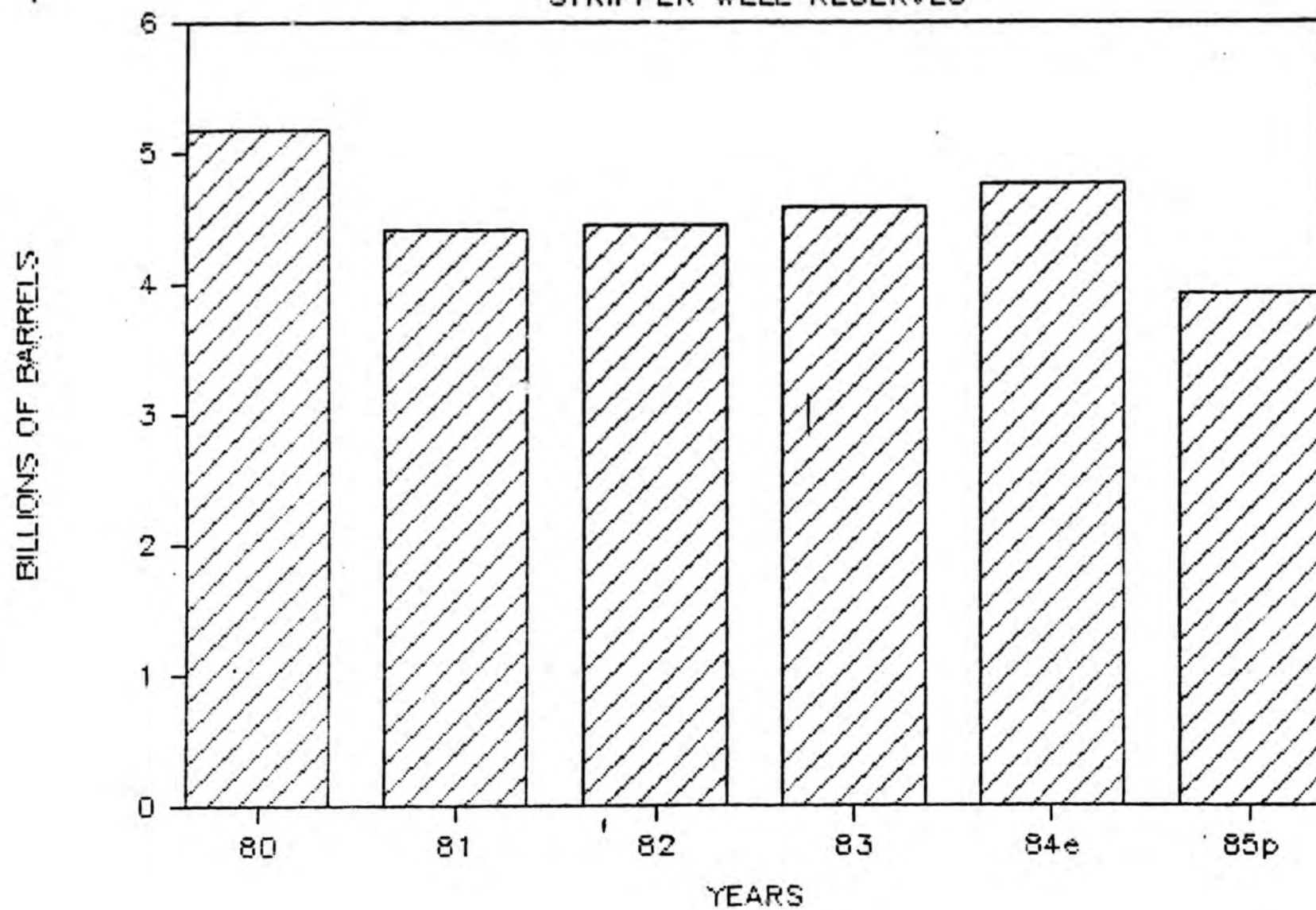


ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672
1510 SCOMM 55: JNT. SPEC. COMM. ON STATE TAX POLICY, 1986-1987 1310

NATIONAL STRIPPER WELL PRODUCTION



NATIONAL STRIPPER WELL RESERVES



IMPACT OF FEDERAL TAX PROPOSALS ON ENHANCED OIL RECOVERY (EOR)

	U.S. *	ALASKA *	ARKANSAS *	CALIFORNIA *	COLORADO *	FLORIDA *	KANSAS *
REDUCTIONS	(Millions of Dollars)						
IN ROYALTY PAYMENTS	10,351	184	77	1,221	200	42	65
IN PROPERTY & SEVERANCE TAX PAYMENTS	2,228	8	32	245	76	17	42
IN STATE INCOME TAX COLLECTIONS	635	66	17	77	9	6	(1)
IN FEDERAL INCOME TAX COLLECTIONS	1,313	(220)	74	(1,473)	4	(25)	(72)
IN PAYMENTS TO THIRD PARTIES	34,174	1,404	428	7,978	947	194	332
IN EQUIPMENT PURCHASES	2,250	14	6	(887)	26	3	9
IN IDC'S FOR EOR WELLS	896	8	5	44	75	32	212
TOTAL	51,847	1,464	639	7,205	1,337	269	587
IN EOR PRODUCTION#	1,832	94	21	423	54	6	17

* All impacts are cumulative.

Millions of barrels.

Basis:

- National Petroleum Council Enhanced Oil Recovery, June, 1984 and Bartlesville Project Office (DOE) EOR Data Base and Economic Model.
- Actual state by state current property and severance tax rates.
- Actual state by state income tax rates.
- Provisions of Secretary Regan's November, 1984 tax proposal regarding:
 - Intangible investments
 - Tertiary injectants
 - Revised ACRS depreciation
 - No tax credit
 - Modified depreciation schedules
 - Crude oil price of \$30.00 per barrel
 - 10% rate of return on investment

IMPACT OF FEDERAL TAX PROPOSALS ON ENHANCED OIL RECOVERY EOR

	U.S.*	KENTUCKY*	LOUISIANA*	MISSISSIPPI*	MONTANA*	NEBRASKA*	NEW MEXICO*
REDUCTIONS	(Millions of Dollars)						
IN ROYALTY PAYMENTS	10,351	0	(48)	60	86	29	806
IN PROPERTY & SEVERANCE TAX PAYMENTS	2,228	0	75	29	43	8	530
IN STATE INCOME TAX COLLECTIONS	635	4	(58)	6	11	3	92
IN FEDERAL INCOME TAX COLLECTIONS	1,313	13	(136)	28	54	12	353
IN PAYMENTS TO THIRD PARTIES	34,174	75	311	250	406	161	3,471
IN EQUIPMENT PURCHASES	2,250	0	(3)	8	10	5	95
IN IDC'S FOR EOR WELLS	896	0	(45)	29	19	2	271
TOTAL	51,847	92	96	410	629	220	5,618
IN EOR PRODUCTION#	1,832	0	(14)	16	23	8	288

* All impacts are cumulative.

