

SCOMM

144:3

ALASKA STATE LEGISLATURE

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HOUSE SPECIAL COMMITTEE ON OIL & GAS

STATE CAPITOL, RESOURCES ROOM # 124

Committee Schedule
House Special Committee on Oil & Gas
February 3rd, 2005
Ramona Barnes room #124 5:00pm-7:00pm

Thursday February 3rd, 2005

+ Joint Overview by Department of Revenue, Tax Division, Dan Dickenson. And Department of Natural Resources Bill Van Dyke "Field Development, what drives development and exploration decisions, and ELF.

*First Hearing in First Committee of Referral

+Teleconferenced

=Bills previously heard/scheduled

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Background Matrix
January 12 2006 Aggregation Decision
FY 2005 and FY 2006 Data

Field	FY 2005 Oil Prod (bbls/day) ¹	FY 2005 Oil Severance Taxes (\$millions) ²	FY 2005 Oil Royalties (\$millions) ³	FY 2006 Incremental Severance Taxes from Decision (\$million)	ELF prior to Decision ⁴	ELF after Decision ⁵	Heavy Oil? (Conoco Phillips terminology)	OWNERSHIP %				Included in 1/12/05 decision?	Prior decision not to aggregate?	no request - single property
								Bp %	EDM %	CP %	Other %			
Prudhoe Bay Unit														
Prudhoe Bay IPA	341,769	\$ 604.6	\$ 651.8	\$ 39.4	0.821470	0.895958		28.4	38.4	38.1	1.2	yes		
Point McIntyre	38,111	4.8	44.6	40.8	0.071284	0.895958		28.4	38.4	38.1	1.2	yes		
Midnight Sun	4,086	0.0	4.2	3.9	0.000000	0.895958		28.4	38.4	38.1	1.2	yes		
Polaris	2,786	-	3.0	4.8	0.000000	0.895958	Medium Heavy Oil	28.4	38.4	38.1	1.2	yes		
Orion	8,214	0.0	10.9	15.2	0.000072	0.895958	Medium Heavy Oil	28.4	38.4	38.1	1.2	yes		
Aurora	9,148	0.0	10.4	13.6	0.000000	0.895958		28.4	38.4	38.1	1.2	yes		
Borealis	25,634	1.2	28.7	32.4	0.027994	0.895958		28.4	38.4	38.1	1.2	yes		
Liburne	10,055	0.0	10.6		0.000000	no change		28.4	38.4	38.1	1.2	yes (6)		
Niakuk	9,672	0.0	9.6		0.000000	no change		28.4	38.4	38.1	1.2	yes (7)		
Kuparuk River Unit														
Kuparuk	144,691	20.9	223.8		0.085881	no change		39.2	0.6	65.2	5.1	yes		
West Sak	14,944	0.0	23.0		0.000000	no change	Heavy Oil	39.3	0.4	65.3	5.1	yes		
Tabasco	5,026	0.0	7.3		0.000000	no change	Heavy Oil	39.3	0.4	65.3	5.1	yes		
Tarn	26,634	0.5	41.2		0.009797	no change		39.3	0.4	65.3	5.1	yes		
Meltwater	8,828	0.0	13.8		0.000000	no change		39.3	0.4	65.3	5.1	yes		
Milne Point Unit														
Milne Point	30,440	0.0	62.7		0.000000	no change		100.0			-	yes		
Schrader Bluff	21,287	0.0	26.9		0.000000	no change	Heavy Oil	100.0			-	yes		
Duck Island Unit														
Endicott	22,226	0.0	39.9		0.000005	no change		67.9	21.0	0.0	11.0	yes		
Eider	52	0.0	0.0		0.000000	no change		100.0			-	yes		
Alpine Unit	102,073	128.4	167.6		0.827440	no change				78.0	22.0		yes	
Northstar Unit	67,248	59.8	160.3		0.836806	no change		98.0			2.0		yes	
	892,922	\$ 720.1	\$ 1,530.1	\$ 150.1										

High ELF Fields Bolded - Note PBU volume does not include gas liquids

¹ Actual volumes thru November 2005. Fall2004 forecasted volumes for rest of fiscal year.

² Includes actual oil severance thru November 2005. Fall2004 forecasted revenues for rest of fiscal year. Severance Tax includes % of value tax. It does not include Property tax, Oil & Gas Corporate Income tax, Hazardous Release Surcharge or Gas Production Tax.

³ Includes actual oil royalties thru October 2005. Fall2004 forecasted oil royalties for rest of fiscal year.

⁴ Actual elf thru November 2005. Fall2004 forecasted ELF for rest of fiscal year.

⁵ Average aggregate ELF calculated for all of FY2005. Actual wellheads and volumes used thru November 2004. Fall2004 forecasted data used for rest of fiscal year.

⁶ Agreement to not aggregate with Niakuk or Pt. McIntyre.

⁷ Agreement to not aggregate with Liburne or Pt. McIntyre. Two separate PAs in Niakuk already aggregated.

DED

AggELFMatrix20050113ded

ELF one pager 1.17.05

1/17/2005

Economic Limit Factor

AS 43.55

Presentation to:

Alaska House of Representative

Special Committee on Oil & Gas

February 3, 2005



Bill Corbus, Commissioner

Dan Dickinson, Tax Division, Director

Alaska Department of Revenue

Original Intent of ELF

*Severance (production)
taxes.*

- **Protect marginal fields**
 - ◆ Tax should not cause a field to shut-in

- **Tax base is gross value at wellhead**
 - ◆ Downstream costs deducted
 - ◆ Upstream costs covered by ELF proxy
 - Shield the volume of oil required to cover direct operating costs from taxation

- **With the introduction of field size factor in 1989**
 - ◆ Large fields pay higher tax
 - ◆ Small (marginal) fields pay little or no tax

Fields With Positive ELF

	2005	2008	2011	2014	2017	2020
Prudhoe ⁽¹⁾	.8166	.7511	.6910	.6224	.5638	.5250
Orion ⁽¹⁾	---	.0005	.0009	---	---	---
Borealis ⁽¹⁾	.0398	.0250	.0002	---	---	---
Kuparuk	.1045	---	---	---	---	---
Tarn	.0133	---	---	---	---	---
Schrader Bluff	---	.0040	.0333	.0995	.1019	.0536
Pt McIntyre	.0832	.0377	.0054	.0005	---	---
Alpine	.8197	.8083	.5671	.1881	.0248	.0003
North Star	.8273	.3444	.0021	---	---	---

Tax Free Barrels	51%	62%	60%	68%	77%	81%
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(1) prior to aggregation

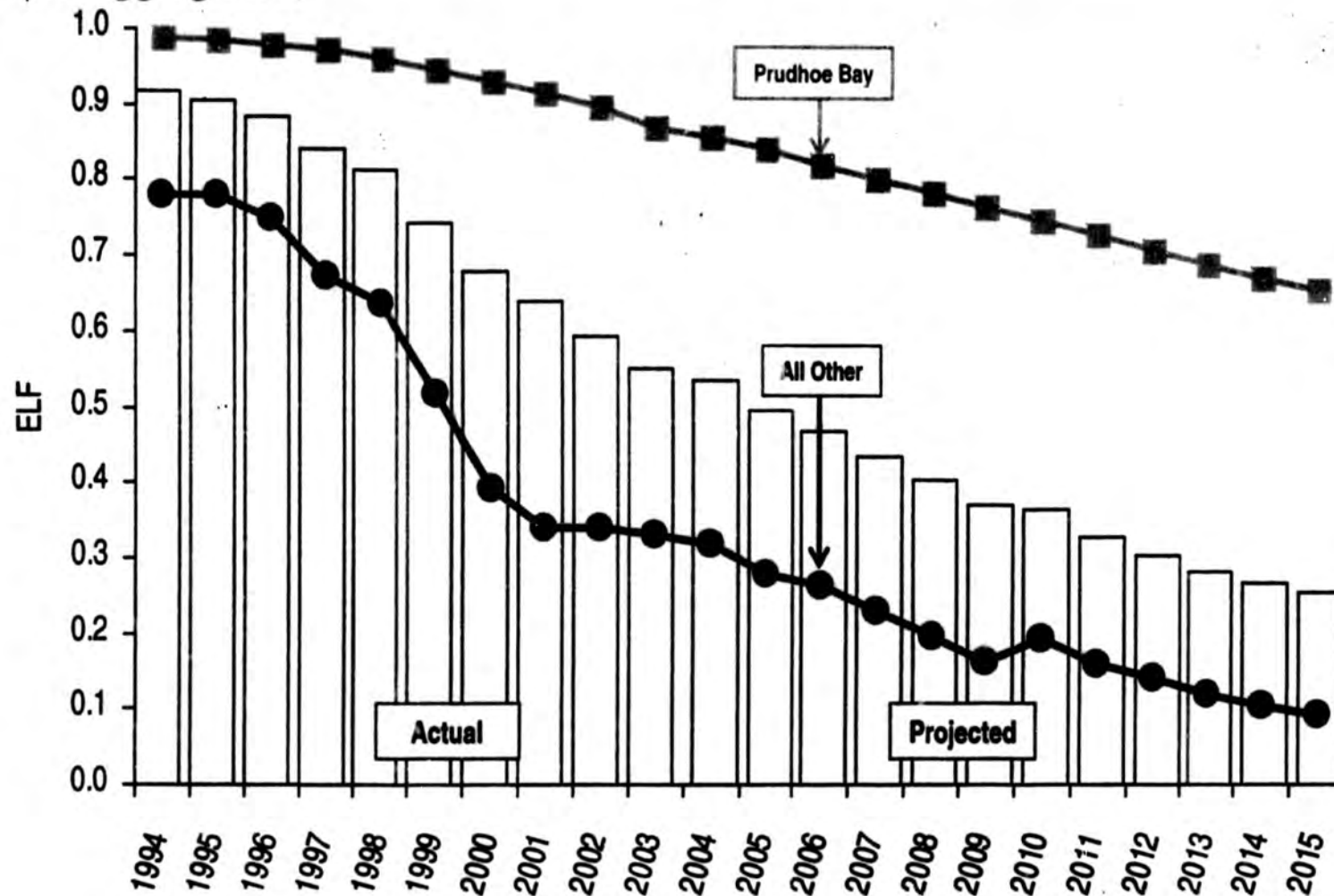
1/27/05

Alaska Department of Revenue, Tax Division

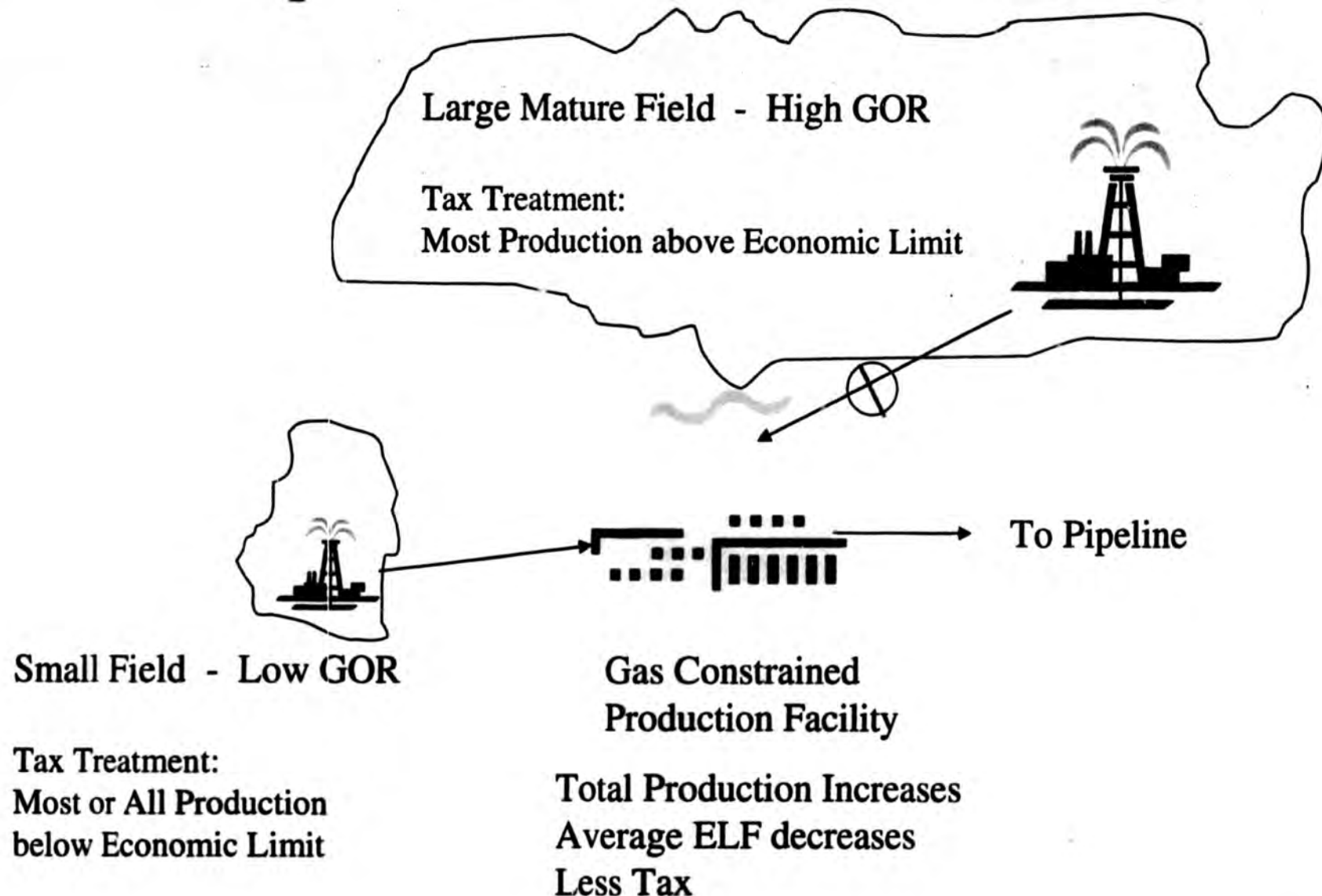


ELF Forecast & History

(without aggregation)

