT ENERGY COULD BE MET ONLY IF AMERICAN CONSUMERS MAKE USE OF HIGHER PRICED AND/OR LESS DESIRABLE ALTERNATIVES.

THE CURRENTLY PROVED PRUDHOE BAY GAS RESERVES, DELIVERED TO THE LOWER-48 STATES BY A PIPELINE SYSTEM, CAN MEET THIS FREE-MARKET TEST BASED ON SIX KEY CONSIDERATIONS:

--FIRST: THE COST OF THE ANGTS. THE RECENTLY REVISED COST ESTIMATE FOR THE REMAINING ELEMENTS OF THE ANGTS WILL MAKE THE DELIVERED GAS PRICE HIGHLY COMPETITIVE DOMESTICALLY IN THE YEARS AHEAD. I WILL ELABORATE ON THIS LATER.

--THE SECOND BASIS FOR DOMESTIC NEED IS A VARIETY OF INDEPENDENT SUPPLY/DEMAND FORECASTS. REASONABLE PROJECTIONS OF A DOMESTIC "NEED" FOR THE ALASKAN GAS DURING THE YEARS AHEAD HAVE BEEN MADE BY A NUMBER OF INDEPENDENT, RESPECTED ANALYTICAL ORGANIZATIONS SUCH AS THE GAS RESEARCH INSTITUTE.

A NEW, VERY RECENT STUDY IS ATTACHED TO THE PREPARED STATEMENT OF VERNON T. JONES, WHICH HAS BEEN PLACED IN YOUR RECORD. IT LENDS ADDITIONAL WEIGHT TO OUR POSITION. THE STUDY WAS PREPARED BY THE WASHINGTON POLICY AND ANALYSIS CONSULTING GROUP UNDER THE DIRECTION OF A FORMER DEPUTY SECRETARY OF ENERGY.

ALL OF THESE SUPPLY/DEMAND STUDIES HAVE ONE THING IN COMMON: THEY PROJECT A VERY REAL NEED FOR THE PRUDHOE BAY GAS IN THE LOWER-48 STATES BY THE YEAR 2010 AT THE VERY LATEST.

--THE THIRD BASIS FOR DOMESTIC NEED IS U.S. NATIONAL ENERGY SECURITY. DOMESTIC DEMAND FOR NATURAL GAS IS ALMOST CERTAIN TO GROW BEYOND CURRENT FORECASTS DUE TO THE RAPIDLY INCREASING U.S. DEPENDENCE ON FOREIGN OIL, NOW OVER 40% AND EXPECTED TO BE ABOUT 70% BY 2010. LET ME REPEAT THAT: 70% DEPENDENT UPON FOREIGN OIL IMPORTS BY THE YEAR 2010! THAT IS AN ALARMING FIGURE, AND IT SHOULD BE OF CONCERN TO ALL AMERICANS. OUR NATION OBVIOUSLY WILL BECOME DANGEROUSLY VULNERABLE TO OIL SUPPLY DISRUPTIONS AND/OR PRICE SHOCKS. MUCH GREATER USE OF DOMESTIC NATURAL GAS PREDICTABLY WILL BECOME A PUBLIC POLICY IMPERATIVE AS AN IMPORTANT MEANS TO LIMIT THIS VULNERABILITY. THE WASHINGTON POLICY AND ANALYSIS STUDY CONCLUDES THAT GREATER DOMESTIC USE OF NATURAL GAS CAN RESULT IN A 2 MILLION BARREL PER DAY REDUCTION IN DEMAND FOR IMPORTED OIL. THE REPORT INDICATES THAT ALASKAN PIPELINE GAS IS NEEDED TO MAKE THIS POSSIBLE. THE ANGTS, AT FULL CAPACITY, WILL PROVIDE THE ENERGY EQUIVALENT OF 30 PERCENT OF THIS TOTAL--600,000 BARRELS OF OIL PER DAY. THAT'S AN IMPRESSIVE CONTRIBUTION TO U.S. ENERGY SECURITY BY ANY MEASURE.

PRESIDENT BUSH, IN ADDRESSING WAYS TO ENHANCE U.S. NATIONAL SECURITY LAST YEAR, DECLARED: QUOTE. THERE'S NO SECURITY FOR THE UNITED STATES IN FOREIGN OIL. . . WE MUST TURN TO ALTERNATIVES LIKE NATURAL GAS. UNQUOTE.

--THE FOURTH BASIS FOR DOMESTIC NEED IS ENVIRONMENTAL REQUIREMENTS. CONCERN IS GROWING ABOUT ACID RAIN, GROUND-LEVEL OZONE, CARBON MONOXIDE, ATMOSPHERIC PARTICULATES, AND THE SO-CALLED GREENHOUSE EFFECT. INCREASED USE OF NATURAL GAS CLEARLY CAN IMPROVE THE SITUATION. MORE STRINGENT STANDARDS APPEAR

INEVITABLE AND WILL RESULT IN INCREASED DEMAND FOR NATURAL GAS. THE WASHINGTON POLICY AND ANALYSIS STUDY THAT I'VE MENTIONED CONCLUDES, AND I QUOTE: A MAJOR FORCE DRIVING THE INTRODUCTION OF MORE NATURAL GAS INTO THE U.S. ECONOMY IN THE FUTURE COULD BE AN EFFORT TO MEET ENVIRONMENTAL STANDARDS IN THE MOST COST-CONSCIOUS MANNER. UNQUOTE.

BUT AN EVEN MORE COMPELLING CASE IS MADE IN A COMBINED REPORT BY THE NATIONAL ACADEMY OF SCIENCES, THE NATIONAL ACADEMY OF ENGINEERING AND THE INSTITUTE OF MEDICINE, TO PRESIDENT BUSH. AND I QUOTE:

. . . WE SHOULD EXPLORE MEANS FOR REDUCING ENERGY DEMAND WITHOUT IMPEDING ECONOMIC GROWTH, FOR EXAMPLE, BY USING FOSSIL FUELS WITH GREATER EFFICIENCY, AS WELL AS INCENTIVES AND OTHER MEANS TO INCREASE USE OF THE 'CLEANEST' FOSSIL FUELS SUCH AS NATURAL GAS. UNQUOTE.

--THE FIFTH BASIS OF DOMESTIC NEED IS THAT IMPORTS OF NATURAL GAS WILL NOT BE ENOUGH TO SATISFY DOMESTIC REQUIREMENTS. IT IS UNREALISTIC TO ASSUME THAT U.S. IMPORTS OF GAS FROM CANADA, MEXICO, OR OF LNG CAN BE OBTAINED ESSENTIALLY WITHOUT LIMITATION, INDEFINITELY AND AT MORE ATTRACTIVE PRICES THAN ALASKAN PIPELINE GAS. CREDIBLE FORECASTS WHICH TAKE BOTH PRICE AND AVAILABILITY INTO CONSIDERATION CALL FOR GAS FROM AN ALASKAN PIPELINE IN ADDITION TO SUBSTANTIALLY INCREASED LNG IMPORTS AND CANADIAN GAS.

THE CANADIAN NATIONAL ENERGY BOARD RECENTLY RELEASED A REVISED ENERGY SUPPLY AND DEMAND FORECAST. IT SHOWS CLEARLY THERE WILL HAVE TO BE INCREASING RELIANCE IN CANADA UPON GAS FROM

"FRONTIER" AREAS STARTING IN THE LATE 1990'S. ABOUT 1.2 BILLION CUBIC FEET OF GAS PER DAY FROM THE MACKENZIE DELTA AND ARCTIC ISLANDS, WHICH WILL HAVE MANY OF THE SAME ECONOMIC COSTS THAT THE BUILDERS OF THE ANGTS FACE IN CONSTRUCTING A PIPELINE FROM THE NORTH SLOPE, WILL PROBABLY START FLOWING BEFORE THE YEAR 2000.

SUBSTANTIAL MEXICAN IMPORTS, HOWEVER, DO NOT APPEAR LIKELY. MEXICAN GOVERNMENT POLICY IS TO MAXIMIZE THE USE OF NATURAL GAS DOMESTICALLY.

REGARDING LNG IMPORTS, WHEN THE LIMITED UNUSED CAPACITY IN EXISTING DOMESTIC TERMINALS IS USED UP, ANY ADDITIONAL CAPACITY CAN THEN ONLY BE OBTAINED BY A COSTLY, CONTROVERSIAL AND PROTRACTED PROCESS OF SITING AND ENVIRONMENTAL APPROVALS OF MAJOR NEW TERMINALS.

IT SEEMS CLEAR, THEREFORE, THAT THE U.S. GAS MARKET WILL BE SERVED BY A VARIETY OF SOURCES, EACH WITH ITS LIMITATIONS. IN SUCH AN ENVIRONMENT, THE OVERLAND DELIVERY OF THE PRUDHOE BAY RESERVES SHOULD BE HIGHLY COMPETITIVE. AGAIN, EACH OF THESE SOURCES WILL BE NEEDED TO MEET DOMESTIC DEMAND.

--THE SIXTH AND FINAL BASIS FOR DOMESTIC NEED IS A PROJECTED ELECTRIC POWER GENERATION SHORTFALL IN THE UNITED STATES. THIS HAS MAJOR IMPLICATIONS FOR DOMESTIC GAS DEMAND. THERE IS A VERY SERIOUS POTENTIAL SHORTFALL OF ELECTRIC POWER GENERATION CAPABILITY IN THE U.S. IN THE NEXT TEN YEARS AND ON INTO THE NEXT CENTURY. NATURAL GAS TURBINES CAN BE CONSTRUCTED QUICKLY AND AT FAR LESS COST THAN ANY TYPE OF STEAM-GENERATION PLANT. THEY ARE PROBABLY THE ONLY REALISTIC WAY TO AVERT POWER SHORTAGES.

THE U.S. ENERGY INFORMATION ADMINISTRATION RECENTLY PROJECTED A BASE-CASE NEED FOR ABOUT 127 GIGAWATTS OF ADDITIONAL ELECTRIC GENERATING CAPACITY BY THE YEAR 2000, INCLUDING ABOUT 33 GIGAWATTS CURRENTLY UNDER CONSTRUCTION. THIS TOTAL IS EQUIVALENT TO BUILDING ABOUT 127 MAJOR NUCLEAR POWER GENERATING PLANTS IN THE NEXT DECADE.

THE SIGNIFICANCE OF THIS PROJECTION IS THE 10- TO 12-YEAR LEAD TIME REQUIRED FOR REGULATORY APPROVAL AND CONSTRUCTION OF NEW STEAM GENERATION PLANTS. OBVIOUSLY, THE LEAD TIME FOR SUCH CONSTRUCTION IS BEING DISSIPATED BY EVERY PASSING MONTH. IN THE MEANTIME, NATURAL GAS COMBINED-CYCLE OR COMBUSTION TURBINES ARE RAPIDLY TAKING OVER THE MAJOR SHARE OF FUTURE PLANNED CONSTRUCTION.