Millions of barrels.

Basis:

- National Petroleum Council Enhanced Oil Recovery, June, 1984 and Bartlesville Project Office (DOE) EOR Data Base and Economic Model.
- Actual state by state current property and severance tax rates.
- Actual state by state income tax rates.
- Provisions of Secretary Regan's November, 1984 tax proposal regarding:
 - Intangible investments
 - Tertiary injectants
 - Revised ACRS depreciation
 - No tax credit
 - Modified depreciation schedules
 - Crude oil price of \$30.00 per barrel
 - 10% rate of return on investment

IMPACT OF FEDERAL TAX PROPOSALS ON ENHANCED OIL RECOVERY EOR

REDUCTIONS	U.S.*	NORTH DAKOTA*	OKLAHOMA*	TEXAS*	UTAH*	WYOMING*	OTHER*
	----- (Millions of Dollars) -----						
IN ROYALTY PAYMENTS	10,351	193	768	1,558	(4)	41	5,073
IN PROPERTY & SEVERANCE TAX PAYMENTS	2,228	177	435	567	0	21	(77)
IN STATE INCOME TAX COLLECTIONS	635	34	70	0	(9)	0	308
IN FEDERAL INCOME TAX COLLECTIONS	1,313	82	469	(693)	(109)	(38)	2,990
IN PAYMENTS TO THIRD PARTIES	34,174	913	3,629	9,656	(26)	227	3,818
IN EQUIPMENT PURCHASES	2,250	23	60	432	0	6	2,443
IN IDC'S FOR EOR WELLS	896	41	69	408	0	(19)	(255)
TOTAL	51,847	1,463	5,500	11,928	(148)	238	14,300
IN EOR PRODUCTION [#]	1,832	51	209	465	(1)	12	

* All impacts are cumulative.

[#] Millions of barrels.

Basis:

- National Petroleum Council Enhanced Oil Recovery, June, 1984 and Bartlesville Project Office (DOE) EOR Data Base and Economic Model.
- Actual state by state current property and severance tax rates.
- Actual state by state income tax rates.
- Provisions of Secretary Regan's November, 1984 tax proposal regarding:
 - Intangible investments
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 - No tax credit
 - Modified depreciation schedules
 - Crude oil price of \$30.00 per barrel
 - 10% rate of return on investment

Severance

Tax

MEMORANDUM

State of Alaska

TO: Tax Policy Committee

DATE: September 16, 1986

FILE NO.:

THRU:

TELEPHONE NO.: 465-2302

SUBJECT: Severance Tax (AS 43.55)

FROM: 
Richard D. Monkman
Deputy Commissioner, Taxation

Attached is a memorandum which discusses some policy considerations behind the severance tax, written several years ago by former Assistant Attorney General Jon K. Tillinghast. Of particular interest is the memorandum's historical perspective on resource development in Alaska.

RDM:mkw

Attachment

cc: Royce Weller

ALASKA OIL SEVERANCE TAX POLICY
Alaska Department of Law: Juneau, Alaska
Jon K. Tillinghast, Asst. Atty. Gen.

Each day, some 1.57 million barrels of oil are drawn from the Sadlerochit and Kuparuk reservoirs which underly Alaska's Arctic coast. The oil is passed through the Trans-Alaska pipeline to the port of Valdez, and shipped by tanker to refineries along the Pacific coast and Gulf of Mexico. North Slope oil is the consummate asset in Alaska's economic portfolio. It builds schools in the villages of the Bering Sea: it saves lives in hospitals on the Arctic rim. And, as each tanker departs Alaska's territorial waters, the day when it will be gone draws nearer. In 15 years, North Slope production, including likely new discoveries, will probably be about half of what it is today.

For 250 years, Alaska has known brief and furious interludes of intensive natural resource development. In the main, however, Alaska's history has been one of poverty, stagnation and aftermath. Each profiteer who has dipped into Alaska's resource coffer has paid little for his reward, and has left to those who remained the consequences of his exploitation.

In the beginning, it was the Russian fur merchant. Between 1797 and 1821, the Russian American Co. took of Alaska's waters some 1,3000,000 fur seals and sea otters. Having rendered the sea otter comparantly extinct, the company left as its legacy not only barren waters, but a

diseased Aleut native population which stood at 12,000 in 1780, but numbered 2,200 sixty years hence.

The whalers came next, and after them the miners and fishermen. Each had their golden age--an age about as long as the life of an oil field--and each left behind remains as sad as those bestowed by their Russian predecessors.

Alaska's lot is such that it's economy will always be vulnerable to cycles. It is remote; it is inaccessible; and its weather and its terrain are hostile. For the foreseeable future, the state cannot expect a self-sustaining economy rooted in manufacturing or agriculture. Eight percent of Alaska's work force is involved in manufacturing, most of that being associated with raw processing of fish, timber and oil. The value of agricultural production in Alaska was only \$5.5 million in 1960, and had increased to but \$9 million by 1979.

Recurring and stable economic development in the extraction of Alaska's natural resources is limited by both the carrying capacity of the resource, and the extraordinarily high costs associated with any economic activity in the state. Although Alaska's commercial fisheries have recovered from the aftermath of systematic overfishing in pre-statehood years, that recovery has been achieved only by freezing the level of commercial gear through the state's limited entry legislation, and an aggressive state-funded hatcheries program. Timber

production peaked in Alaska in 1973, when 655 million board feet were harvested from the state's public lands. In 1979, some 493 million board feet were cut.

Alaska's mining industry --for minerals other than oil, gas and gravel--produced \$17 million in minerals in 1959, and essentially the same amount in 1979. In 1976 (the last available data year), the per-square-mile valuation of hard rock mineral production in the eleven contiguous western states was \$5,545. In Alaska it was \$410, and decreased to \$284 in 1979.

Regardless of the growth potential in Alaska's base industries--and in many cases that potential is substantial--the cumulative benefits of all recurring economic activities will not sustain a state which, even during the flush of oil revenue, faired poorly with its sisters in the provision of basic services and facilities. For example, Alaska has less than half the national average of hospital beds per capita. The state has .64 nursing home beds per 100,000, compared to the national average of 4.89. 17 percent of Alaska's homes are substandard or overcrowded, as opposed to a national average of 7.7%. The U.S. Environmental Protection Agency estimated in 1980 that it would require per capita expenditures of \$783 to bring Alaska's publicly owned sewage treatment works to secondary treatment standards. The national average per capita cost was \$128, and no other state had per capita costs over \$300. Alaska shares honors with Mississippi for the fewest

physicians per 100,000 residents--78, compared to the national average of 163. Less than one percent of the state's area is accessible by road.