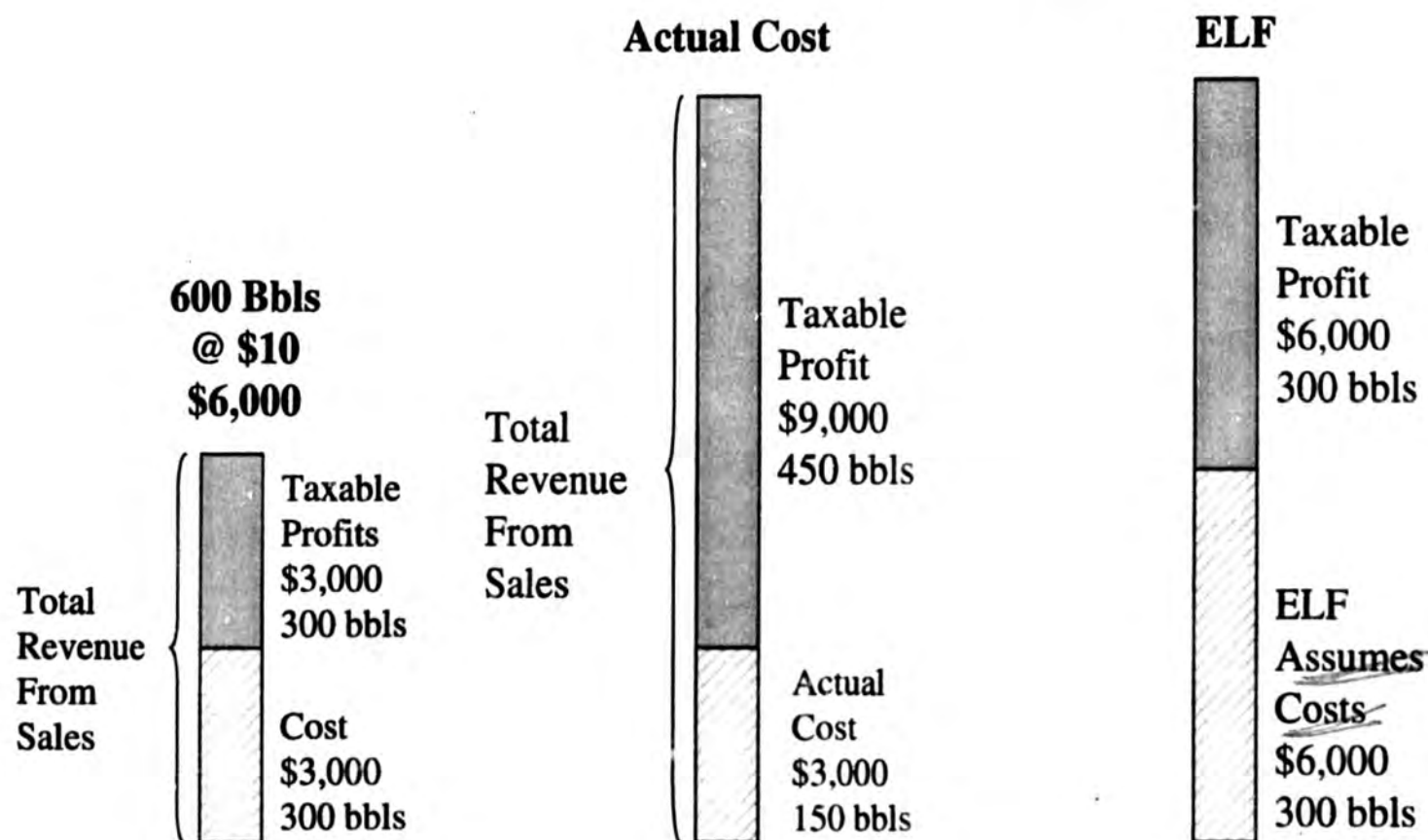


Unified Operations: "Best Well" Produces



ELF is an Imperfect Proxy

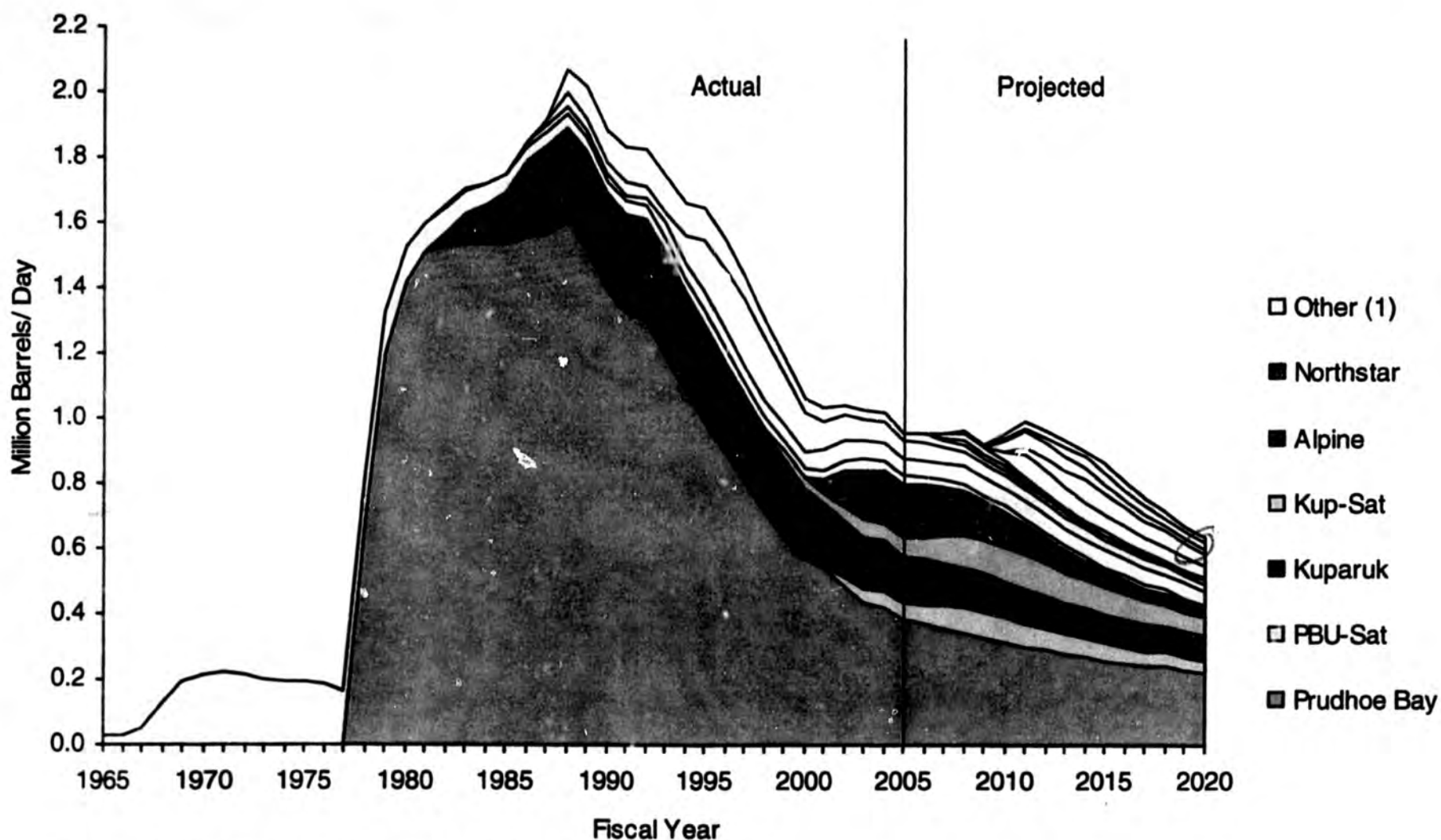
600 bbls @ \$20 = \$12,000



Solution: Administrative ELF Change

- Department has discretion under AS 43.55.013 (j) to aggregate certain “leases or properties (or portions of them)...”
*Question is, is this is excessive?
files nothing?
good policy?*
- Aggregation in Prudhoe Bay Unit
 - ◆ Prudhoe IPA, Midnight Sun, Aurora, Borealis, Pt McIntyre, Orion and Polaris
- Reasons for Aggregation
 - ◆ Substance over form
 - ◆ Measurement concerns
 - ◆ Persistent high oil prices*Field is operating as a "single unit" (for purposes of ELF).*