THE PLAIN RESULT OF THIS GROWING RELIANCE UPON NATURAL GAS FOR ELECTRIC POWER GENERATION HAS NOT YET BEEN FULLY REFLECTED IN MOST SUPPLY AND DEMAND PROJECTIONS. THE RECENT WASHINGTON POLICY AND ANALYSIS REPORT I'VE MENTIONED, HOWEVER, STATES, AND I QUOTE:

. . . WE FELT CONFIDENT WITH A DETAILED ANALYSIS THAT SHOWED GAS SUPPLYING NEARLY ONE-SIXTH OF THE PRIMARY ENERGY USED IN GENERATING ELECTRICITY BY 2010. THIS ALONE WOULD REQUIRE ABOUT 6 TRILLION CUBIC FEET OF GAS ANNUALLY, OR MORE THAN TWICE AS MUCH AS IS BEING USED NOW BY THE ELECTRICITY INDUSTRY. UNQUOTE

A UNIQUE ATTRIBUTE OF THE PROVEN PRUDHOE BAY RESERVES, DUE TO THEIR MAGNITUDE, IS THE ABILITY TO SUPPLY A LONG-TERM -- UP TO AT LEAST 25 YEARS -- ASSURED SOURCE OF SUPPLY FOR THE

CONSTRUCTION AND FINANCING OF BASELOAD ELECTRIC GENERATING PLANTS.

IN SUMMARY OF DOMESTIC NEED, WE BELIEVE THAT BY ANY REASONABLE ASSESSMENT, THE PRUDHOE BAY GAS RESERVES WILL BE NEEDED BY AMERICAN CONSUMERS DURING A PERIOD COMMENCING ABOUT 1996.

THE REASONABLY PROJECTED DOMESTIC NEED FOR PRUDHOE BAY'S PROVEN GAS RESERVES SHOULD BY ITSELF BE SUFFICIENT TO DEMONSTRATE THAT GOVERNMENT AUTHORITIES AT ALL LEVELS SHOULD AVOID ANY ACTION THAT MIGHT JEOPARDIZE THE OVERLAND DELIVERY OF THAT GAS TO AMERICAN CONSUMERS. THERE ARE, IN ADDITION, TWO OTHER IMPORTANT CONSIDERATIONS.

FIRST: THERE IS SIMPLY NOT ENOUGH PROVED AND ECONOMICALLY TRANSPORTABLE GAS RESERVES ON THE NORTH SLOPE TO WARRANT CONSTRUCTION OF TWO MAJOR GAS CONDITIONING PLANTS AND TWO LARGE-DIAMETER PIPELINE SYSTEMS IN THE SAME TIME FRAME.

THE ONLY BASIS UPON WHICH A MAJOR GAS TRANSPORTATION SYSTEM CAN BE FINANCED AND CONSTRUCTED IS PROVED RESERVES. PROVED RESERVES, AS YOU KNOW, ARE SOMETHING ENTIRELY DIFFERENT FROM UNDISCOVERED RESOURCES AND OTHER SPECULATIVE CATEGORIES OF POTENTIAL GAS FINDINGS.

THE ANGTS HAS ALWAYS RELIED UPON THE 26 TCF OF PROVED GAS RESERVES AT PRUDHOE BAY, NOTABLY GAS ASSOCIATED WITH THE PRODUCTION OF OIL AND THEN REINJECTED INTO THE PRUDHOE BAY FIELD. THIS IS WELL ESTABLISHED IN THE PRESIDENT'S DECISION OF SEPTEMBER 1977 AND ELSEWHERE IN THE REGULATORY RECORD. THIS GAS REQUIRES MINIMAL GATHERING OR PRODUCTION EXPENDITURES. MOREOVER,

IT IS CONCENTRATED IN A SMALL AREA WITH SUBSTANTIAL EXISTING SUPPORT FACILITIES. FOR THESE REASONS, TOGETHER WITH THE LARGE QUANTITY OF PROVEN RESERVES, GAS IN THE GENERAL PRUDHOE BAY AREA--INCLUDING THE ENDICOTT, KUPARUK, AND LISBURNE RESERVOIRS--IS TRULY THE "CREAM" OF WHATEVER GAS RESOURCES MAY EXIST ON THE NORTH SLOPE. THESE CONSIDERATIONS WOULD BE IMPORTANT IN MOST OTHER PARTS OF THE WORLD, BUT THEY ARE OF CRITICAL IMPORTANCE TO ECONOMIC VIABILITY IN THE ARCTIC. WITH RESPECT TO ANY OTHER POTENTIAL, BUT UNPROVEN OR UNDEVELOPED NORTH SLOPE GAS SOURCES, WE CAN SAY WITH REASONABLE CONFIDENCE THAT--EVEN UNDER THE BEST OF CIRCUMSTANCES--UNCERTAINTIES AS TO GAS AVAILABILITY, TRANSPORTABILITY, AND COSTS WILL DELAY ANY MAJOR PIPELINE PROJECT RELYING ON SUCH POTENTIAL ALTERNATIVES UNTIL LONG AFTER A PROJECT USING THE PRUDHOE BAY GAS COMES ON STREAM.

AS INDICATED BY THE EXPERT TESTIMONY OF MR. JAMES JENSEN OF JENSEN ASSOCIATES, INC., WHOSE STATEMENT I'VE PLACED IN YOUR RECORD, THE CHOICE IS CLEAR FOR THE REASONABLY FORESEEABLE FUTURE, EXTENDING WELL INTO THE NEXT CENTURY: EITHER GAS WILL BE AVAILABLE FOR AMERICAN CONSUMERS WHEN NEEDED OR PRUDHOE BAY GAS WILL BE COMMITTED TO SOME OTHER LARGE-SCALE PURPOSE, BUT NOT BOTH.

A SECOND MAJOR CONSIDERATION FOR GOVERNMENT AUTHORITIES IS THE BODY OF UNRESOLVED LEGAL ISSUES RAISED BY YUKON PACIFIC CORPORATION'S PROPOSED EXPORT PROJECT. THESE ISSUES NO DOUBT WILL HAVE TO BE RESOLVED BY THE FEDERAL COURTS. I WILL NOT FURTHER ELABORATE OTHER THAN TO REEMPHASIZE THAT THE ANGTS SPONSORS HAVE ALREADY INVESTED ABOUT \$1.5 BILLION DOLLARS IN GOOD

FAITH RELIANCE ON EXPLICIT GOVERNMENT REPRESENTATIONS. WE WILL TAKE ALL NECESSARY ACTIONS IN THE APPROPRIATE FORUMS TO PROTECT THE SPONSORS' INTERESTS IN THAT INVESTMENT AND WILL CONTINUE TO WORK TOWARD THE STATED NATIONAL OBJECTIVE OF PROVIDING PRUDHOE BAY GAS TO LOWER-48 CONSUMERS AT THE EARLIEST OPPORTUNITY.

I SAID EARLIER THAT I WOULD ELABORATE ON THE REVISED COST ESTIMATE FOR THE ANGTS. THE DELIVERED GAS PRICE TO THE LOWER-48 STATES IS A CRITICAL DETERMINANT OF FEASIBILITY AND TIMING OF AN OVERLAND PIPELINE SYSTEM FROM ALASKA. I'LL NOW EXPLAIN WHY WE'RE CONFIDENT THAT THE PRUDHOE BAY GAS WILL BE SALABLE TO AMERICAN CONSUMERS ON A FREE-MARKET BASIS, WITHOUT GOVERNMENT SUBSIDY, DURING THE PERIOD 1996 TO 2021.

I WILL FIRST REVIEW THE PRICES PROJECTED FOR IMPORTS BY THE U.S. OF PIPELINE GAS AND LNG SO THAT WE HAVE A BASIS FOR DETERMINING WHETHER THE ANGTS GAS REASONABLY COULD BE COMPETITIVE WITH THESE POTENTIAL ALTERNATIVES.

THE GAS RESEARCH INSTITUTE, A WELL-RECOGNIZED ANALYTICAL ORGANIZATION, HAS FORECAST "ACQUISITION PRICES" AT THE U.S. BORDER FOR BOTH PIPELINE IMPORTS AND LNG OF \$3.20 PER MILLION BTUs IN 1995, \$3.32 IN 1996 AND ABOUT \$6.50 IN THE YEAR 2010. ALL OF THESE PRICES ARE EXPRESSED IN CONSTANT 1987 DOLLARS.

A RISING TREND IN REAL PRICE--THAT IS, IN ADDITION TO ANY INCREASES IN THE GENERAL PRICE LEVEL DUE TO INFLATION--IS CLEARLY EVIDENT. IT IS IMPORTANT TO NOTE THAT GRI FORECASTS AN INCREASING TOTAL DOMESTIC DEMAND FOR NATURAL GAS THROUGH 2010 DESPITE THIS INCREASE IN REAL PRICES. WITH THESE FIGURES AS A BACKGROUND FOR COMPARISON PURPOSES, I WILL ADDRESS THE PRICE AND

MARKETABILITY OF ALASKAN GAS AS DELIVERED BY PIPELINE THROUGH CANADA TO THE U.S. BORDER.

BEFORE DOING SO, I WOULD OBSERVE THAT EXPERT GAS MARKET ANALYSTS REASONABLY MIGHT DIFFER OVER ANY PARTICULAR FORECAST OF GAS PRICES, WHICH NECESSARILY IS BASED ON ASSUMPTIONS REGARDING FUTURE ECONOMIC GROWTH, WORLD OIL PRICES, ETC.

OF OVERRIDING IMPORTANCE, HOWEVER, IS THE FACT THAT THERE IS A CONSENSUS AMONG QUALIFIED OBSERVERS THAT THE REAL PRICE OF BOTH LOWER-48 GAS PRODUCTION AND GAS IMPORTS WILL RISE OVER THE YEARS AHEAD. ONLY THE RATE OF INCREASE MAY DIFFER. THIS FACT, AS I WILL DEMONSTRATE, VIRTUALLY ASSURES THE DOMESTIC MARKETABILITY OF ALASKAN PIPELINE GAS AND LEAVES OPEN ONLY THE QUESTION OF SPECIFIC TIMING.

NOW, THE SALABILITY OF ALASKAN PIPELINE GAS OBVIOUSLY WILL BE DETERMINED BOTH BY THE CAPITAL COSTS OF THE PIPELINE SYSTEM AND THE WELLHEAD PRICE OF THE GAS.

IN MAY 1988, THE U.S. AND CANADIAN SPONSORS OF THE ANGTS COMPLETED AN IMPORTANT REESTIMATE OF THE CAPITAL COST OF THE REMAINING ELEMENTS OF THE ANGTS. THE STUDY DREW UPON AN EXTENSIVE BODY OF PROPRIETARY AND CONFIDENTIAL INFORMATION DEVELOPED SINCE OUR EARLIER COST ESTIMATES PREPARED IN THE LATE 1970s AND EARLY 1980s. IT TOOK INTO CONSIDERATION:

- ADVANCES IN PIPELINE DESIGN,
- INFORMATION GATHERED FROM EXTENSIVE FIELD TESTING PROGRAMS AND OPTIMIZATION STUDIES CONDUCTED BY THE PROJECT SPONSORS, AND
- SIGNIFICANT CHANGES IN THE ECONOMIC CLIMATE.