The modest level of tax revenues capable of being generated by Alaska's base economy is the cause of the state's historical inability to achieve equal footing in the provision of rudimentary services. In 1959, the year of statehood, Alaska's tax revenues totalled \$25 million. The Trans-Alaska Pipeline commenced operation in 1977. Between 1970 and 1976, per capita state expenditures, adjusted for inflation, remained virtually constant. While all corporations in the state are subject to the same income tax rate, in FY 1981 the state collected \$860 million in income taxes from corporate oil producers, and \$35 million in income taxes from all other corporate activity in the state.

Because of the backdrop against which it occurred, and the return of a "bust" period which imprudent fiscal management would ensure, no issue has more consumed the Alaska Legislature over the past decade than the establishment of sound tax policy during the brief, intensive and extraordinarily profitable period of oil production in Alaska. State government cannot alter the variations inherent in an extractive economy. However, no motivation more underlay statehood than did Alaska's need to steward the brief periods of intense wealth generation--largely by non-residents--in order to cushion the inevitable prolonged aftermath which Alaskans alone would be required to suffer.

Possessing the essential attribute of statehood--the power to tax--Alaska would be capable of evening the curves by establishing a tax structure which, among of other legal and policy considerations, was responsive to three fundamental concerns:

(1) "Boom" activities, for two reasons, tended to generate substantial profits which were exported in toto and virutally tax free. First, because of the marginal nature of Alaska's base economy, tax liability was of necessity often low. Of perhaps greater importance, the incidence and measure of taxation in Alaska's laws were drawn from experience with the base economy. The "boom activities" could be of a nature for which the incidence and measure of the tax were inappropriate, resulting in under-taxation. For example, the Alaska Legislature found in the mid-1970's that, largely because of the way that Alaska law measured the income of a multi-state corporation doing business in Alaska, the effective tax rate on a multi-state company producing oil in Alaska was about 2 percent, instead of the 9.4 percent paid by local Alaska companies;

(2) The "boom activity" inevitably aggravated the state's existing fiscal deficiencies through inflation and population increases, and the attendant increased needs for public services. In 1970, Alaska's population stood at 302,000. By the completion of pipeline construction in 1977, the state's population had swelled to 396,000. During the pipeline construction year of 1975, the Consumer Price

Index ("CPI") rose 7 percent nationwide. In Anchorage it rose 11.1 percent--although in the pre-construction years of 1967-73 that city's CPI had risen at substantially lower rates than the nationwide average. In 1981, an average American family of four spent \$72 per week on food. In Fairbanks it spent \$93, and in Barrow \$180. Completion of the pipeline in 1977 also left an inevitably high unemployment rate among an artificially high work force. In 1978, Alaska had an 11 percent unemployment rate (the highest in the nation), against a national average of 6 percent; and

(3) The "boom" participants were not merely earning and exporting returns from Alaska's economic portfolio. They were raiding its corpus. And, with little but speculation as to whether there lay hidden future assets of the magnitude of Prudhoe Bay, it was incumbent upon the Alaska Legislature to ensure that the greatest long-term public value was made of this asset before it so soon and so finally evaporated.

Intensive oil exploration in the state began in 1954, when the Bureau of Land Management awarded 272 oil and gas leases covering some one-half million acres. At the time, any oil production would have been subject to the territory's general mining license tax, which was first enacted in 1913, and which levies a progressive 3-7 percent tax on net income from the mining operation.

The commencement of drilling activities under the 1954 leases elicited the territory's first interest in tax

legislation responsive to oil and gas production activities. In 1955, the legislature adopted Alaska's first oil and gas severance tax. Modelled after Oklahoma's statute, the act imposed a tax of one percent on the gross value of produced oil at the wellhead.

On September 29, 1957, Alaska became an oil producing territory with the discovery of the Swanson River oil field in the Kenai National Moose Range. Two years later, Alaska became a state, and thereafter a series of discoveries in upper Cook Inlet clearly entrenched oil production as a major component of Alaska's base economy. The first offshore discovery was the Middle Ground Shoal field in Cook Inlet in June, 1962, followed by the Trading Bay field (June 1, 1965), the Granite Point field (June 9, 1965) and the McArthur River field (October 24, 1965). Coupled with several gas discoveries during the same period, the value of Alaska oil and gas production rose from \$301,000 in 1959 to \$50.4 million in 1966.

Despite the success of Cook Inlet development--which was to eventually peak in 1970 with the production of some 81.6 million barrels of oil--the Alaska Legislature remained unwilling to increase the industry's severance tax liability above the conservative one percent rate established two years before oil was discovered. Statehood did not bring a rush to tax for taxation's sake, and the health of Cook Inlet activity did not convince the legislature that

oil development was anything other than another tentative component of Alaska's vulnerable base economy.

In 1967, the state finally increased the severance tax from one to two percent--for reasons hardly of its own making. In that year, the city of Fairbanks was devastated by savage floods, and the legislature was called into special session to provide emergency relief. Some \$9 million in disaster appropriations were necessary. To fund a portion of the deficit, the legislature temporarily increased the severance tax.

Between 1966 and 1968, Cook Inlet production had expanded from 14 million barrels annually to 66 million barrels. Annual production was worth \$187 million in 1968. The 1968 legislature concluded that higher severance tax rates were warranted in light of this swell in industry profitability. The decision was colored by perceived price reporting anomalies by Cook Inlet producers, and the result was an increase in the severance tax rate from one to three percent--plus the one percent disaster severance tax. Severance tax revenues grew the following year from \$1.1 to \$4 million.

By 1968, then, the state's oil severance tax remained at a level comparable to taxes assessed against even marginal components of the state's base economy. In 13 years, the tax had increased 3 percent from the initial hesitant levy on an unproven industry. In early 1968, however, the largest oil field ever found in the United

States was discovered at Prudhoe Bay. It was immediately apparant that the brief window of intensive industrial activity heralded by the discovery would dwarf the booms of the past, and that a tax regime conservatively developed in response to Cook Inlet production would not be sufficient to manage the impacts and significance of Prudhoe Bay.

After nearly two years of study and debate, the legislature in 1970 adopted the state's first progressive severance tax rates--although the 1968 increase had been "progressive" in the sense that it was responsive to substantial increases in profitability in the one region where oil development was occurring. The rates established by the 1970 law were:

<u>Daily Well Production</u>	<u>Rate (%)</u>
Up to 300	3
Next 700	5
Next 1500	6
Above 2500	8

Since the 1967 disaster severance tax was repealed, the law had the effect of reducing the nominal rate on marginal wells. Severance taxes in FY 1971 increased from \$5.9 million to \$9.9.