Alaska Oil Production, 1965 - 2020

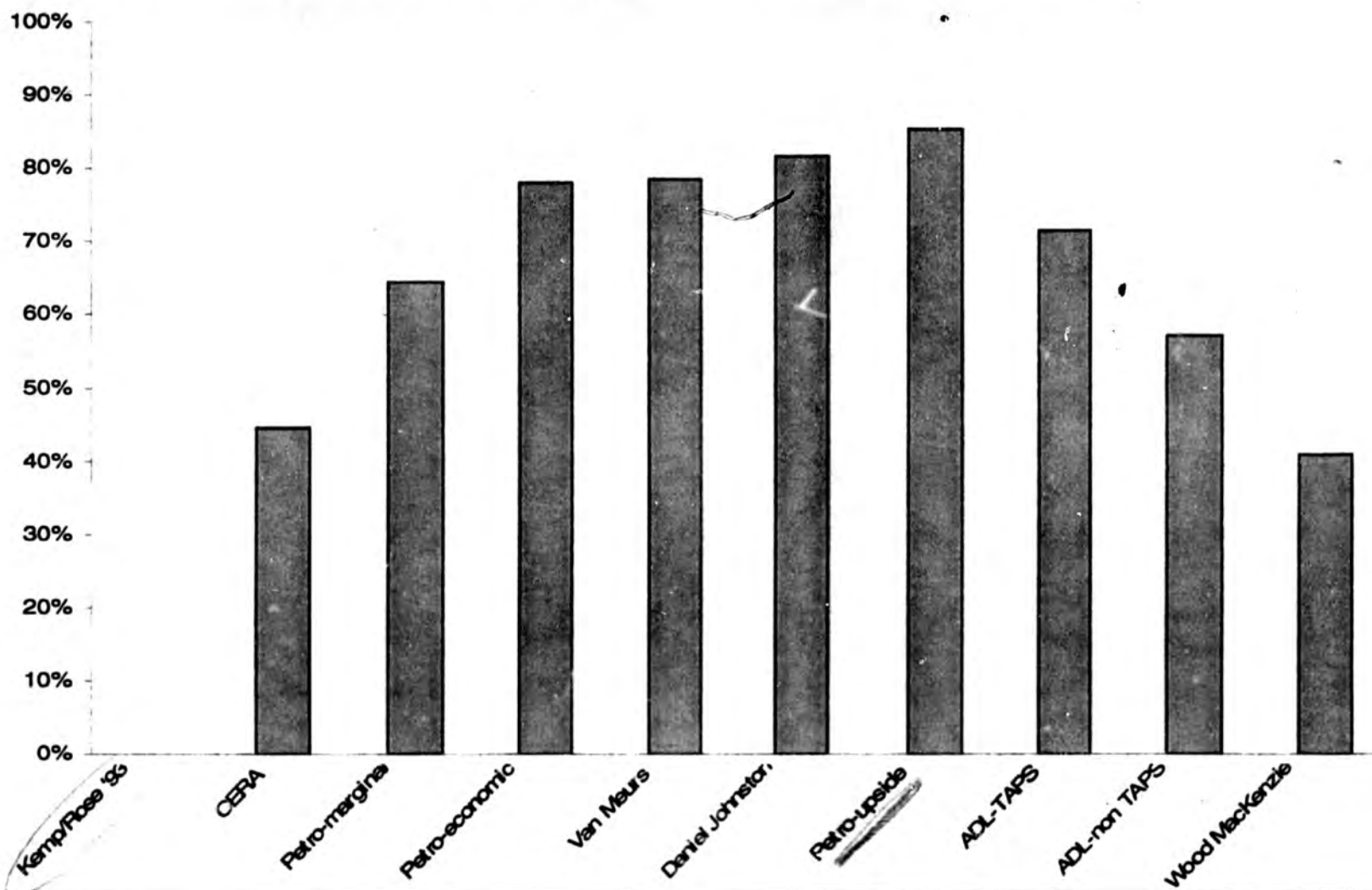


Source: Alaska Department of Revenue, Fall 2004 Revenue Sources Book

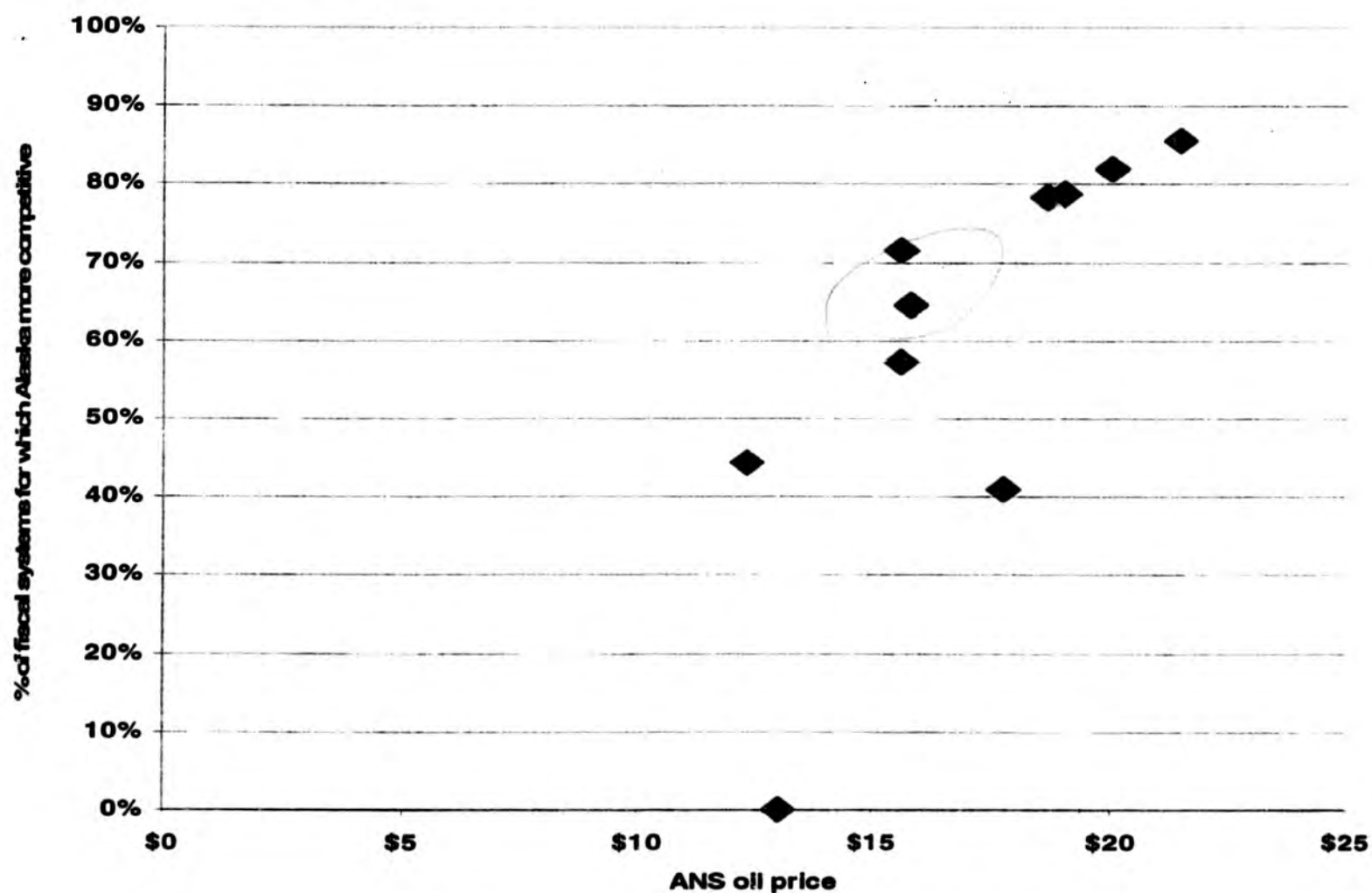
(1) Cook Inlet, Duck Island, Milne Point, Greater Point McIntyre, Liberty, Known On & Offshore, Fiord and NPRA.

Most Experts Rate Alaska as Competitive

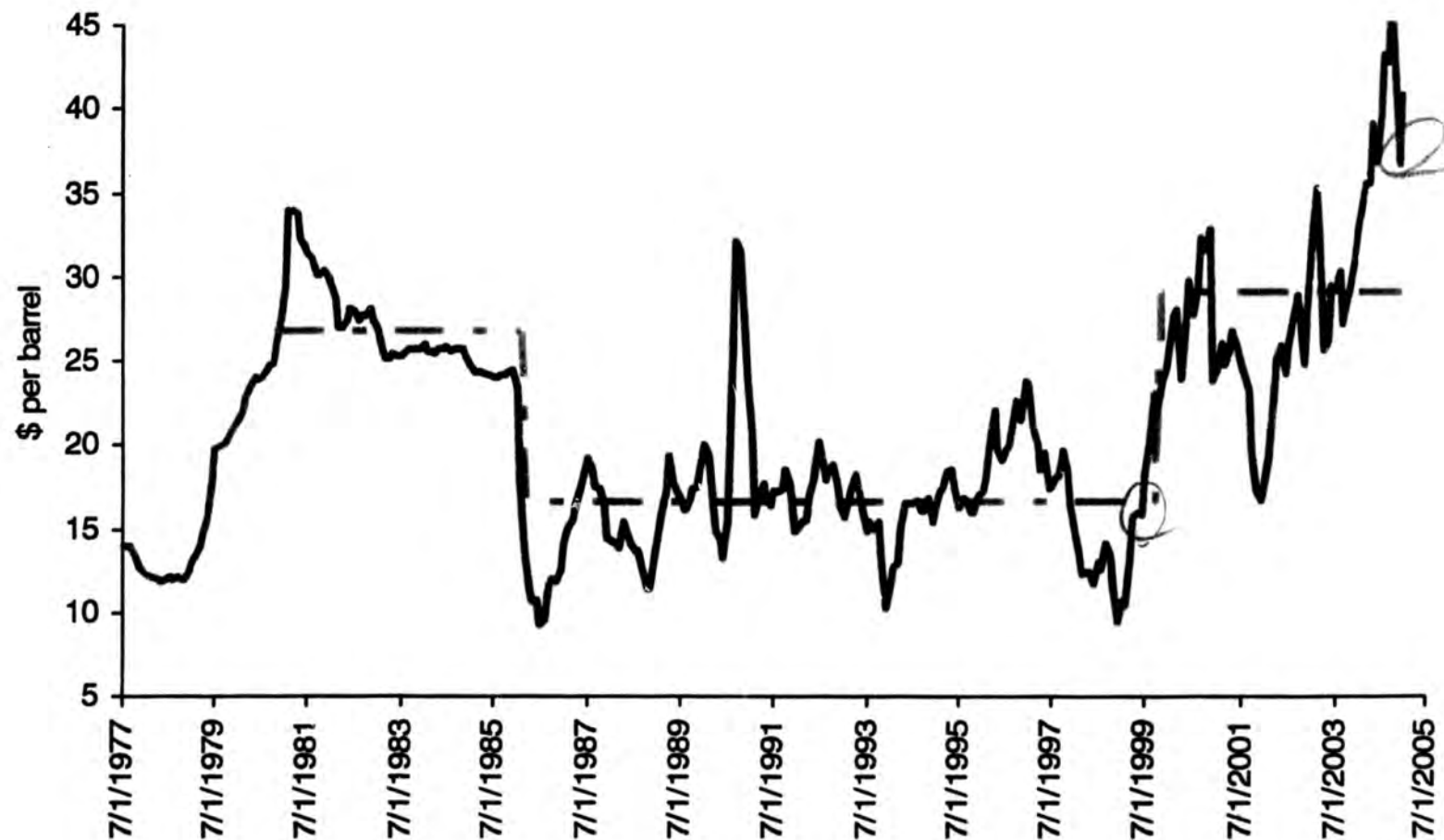
(100% is most competitive, 0% is least competitive)



Alaska's Fiscal System Ranking Dependent on Underlying Price Assumption



ANS West Coast Price, July 1977 – January 2005



Source: Alaska Department of Revenue, Tax Division

1/27/05

Alaska Department of Revenue, Tax Division



Oil and Gas Opportunities In Alaska

Governor Frank H. Murkowski

Presented
By

State of Alaska
Office of the Governor

Department of Natural Resources
Division of Oil and Gas

Department of Revenue
Tax Division

December 9 & 10, 1981
Juneau, Alaska



The Economic Limit Factor

—— 43.55.013 (b) ——

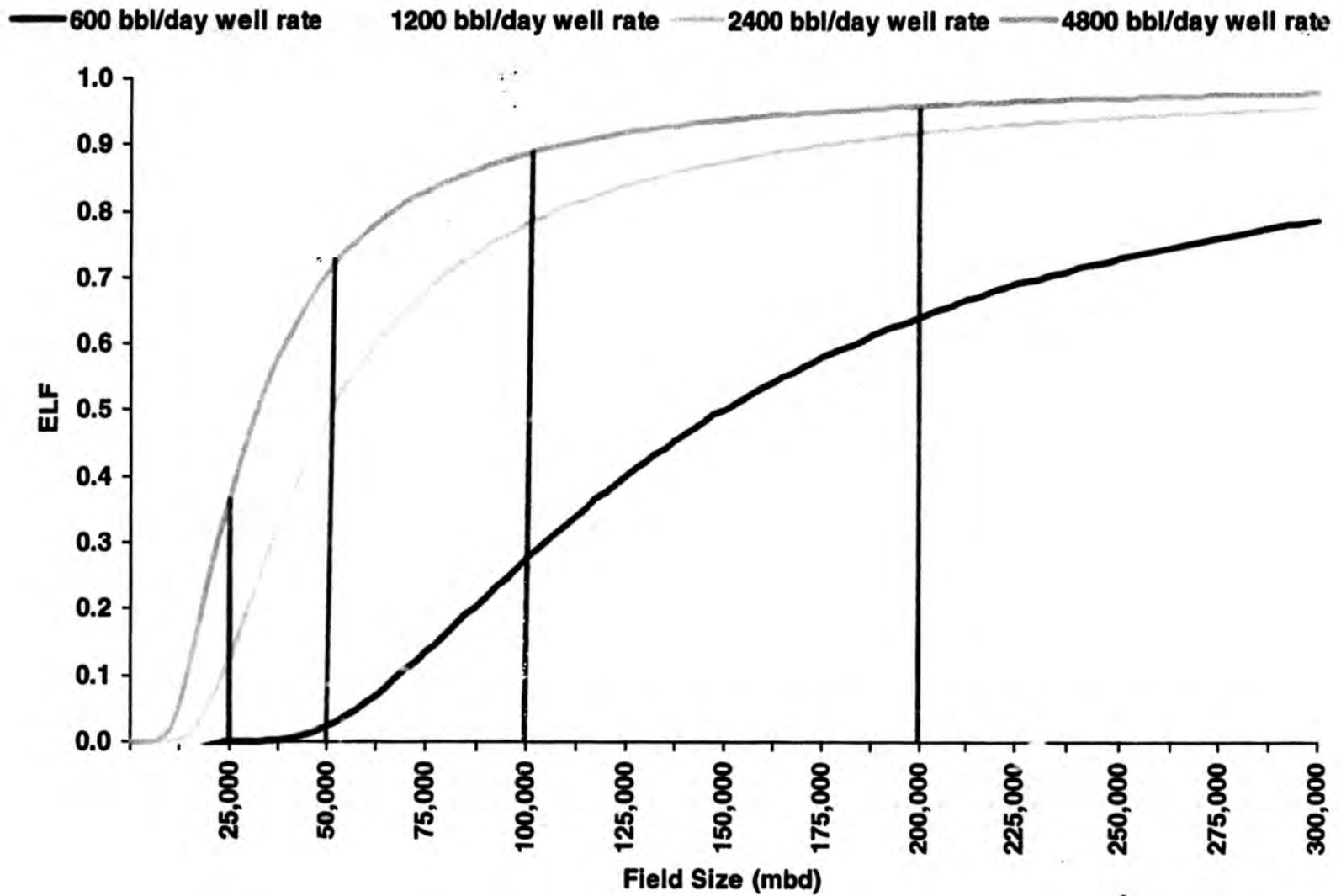
$$\left[1 - \left(\frac{300 \times \text{wells}}{\text{volume}} \right) \right]^{\left[\left(\frac{150,000}{\text{volume}} \right)^{1.5333} \right]}$$

Wells = number of production wells in the field

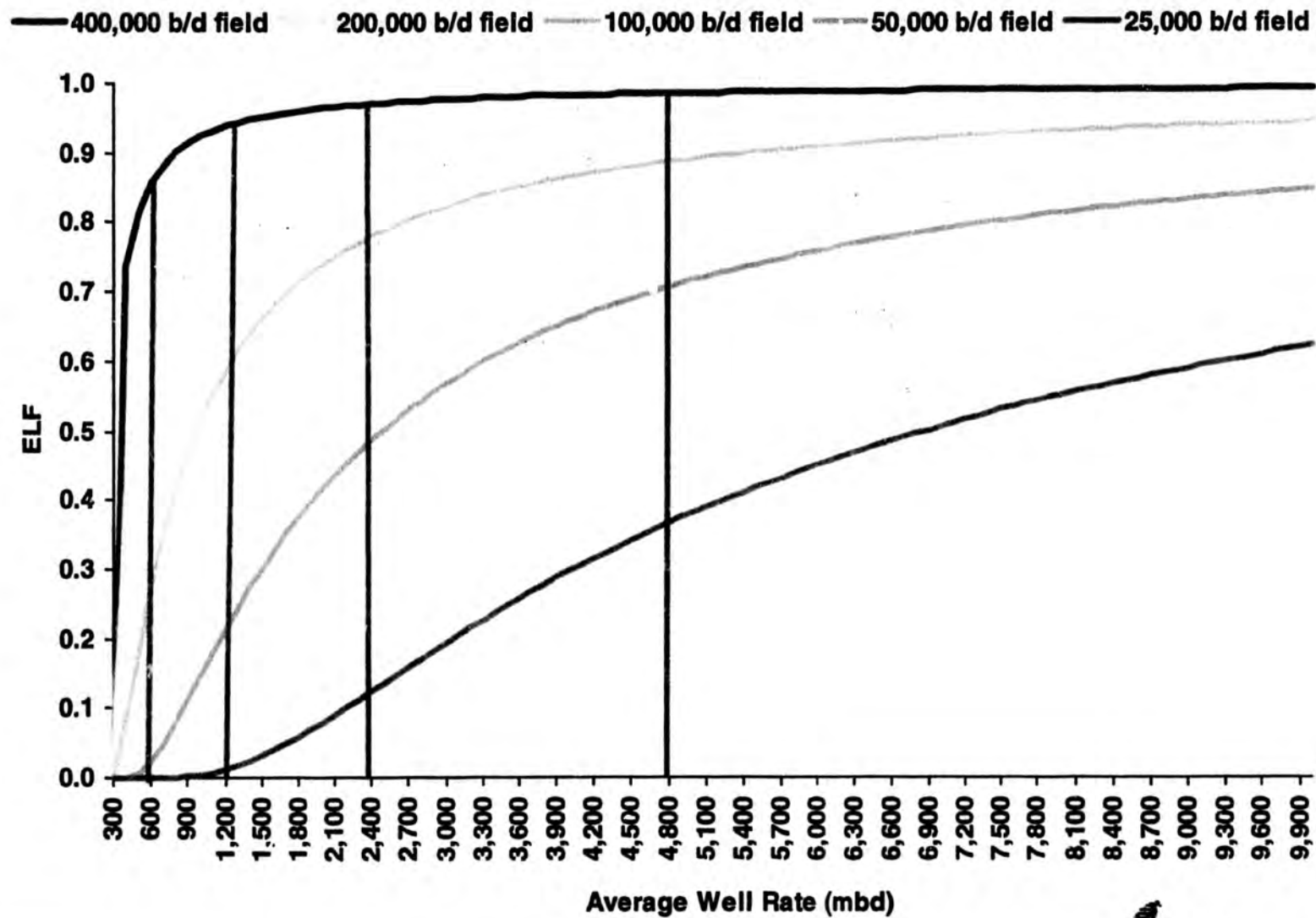
Volume = total daily production for the field

Assumes only commercial production from well is oil. (No gas.)