THE RESULT WAS A DRAMATICALLY LOWER COST ESTIMATE, RESULTING IN PART FROM THE FOLLOWING:

- REDUCED CONSTRUCTION SCHEDULE,
- IMPROVED WELDING TECHNOLOGY,
- MORE TRADITIONAL OWNER/CONTRACTOR FUNCTIONS,
- USE OF EXISTING COMMUNICATION SYSTEMS,
- REDUCED CONTINGENCY ALLOWANCES,
- HIGHER PRESSURE, SMALLER DIAMETER MAINLINE PIPE, BUT HIGHER GAS THROUGHPUT, AND
- MORE MODEST ASSUMPTIONS ABOUT THE RATE OF INFLATION AND INTEREST RATES.

EXPRESSED IN 1988 DOLLARS, THE CAPITAL COST OF THE PROJECT, INCLUDING THE NORTH SLOPE CONDITIONING PLANT, TOGETHER WITH THE REMAINING PIPELINE SEGMENTS IN ALASKA, CANADA AND THE LOWER-48 STATES, WAS ESTIMATED AT \$14.6 BILLION, COMPARED TO \$26.1 BILLION IN THE EARLIER ESTIMATE--APPROXIMATELY A 45% REDUCTION. THIS, IN TURN RESULTED IN A NEW, LOWER COST OF THE PIPELINE DELIVERY SERVICE.

BASED ON THE NEW CAPITAL COST ESTIMATE, THE TRANSPORTATION COST OF DELIVERING ALASKAN GAS TO THE LOWER-48 STATES IS \$2.44 PER MILLION BTUS IN THE YEAR 1996, EXPRESSED IN 1987 DOLLARS.

WITH A REASONABLE ALLOWANCE FOR THE WELLHEAD PRICE OF THE GAS ADDED, THE ALASKAN GAS OBVIOUSLY WOULD BE COMPETITIVE WITH THE PROJECTED PRICE IN 1996 OF \$3.32 FOR IMPORTS AND LNG THAT I MENTIONED EARLIER.

UP TILL NOW, I'VE USED A 1996 INITIAL IN-SERVICE DATE AS AN EXAMPLE. THE ANGTS GAS WOULD BE COMPETITIVE AT THAT TIME BASED

ON THE PROJECTED PRICES; HOWEVER, THE SPECIFIC DATE THAT THE ALASKAN GAS WILL FLOW WILL BE DETERMINED BY ACTUAL DEVELOPMENTS IN THE MARKET PLACE, INCLUDING THE WORLD PRICE OF OIL. IN THIS REGARD, SEVERAL KEY FACTORS WILL MAKE THE ANGTS GAS MUCH MORE SALABLE AS TIME PASSES. THEY ARE:

- FIRST, THE CAPITAL COSTS OF THE "PREBUILT," OPERATING PORTIONS OF THE SYSTEM--ABOUT 1/3 OF THE TOTAL MILEAGE--CONTINUE TO BE DEPRECIATED. THIS RESULTS IN A PROGRESSIVELY LOWER TRANSPORTATION COST OF SERVICE, AND
- SECOND, AS I'VE PREVIOUSLY STATED, THE REAL COST OF GAS IMPORTS, LNG, AND OTHER ALTERNATIVES IS PROJECTED BY MOST OBSERVERS TO RISE SUBSTANTIALLY OVER TIME. ON THE OTHER HAND, BOTH THE PRUDHOE BAY GAS PRICE AND PIPELINE CONSTRUCTION COSTS SHOULD REMAIN ESSENTIALLY LEVEL IN REAL DOLLAR TERMS. THE PRUDHOE BAY GAS, IT SHOULD BE NOTED, WILL INCUR VIRTUALLY NO ADDITIONAL PRODUCTION OR GATHERING COSTS. THE NET EFFECT IS TO MAKE ALASKAN PIPELINE GAS PROGRESSIVELY MORE ATTRACTIVE THAN POTENTIAL ALTERNATIVES IN THE YEARS AHEAD.

THE ANGTS SPONSORS RECOGNIZE CLEARLY THE RADICALLY ALTERED DOMESTIC GAS MARKET TODAY AS COMPARED TO THE LATE 1970s WHEN THE ALASKA GAS PIPELINE PROJECT WAS INITIATED. AT THAT TIME, A HANDFULL OF MAJOR INTERSTATE GAS TRANSMISSION COMPANIES PLANNED TO PURCHASE THE PRUDHOE BAY GAS FOR RESALE FROM THEIR OWN INVENTORY. EVEN THEN, IT WAS DETERMINED THAT THIS GAS WOULD BE ACCESSIBLE TO LOCAL DISTRIBUTION COMPANIES IN 47 OF THE LOWER-48 STATES. TODAY, WITH THE EMPHASIS ON OPEN ACCESS TO

TRANSPORTATION SERVICES, WE EXPECT AN EVEN MORE WIDELY SPREAD UTILIZATION.

WE HAVE NOTED PREVIOUSLY THAT THE LONG-TERM, ASSURED SOURCE OF SUPPLY REPRESENTED BY THE PRUDHOE BAY GAS IS HIGHLY ATTRACTIVE. THESE ATTRIBUTES ARE PARTICULARLY IMPORTANT AS GAS INCREASINGLY BECOMES THE FUEL OF CHOICE FOR MAJOR ELECTRIC GENERATING PLANTS. THE SUCCESSFUL FINANCING OF MAJOR COMBINED-CYCLE AND COMBUSTION TURBINE GAS PLANTS REQUIRES ASSURANCE OF GAS SUPPLY AND REASONABLY PREDICTABLE PRICES. THE ALASKAN GAS, THROUGH THE ANGTS, CAN MEET THAT REQUIREMENT.

AS THE SO-CALLED GAS "BUBBLE" DISSIPATES OVER THE NEXT TWO YEARS, AS MOST RESPONSIBLE OBSERVERS PREDICT, THE SPOT MARKET FOR GAS PURCHASES IS LIKELY TO BECOME MORE UNPREDICTABLE AND, THEREFORE, LESS ATTRACTIVE. UNDER THESE CIRCUMSTANCES, WE FORESEE A RENEWED RECEPTIVENESS TO LONG-TERM SUPPLY ARRANGEMENTS, WHICH WILL SUPPORT BUILDING THE ANGTS.

IN SUMMARY, ALASKAN PIPELINE GAS, BASED ON REASONABLE PRICE PROJECTIONS FOR POTENTIAL ALTERNATIVES, SHOULD BE VERY SALABLE IN THE DOMESTIC MARKET DURING THE PERIOD COMMENCING ABOUT 1996. THE DELIVERED GAS WILL BE INCREASINGLY COMPETITIVE EACH YEAR THAT PASSES FROM 1996 FORWARD INTO THE NEXT CENTURY AS THE REAL PRICES OF ALTERNATIVES CONTINUE TO RISE.

IN CLOSING, I WANT TO REITERATE THE ANGTS SPONSORS' CONVICTION THAT THE PRUDHOE BAY GAS RESERVES WILL BE NEEDED BY AMERICAN CONSUMERS. ONLY THE PRECISE TIMING OF AN OVERLAND PIPELINE DELIVERY SYSTEM CANNOT BE SPECIFIED. ONE FINAL NOTE: WE ARE VERY MUCH AWARE OF YOUR INTEREST, ALONG WITH MOST OTHER

ALASKANS, IN SEEING THE NORTH SLOPE GAS BROUGHT TO MARKET AT THE EARLIEST POSSIBLE DATE. WE SHARE THAT INTEREST. WE SINCERELY BELIEVE THAT AN OVERLAND PIPELINE SYSTEM TO SERVE THE DOMESTIC U.S. MARKET REMAINS THE BEST AND THE EARLIEST POSSIBILITY TO MEET THAT OBJECTIVE. THANK YOU AGAIN MADAM CHAIRMAN.

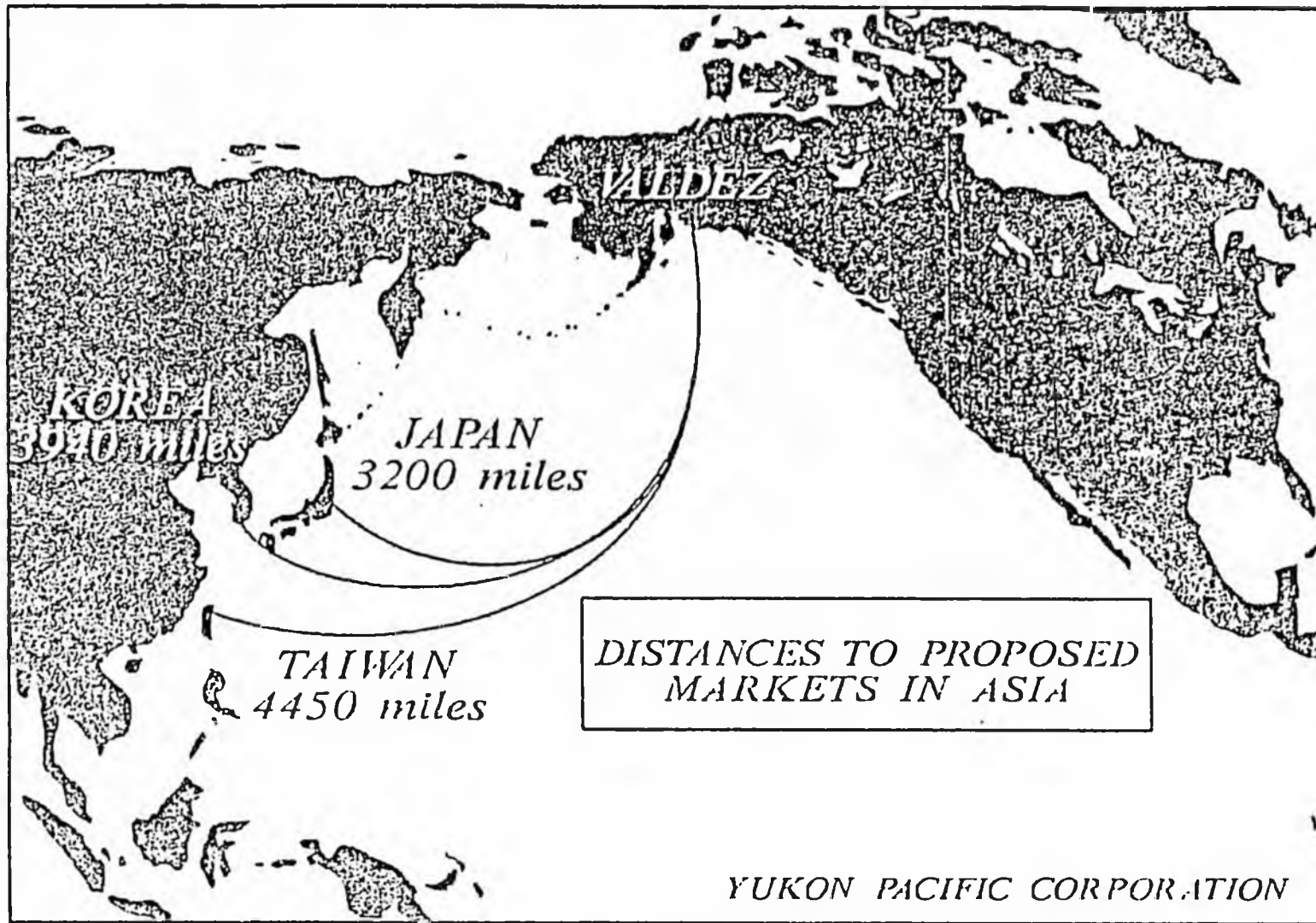


YUKON
PACIFIC
CORPORATION

TRANS-ALASKA PIPE SYSTEM

CSX Corporation

- Majority owner of Yukon Pacific
- Major transportation company
- 1987 turnover:
\$8 billion on \$13.2 billion in assets