Severance taxes are based upon value at the well-head--a sum which decreases with any increase in transportation costs to the point of ultimate sale. During the early 1970's, cost estimates for the Trans-Alaska Pipeline grew from \$1.3 to \$3 billion, and the state became concerned that

what the severance tax gaveth, high pipeline tariffs imprudently allowed would taketh away.

The legislature's response in 1972 was to establish a combined floor on state royalty payments and severance taxes. The floor was established by applying the applicable severance tax rate, with a credit for royalties, to a wellhead price of \$2.65/barrel. The law resulted in only a nominal increase in severance tax revenue in FY 1973-- from \$11.4 million to \$12 million.

The concept of a combined "floor" on severance taxes and royalties was an anathema to the oil industry. Royalty payments had been set by lease agreement with the state at 1/8 of the value of production--without a price "floor"--and the industry sued the state over the 1972 law as part of wide-ranging litigation dealing with state regulatory authority over pipeline construction and operation.

In 1973, Governor Egan called a special session of the legislature to attempt to settle the lawsuit. The state agreed to repeal the royalty portion of the "floor", and also agreed to repeal or modify a host of pipeline revenue and regulatory measures which the industry found objectionable, but only after the industry agreed to corresponding increases in the severance tax rate. Industry was willing at the time to sacrifice severance tax advantages for a removal of the royalty floor, together with substantial state

concessions in the area of pipeline regulation. The rates established in the 1973 special session were:

<u>Daily Production</u>	<u>Rate</u>
Up to 300	5
Next 700	6
Over 1000	8

The "floor" on the severance tax was retained, with a cents-per-barrel minimum tax established based on applying the applicable rate to a wellhead value of \$3.375. The floor was to be adjusted, however, both by the API gravity of the oil, and by increases or decreases in the U.S. Bureau of Labor Statistic's Wholesale Price Index for crude oil.

The 1973 "package" was in fact a miscalculation by both sides. Neither side foresaw the Yom Kippur war months hence; the resultant embargo; the quadrupling of OPEC prices; and the imposition of federal price controls. The industry found the cents-per-barrel floor increasing through the WPI while federal price controls capped the value of "old" Cook Inlet oil. The legislature, on the other hand, was faced with potentially skyrocketing Prudhoe Bay profits, with only a 3 percent rate change separating the most profitable Prudhoe Bay operation from the most marginal well in Cook Inlet.

The sessions of the legislature between 1974 and 1978 were consumed with the controversy of oil industry taxation. In-depth studies were undertaken of the likely

profitability of Prudhoe Bay production, with an eye toward equalizing the impact of the severance tax on the state's producing regions, and evening out the boom-bust curve threatened by North Slope production. Information developed for the legislature suggested that Prudhoe Bay production would yield a 35 percent rate of return. The existing severance tax law, in short, was insufficiently progressive.

In 1977, the legislature fundamentally altered the state's severance tax. A single nominal rate of 12.5 percent was established. That rate, however, was reduced by a fraction called the "economic limit factor" ("ELF"). The ELF fraction had the effect of reducing the nominal rate as production from a well decreased, to the point where no tax was imposed when a well operated at its minimum economic limit.

The ELF fraction is a unique feature of Alaska's severance tax, and reflects the legislature's sensitivity to the very different circumstances of northern and southern oil development in the state. Cook Inlet production began to decline after 1970. As a well's productivity declines, the point approaches when production from the well is no longer economically justified. Near that level, even a very small flat rate severance tax will cause the well to be shut-in. The ELF fraction is thus not only consistent with principles of progressive taxation, but as well performs a critical conservation function. In Cook Inlet today, the average "ELF factor" is 30 percent, which means that the

average effective severance tax rate is 5 rather than the current nominal 15 percent. Numerous wells are currently operating at or near their minimum economic limit, which means that the effective tax rate for those wells is at or near zero.

The 1977 law also retained the cents-per-barrel floor, raising it to a base of \$4.90/barrel for "old" oil and \$6.53/barrel for all other oil. The floor was no longer indexed to the WPI.

As discussed previously, the adverse economic impacts and population increases caused by the North Slope boom peaked in the mid-1970's. Alaska's population grew by 10 percent in 1974, and again in 1975, as Trans-Alaska pipeline construction commenced. And even though real state spending per-capita remained virtually constant over that period (see above), the legislature found itself in 1975 with a \$450 million revenue shortfall for the period 1975-77. Although increased demands for government services were substantially attributable to pipeline activity, revenues from North Slope development would not be received until the pipeline was completed. Thus, in 1975, the legislature was compelled to enact a two-year "reserves tax." The tax was levied on the value of the oil in the ground, and the tax paid was subsequently credited against later severance taxes.

The two-year reserves tax generated \$494 million in revenues. It also served to substantially reduce

severance tax payments in fiscal years 1978 and 1979--the first two years of pipeline operation.

The changes made by the Alaska Legislature to the severance tax in the 1970's were the product of a considered effort to make state oil tax policy responsive to the rapidly changing nature, impact and significance of oil production in the state. Although the changes were frequent, they were no more so than the events of the decade which necessitated them. The progressive divergence in the rate of taxation reflected the emergence of Prudhoe Bay as a uniquely profitable enterprise which could in all fairness be subjected to a higher effective severance tax rate with at worst no more severe impact than had been suffered by Cook Inlet operations. The amount of severance taxes imposed on North Slope development was itself influenced by the unquestionably high adverse economic impacts caused by pipeline construction.

The severance tax, however, was not made to pay the price of Prudhoe Bay's role in Alaska's long-term economic goals. To smooth the future economic curve during the brief period of North Slope development, the state, put simply, needed a savings account--a sum above those uncertain revenues which the state's future base economy would yield in order to fund the continuing needs of a population swollen by Prudhoe Bay itself. The state's response was the Permanent Fund--authorized as a constitutional amendment by the voters in 1976, and into

which is placed at least 25 percent of all money received by the state as the lessor of mineral acreage. In Alaska, then, "saving for the future" is a function not of tax policy, but rather of the state's role as proprietor.

In 1981, the state again altered its severance tax laws. As in 1973, it did so in response to oil industry litigation, and the net result was to materially decrease the tax liability on the production industry. As discussed previously, the state's corporate income tax, the fundamentals of which were enacted at the time of statehood, proved an inappropriate measure of a multi-state company's production income attributable to Alaska. In 1978, the legislature amended the income tax to insure that the tax levied on Prudhoe Bay production was at the same rate as that applicable to other taxpayers. The major Prudhoe Bay producers sued the state, seeking to have the income tax declared unconstitutional and some \$1.8 billion (collected between 1978 and 1981) refunded.