ELF for Four Well Rates and by Field Size



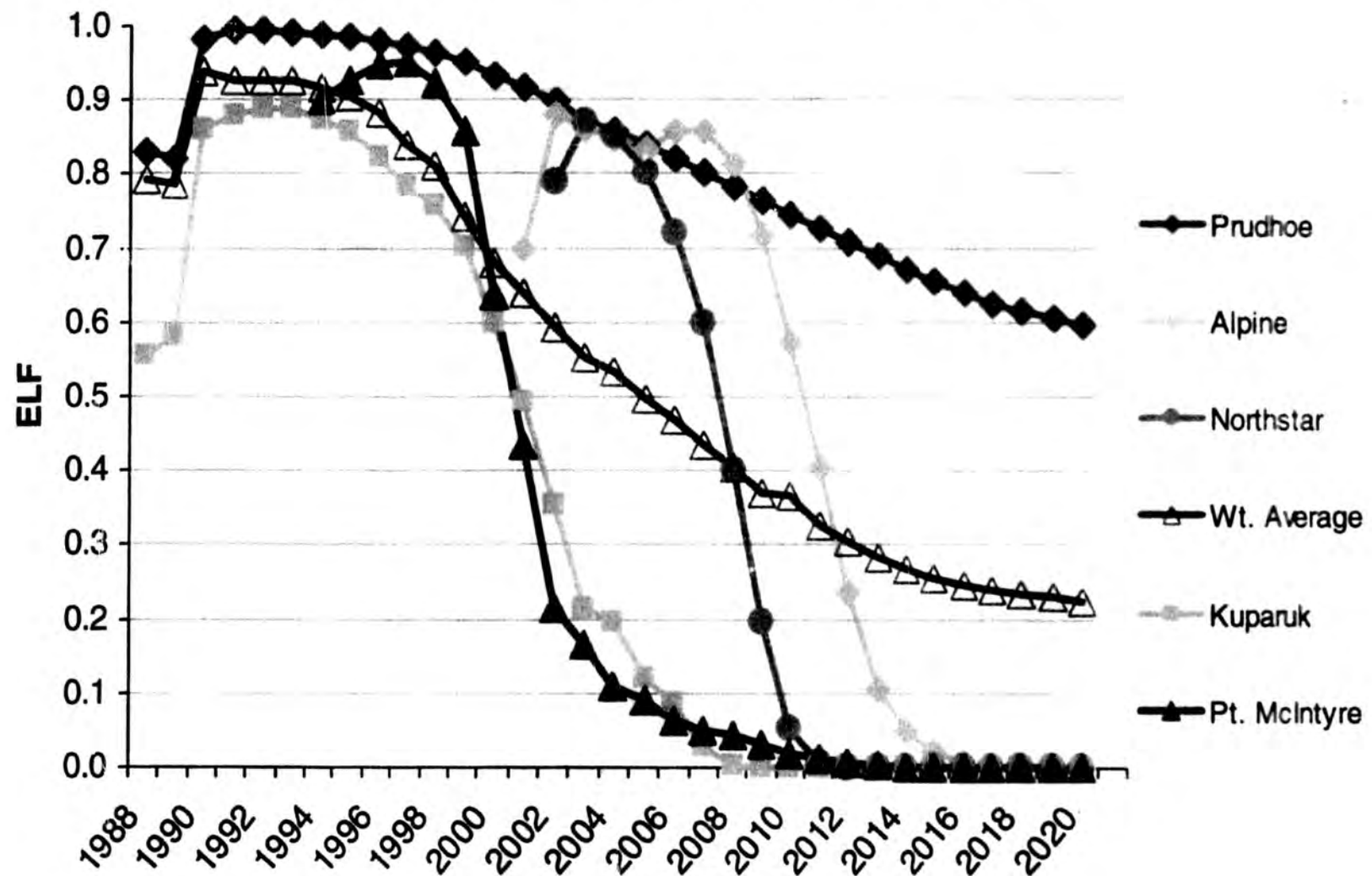
ELF for Five Field Sizes and by Well Rate



Economic Limit Factor FY 2004 Summary Data

NORTH SLOPE					
Region/ Property	Daily Production (bbl/day)	Oil Wells	ELF	Production per Well (bbl/day)	Taxable Daily Production (bbl/day)
Alpine	99,006	35	0.843008	2,828.7	83,462.9
Aurora	10,754	11	0	977.6	0.0
Borealis	31,744	23	0.083892	1,380.2	2,663.1
Eider	562	1	0	562.0	0.0
Endicott	27,914	54	0.000306	516.9	8.5
~~Kuparuk~~	<u>155,233</u>	450	0.179808	345.0	27,912.2
~~Lisburne~~	10,371	31	0	334.5	0.0
Meltwater	5,241	10	0	524.1	0.0
Midnight Sun	4,501	2	0	2,250.5	0.0
Milne-Kuparuk	30,414	85	0	357.8	0.0
Milne-Schrader Bluff	20,270	52	0	389.8	0.0
Niakuk	12,185	16	0	761.6	0.0
Northstar	65,854	13	0.846758	5,065.7	55,762.4
Orion	2,535	10	0	253.5	0.0
Prudhoe Bay	377,717	770	0.854717	490.5	322,841.0
Polaris	2,619	10	0	261.9	0.0
Point McIntyre	37,965	38	0.108383	999.1	4,114.8
Tabasco	3,713	8	0	464.1	0.0
Tam	31,407	25	0.059667	1,256.3	1,874.0
West Sak	8,926	35	0	255.0	0.0

Oil ELF Select Oil Fields, FY 1988 – FY 2020



Source: Alaska Department of Revenue, Spring 2004 Revenue Sources Book

WOOD MACKENZIE

GLOBAL OIL AND GAS — RISKS AND REWARDS 2004

Alaska's Profitability – Full Cycle, Post Government Take

Rate of Return (IRR – Nominal)

	Low Price (\$16)	Base Price (\$22)	High Price (\$35)
Alaska's Ranking	15/49	14/52	14/53
Alaska's IRR	18.09%	23.57%	29.11%
Global Average IRR	15.20%	18.94%	23.07%

Net Present Value (NPV @10% in \$/Bbl of Oil Equivalent)

	Low Price (\$16)	Base Price (\$22)	High Price (\$35)
Alaska's Ranking	17/58	11/58	8/58
Alaska's NPV	\$0.90	\$2.14	\$4.43
Global Average NPV	\$0.65	\$1.33	\$2.35

Value Creation Ratio

	Low Price (\$16)	Base Price (\$22)	High Price (\$35)
Alaska's Ranking	22/66	22/66	19/66
Alaska's VCR	1.98	3.33	5.82
Global Ave. VCR	1.90	2.84	4.26

Field Development--What Drives Exploration and Development Decisions?

Presentation to the House of Representatives
Special Committee on Oil and Gas
February 3, 2005

Bill Van Dyke
Division of Oil and Gas
Department of Natural Resources

Good
A knowledge -
hant.)
2

Introduction

In its simplest form, oil and gas exploration and development decisions are driven by expected profits. The expected profits need to be commensurate with the necessary investments and the associated risks or the projects are not sanctioned.

Oil and gas companies, just like Walmart and Alaska Airlines, are accountable to their shareholders. They are for-profit corporations.

What is different for oil and gas companies is that the business model has to account for the likelihood of many failures and few successes, especially in the exploration phase. It also has to account for widely fluctuating commodity prices over long time periods. This business model is very different from McDonalds or General Motors.

Oil and Gas Life Cycle

Exploration

- Pre Lease
- Lease acquisition
- Drilling

Delineation/Appraisal

Development

Production

Continue to repeat cycle of exploration/appraisal/development/production as opportunities allow

- Deeper or shallower prospects
- Adjoining and nearby prospects
- Infill drilling
- Enhanced oil recovery

Option to suspend or terminate activity at any stage of the process, and likewise, resume it at a later point in time. This is not unique to Alaska.

- Unexplored leases expire
- Unsuccessful exploration (Mukluk)
- Withdrawn development permits (Point Thomson)
- Shut in fields (Badami)

Continually evaluate opportunities, business practices and performance at each stage using analytical tools (cash flow models) that incorporate risk and reward.

Accounting for Risk

The Process

Identify the risks
Eliminate the risks where possible
Reduce/mitigate the risks where possible
Manage the remaining risks

Example Oil and Gas Risks:

Geology--traps, reservoirs seals, rock porosity and permeability
Fluid type--water v. oil v. gas
Size of accumulation--how full is the trap?
Oil Quality--viscosity, sulfur content, gasoline content
Flow rate from each well--function of viscosity, rock properties, wellbore geometry
Development cost--cost overruns, delays
Operating cost--corrosion, labor cost, regulatory compliance
Transportation cost to market--tariffs and fees
Tax and Royalty structure--government take
Market Price of oil and gas--short term, long term

*good things
to recognize*

During the exploration phase, all the above factors are modeled using assumptions and analogs. As projects move to development and production, the focus shifts to the later half the list. Multiple scenarios are evaluated.

Need to constantly evaluate and optimize the operations:

- Risks and conditions change--good/bad/just different
 - Field conditions--such as labor costs, government take
 - Reservoir conditions--flow rates decline
 - Market conditions--prices, transportation costs
- Adjust operations as needed to maximize net present value.
 - Consolidate operations, automate operations, implement new technology

Again, projects that fall below the established economic thresholds get suspended or terminated if the long term metrics don't look good. Likewise, projects move forward as conditions become more favorable.

- Milne Point EOR
- North Slope gas line

What Separates the Winners From the Losers?

There is no simple single answer. But profitability is a good first lens.

Metrics used to measure profitability

- Rate of return
- Net present value
- Profitability index
- Payout

Factors to consider:

- Size of accumulation-- ultimate recoverable oil and gas
- Flow rate per well
- Location relative to existing infrastructure

Today there are several very large undeveloped oil fields on the North Slope. So size alone isn't the only measure.

Kuvlum, Hammerhead, Umiat

Today there is at least one very large undeveloped satellite pool on the North Slope. So proximity to existing infrastructure isn't the only measure.

Ugnu

Today there are world class gas accumulations on the North Slope so size, location and flow rate together don't guarantee a successful project.

Prudhoe Bay and Point Thomson

The offshore examples cited above are most likely uneconomic to develop today using today's technology and today's expected oil and gas market prices even at a zero tax and zero royalty rate. There always will be a continuum of "sub-economic" to "economic" projects on the North Slope regardless of commodity prices and exploration/development costs.

Projects can move back and forth on this continuum as conditions change.

The Future of Exploration and Development on the North Slope

There is no single or simple analog or model that describes all future exploration and development opportunities on the North Slope. The prospects and their associated economic potential are diverse and not viewed the same by all oil and gas companies.

For Exploration

Opportunities for multiple fields and pools--oil and gas

Some stand alone, some satellites. Some near infrastructure, some remote.