Phase I TAGS Permits

1. Define F.E.R.C. role
2. Obtain Federal Right-of-Way
(requires Environmental Impact Statement)
3. Obtain Presidential Finding
(required under ANGTA)
4. Obtain State Right-of-Way
5. Obtain Federal Export License

Phase I TAGS Permits

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5. Obtain Federal Export License *

* Application pending, awaiting decision

YUKON PACIFIC CORPORATION TASKS

PHASE II

- o Detailed Design
- o Detailed Permitting
- o Final Cost Estimate
- o Final Contracts

Asian LNG Demand by 2000

(million tons)

	<u>Currently under Contract</u>	<u>Projected by 2000</u>		<u>Total New Demand</u>	
		1987	1989	1987	1989
Japan	34.0	38.0	48.0	4.0	14.0
Korea	2.0	3.5	8.7	1.5	6.7
Taiwan	<u>1.5</u>	<u>3.0</u>	<u>4.5</u>	<u>1.5</u>	<u>3.0</u>
TOTAL	37.5	44.5	61.2	7.0	23.7

Source: Government and Research Institute Projections in each country

Reasons for LNG Demand Growth in Asia

- Greater electricity demand than expected
- LNG more competitive, especially vs. nuclear
- Rising environmental concerns
- Diversification to reduce energy source risk
- Distribution infrastructure is growing

Alaska LNG is Competitive in Asia

- Price competitive
- Economies of scale
- U.S. a secure supplier
- Expand U.S. trade where most needed

Capital Cost Estimates

(\$ millions)

	<u>To Deliver 7MMT/YR</u>	<u>To Raise to 14MMT/YR</u>	<u>TOTAL</u>
Alaska facilities	6,816	1,824	8,640
Shipping	<u>980</u>	<u>1,120</u>	<u>2,100</u>
Total	\$7,796	\$2,944	\$10,740

Economic Feasibility

- Sales threshold of 7-8.5 mmt in mid-1990's.
- Economic studies based on \$24/bbl crude oil and LNG price of \$4/mmmbtu.
- Price will fluctuate up and down with crude oil.
- Alaska does not have a posted crude oil price.

TAGS Gas Supply

North Slope Gas Reserves 36 TCF

Undiscovered Resources 102 TCF

Gas Ownership:

ARCO, EXXON, British Petroleum,
State of Alaska and minor owners

"Undiscovered, recoverable supplies of natural gas from Alaska's North Slope may exceed 100 trillion cubic feet."

Presidential Finding Excerpt
Yukon Pacific Corporation
Exhibit "M"

STATE INCENTIVES TO MOVE FORWARD

- Tax, Royalty Income of \$ 1-2 million/day.
- 10,000 Construction jobs.
- 550 Permanent jobs.
- Spur to other exploration, refining
- Alaska's largest opportunity

What can the State do to help?

- Continue International Trade Office efforts. Customers and competitors are governments; it helps for our government to lend support.
- Continue cooperative efforts in right-of-way and environmental permitting.
- Maintain stable tax climate.
- Enter into royalty gas sales discussions when appropriate.



BP EXPLORATION

B.E. Grote
Vice President
Commercial, Alaska

BP Exploration (Alaska) Inc.
900 East Benson Boulevard
P.O. Box 196612
Anchorage, Alaska 99519-6612
(907) 564-5121

BP EXPLORATION POSITION REGARDING NORTH SLOPE NATURAL GAS

- BP Exploration is the owner of approximately 25% of the 26 trillion cubic feet of gas at Prudhoe Bay.
- We are determined to see the gas developed as soon as possible and have continuously sought out alternatives for moving the gas to market.
 - We have been a member of the ANGTS Design and Engineering Cooperative Agreement since 1980.
 - We have evaluated a wide range of options, including TAGS, since the initial delay of ANGTS announced in 1982.
- In March, 1984, we spoke before the Alaska State Legislature Joint Committee on Oil and Gas indicating our support of ANGTS as the most likely means of getting gas to market.
- While BP Exploration continues as an ANGTS participant, we now believe that the progress made by Yukon Pacific warrants full consideration.
- E.J.P. Browne, Chief Executive, BP Exploration, U.S.A., stated in February that BP is willing to work with Yukon Pacific to determine if the TAGS project is possible and would be prepared, under the right circumstances, to commit our gas to the project.
- Both ANGTS and TAGS face a number of major hurdles -- most serious of which are the uncertainties of future energy prices and the sheer scale of both projects.
- In the absence of a gas pipeline, we still strive to get maximum benefit from the gas being produced -- as fuel for field production facilities and the Trans-Alaska Pipeline, as a component of miscible injectant for enhanced oil recovery, and finally by reinjecting the remainder to maintain reservoir pressure.
- The State of Alaska can help progress North Slope gas development by working to prevent the creation of any barriers that would restrict the range of options available for consideration.

March 10, 1989

STATEMENT OF JUDD MILLER, JR.
VICE PRESIDENT, EXXON COMPANY, U.S.A.
BEFORE THE SENATE SPECIAL COMMITTEE ON OIL AND GAS
ALASKA STATE LEGISLATURE
MARCH 10, 1989

My name is Judd Miller, Jr., Vice President of Exxon Company, U.S.A. I am responsible for Exxon's marketing and transportation of natural gas in the United States. Exxon appreciates the opportunity to testify at this hearing today on the prospects of commercializing North Slope gas.

Summary

Substantial gas reserves exist on the North Slope of Alaska. Exxon, like the state and its citizens, has a substantial interest in seeing these reserves commercialized. However, the reserves are far distant from any market. The transportation system required will be huge both in scope and magnitude of dollars required with a long lead time needed to bring the project into operation. Before such a project can move forward there must be evidence of markets and prices sufficient to provide reasonable assurance to the many participants that the investment will be sound. Today, neither an overland pipeline to the lower 48 states nor the export of liquified natural gas (LNG) to Far East markets is economic. Real growth in energy prices and in market demand will be necessary before any project to move North Slope gas reserves to market can be economic.

Since the discovery of the Prudhoe Bay field over 20 years ago, Exxon has considered and reconsidered many alternative methods of commercializing the gas reserves including a pipeline to the lower 48 states, liquefaction and shipment to domestic or foreign markets, and less conventional alternatives such as chemical conversion to methanol or petrochemical facilities at a south Alaska tidewater location. Based on these studies, Exxon believes that the best market for Alaska's North Slope gas will be the lower 48 states and that an overland pipeline will be the best mode of transportation to that market. We have serious concerns that LNG made from North Slope gas would not be competitive in Far East markets because of the large and unique pipeline investment required; an investment that competing LNG suppliers in the Far and Middle East would not incur.

Nevertheless, the Trans-Alaska Gas System (TAGS) sponsors are to be complimented for their efforts to develop an outlet for North Slope gas. Although we have serious reservations about the LNG export project, Exxon does not want to discourage anyone from proposing promising alternatives for commercializing Alaska's North Slope reserves.

Introduction

I would like nothing better than to tell you today that commercial development of Alaska's North Slope reserves is at hand. However, I cannot do that. In reality, neither an overland pipeline to the lower 48 states nor the export of LNG to Far East markets is economic at today's prices. An assured market and a substantial real growth in energy prices will be required before a project to commercialize North Slope gas reserves can be economic. Exxon believes that such a market will develop in the lower 48 states which will

ultimately be the best market for North Slope gas. We further believe that an overland pipeline is the best mode of transportation to that market.

Exxon, like the State and its citizens, has a substantial interest in seeing these reserves commercialized. Exxon has approximately a 37 percent working interest in the gas reserves in the Prudhoe Bay Field and significant interests in Point Thomson and other nearby fields. Commercialization of these reserves would provide new job opportunities, further economic development and additional revenue for Alaska, as well as substantial income for Exxon.

Project Scope and Fundamentals

The Prudhoe Bay Field alone is estimated to contain 26 Tcf of gas.¹ There is also an estimated 8 Tcf of gas in Point Thomson and other nearby fields.² Any project to commercialize reserves of that magnitude would be a major, world-scale endeavor by any standards. Whether it is an overland pipeline to the lower 48 states or the export of LNG to Far East markets, it will be one of the largest privately financed projects in the free world.

The magnitude of the financial and business undertakings are as significant as the physical scope of the facilities. Large investments will be required -- \$10 billion or more -- and the lead times will be long -- 5 or more years of substantial investment -- before a single dollar of revenue will be received and many more years before any return on the investment can be realized. Numerous interests must be brought together, including the owners of the gas on the North Slope, the buyers of the gas, the pipeline owners, governments and financial institutions. Financing will require complex arrangements involving numerous entities and will only be possible if the project's economic basis is fundamentally sound.

Investors in a project of that magnitude will require stable supplies, dependable markets and a product which can be priced at a competitive level. In addition to these market fundamentals, a stable government fiscal and regulatory environment will be essential.

Alternatives Considered to Market North Slope Gas

Since the discovery of the Prudhoe Bay Field, Exxon has considered and reconsidered many alternative methods of commercializing Alaska North Slope gas reserves. These considerations have included overland pipelines to the lower 48 states and transportation of the gas to a tidewater port for liquefaction and shipment to domestic or foreign markets. Less conventional

¹ Alaska Department of Natural Resources, Historical And Projected Oil And Gas Consumption January 1989.

² Id.

alternatives, such as chemical conversion to methanol and locating petrochemical facilities at tidewater have also been studied. Based on our consideration of many alternatives, we have consistently concluded that the best market for North Slope gas will develop in the lower 48 states and that an overland pipeline will be the most economical and efficient method for delivering the most energy to that market.