In 1981, the legislature altered the income tax in order to reduce the state's exposure in the litigation. The amendments, however, substantially reduced the state's income tax receipts. In order to partially compensate for the lost revenues, the nominal severance tax rate was increased to 15 percent, and the ELF discount was disallowed for the first 10 years of production for highly productive wells.

The net result was a decrease in state severance and income tax revenues of some \$225 million for upcoming FY 1983--although the decrease was not sufficient to induce the company's to dismiss the income tax litigation.

The fiscal impact of the 1981 package is dwarfed, however, by the current \$4-6/barrel drop in world oil prices. Sound fiscal management of Prudhoe Bay must cope not only with the location of the North Slope peak in Alaska's long-term economic continuum, but as well with the yearly and even monthly gyrations in world oil prices. Every \$1 drop in oil prices lowers the state's severance tax by 4.5 percent, and has a similar effect on state royalty payments. The severance tax in turn represents about 30 percent of the state's unrestricted revenues.

Much of the popular criticism of Alaska's treatment of the oil industry flows from the events of FY 1982, when OPEC oil prices completed their two year ascension from \$12 to \$34 per barrel. In FY 1979, with North Slope wellhead values in the \$6 range, the state received \$1.13 billion in total unrestricted revenues. Total unrestricted state revenues for FY 1982-- the year in which oil prices peaked--were estimated in January, 1982 at \$4.13 billion. This year's oil price decreases, however, are now predicted to cause a loss of \$1.68 billion in revenues for the remainder of FY 1982 and for FY 1983. Similar drops are predicted for subsequent fiscal years.

AGO 484233

The results are state revenues for FY 1983 of \$2.74 billion--about the same as the \$2.5 billion received for FY 1980. The state's flush of oil revenues lasted two years, and the state now finds itself in the position of making massive cuts in both its operating and capital budgets. The state's operating budget will not increase over FY 1982, despite inflation. The FY 1983 capital budget will be approximately one-third of the amount authorized in FY 1982.

The response of the legislature has not been to increase oil production taxes. Indeed, with the exception of the 1967 disaster tax, and perhaps the 1975-77 reserves tax, Alaska's policy has been motivated not by monetary reaction, but rather by at least an attempt at principle. Prudhoe Bay is a unique phenomenon played out on an equally unique economic stage. Its astounding magnitude and profitability; its stark contrast in kind and degree to the state's marginal base activities on which Alaska's tax laws are otherwise based; and its fleeting presence on an otherwise depressed frontier, call for the development of tax policies that might seem inappropriate in other times and places. That, however, is the fulcrum of federalism, and it is our federal system which has allowed Alaska to intelligently manage this brief and consequential episode in its very difficult history.

10/7/86

HISTORY OF OIL AND GAS TAX LAW

Severance Taxes

In 1955 the Alaska Legislature enacted two bills which imposed a tax on the production of crude oil and natural gas in the state. One of those measures, which imposed a 1% tax on the gross value of production, was the foundation from which the state's existing oil and gas production properties tax evolved. The other statute, that has since been repealed, was a conservation tax of five mills for each barrel of oil and every 50,000 cubic feet of gas produced.

Between 1955 and 1967 no changes were made in the production taxes. Then, in 1967, the legislature convened in a special session to provide statutory relief for the victims of the Fairbanks flood. Faced with extraordinary costs associated with the Fairbanks disaster, the legislature enacted an additional one percent disaster severance tax on the gross value of oil and gas production.

In 1968 the legislature raised the "regular" production tax from one percent to three percent, but did not change the one percent disaster severance tax or the five mill conservation tax.

In 1970, the legislature, by amendment, embodied a progressive or "stairstepped" rate structure for oil based on average daily production per well. The rates were three percent on the first 300 barrels per day, five percent on the next 700, six percent on the next 1,500 and eight percent on the production exceeding 2,500 barrels per day. Gas production was taxed at four percent. Since the one percent disaster severance tax and the five mill conservation tax were simultaneously repealed, there was no increase in the overall nominal gas tax rate.

In 1972 the Joint Pipeline Impact Committee requested legislation be enacted to protect state revenues from unacceptably low wellhead prices at Prudhoe Bay. The committee anticipated that low prices would result from high pipeline tariffs that could stem from either inadequate tariff regulation or construction cost overruns, or both. In response to that request the legislature enacted a unit of production (cents-per-barrel) tax with a credit for royalties paid to the state. If the cents-per-barrel tax, minus the royalty credit, exceeded the tax collected under the existing

percentage-of-value method, then the cents-per-barrel tax would be payable. Litigation concerning the validity of this new tax began on the heels of enactment.

The 1973 Special Session of the Legislature made several changes to the 1972 law. The royalty credit provision was repealed. The effective tax rate that would apply to oil production was increased by increasing the effective floor of the cents-per-barrel tax from \$2.65 to \$3.375. Instead of four "stairsteps" there were three: the first 300 barrels a day from a well were taxed on the higher of five percent of the oil's value or \$0.16875 per barrel, the next 700 at six percent or \$0.2025 per barrel, and all production over 1,000 barrels a day at eight percent or \$0.27 barrel. In addition, the cents-per-barrel amounts increased or decreased by two cents for each degree of API gravity above or below 27 degrees. Thus a complete schedule of three unit-of-production rates (one for each "stairstep") could have been established for various API gravities. The whole schedule of rates was in turn to be increased or decreased monthly based on changes in the Wholesale Price Index for crude oil, published by the U.S. Bureau of Labor Statistics. The tax on gas production remained a simple four percent of value. In addition, an oil and gas regulation and conservation tax at a rate of \$0.00125 per barrel removed or sold was enacted during this legislative session.

In 1976 no changes were made to the production tax rates, but the legislature did replace the "cash price prevailing" language with "prevailing value" and enacted a section titled "Determination of Gross Value". The changes made it clear that value was to be determined by using reasonable costs of transportation to determine the value at the point of production. The legislature found the terms price and value were not necessarily synonymous and that taxable gross value was to be determined by subtracting reasonable transportation costs from the full consideration realized by the producer at the point of sale.