Brooks Range Foothills, remote NPRA (Kokoda)

Satellites outboard of the Kuparuk River Unit

Additional satellites inside producing units

For Development

Opportunities for multiple fields and pools--oil and gas

Some stand alone and some satellites. Some near infrastructure, some remote

Point Thomson

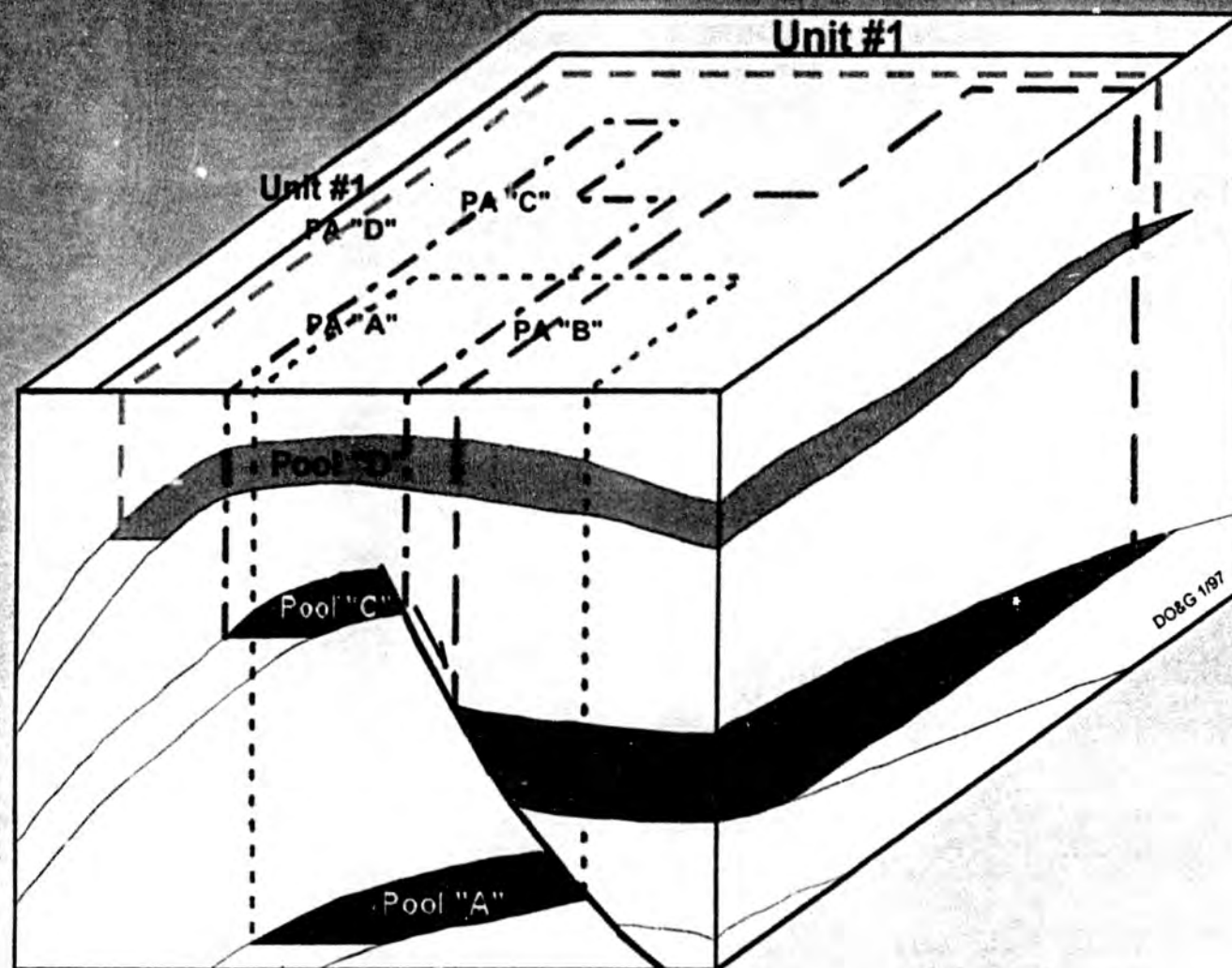
Close-in NPRA, remote NPRA

Oooguruk Unit, Nikaitchuk Unit, Tuvaaq Unit

Alpine satellites

Satellites inside producing units

Hypothetical Unit with 4 Pools & Four Participating Areas (PAs)



①

SOUND WAVES
ARE REFLECTED
DIFFERENTLY
BY EACH
MATERIAL

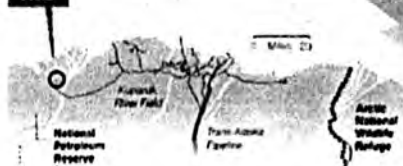


LOOKING FOR OIL
Images generated by supercomputers allow geologists to locate small pockets of oil or gas.

DRILLING TECHNOLOGY

Old drills were limited to a single vertical well, but newer wells can drill horizontally or spread in different directions to tap small pockets of oil.

Alpine Field



TRANSPORTING THE OIL

A 14-inch pipeline connects the Alpine field to the Trans-Alaska Pipeline about 60 miles west of the Arctic National Wildlife Refuge, a site proposed for new drilling.

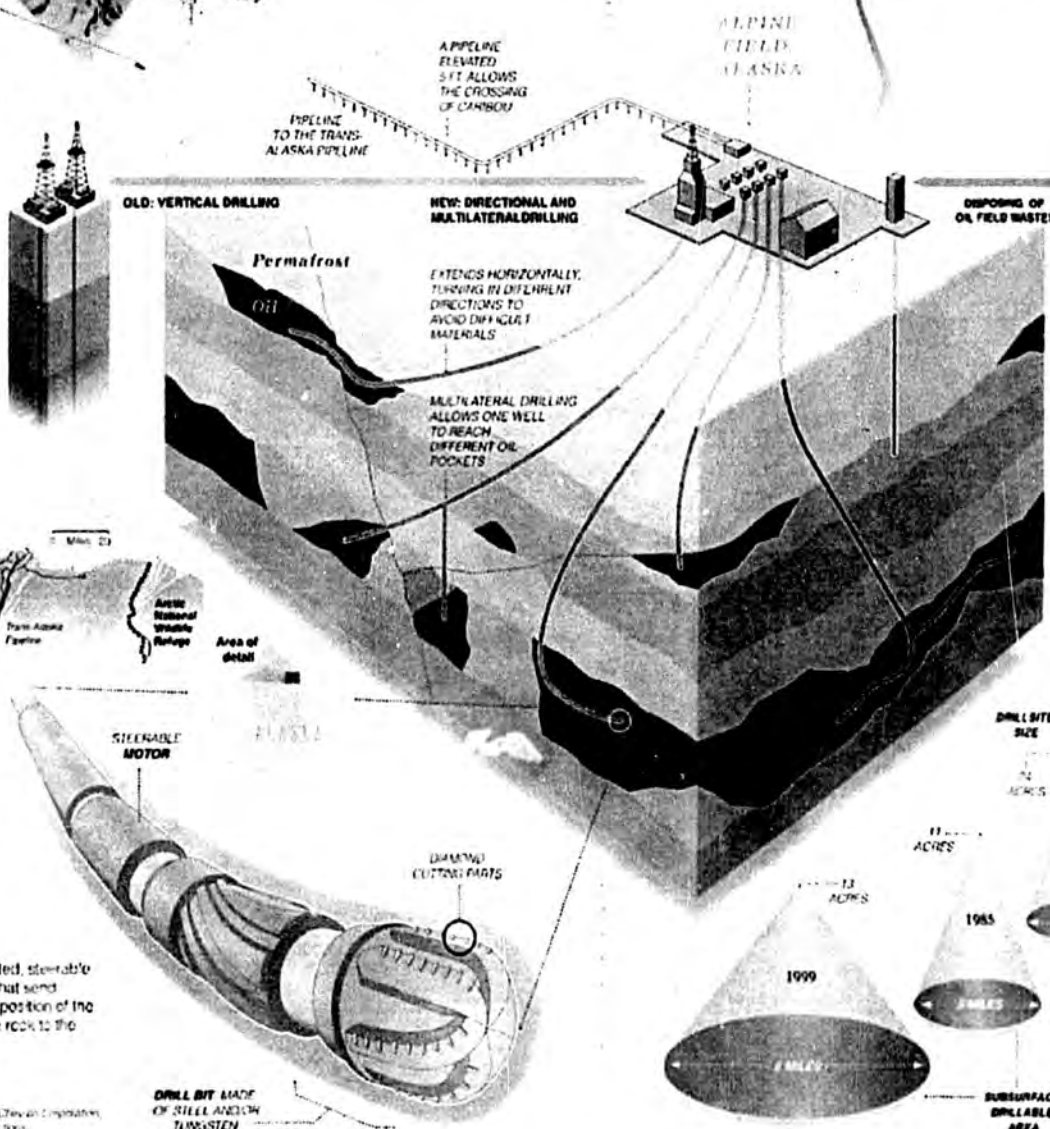
CUTTING PARTS

Today's drills are sophisticated, steerable machines with instruments that send information about the exact position of the drill bit and properties of the rock to the drilling team.

Sources: Phillips Petroleum Company; Chevron Corporation; BP America; McGraw-Hill; Arctic Connection.

Using the Latest Drilling Technology ...

Oil drilling sites like those in the Alpine field on Alaska's North Slope are using cutting-edge technology in hopes of reducing environmental damage.



... To Reduce Environmental Damage

Recent advances are lessening the industry's impact on the fragile Arctic ecosystem.



BP/Amoco

GETTING THERE

To minimize the project's impact on the environment, temporary ice roads are used in the winter, leaving few traces after they thaw.

MUD/ROCK
PASTE
CRUSHED
AND INJECTED



DISPOSING OF WASTES

Mud and debris from drilling used to be placed in big reserve pits. Today, rock cuttings are crushed, mixed with the mud, and sent deep into the earth where they originated. This minimizes the size of well paths.



CROSSING A RIVER

Although traditional pipelines are built above ground, the pipeline to the Trans-Alaska Pipeline plunges beneath the Colville River, preserving the surface and the river best environment.

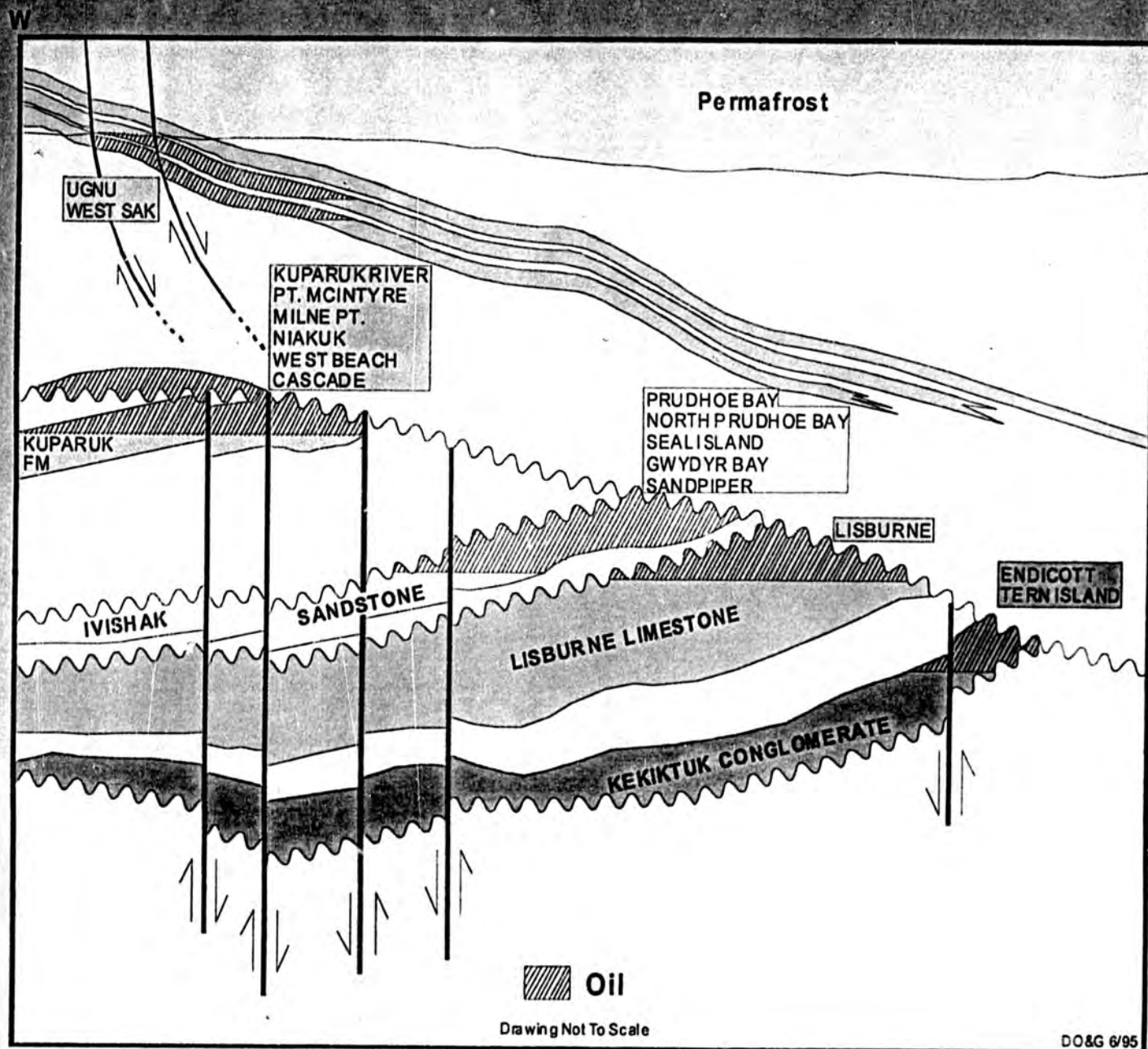
OCCUPYING LESS OF THE TUNDRA

The new drilling technology allows for smaller surface production pads and larger areas explored in the earth.