At the time the present project for an overland pipeline was selected by the President and Congress, a competing project was also considered under which North Slope gas would be transported by pipeline to a tidewater port on the southern coast of Alaska and there liquified and shipped as LNG to California. That project was ultimately rejected because an overland pipeline could transport gas more efficiently and could be expanded at lower cost than an LNG project. Following selection of the Alaska Natural Gas Transportation System (ANGTS), Exxon participated as a member of the pipeline/producer consortium performing the design and engineering of the system. We remain active in that consortium to this day.

Overland Pipeline to Lower 48 States

Studies by the American Gas Association³ and Gas Research Institute⁴ have concluded that North Slope gas can be accommodated in the lower 48 states after the year 2000 and that energy prices will increase to a level which will make North Slope gas economic. These studies indicate that the Lower 48 demand will be sufficient to accommodate all domestic gas production, imports from other countries, as well as gas from the North Slope of Alaska. Our conclusions are generally consistent with those studies. We are optimistic that an overland pipeline to deliver the gas to the lower 48 states can be constructed in the time frame indicated by the studies.

In 1988, the pipeline sponsors of the ANGTS announced a 45 percent reduction in their prior cost estimate for the ANGTS. Given the improvements in pipeline design and construction techniques since their prior estimate, Exxon agrees that the cost of building the ANGTS can be significantly reduced as suggested by the ANGTS pipeline sponsors. Further reductions in cost that would enhance the economics of transporting the gas to the lower 48 states may also be possible.

An overland pipeline is a safe and efficient means of transporting energy over long distances. In addition, an overland pipeline can be expanded at relatively low cost if needed to accommodate new discoveries. Such expansion capability would encourage exploration for new gas reserves.

³ American Gas Association, The Gas Energy Supply Outlook, October 1987.

⁴ Gas Research Institute, 1987 GRI Baseline Projection Of U.S. Energy Supply And Demand To 2010, December 1987; 1988 GRI Baseline Projection Of U.S. Energy Supply And Demand (Preliminary) August 1988.

The use of North Slope gas in the lower 48 states will enhance U.S. energy security and ensure a stable long term supply of environmentally desirable fuel. Utilization of North Slope gas to meet U.S. energy needs can back out 400,000 to 600,000 barrels per day of imported oil.

Trans-Alaska Gas System

Lately, much attention has been focused on exports of North Slope gas as LNG to markets in the Far East. Governor Hickel and the team at Yukon Pacific are to be complimented for their efforts to develop the TAGS project. The TAGS project is a complex project consisting of integrated pipeline, liquefaction, shipping and regasification facilities. The 800-mile pipeline through Alaska would, in itself, be a project rivaling the Trans-Alaska oil pipeline. The LNG facility would be one of the world's largest and would require a substantial LNG ship fleet as well.

Exxon has considered the export of North Slope gas to the Far East and I must tell you that we have serious reservations that such a project would be competitive with other supplies in that market. Because of the substantial investment required to transport North Slope gas across Alaska, the LNG from such a project would be at a severe competitive disadvantage relative to other Far East and Middle East sources of LNG that would not be burdened by such a large pipeline investment. The supplies of LNG potentially available from these other sources vastly exceed any forecasts of demand for LNG in the Far East.

I have two charts that demonstrate this graphically. The first is a map which shows the potential supplies of LNG for Far East markets. The numbers shown under each country represent that country's gas reserves expressed in trillions of cubic feet. As shown, there is a lot of gas in the Far East and Middle East. The arrows from Alaska reflect the distances that North Slope LNG would be transported using tankers that are estimated to cost 2.4 billion dollars. The dashed line across Alaska represents the 5.4 billion dollar pipeline to Valdez, which, on an investment basis, is equivalent to adding 7,600 miles to the LNG shipping distance. Thus, North Slope gas is effectively 11,000 miles from Japan. 11,000 miles is roughly equal to one-half the circumference of the earth, therefore, all else being equal, LNG from almost anywhere in the world could be delivered more economically to the Far East than North Slope gas.

The table on my next chart puts shipping distances and potential supplies for the Far East into perspective. Shown are various countries arranged by their distance to Japan. Shown for each country are its estimated total proven reserves, the reserve which may be needed to meet current contracts assuming they are extended to the year 2020, and the remaining uncommitted reserves. As you can see, there are 1,127 trillion cubic feet of uncommitted reserves that are effectively closer to Japan than Prudhoe Bay. That volume is roughly 33 times the total known reserves on the North Slope. Assuming an export volume of 14 million tons of LNG per year, the suppliers closer to Far East markets than the North Slope could deliver that volume for over 1,400 years.

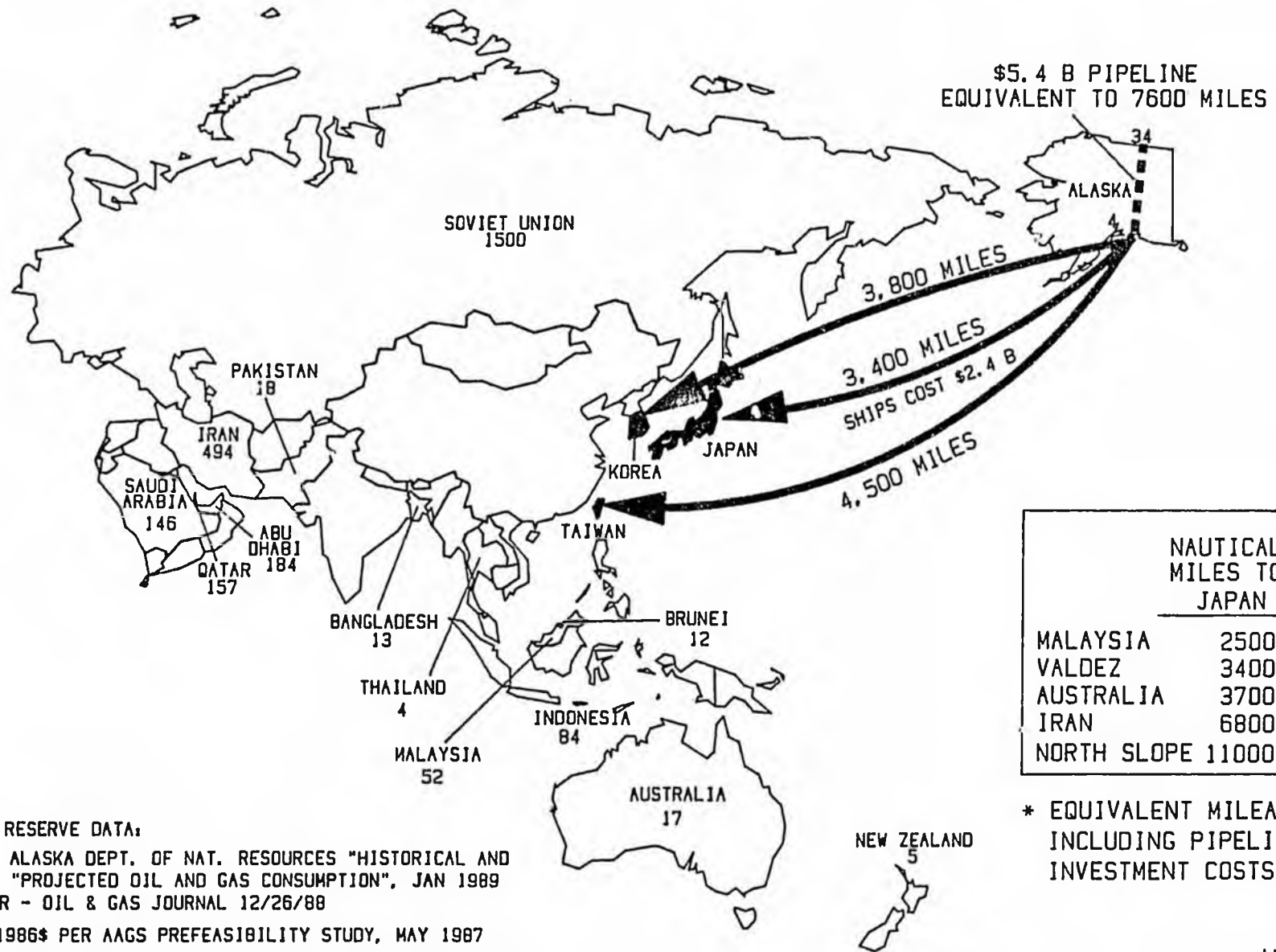
I would not want to be interpreted as suggesting that all of these reserves will be made available to Far East markets soon or even ever. However, it is clear that should Far East demand grow so that the full TAGS volume of 14 million tons of LNG per year could be accommodated, North Slope LNG would be the high cost supply in a potentially oversupplied market and thus, would not be competitive with other LNG supplies. (It should be noted that in Exxon's view, a smaller 7-8 million tons of LNG per year project would be grossly uneconomic.) It is also clear that there are ample supplies of gas in other countries that could be competitive in Far East markets.

Conclusion

Alaska's North Slope gas reserves are an important component of the energy future of both Exxon and the state of Alaska. On balance, Exxon continues to believe that an overland pipeline to the lower 48 states will be the best alternative for commercializing North Slope gas. In reaching this conclusion, numerous alternatives to bring these reserves to market have been studied. While Exxon has serious reservations about an LNG export project, we would not want to discourage anyone from proposing promising alternatives for commercializing the reserves. We will continue to examine options to market North Slope gas considering the market fundamentals against which any project must be tested.

POTENTIAL SUPPLIERS OF LNG TO FAR EAST MARKETS

XX = TCF OF RESERVES



SOURCE OF RESERVE DATA:

ALASKA - ALASKA DEPT. OF NAT. RESOURCES "HISTORICAL AND
"PROJECTED OIL AND GAS CONSUMPTION", JAN 1989

ALL OTHER - OIL & GAS JOURNAL 12/26/88

COSTS IN 1986\$ PER AAGS PREFEASIBILITY STUDY, MAY 1987
DISTANCES PER "WORLD-WIDE MARINE DISTANCE TABLES", 1976

* EQUIVALENT MILEAGE
INCLUDING PIPELINE
INVESTMENT COSTS.