The production tax was amended again in 1977 when the legislature adopted an economic limit factor (ELF) for the purpose of reducing the effective production tax rate as the amount of production from a lease or property declines. The nominal tax rate for oil was set at 12.25 percent and 10 percent for gas. However, the effective rate was determined through the use of the ELF. The cents-per-barrel and cents-per-mcf rates were also subject to the ELF. Nominally they were 6.4 cents per mcf (corresponding to a 64 cent per mcf floor), 60 cents per

barrel for "old oil" (a \$4.90 per barrel floor) and 80 cents for all other oil (a \$6.53 per barrel floor). Before being reduced by the ELF, the cents-per-barrel amounts were adjusted up or down by a half-cent for each degree above or below 27 degrees per API gravity. There was no automatic escalator for the unit-of-production rates; instead, the Department was to recommend changes to the rates that were appropriate in light of transaction prices and market conditions. Also, the removed and sold standard that historically was used as the measure of taxable production was changed to a produced standard. At the same time, and as a result of Alaska's protracted royalty litigation with oil and gas producers in the Cook Inlet area, the definitions of the point of production were either established or better defined.

It is also noteworthy that some of the complexities of this 1977 legislation caused the Department of Revenue to promulgate the first production tax regulations.

The remaining major amendment to the production tax statute occurred in 1981. The nominal rate of tax on oil was changed from 12.25 percent to 15 percent on any oil produced after June 30, 1981 from a lease or property that was in commercial production prior to that date. The nominal rate on oil produced from a lease or property coming into production after that date was to be 12.25 percent during the first five years of production and 15 percent thereafter. Modifications also were made to the economic limit factors for both oil and gas. The major impact of this legislation changed the effective rate of this tax on over 90 percent of the oil produced in Alaska from approximately 11.5 percent to 15 percent.

On the following page is a summary of production events and tax changes by year beginning in 1954.

OIL AND GAS PRODUCTION AND TAX TIMELINE
9/19/86

1954	BLM ISSUED 272 OIL AND GAS LEASES
1955	ONE PERCENT OIL AND GAS PRODUCTION TAX
1955	CONSERVATION TAX OF FIVE MILLS PER BARREL AND FOR EVERY 50,000 CUBIC FEET OF GAS
1957	SWANSON RIVER OIL FIELD DISCOVERED
1959	KENAI GAS FIELD DISCOVERED
1962	COOK INLET OIL DISCOVERED
1967	ONE PERCENT DISASTER SEVERANCE TAX
1968	OIL AND GAS PRODUCTION TAX INCREASED FROM ONE TO THREE PERCENT
1968	PRUDHOE BAY OIL DISCOVERED
1970	THREE TO EIGHT PERCENT "GRADUATED" PRODUCTION TAX (BASED ON PRODUCTION LEVELS)
1970	CONSERVATION AND DISASTER SEVERANCE TAX REPEALED
1970	GAS PRODUCTION TAX INCREASED TO FOUR PERCENT
1972	CENTS PER BARREL "FLOOR" ON PRODUCTION TAX
1973	20-MILL OIL AND GAS EXPLORATION, PRODUCTION AND PIPELINE TRANSPORTATION PROPERTY TAX
1973	THREE TO EIGHT PERCENT PRODUCTION TAX (BASED ON LOWER OUT-PUT LEVELS) PLUS TIED AN "ESCALATOR" TO THE CENTS PER BARREL FLOOR.
1973	OIL AND GAS REGULATION AND CONSERVATION TAX OF ONE-EIGHTH OF A CENT PER BARREL
1973	OPEC QUADRUPLD WORLD MARKET PRICE FOR CRUDE
1975	20-MILL RESERVES TAX
1977	-NOMINAL 10 PERCENT PRODUCTION TAX ON GAS -NOMINAL 12.25 PERCENT PRODUCTION TAX ON OIL -ADOPTION OF ECONOMIC LIMIT FACTOR (ELF)
1977	20-MILL RESERVES TAX EXPIRES
1977	PRUDHOE BAY OIL BEGAN FLOWING THROUGH TAPS
1978	OIL AND GAS CORPORATE INCOME TAX (SEPARATE ACCOUNTING)

1979 PRUDHOE BAY WELL HEAD PRICES INCREASED FROM \$5.80 PER
BARREL IN JANUARY TO \$10.57 IN JUNE AS A RESULT OF THE LOSS
OF IMPORTS FROM IRAN

1981 -OIL AND GAS CORPORATE INCOME TAX (REPEAL SEPARATE
ACCOUNTING AND ADOPTED MODIFIED APPORTIONMENT)
-15 PERCENT PRODUCTION TAX(ON ANY OIL PRODUCED AFTER
JUNE 30, 1981 FROM A LEASE OR PROPERTY THAT WAS IN
COMMERCIAL PRODUCTION PRIOR TO THAT DATE. THE NOMINAL
RATE ON OIL PRODUCED FROM A LEASE OR PROPERTY COMING
INTO PRODUCTION AFTER THAT DATE WAS TO BE 12.25 PERCENT
DURING THE FIRST FIVE YEARS OF PRODUCTION AND 15 PERCENT
THEREAFTER)

History of AS 43.21,
Oil and Gas Corporate Income Tax

1978 - 1981

In 1978, the Legislature enacted the Oil and Gas Corporate Income Tax, AS 43.21. Basically, 43.21 is a separate accounting method wherein all of the income and expense elements are defined by statute. Income is divided into three types: (1) income from oil and gas production; (2) income from oil and gas pipeline transportation; and (3) income from any other activities.

The determination of taxable income from oil and gas production starts with the calculation of gross income. Gross income from the production of oil and gas is basically the gross value at the point of production. There are several ways of determining that value including using actual prices or value received, posted prices in the same field or prevailing prices of oil and gas in the same field. The deductions from gross income in order to arrive at the net taxable income include:

- royalties paid in kind or in value
- production property taxes paid
- direct costs of operating the lease or property
- depreciation based on the units of production method
- amortization of lease acquisition payments and taxes paid prior to commencement of commercial production
- interest expense not capitalized during construction
- expenses of unsuccessful exploration of oil and gas in the state including acquisition costs, abandonment of properties, dry-hole costs (only subsequent to abandonment of a lease), and geological and geophysical exploration costs related to the abandoned properties
- general overhead and administrative expense
- income from the production of oil and gas which is divided among the regional native corporations under the Alaska Native Claims Settlement Act
- windfall profit tax

Interest and overhead are presumed not to exceed the corporation's total interest and overhead expenses multiplied by a fraction of which the numerator is the corporation's real and tangible personal property used directly in the production of oil and gas from a lease or property in the state and the denominator of which is all such property of the consolidated business. A corporation may rebut this presumption by satisfactorily demonstrating its actual expenses in Alaska are greater.

The net income of oil and gas pipeline transportation, basically, is the net operating income that is reported to the Federal Energy Regulatory Commission (FERC) or that would be reported to that commission in the case of pipelines that are not regulated by FERC. That method is modified by adding back taxes on or measured by net income. There are also limitations on interest and overhead expenses that may be deducted.