From Wikipedia/The New York Times

Central North Slope

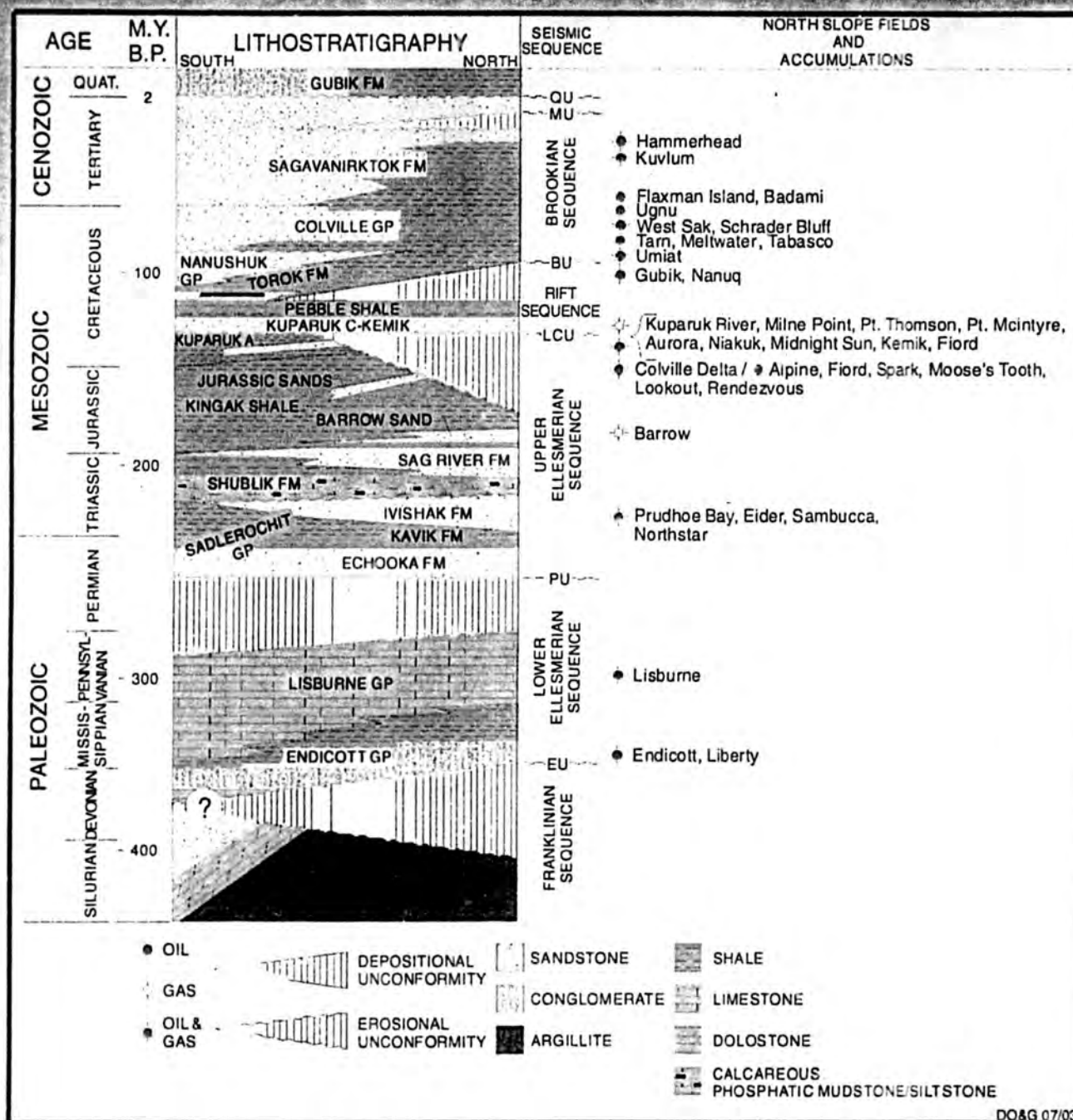
Generalized Geological Cross-Section



<http://www.dog.dnr.state.ak.us/oil/>

3

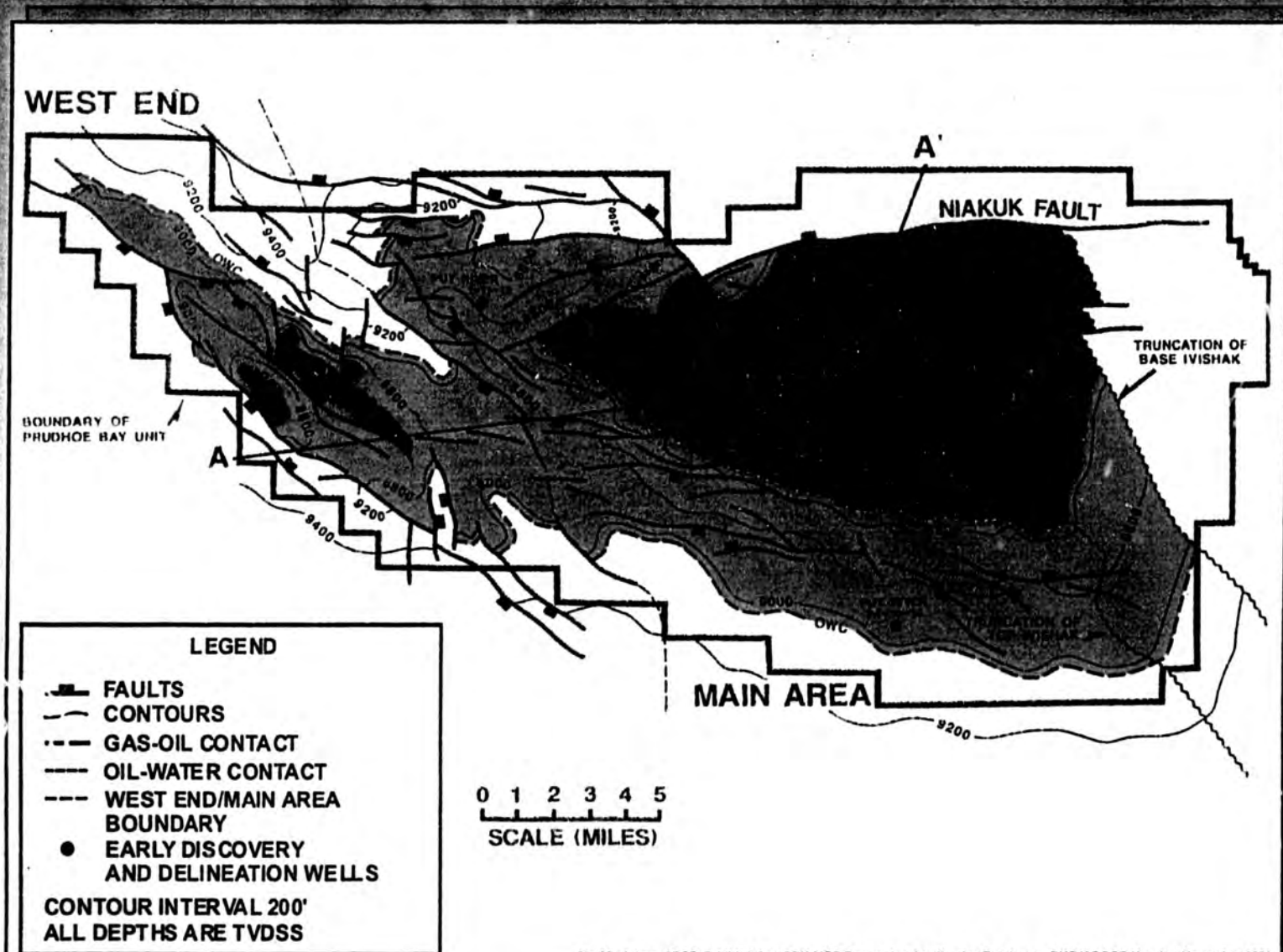
Generalized North Slope stratigraphic column displaying oil and gas reservoirs and associated accumulations



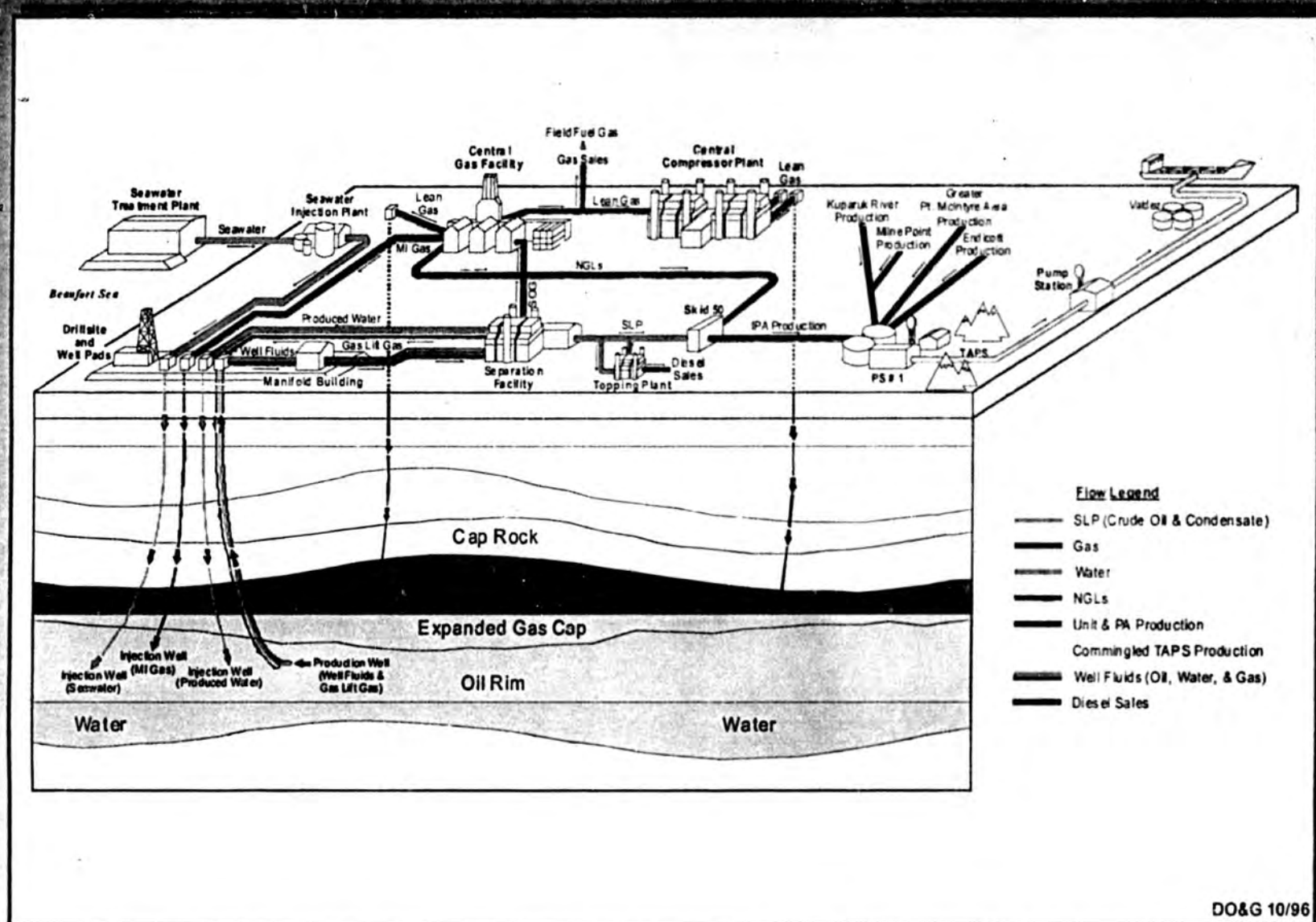
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Prudhoe Bay Field

Top Ivishak Structure Map



Prudhoe Bay Production and TAPS Schematic



DO&G 10/96

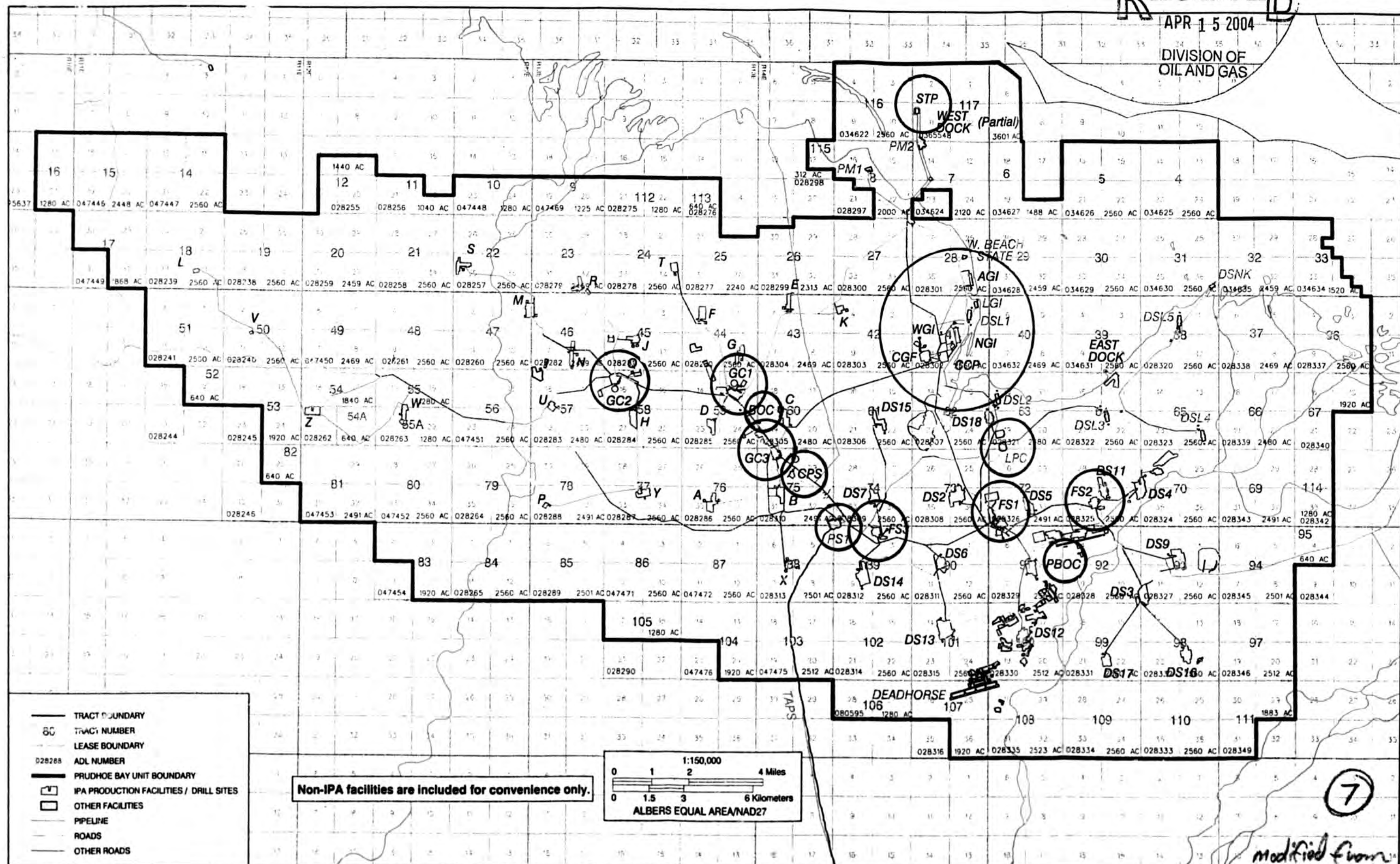
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PRUDHOE BAY UNIT - PRODUCTION FACILITIES

RECEIVED

APR 15 2004

DIVISION OF
OIL AND GAS



Non-IPA facilities are included for convenience only.