POTENTIAL SUPPLIERS OF LNG TO FAR EAST MARKETS

COUNTRY	APPROXIMATE NAUTICAL MILES TO JAPAN	ESTIMATED PROVED RESERVES (TCF)		
		TOTAL	REQUIRED TO MEET EXISTING CONTRACTS IF EXTEND TO 2020	UNCOMMITTED
Brunei	2400	12	9	3
Malaysia	2500	52	11	41
Indonesia	2900	84	26	58
Thailand	3000	4	-	4
U.S.-South Alaska	3400	4	2	2
Australia	3700	17	11	6
Bangladesh	4500	13	-	13
New Zealand	4800	5	-	5
Pakistan	5800	18	-	18
Abu Dhabi	6300	184	4	180
Qatar	6500	157	-	157
Saudi Arabia	6600	146	-	146
Iran	6800	494	-	494
Reserves effectively closer than North Slope:		1190	63	1127

33 TIMES THE KNOWN NORTH SLOPE
 GAS RESERVES. EQUIVALENT TO
 14 MT OF LNG (.8 Tcf) PER YEAR
 FOR OVER 1,400 YEARS.

SOURCE OF TOTAL RESERVES DATA:

- South Alaska & North Slope - Alaska Department of Natural Resources publication entitled "Historical and Projected Oil and Gas Consumption" published January 1989.
- All others - Oil & Gas Journal 12/26/88

DISTANCES PER "WORLD-WIDE MARINE DISTANCE TABLES", 1976

Oil and Gas Overview

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

STEVE COWPER, GOVERNOR

PO. BOX 7034
ANCHORAGE, ALASKA 99510-7034

(907)762-2547

February 9, 1989

The Honorable Bettye Fahrenkamp, Chair
Senate Resources Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

FEB 15 1989

Dear Senator Fahrenkamp:

During the overview of oil and gas issues before the Senate Resources Committee last week, there were a number of questions posed by you and other members of the committee which required additional research to answer. A summary of those questions, and my written response for the committee record is provided below.

During our discussion of the United States-Canada Free Trade Act of 1988, you asked for the name of the individual responsible for the inclusion of the provision that requires vessels transporting ANS crude oil to Canada to be registered for the coastwise trade. The original terms of the treaty drafted by federal negotiators (see enclosed document entitled "Annex 205") required "...that such oil be transported to Canada from a suitable location within the lower 48 states."

As indicated in the April 26, 1988 Congressional Record-Senate, page 4744-45 (copy enclosed), Senator Stevens challenged this requirement on the basis that it was a violation of Article I, Section 9 of the Constitution. This requirement was subsequently deleted, but the language requiring "coastwise trade" registration appeared in its place in the implementing legislation, and is, of course, a provision of the interim regulations recently issued by the U. S. Department of Commerce. It is unclear from the legislative record who proposed the substitute language.

You also asked that I provide the committee with a copy of a map which indicates areas with oil and gas potential near the T.A.P.S. corridor which are proposed for leasing by the federal government. Based upon a follow-up conversation between Ms. Pam Rogers, the division's Lease Sales Manager, and Ms. Kay Kletka, the Bureau of Land Management's Oil and Gas Leasing Manager, BLM has no current plans to lease anywhere near the pipeline corridor. If you or other members of the committee have additional questions of Ms. Kletka, she can be reached in Anchorage at 271-3791.

The Honorable Bettye Fahrenkamp
February 9, 1989
Page 2

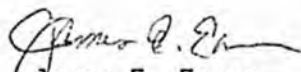
Senators Halford and Zharoff, as well as you, requested copies of the department's regulations governing the extension of the initial confidentiality period for well data. To clarify the record, the statute authorizing extensions is A.S. 31.05.035, not A.S. 38.05.035, as I recalled during our discussion. I have enclosed a copy of both A.S. 31.05.035 (a)-(e) and the pertinent regulations, 11 AAC 83.153 (a)-(d) for your review.

Senator Zharoff requested information on the current status of the federal Outer Continental Shelf lease sale in Bristol Bay. On October 9, 1988, the 9th U. S. Circuit Court issued a decision allowing former Secretary of the Interior Hodel to proceed with Sale 92, which had been suspended following an earlier challenge to the sale. On October 11, 1988, the Minerals Management Service opened the sealed bids which had been received earlier, and announced the sale results. I have enclosed a copy of an article from the October 22, 1988 edition of the Anchorage Daily News which describes these events in more detail.

According to Assistant Attorney General Gary Amendola, the state's attorney assigned to this case, the Department of Law filed a petition for hearing with the 9th Circuit Court on October 19, 1988. The Court has yet to act on that request. Should you or other members of the committee have additional questions on Sale 92 or the status of the state's litigation, Mr. Amendola can be reached in the Juneau office of the Department of Law at 465-2400.

Again, I would like to express my appreciation to you and the members of the Committee for your continuing interest in the department's oil and gas leasing program and for your support of our activities. If you have additional questions or would like further briefing on any of the issues before the division, please feel free to call.

Sincerely,


James E. Eason
Director

cc Commissioner Lennie Gorsuch
Carol Wilson, Special Assistant
Senator Drue Pearce

1726E

State asks court to reconsider lease decision

By BRIAN S. AKRE
The Associated Press

JUNEAU — The state has requested a rehearing of a federal appeals court's decision to allow the sale of oil leases on 5.6 million acres of Bristol Bay, home to the world's largest salmon fishery.

The petition for a rehearing was filed Wednesday with the 9th U.S. Circuit Court of Appeals in San Francisco. It also calls for the court to vacate its Oct. 5 decision pending a ruling on a rehearing.

The decision allowed Interior Secretary Donald Hodel to proceed with the oil-lease plan for Lease Sale 92. Bids totaling \$95.4 million were opened



Oct. 11 in Anchorage. Shell-Western and Amoco jointly offered the top bid of \$24 million for just under 5,700 acres.

The lease covers an area in the North Aleutian Basin off the southwest coast of Alaska that is home to some of the world's most productive fisheries and endangered species of birds and mammals. Eighty percent of the eastern population of the Pacific gray whales migrate there each spring and fall.

Opponents of the sale, including the fishing industry, argue that drilling would endanger the fisheries and the Native people who depend on fishing for food.

The state argues in the petition that the court misinterpreted the Outer Continental Shelf Lands Act by not providing the governor with enough influence over the lease decision.

Gov. Steve Cowper recommended against allowing the leases. He said the threat to fish in Bristol

Bay from drilling outweighed the marginal potential for oil.

Congress amended the act in 1978 "to provide the governor with an important role in the process" over whether and where leases should be granted by the interior secretary.

The appeals court's decision "diminishes the governor's role in the process to one not unlike that of any other member of the public who may comment on proposed federal actions," the state's petition says.

If the act "does not have enough teeth to allow the governor of Alaska to protect an ecological and environmental wonder like Bristol Bay, then the enactment is an illusion," the petition concludes.

The state also argues that the court overlooked an analysis of oil risks that it says was flawed with assumptions that were arithmetic nonsense. Hodel relied on the analysis in making his decision and, as a result, the decision was erroneous, the petition says.

1

Annex 902.5

Import Measures

1. The United States of America shall exempt Canada from any restriction on the enrichment of foreign uranium under section 161v of the *Atomic Energy Act*.

Export Measures

2. Canada shall exempt the United States of America from the Canadian Uranium Upgrading Policy as announced by the Minister of State for Mines on October 18, 1985.

3. The United States of America shall exempt Canada from the prohibition on the exportation of Alaskan oil under section 7(d) of the *Export Administration Act of 1979*, as amended, up to a maximum volume of 50 thousand barrels per day on an annual average basis, subject to the condition that such oil be transported to Canada from a suitable location within the lower 48 states.

S 4744

CONGRESSIONAL RECORD — SENATE

April 26, 1988

tervailing duties. Among the most significant changes are provisions which ensure that third-country dumping will be addressed. We see a number of provisions in this portion of the bill which are designed to make sure that we cut through efforts to hide dumping activities; that is, to sell foreign goods at below the cost of actual manufacturer here in the U.S. consumer market.

I want to take just a moment, Mr. President, to discuss the provisions of this conference report which pertain to something near and dear to my heart, and that is the small business sector of our economy. The language in the small business title of this measure closely parallels S. 1344, a small business trade bill which I introduced in the first session of this Congress. My bill served as the basis for the small business title in the Senate's trade bill. This title reflects the importance of the export side of the trade equation with regard to small business. In restoring balance to our trade accounts will require increased export activity on the part of all American industries, and that includes small business.

Small business and the small entrepreneurs have often served as the catalyst that is driving our economy. Small business can play a central role in efforts to expand our export base. We need to do more to encourage small firms to compete in today's world markets.

This bill takes several important steps, I submit, toward that end.

I think it would be truly tragic, I say to my colleagues, to waste an opportunity to enact these important provisions. Several years of very hard work have gone into this comprehensive trade measure. But all of these positive elements are now threatened because of the administration's misgivings about a few relatively insignificant provisions in the bill.

The veto of this trade bill would send the wrong signal to the working men and working women of this country. Americans know that something must be done now to combat the trade deficit. Indeed, in the town meetings that I routinely hold across the State of Tennessee I am continually asked "What is the President doing about the problem of foreign goods depriving us of our jobs? What is the Congress doing to make our goods more competitive on the international markets?"

I say, Mr. President, that those asking these questions, the working men and working women of this country, those in the business sector, are not satisfied with speechmaking or posturing on this critical issue of jobs, of trade, and of business and of our livelihood. They are looking for some sign that help is on the way for those Americans who have been hard hit by the trade deficit over the past 7 years.

I submit that we can send that signal with the passage of this legisla-

tion. We can also send a signal to our trading partners that while we believe in free trade here in the United States, traditionally we have been free traders and certainly those from the southern part of the United States, and while we believe in free trade, we also believe in fair trade. We can send a signal to markets around the world that we can and we will address our trade deficit. And we can assure the working men and women of this country that we are concerned about their interests, concerned about their livelihood, concerned about their jobs, and that we are doing what we can to look out for them.

A vote in support of this trade bill will send that type of positive message. I urge my colleagues to support this conference report. I hope that the President will put away his veto pen and back these constructive steps to make America competitive once again.

Mr. President, I suggest the absence of a quorum.

The PRESIDING OFFICER. The clerk will call the roll.

The bill clerk proceeded to call the roll.

Mr. STEVENS. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The PRESIDING OFFICER. Without objection, it is so ordered.

The Senator from Alaska [Mr. STEVENS] is recognized.

Mr. STEVENS. Mr. President, I come from a State that has a very small population and a very large area. I have a map of the State back here, and I will move back to the map to make a few observations.

Mr. President, my State is one-fifth the size of the entire United States. We are now the largest oil-producing State in the country. We are producing and sending 2 million barrels a day of oil down the trans-Alaska pipeline from Prudhoe Bay to Valdez.

Most people look at maps depicting the trans-Alaska pipeline and think that since it crosses only one State it must be a short distance. It is 800 miles. It is the same distance as if Prudhoe Bay were Duluth and Valdez were New Orleans.

People do not understand our State, and they quite often treat our State differently in Federal legislation.

This legislation discriminates against my State. I have had my staff prepare this small map of Alaska to try to explain our problem with this bill.

Our oil comes down from Prudhoe Bay and goes to Valdez. We now have a proposed refinery there to refine a portion of that oil. Part of the oil is actually taken out of the pipeline for the MAPCO and Petrostar Refineries near Fairbanks, and the residue of their operations is put back into the pipeline and delivered to the southern terminus at Valdez. We are not exporting, in effect, the incidental refined byproducts of those refineries because they go down with the rest of the

crude oil. We have another refinery, Tesoro, at Kenai.