Income from activities other than the production of oil and gas from a lease or property in the state or pipeline transportation of oil or gas in the state is apportioned to the state. The determination starts with the total taxable income and then adding, if appropriate, income of member(s) of the worldwide consolidated business not required to file under the U.S. Internal Revenue Code less that portion of the entire income attributable to production and pipeline transportation of oil and gas worldwide. The apportionment formula is modified so that the numerator and denominator of the property, payroll, and sales factors are each calculated without reference to that portion of property, payroll, or sales directly related to the production of oil or gas or the pipeline transportation of oil or gas in the state.

IMPACT OF 1981 SLA, ch. 116 (SB 524)

Chapter 116 of the 1981 Session Laws of Alaska amended the oil and gas corporate income tax and the oil and gas severance tax in the following manner:

1. Prior to the amendments, AS 43.55 provided for a tax on oil production amounting to 12.25 percent of the gross value at the point of production modified by the economic limit factor (ELF) set forth in AS 43.55.013. The ELF factor on Prudhoe Bay production during FY 1982 was approximately .9249 which led to an effective rate of 11.33 percent. The ELF on Cook Inlet production in FY 1982 averaged approximately .2864 which led to an effective rate of 3.51 percent. The tax rate on gas was 10 percent of the gross value at the point of production modified by an ELF factor.

2. The new law increased the nominal tax rate to 15 percent on oil production (except that for fields commencing commercial production after June 30, 1981, the rate would be 12.25 percent for the first five years). The ELF was also modified so that if the actual calculation resulted in an ELF greater than 0.7 a factor

of 1 would be used. See AS 43.55.011(b) and AS 43.55.013(b)(4). Thus the actual tax rate on Prudhoe Bay production became equal to the nominal rate ($15\% \times 1 = 15\%$), the Kuparak rate became 12.25% ($12.25\% \times 1 = 12.25\%$) and Cook Inlet during FY 82 was approximately 4.3% ($15\% \times .2864 = 4.3\%$). The gas severance tax rate was unchanged although the gas ELF factor calculation was modified. See AS 43.55.013(g). The increased severance tax rates were made effective July 1, 1981, the beginning of FY 82.

3. The oil and gas corporate income tax method set forth in AS 43.21, known as separate accounting, was repealed and a new modified apportionment scheme was enacted effective January 1, 1982. These provisions can be found in AS 43.20.072. The new method for attributing oil and gas income to the state combined with the introduction of a graduated rate structure set forth in AS 43.20.011(e) decreased revenues from the overall corporate income tax.

EXPLORATION, PRODUCTION AND PIPELINE
TRANSPORTATION PROPERTY TAXES - AS 43.56

In its First Special Session in 1973, the Eighth Legislature passed the first statewide ad valorem tax on oil and gas properties. The tax as enacted not only established a tax on specified categories of oil and gas property, but also set limitations on the power of the municipalities to impose taxes on oil and gas properties in general.

The property or "hardware" tax is levied at 20 mills against full and true value of the three types of real and personal property: exploration property is to be valued on the basis of what it would bring in an open market between an informed and willing seller and an informed and willing buyer. Production property is valued on the basis of replacement cost less depreciation based on the economic life of the proven reserves. Pipeline property under construction is assessed using its actual incurred or accrued cost as of the date of the assessment, while operating pipelines are ordinarily valued with due regard to their economic value based on the estimated life of the proven reserves then technically, economically, and legally deliverable into the pipeline. If the proven reserves of oil or gas indicate an economic life materially shorter than the pipeline's estimated physical life, then the assessed value is its actual cost with depreciation based on the time since the pipeline began full operations plus the remaining economic life of the deliverable reserves. These assessed values are determined as of January 1 each year by the Department of Revenue.

A few types of oil and gas properties are specifically excluded from the coverage of the tax even though they fall within the definitions of exploration, production, and pipeline transportation. For example, pipelines operated for the retail distribution of natural gas and regulated by the Alaska Public Utilities Commission are exempt.

Municipalities may also levy and collect property taxes on the same properties as the state, although the actual assessment of the properties is made by the Department of Revenue. A municipality choosing to levy taxes on these properties may do so only at the same millage as it taxes other properties in its boundaries. In addition, there are specific limitations that restrict the amount of taxes that a municipality may ordinarily collect.

One limitation provides that a municipality may not levy taxes which will result in its total property tax revenues exceeding \$1,500 per capita for its residents. The second limitation provides that the total assessed value of taxable property in the municipality will not exceed the product of 225 percent of the average per capita assessed full and true value of property in the state multiplied by the number of residents in the municipality. The average per capita assessed full and true value of property in the state is reported by January 15 each year to each municipality by the Department of Revenue. Municipal population is determined by the Department of Community and Regional Affairs.

The municipal tax paid on the oil and gas properties assessed by the state may be claimed as a credit by the taxpayer against the state tax on the same properties. If the municipal tax is not paid until after the due date of the state tax payment (June 30), the taxpayer must pay the full amount of the state tax and may apply for a refund equal to the municipal tax when it has been paid. State property tax bills are mailed to the owner of the taxable property or his authorized agent no later than June 1 of each year.

Both taxpayers and municipalities have the right to appeal the Department's property valuations. A State Assessment Review Board has been established to hear and decide on appeals (AS 43.56.040). The Board consists of five persons appointed by the Governor to serve at his pleasure, each of whom must have knowledge of assessment procedures. An owner or a municipality may appeal to the superior court for, and is entitled to, trial de novo of the board's action.

During the 1980 regular legislative session, aircraft and motor vehicles (except those owned by a person whose principal business in the state is the exploration for, production of, or pipeline transportation of gas or unrefined oil and whose operation of the aircraft directly relates to the conduct of that business) were specifically excluded from the state property tax. Similarly, communication facilities were specifically excluded from state taxes during the 1981 regular legislative session.

OIL AND GAS REGULATION AND CONSERVATION TAX
(AS 43.57)

Enacted during the First Special Session of the Eighth State Legislature in 1973, the Oil and Gas Regulation and Conservation Tax ("conservation tax") is imposed on oil production only. It is a non-escalating tax of one-eighth of a cent per barrel. As with the production tax, production attributable to a royalty interest of the state, the United States or other tax-exempt entity is not taxed.

The payment and administration of the conservation tax are done in the same manner as the production tax.