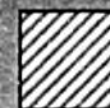
modified from

Lease Ownership Without Common Equity

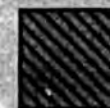
		ADL 300102	ADL 300101
ADL 300105	ADL 300104	ADL 300103	ADL 300301
ADL 300204	ADL 300203	ADL 300305	ADL 300304
ADL 300205	ADL 300206	ADL 300201	ADL 300202



BP 100%



CHEVRON 100%



BP 50%
CHEVRON 50%



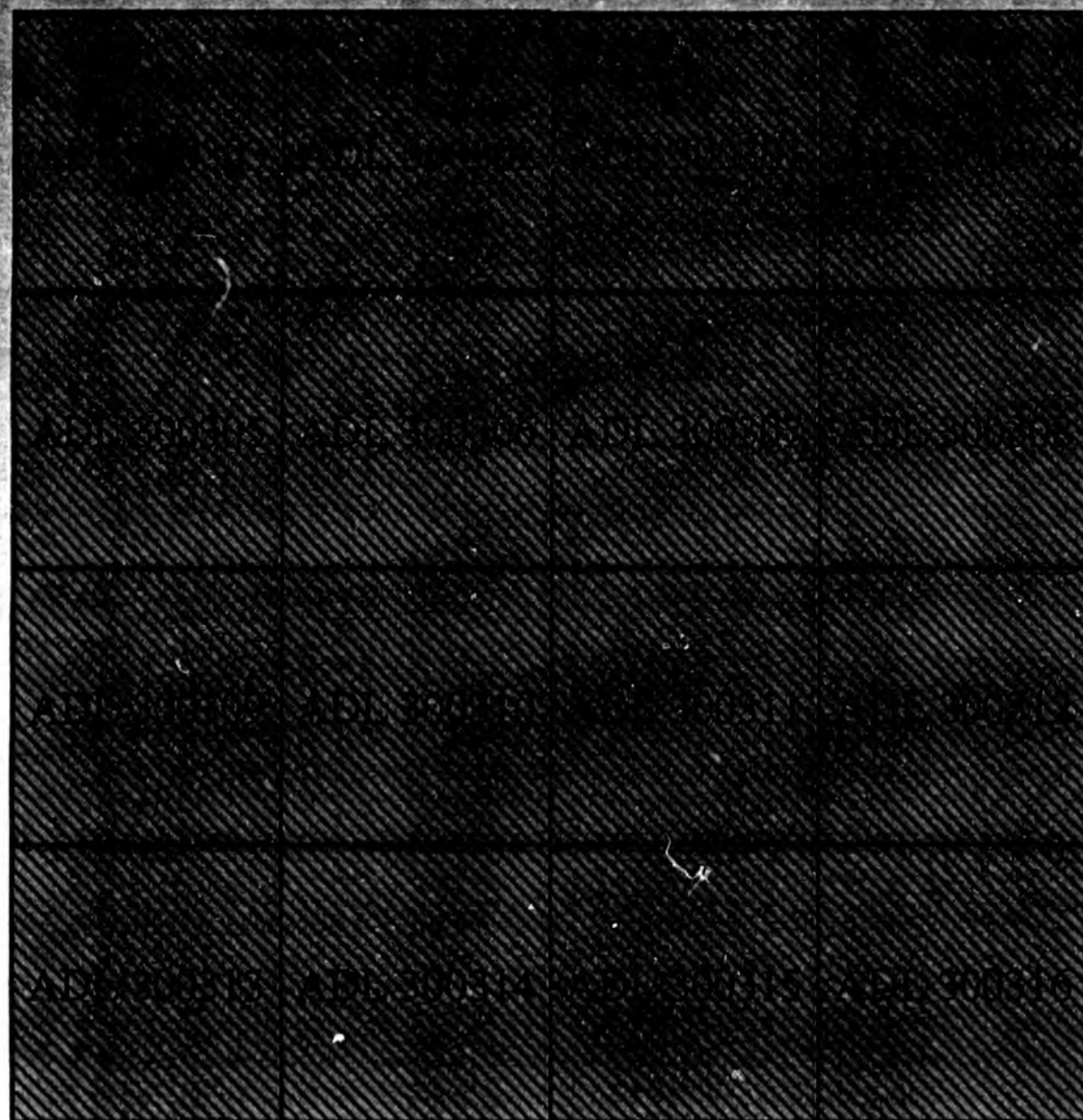
UNOCAL 100%



WINTHER 100%

(8)

Lease Ownership With Common Equity



BP 35%



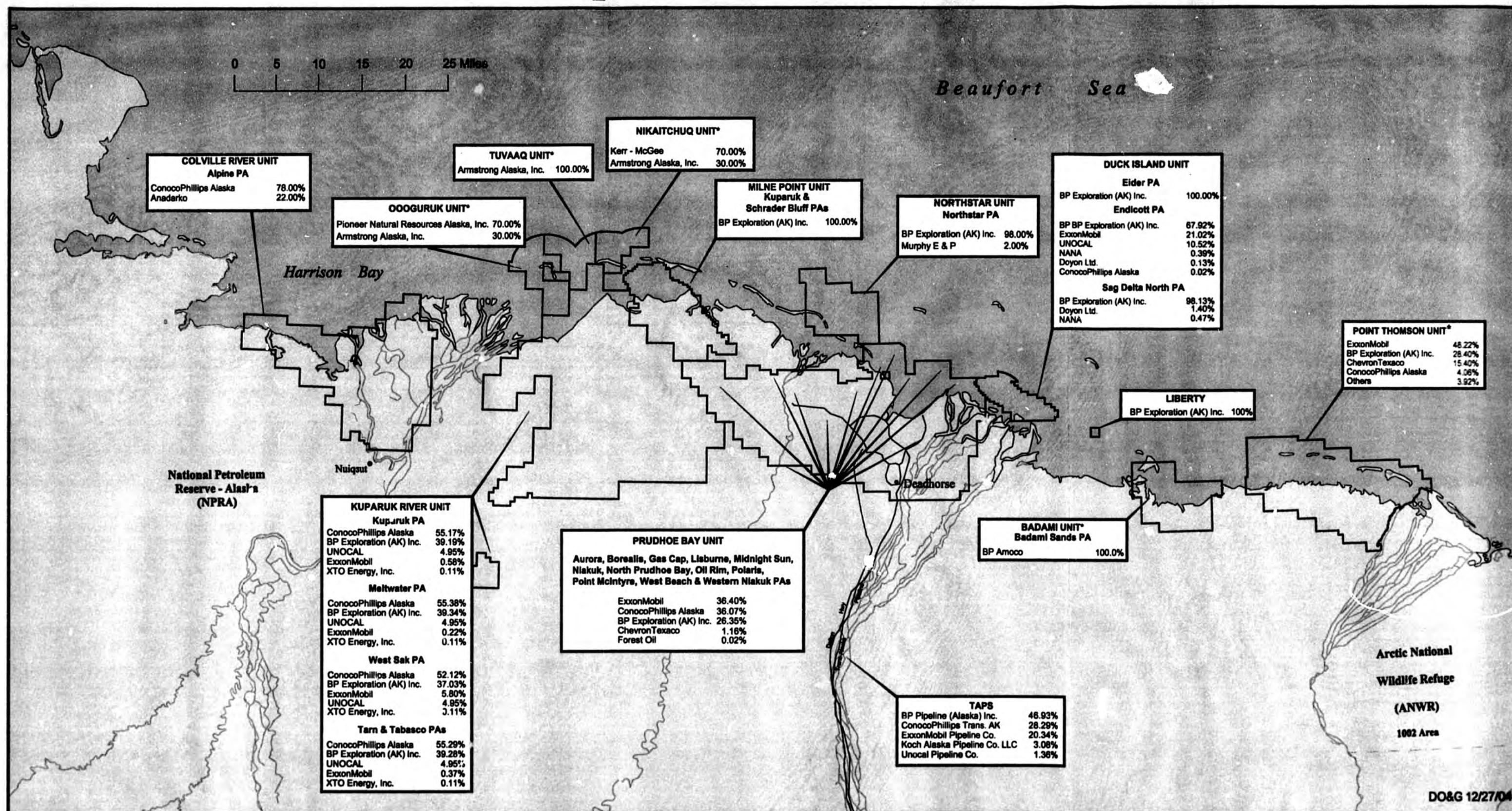
CHEVRON 35%

WINTHER 5%

UNOCAL 25%

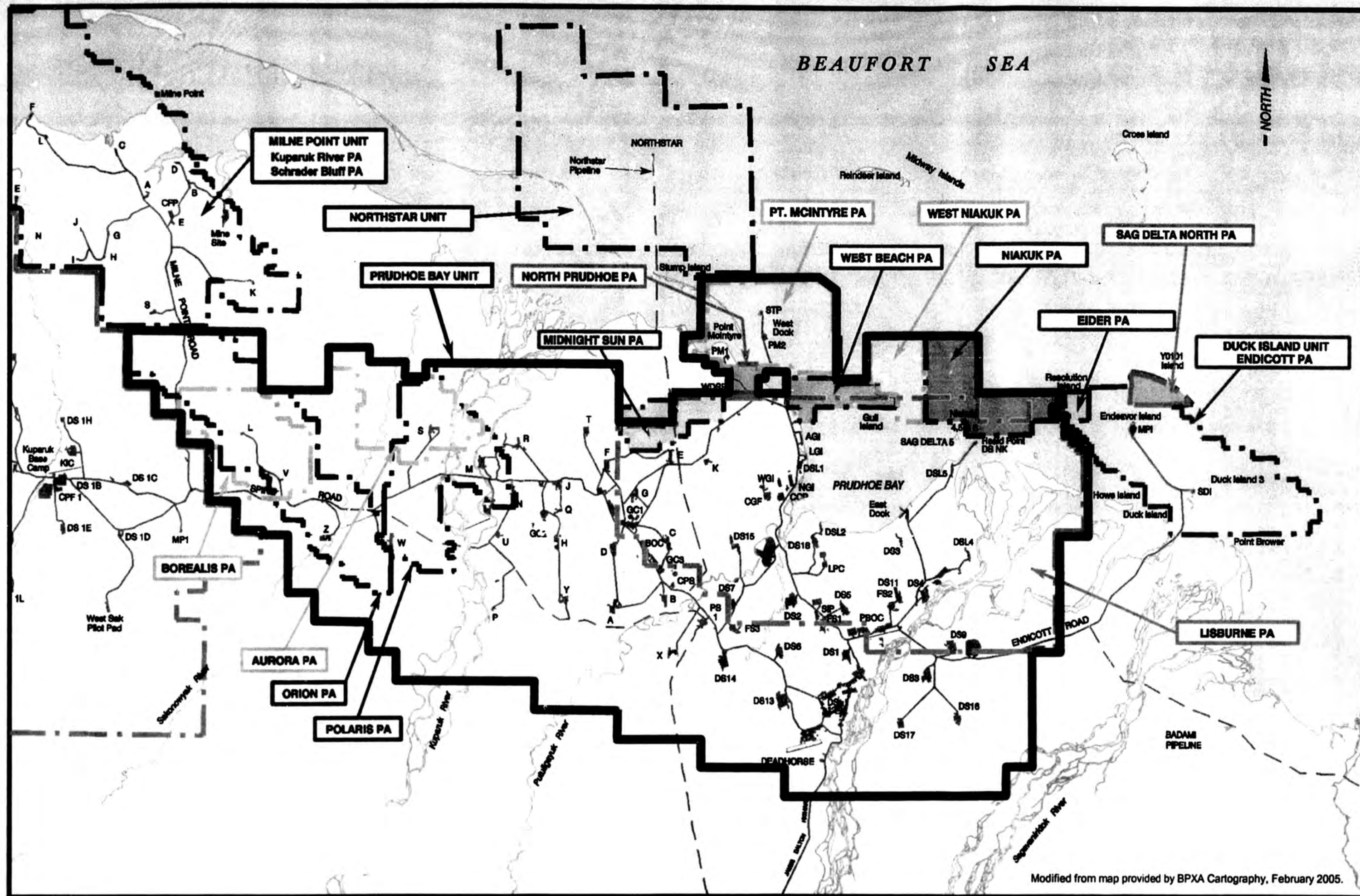
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North Slope Oilfield and Pool Ownership



*When there is no production or PA, percentages are based upon working interest ownership on an acreage basis.