Here is a State one-fifth the size of the United States, with the largest production of oil in the country, the greatest potential for future production of oil on the North American Continent, and there is a provision in this bill that says that of this 2 million-plus barrels of oil a day that comes down this pipeline, not more than 70,000 barrels a day could be exported as refined products from any new refinery. The catch in that provision is that that means 70,000 barrels from all new refineries that are built in Alaska from now on, if this bill becomes law.

Second, there is a provision that says that if the free trade agreement with Canada becomes effective, the 50,000 barrels a day that it was agreed we would export to Canada from Alaska under the proposed Free Trade Agreement will have to clear through a port in the contiguous 48 States, what we call the South 48. Mr. President, that is the reason for my presentation to the Senate today.

I would like the Senate to think about my home State of Alaska. If a person were standing at Tok, on the Canadian border, and flew to Attu. It would be the same as flying from Baltimore to San Francisco; or, going from Anchorage to Fairbanks is like going from here to Chicago.

People do not understand Alaska, and they come up with these amendments that sort of treat us as though we are a county of the State of Washington.

The whole western and northern coastal areas of Alaska have great potential for oil and gas. This provision would put into permanent Federal law a prohibition that no more than 70,000 barrels a day of refined products could be exported from production in these areas of Alaska. It is a concept which I am unable to accept, and I want to explain why.

Mr. President, I think that any Senator, when he wants to protect his State, should first turn to the Constitution. So let me read to the Senate article I, section 9, clause 6 of the Constitution. It provides:

No preference shall be given by any Regulation of Commerce or Revenue to the Ports of one State over those of another; nor shall Vessels bound to, or from, one State be obliged to enter, clear, or pay Duties in another.

I take the position that the provisions in this bill that are known as section 2474 are unconstitutional as applied to the State of Alaska. Those are the provisions that would amend the Mondale provision of the Alaska pipeline amendments to the Right-of-Way Act we passed in the Senate to authorize the construction of the Alaska oil pipeline.

During the long debate on the Alaska oil pipeline we had to accept some restrictions. One of them we did

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Unfortunately have to accept was the restriction that provided a prohibition against the export of any crude oil that was transported by the pipeline to be built across Federal lands from Prudhoe Bay to Valdez.

That unfortunately was constitutional because it was a condition in the grant of the right of way across Federal lands.

Now this provision would extend the prohibition against export to refined products, but only those from Alaska.

I have in my hand a report here that was prepared by the Energy Information Administration. It is the petroleum supply monthly report for August 1987. It sets forth the situation with regard to the issues in exporting crude oil.

I ask unanimous consent that the full portion of this report be printed in the Record at this point.

There being no objection, the material was ordered to be printed in the Record, as follows:

U.S. TERRITORIES

Of the 164,000 barrels per day of crude oil which was shipped from the 50 States and the District of Columbia in 1986, some 137,000 barrels per day were received at refineries in U.S. territories—U.S. Virgin Islands, Puerto Rico, and the Hawaiian Foreign Trade Zone. Nearly all of these shipments originated in Petroleum Administration for Defense District V (PAD District V), particularly in Alaska. This pattern of shipments and receipts developed after crude oil production on the Alaskan North Slope began in 1977. In 1986, refineries in the U.S. Virgin Islands, Puerto Rico, and Hawaiian Foreign Trade Zone reported about 8 percent of all Alaskan oil receipts (Table FES). Products refined from U.S.-origin crude oil may be exported to any foreign country or shipped to the United States. However, for the most part, the refined oil is shipped to U.S. markets. Almost all of the crude oil sent to the Virgin Islands is returned to the 50 States and District of Columbia as refined product. The total amount of refined products imported from the Virgin Islands exceeds the volume of U.S. crude oil shipped there. Likewise, Puerto Rico refineries also provide larger volumes of refined products to U.S. markets than they receive as crude oil.

The refinery in the U.S. Virgin Islands has received the largest volume of U.S.-origin crude oil in each year of these shipments. In recent years, the second largest volume was received by the refinery in the Hawaiian Foreign Trade Zone, although Puerto Rican refineries together had received more until 1984. In 1987, because the treatment of the Hawaiian Foreign Trade Zone was changed, Puerto Rico is expected to be the second-ranking export destination.

The Alaskan North Slope oil comes to terminals in Valdez, Alaska, at the end of the Trans-Alaska Pipeline for loading into tankers. Except for the oil being shipped to the U.S. Virgin Islands, all of the oil is transported in U.S. flag vessels. If the destination is beyond PAD District V or the Hawaiian Foreign Trade Zone, the oil in U.S. tankers travels to Panama for shipment across the Isthmus in the Trans-Panama Pipeline or through the Panama Canal. Before the pipeline opened in 1983, all oil was transferred to vessels small enough to travel the Panama Canal. On the Caribbean side of the Isthmus, the oil is transferred to other

U.S. flag vessels to travel on to Puerto Rico or ports in the mainland.

The oil being shipped to the Virgin Islands is allowed to move in larger foreign flag tankers. These tankers travel from Valdez, Alaska around the tip of South America (over twice the distance by way of Panama) but are able to make the longer trip at competitive costs.

COOK INLET OIL

In November 1985, the Secretary of Commerce made the finding that crude oil produced from the State submerged waters of Alaska's Cook Inlet could be exported to any country. Since this determination, several export licenses have been awarded. In February 1987, the first export under these licenses occurred—a shipment to Korea.

Cook Inlet fields are South Alaska fields located to the west of Valdez. They do not use the Trans-Alaska Pipeline to transport crude oil. Some of the fields are submerged and have gathering lines that come ashore at different points on the way to terminals where loading to tankers will occur. Only part of Cook Inlet production is eligible for export because some of it uses Federal right-of-ways to reach a loading terminal. The fields which were eligible for licenses produced about 80,000-32,000 barrels per day during 1986. The State of Alaska receives 12.5 percent of this production in royalties. The State has contracted to sell this royalty oil—about 3,000-4,000 barrels per day.

The significance of this export finding depends upon the decisions of the Cook Inlet owners and the quantity produced by the fields in the future. The production of Cook Inlet (not just the fields eligible for export) is projected to decline about 30 percent from 1986 levels by 1992 under assumptions of world oil prices reaching or exceeding \$20 per barrel between 1986 and 1992. If crude oil prices remained below \$15 per barrel, the production could fall 70 percent by 1992.

ISSUES IN EXPORTING CRUDE OIL

The restrictions on crude oil exports have the greatest current and future effects on PAD District V because of the volume and location of Alaskan and California production. Together, these States produce more crude oil, especially heavy crude oil, than PAD District V can consume. The district is expected to have this surplus until the mid-1990's. As a result, groups in both States have pushed for changes in crude oil export policy. Other responses have included developing ways to transport the crude oil to refineries outside the district exporting refined products instead of the raw material.

A major investment has been made to transport crude oil from PAD District V to markets elsewhere in U.S. territory. As discussed earlier, through 1986 the one method of transporting Alaskan and Californian crude oils to other markets was water shipment. Most Alaskan oil was transported in U.S. flag vessels by way of Panama (except the crude oil going to the Virgin Islands). About 60 percent of U.S. flag shipping tonnage has been used in this transfer. The Trans-Panama pipeline, with average maximum capacity of 800,000 barrels per day, was built for this purpose. However, a new pipeline of 300,000 barrels per day capacity, from Santa Barbara, California to Midland, Texas, is scheduled to begin operations in late 1987. The Celeron line will be 80 percent heated, which makes it able to handle heavy oils from California.

These transfers have given PAD District V oils a piece in the domestic crude oil demand of most districts. An indication of this role is provided by data the EIA has collected since 1981 about receipts of Alaskan crude at refineries. The EIA began pub-

lishing these data in 1986. Table FES shows the wide distribution of Alaskan oil in the last 6 years. The greatest volume, as expected, was received by PAD District V refineries. Between one-half and two-thirds of total receipts in each year was reported there. The Gulf Coast and inland refineries received the next largest volumes. Over the 6 years, Alaskan crude oil accounted for about 44 percent of all crude oil receipts on the West Coast, and about 25 percent in the territories but less than 9 percent in other districts.

Because between 52 and 67 percent of Alaskan oil has been received for processing at West Coast refineries, these refineries have increased their product exports. They now export a higher percentage of their output than the refineries in other districts. West Coast refineries exported over 10 percent of their output in 1986. The export growth has been greatest in the heavy products because demand for these is limited in PAD District V and the crude oil available yields relatively high percentages of heavy products. The highest proportion of exports for any other district, the Gulf Coast, was 4 percent.

Another effect in PAD District V, in the opinion of California producers, has been a lower price for the area's crude oil than the quality of the oil warrants. California producers argue that they are caught between an export ban and difficult and costly domestic shipping requirements. When Alaskan oil was added to the supply, the result was a "glut" and lower prices. These prices discourage prospects of further local development or enhanced recovery.

The idea of allowing greater volumes of crude oil exports has been studied and debated often because of the affect on various parties. The States of Alaska and California now receive royalty oil or taxes which they would hope to see increase in value if the oil could be exported. Other parties that would benefit from higher values include the owners and operators of the producing leases in Alaska and California. Parties who would be adversely affected include the operators of the Trans-Panama and Celeron pipelines, owners and employees of Jones Act U.S. flag vessels, and West Coast refineries because they have made investments on the assumption that exports would not be allowed. The U.S. Department of Defense benefits because the tanker fleet, which would be needed during war or other supply crisis, is maintained without Defense Department support. Some of the parties are involved in more than one way and their interests are correspondingly complicated.

All U.S. consumers are affected to some extent because of the effect on U.S. oil import dependency. At a time when U.S. import dependency is climbing and is projected to pass previous levels, the prospect of trading away U.S. oil concerns some people. Others are concerned that the export ban and the difficulties and costs of U.S. interdistrict transport restricts the market for these crude oils and depresses their prices. With a lower price, the return to producers discourages them from investing in further crude oil production and exploration. This would also contribute to greater U.S. oil import dependency.

The effects of the decision to export crude oil would reach beyond U.S. borders. Potential customers include Japan and other Pacific countries. Potential competitors (Mexico, Indonesia, the Persian Gulf States) who now supply the crude oil demand of these countries would also be interested. Because the government of Panama is a part owner of the Trans-Panama pipeline, Panama's national budget

11 AAC 83.153. CONFIDENTIAL REPORTS.

(a) If the commissioner finds that reports or information required under AS 31.05.035(a) contain significant information relating to the valuation of unleased land within a three-mile radius of the well from which these reports or information were obtained, the commissioner will, upon the written request of the owner of the well, keep the reports or information confidential for a reasonable time not to exceed 90 days after disposal of the unleased land, unless the owner of the well gives written permission to release the reports and information at an earlier date. The commissioner will, in his or her discretion, extend confidentiality to reports or information required under AS 31.05.035 from a well located more than three miles from any unleased land if the owner of the well from which these reports or information are derived makes a sufficient showing that the reports or information contain significant information relating to the valuation of unleased land beyond the three-mile radius.

(b) Reports or information for which extended confidentiality is requested or has been granted under AS 31.05.035 will not be eligible for extended confidentiality when

(1) the lease on which the well is drilled has expired; or

(2) the unleased land within a three-mile radius of the well from which the reports or information are obtained is offered in a competitive lease sale, but receives no bids greater than or equal to any minimum bid established for that sale.

(c) As used in this section, "mile" means a statute mile or 5,280 feet.

(d) As used in this section, "disposal" means the grant or issuance of an oil and gas lease. (Eff. 3/30/84, Reg. 89)

Authority: AS 31.05.035(c)
AS 38.05.020
AS 38.05.180

11 AAC 83.155. DAMAGES. Each lessee or permittee is required to pay any damage that becomes payable under AS 38.05.130 and shall indemnify Alaska and hold it harmless from and against any claims, demands, liabilities and

expenses arising from or in connection with the damage. (Eff. 9/5/74, Reg. 51)

Authority: AS 38.05.020
AS 38.05.130
AS 38.05.145(a)

11 AAC 83.158. PLAN OF OPERATIONS. (a)

Except as provided in (b) of this section, a plan of operations for all or part of the leased area must be approved by the commissioner before any operations may be undertaken on the leased area if

(1) the state owns all or part of the surface estate of the leased area;

(2) the lease reserves a net profit share to the state; or

(3) the state owns all or part of the mineral estate, but the entire surface estate is owned by a party other than the state, and a surface owner requests that a plan of operations be required by the commissioner for the portion of the leased area owned by that surface owner.

(b) A lease plan of operations is not required for

(1) activities that would not require a land use permit under this title; or

(2) operations undertaken under an approved unit plan of operations in accordance with this title.

(c) Before undertaking operations on the leased area, the lessee shall provide for full payment of all damages sustained by the owner of the surface estate as well as by the surface owner's lessees and permittees, by reason of entering the land. If the surface estate is owned by a party other than the state, the lessee shall also notify the surface owner of his opportunity to request that the commissioner require a plan of operations before allowing operations to be undertaken on the portion of the leased area owned by the requesting surface owner.

(d) An application for approval of a plan of operations must contain sufficient information, based on data reasonably available at the time

- (1) the drilling, producing and plugging of wells;
- (2) the shooting and chemical treatment of wells;
- (3) the spacing of wells;
- (4) the disposal of salt water, nonpotable water and oil field wastes;
- (5) the contamination or waste of underground water;
- (6) the quantity and rate of the production of oil and gas from a well or property; this authority shall also apply to a well or property in a voluntary cooperative or unit plan of development or operation entered into in accordance with AS 38.05.180(p).

(f) The commission may classify wells as oil or gas wells for purposes material to the interpretation or enforcement of this chapter.

(g) When the commission finds sufficient likelihood of an unexpected encounter of oil, gas, or other hazardous substance as a result of well drilling in an area of the state, the commission may, by regulation, designate the area and specify a depth in the area as one in which wells or any boring into the soil in excess of the specified depth but not otherwise subject to this chapter are subject to the regulations and requirements adopted under this section. The designation of an area or specification of a depth under this subsection does not constitute a certification that no hazardous substance will be encountered in another area or at a lesser depth, and the state is not liable for any damages arising from such an unexpected encounter of a hazardous substance.

(h) The commission may take all actions necessary to allow the state to acquire primary enforcement responsibility under 42 U.S.C. 300h-4 (Safe Drinking Water Act of 1974, as amended, 42 U.S.C. 300f-300j), for the control of underground injection related to the recovery and production of oil and natural gas. (§ 4 ch 40 SLA 1955; am § 2 ch 75 SLA 1960; am § 1 ch 209 SLA 1970; am § 1 ch 87 SLA 1977; am §§ 1, 2 ch 160 SLA 1978; am § 1 ch 91 SLA 1984)

Effect of amendments. — The 1984 amendment added subsection (h).

Sec. 31.05.035. Confidential reports. (a) For all wells for which a permit to drill has been issued by the commission since January 3, 1959, the commission may require:

(1) the making and filing of reports, well logs, drilling logs, electric logs, lithologic logs, directional surveys, and all other subsurface information on a well drilled for oil or gas, or for the discovery of oil or gas, or for geologic information; and

(2) the filing of flow test information and all logs, except experimental logs and velocity surveys run on a well and not required by (1) of this subsection;

(3) the operator to make available for copying the digitized log information, if it is available, on any log required to be filed under (1) or (2) of this subsection.

(b) Reports and information required under (a)(1) and (2) of this section shall be filed within 30 days after the completion, abandonment, or suspension of a well. However, under (a)(1) of this section, the commission may not require the making of a log on a well completed, abandoned or suspended before June 19, 1970.

(c) The reports and information required in (a) of this section shall be kept confidential for 24 months following the 30-day filing period unless the owner of the well gives written permission to release the reports and information at an earlier date. If the commissioner of natural resources finds that the required reports and information contain significant information relating to the valuation of unleased land in the same vicinity, the commissioner shall keep the reports and information confidential for a reasonable time after the disposition of all affected unleased land, unless the owner of the well gives written permission to release the reports and information at an earlier date. Well location, depth, status and production data and production reports required by the commission to be filed subsequent to the 30-day filing period shall be considered public information and shall not be classified confidential. Production data, as used in this subsection, means volume, gravity and gas-oil ratio of all production of oil or gas after the well begins regular production.

(d) Engineering, geological, and other information not required by (a) of this section but voluntarily filed with the commission shall be kept confidential if the person filing the information so requests.

(e) Notwithstanding (c) of this section, claims of confidentiality will be denied for information disclosed to the commission under AS 31.05.030(h) that is required to be disclosed under 42 U.S.C. 300h-4. (§ 2 ch 209 SLA 1970; am §§ 3 — 6 ch 160 SLA 1978; am § 86 ch 6 SLA 1984; am § 2 ch 91 SLA 1984)

Effect of amendmer*^s. — The first 1984 amendment, in the second sentence in subsection (c), inserted "of natural resources" and substituted "the commis-

sioner" for "he" near the middle of the sentence.

The second 1984 amendment added subsection (e).

NOTES TO DECISIONS

Cited in *Hammond v. North Slope Borough*, Sup. Ct. Op. No. 2499 (File Nos. 5550, 5558), 645 P.2d 750 (1982).

DIVISION OF OIL AND GAS
OVERVIEW FOR THE
SENATE RESOURCES COMMITTEE
ALASKA STATE LEGISLATURE

Wednesday, February 1, 1989

PROPOSED ANWR LAND EXCHANGES:

The Department of the Interior's proposed ANWR land exchange with Alaska Native corporations has been a major concern of the Department of Natural Resources. Interior has agreed tentatively to convey 166,000 acres of subsurface rights within the coastal plain of ANWR to six Native groups (comprised of a number of regional and village corporations) in exchange for the surface estate of 891,000 acres of Native inholdings within other Alaskan wildlife refuges. The state has opposed these land exchanges because they: (1) are highly controversial and premature, diverting attention from the central issue of opening ANWR, (2) limit equal access to highly prospective oil and gas resources by substituting a process that ignores the traditional, open competitive bidding system, and (3) transfer the chance for potential windfalls to a select few private interests at the expense of the public. Based on the interpretation of seismic data, the department concluded that the Native corporations, in partnership with major oil companies, had selected many of the high potential tracts in the ANWR coastal plain, each being over a potential trap in which oil and gas could accumulate.

These proposed exchanges have been criticized by a number of ranking members of Congress. At their request, the General Accounting Office (GAO) conducted an investigation of the exchanges. The GAO's final report recommends that the Secretary of the Interior discontinue consideration of the exchanges. It further recommended that if the Secretary decides to proceed with the proposed exchanges Congress should disapprove them. Prior to the GAO's report, the federal Office of Management and Budget, in a "Budget Pass Back" document, strongly criticized DOI's exchange initiative, stating it was inconsistent with presidential policy. The document directed DOI to cease all actions concerning the exchanges and to develop a strategy necessary to back out of the proposal altogether. Despite these, and other strong oppositions to the exchanges, DOI has proceeded with them, in September issuing a draft Legislative Environmental Impact Statement (LEIS) on the lands to be exchanged, and soliciting public comments on the proposal. In mid-December, DOI issued the final LEIS in which is recommended that the Secretary of the Interior sign the exchange contracts and submit them to Congress for approval.

Former Interior Secretary Hodel recommended on his final day in office that the proposed exchanges ultimately be approved by Congress. However, in his confirmation hearings on Thursday, January 26, 1989, Secretary of the Interior designate Manuel Lujan indicated that "...I am not really inclined to move ahead on those trades...It is incumbent on me to say that so that those who are spending lots of money don't get their hopes up." Mr. Lujan's position on the land exchanges was expressed following questioning by Senator Bennett Johnston, Chairman of the Senate Energy Committee, who had reiterated his strong opposition to the proposed exchanges and once again expressed his

opinion that his committee would never pass out any opening legislation which provided for exchanges.

POTENTIAL ANS EXPORT TO CANADA:

Legislation implementing the United States-Canada Free-Trade Agreement of 1988 provides the first opportunity for export of Alaska's North Slope crude oil. Section 305(a) of the implementing act amends section 7(d) of the Export Administration Act of 1979 to allow the export to Canada of a maximum of 50,000 barrels per day (on an annual average basis) of ANS crude oil. Until now, all ANS oil has been prohibited from export by virtue of having been transmitted by pipeline over a right-of-way granted pursuant to the Trans-Alaska Pipeline Authorization Act (43 U.S.C. 1652).

However, under the provisions of the new law, any oil exported to Canada must be transported by vessels documented for the United States coastwise trade under the terms of 46 U.S.C. 12106. This provision effectively requires that ANS crude oil continue to be transported via "Jones Act" vessels, and thus diminishes any potential revenue increases which the state or others may realize from exports.

On January 17, 1989, the U. S. Department of Commerce issued interim regulations in the Federal Register which amend the short supply controls of the Export Administration Regulations to allow the limited exports to Canada pending the adoption of final regulations. However, the interim regulations contain several provisions which would make any export sale of Alaska royalty oil difficult to implement. The division and the Department of Law are reviewing the interim regulations, and will be submitting recommended revisions which would facilitate sales of royalty oil for export to Canada.

WEST SAK SANDS PILOT PROJECT:

ARCO Alaska, Inc. has started the permitting process to begin another pilot production test of the West Sak sands in the Kuparuk River Unit Area. The area proposed for the second pilot test of the West Sak is located about two miles north of the previous West Sak Pilot that took place from September 1984 through December 1986.

An initial test well is scheduled to be drilled sometime during the spring of 1989. This well is designed to determine the presence, continuity and quality of the West Sak reservoir in the pilot area. If the results are favorable, more wells (possibly 24) would be drilled to test experimental well completion and stimulation techniques suggested by the results of the first pilot project, as well as to determine the "waterfloodability" of the West Sak sands on a 20 acre well spacing pattern. Designers of the pilot hopes to address some of the more technical questions of producing this shallow, high viscosity oil deposit.