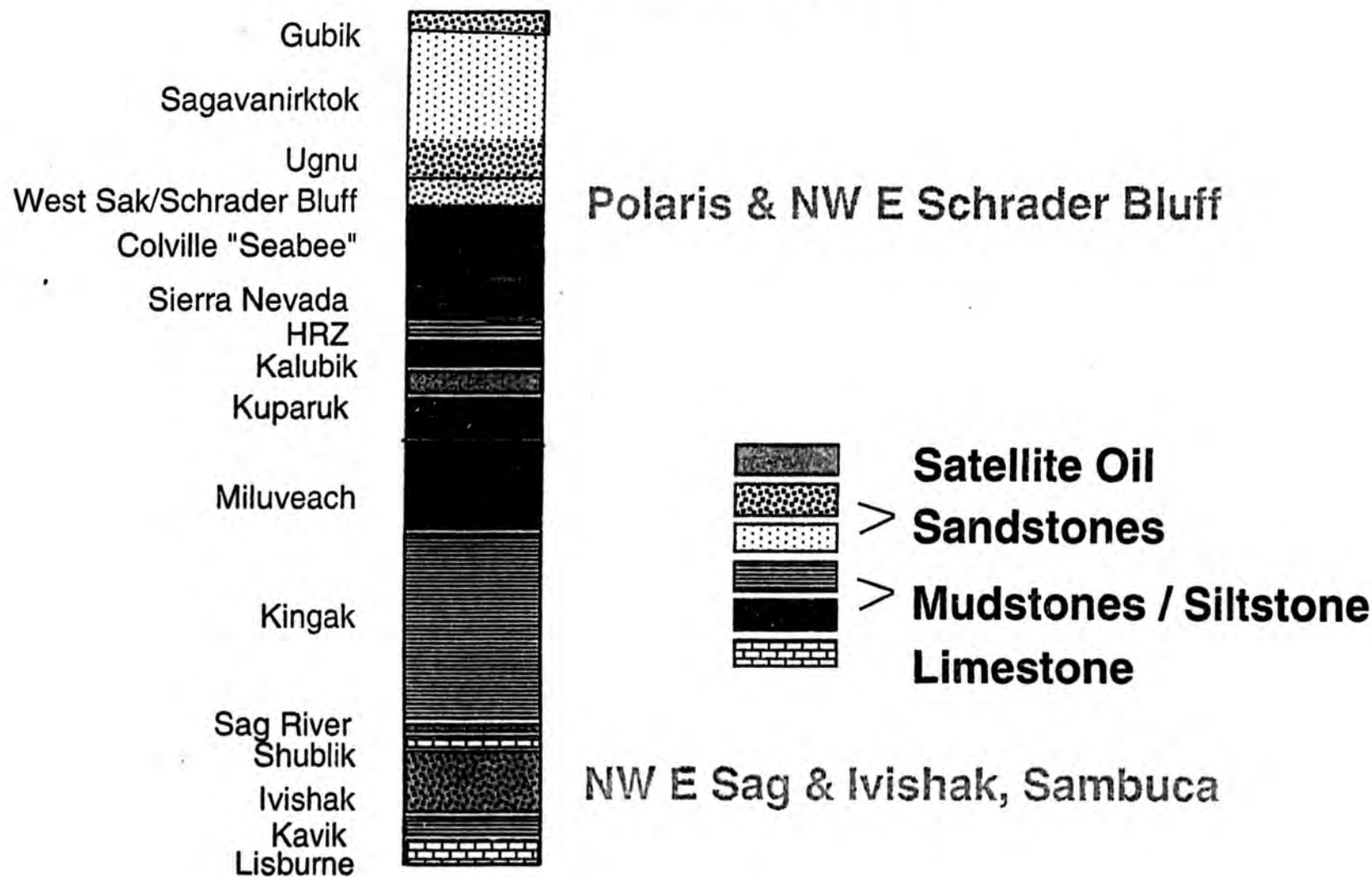
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Modified from map provided by BPXA Cartography, February 2005.

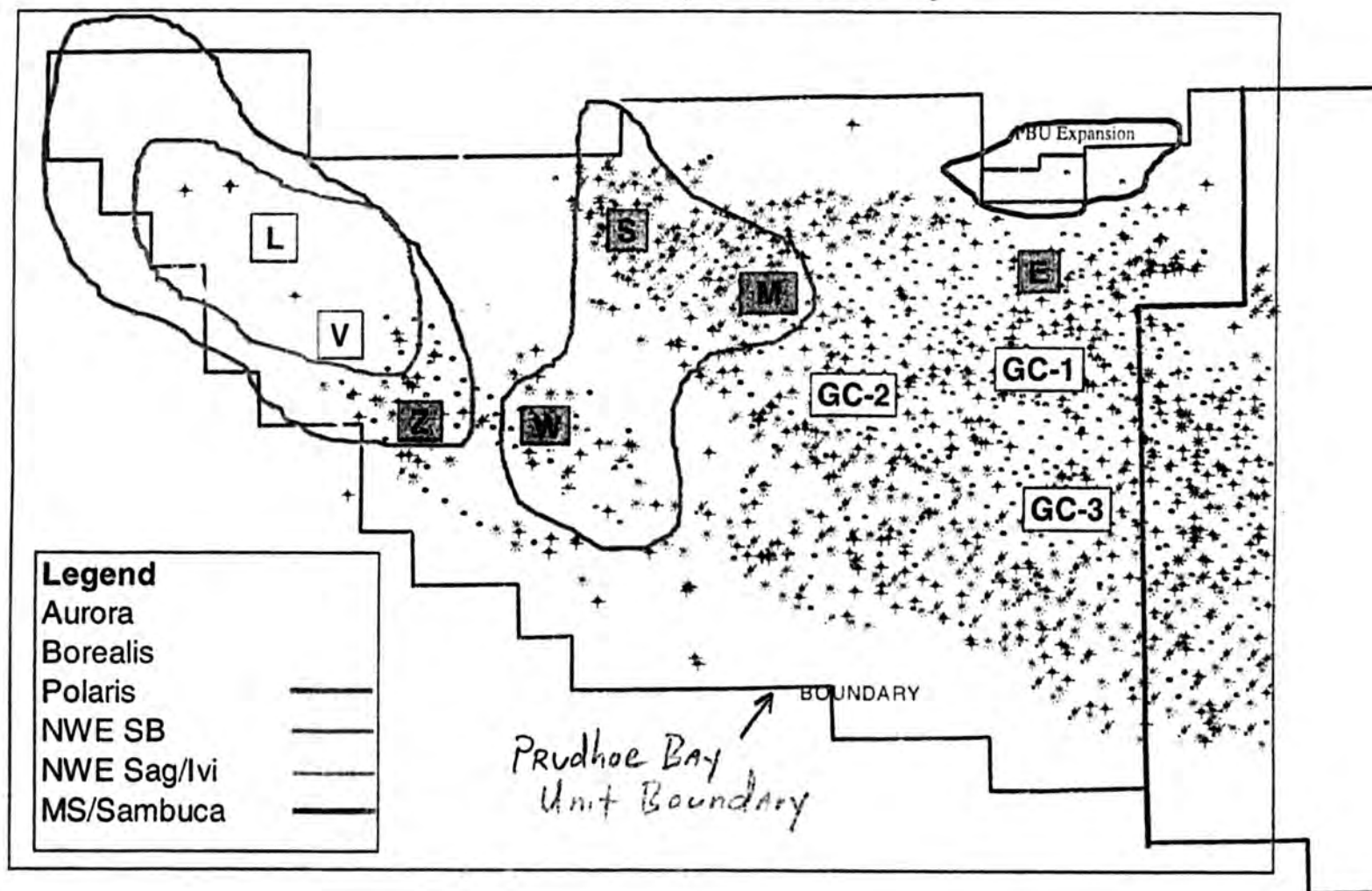
Prudhoe Satellites Update

Stratigraphy

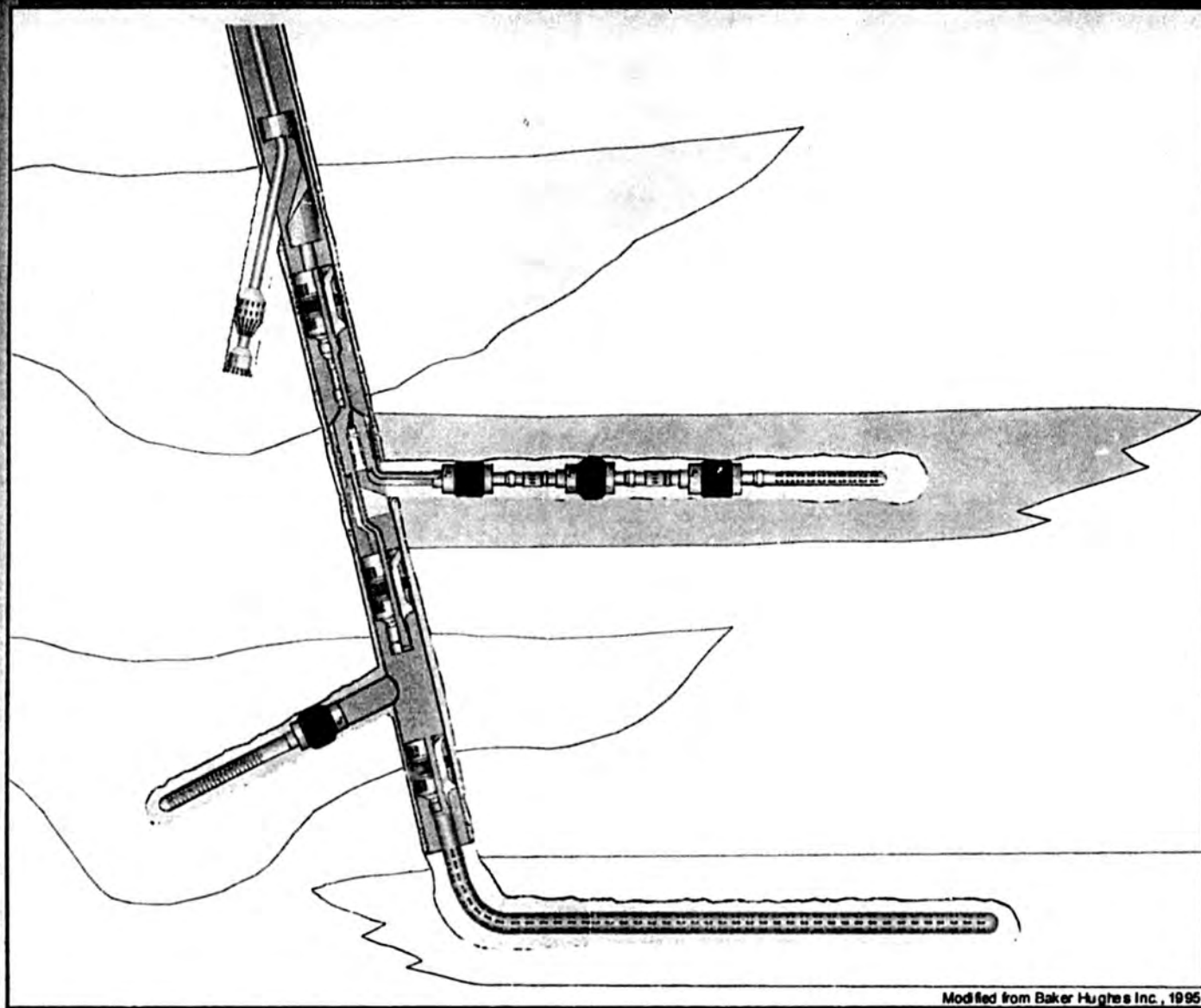


Prudhoe Satellites Update

Satellite Development Map



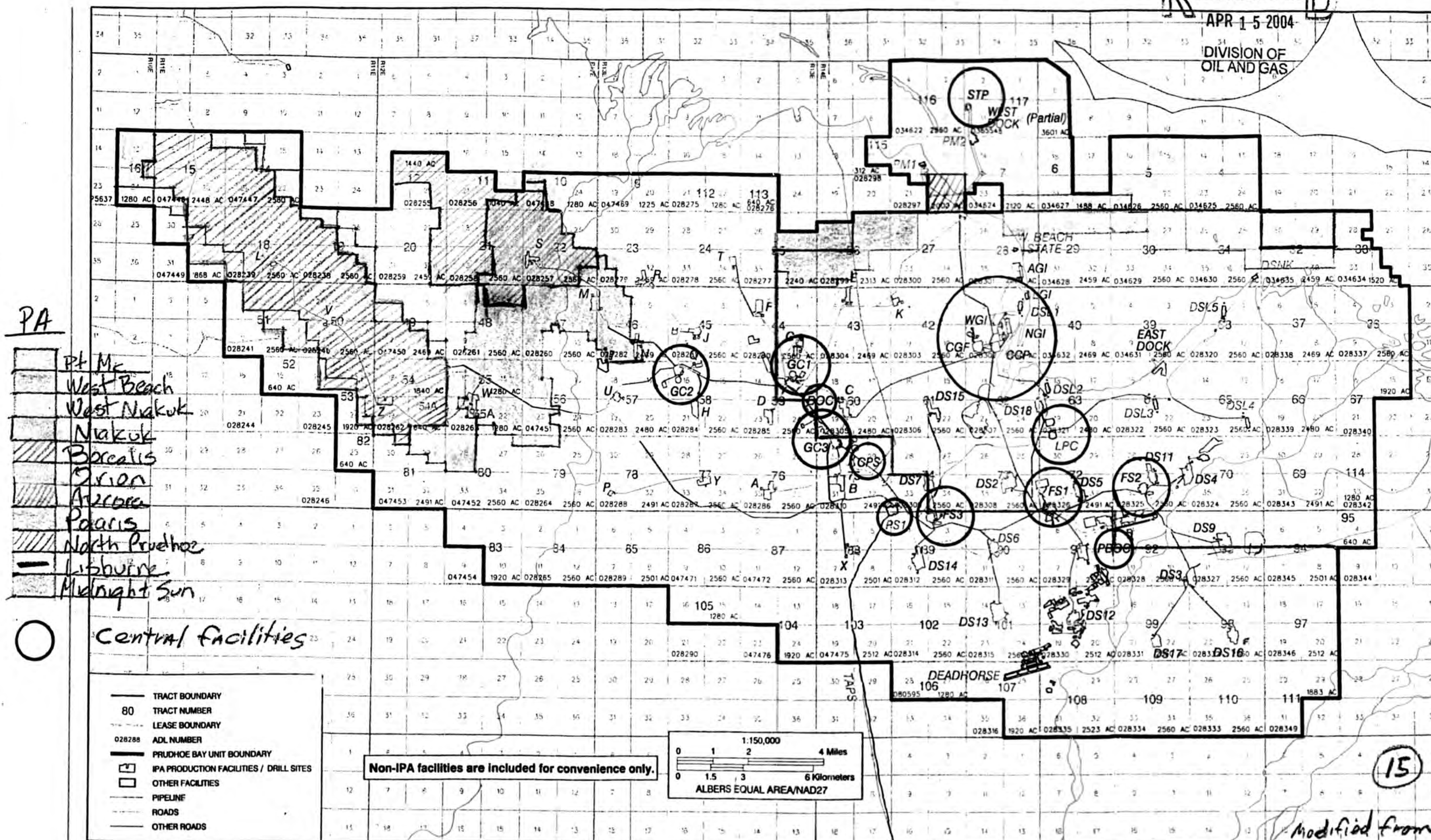
Multilateral Wellbore Completions



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