MEMORANDUM

*Division of Strategic Planning
Office of Management and Budget
MS 0164*

TO: Mary Halloran
Speaker's Office

DATE: 13 Oct. 1986

FROM: Tom Chester *TC*
Senior Economist

SUBJECT: Severance Tax Spreadsheet Update

Enclosed are paper and disk copies of the severance tax spreadsheet, updated with the September forecast assumptions. Note that the exponential constant in the "alternative ELF" is set at 55,500,000, compared with 45,500,000 in the previous update. The higher constant produces a more unabiguous tax reduction on the smaller fields, while still producing greater collections from Prudhoe and Kuparuk. The constant is found in cell A1; users may substitute other numbers if they wish.

cc: Chuck Logsdon

Enclosures: Paper and Disk copies of spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	555000003	10/10/86	Alaska North Slope Oil Revenue													
	Fiscal Years															
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000		
	PRICE/OUTPUT ASSUMPTIONS															
World Oil Price (Mean - Sept. 86)	13.73	15.97	16.95	17.66	18.67	19.42	20.23	21.34	22.62	23.83	24.85	25	25.5	26.49		
Ave. Rate of Inflation (Sept. 86)	2.9	2.83	4.23	4.23	4.23	4.23	4.23	4.89	4.89	4.89	4.89	4.89	5.44	5.44		
Compound Inflation Factor	1.029	1.058121	1.102879	1.149531	1.198156	1.248838	1.301664	1.365315	1.432079	1.502108	1.575561	1.652606	1.742508	1.837300		
World/ANS Qual. & Mktg Dif. (June 86)	2.735	2.811	2.47	2.508	2.71	2.604	2.406	2.228	2.117	1.636	.611	-1.801	-4.339	-6.662		
TransAK Pipeline Tariff (Sept. 86)	4.764	4.554	4.332	3.598	3.966	3.76	3.593	3.627	3.674	3.824	4.003	4.328	5.011	5.794		
Successful Effort Mean Price (PBay)	6.231	8.605	10.148	11.554	11.994	13.056	14.231	15.485	16.829	18.37	20.236	22.473	24.828	27.358		
Success Ratio (Sept. 86)	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
ANS Netback Price PS01 (\$/bbl)	6.114688	8.444373	9.958571	11.33833	11.77011	12.81229	13.96535	15.19595	16.45876	17.6352	18.98137	20.45043	21.94795	23.47316		
Prudhoe Bay Prod. (MMbbl/yr)	535	487	435	412	373	334	355	309	268	296	254	219	188	164		
Prudhoe Bay Price (\$/bbl)	6.114688	8.444373	9.958571	11.33833	11.77011	12.81229	13.96535	15.19595	16.45876	17.6352	18.98137	20.45043	21.94795	23.47316		
Wells (Sept. 86)	519	519	498	493	488	464	445	418	391	371	352	331	311	292		
TOTAL DAILY OUTPUT	1465753.	1334247.	1191781.	1128767.	1021918.	915068.5	972602.7	846575.3	734246.6	610958.9	695890.4	600000	515068.5	449315.1		
TOTAL MONTHLY OUTPUT	44583333.	40583333.	36250000	34333333.	31083333.	27833333.	29583333.	25750000	22333333.	24666667.	21166667.	18250000	15666667.	13666667.		
TOTAL DAILY OUTPUT PER WELL	2824.188	2570.803	2393.134	2289.588	2094.094	1972.130	2185.624	2025.300	1877.868	2185.873	1976.961	1812.689	1656.169	1538.750		
PER	4671000	4671000	4482000	4437000	4392000	4176000	4005000	3762000	3519000	3339000	3168000	2979000	2799000	2628000		
WELL DAYS	15570	15570	14940	14790	14640	13920	13350	12540	11730	11130	10560	9930	9330	8760		
ALTERNATE ELF	.9861283	.9831886	.9797212	.9775752	.9727996	.9676691	.9727101	.9660751	.9577187	.9673642	.9578140	.9465344	.9317488	.9158260		
PRESUMED ELF	.8418148	.8267417	.8143409	.8062613	.7889244	.7764494	.7974112	.7820640	.7657533	.7974334	.7769714	.7577408	.7360732	.7171075		
NOMINAL TAX RATE	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15		
EFFECTIVE TAX RATE CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
EFF. TAX CUR. ELF NO 10 YEAR LIMIT	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
ROYALTY PERCENTAGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SEVERANCE TAX CURRENT ELF	429	446	463	494	455	436	519	482	443	546	492	445	399	362		
SEVERANCE TAX PER BARREL CUR. LAW	1	1	1	1	1	1	2	2	2	2	2	2	2	3		
SEVERANCE TAX NO ELF	429	540	569	613	576	562	651	616	579	685	633	588	542	505		
CUR SEV. TAX NO ELF ON CENTS/BBL	429	446	463	494	455	436	519	482	443	546	492	445	399	362		
CUR SEV TAX NO 10 YEAR LIMIT	429	540	569	613	576	562	651	616	579	685	633	588	542	505		
SEVERANCE TAX PER BARREL CUR. LAW	.9172032	1.047197	1.216451	1.371248	1.392859	1.492214	1.670420	1.782630	1.890503	2.109435	2.212197	2.324419	2.423295	2.524917		
SEVERANCE TAX ALTERNATIVE ELF	429.3657	530.6798	557.0422	599.3709	560.5471	543.4997	632.9408	595.3830	554.4587	662.7678	606.0964	556.3938	504.6032	462.7301		
SEV TAX ALT ELF NO ELF ON CENTS/BBL	429.3657	530.6798	557.0422	599.3709	560.5471	543.4997	632.9408	595.3830	554.4587	662.7678	606.0964	556.3938	504.6032	462.7301		
CONSERVATION TAX	.5851563	.5326563	.4757813	.450625	.4079688	.3653125	.3882813	.3379688	.293125	.32375	.2778125	.2395313	.205625	.179375		
Gathering & Cleaning Charge	.72611	.7471672	.7683120	.8008116	.8346860	.8699932	.9067939	.9451513	.9913692	1.039847	1.090696	1.144031	1.199974	1.265252		
Royalties if Taken InValue	360.3612	468.5674	499.7203	542.6820	509.8642	498.5908	579.4736	550.4375	518.1577	614.0281	568.0288	528.5127	487.5775	455.2622		
InKind Contracts Longterm																
MAPCO (18.6667% exhibit B 2003)	67.26754	87.46608	93.28129	101.3008	95.17483	93.07045	108.1686	102.7484	96.72294	114.6188	106.0322	98.65588	91.01463	84.98243		
Tesoro (24.533% in-v+30 '95)	105.2422	130.5925	136.8475	147.0444	138.0641	134.3030	155.3001	146.8376	137.7328							
Tesoro (13.867% in-value + 0.35)	59.95065	74.23802	77.72849	83.47223	78.36245	76.20270	88.08927	83.26609	78.08418							
Chevron (9.6% in-value + 0.30)	41.18230	51.10212	53.54974	57.53988	54.02582	52.55405	60.77041	57.45897	53.89618							
GVEA (2.6667% in-value + 0.30)	11.43967	14.19521	14.87511	15.98350	15.00736	14.59853	16.88088	15.96102	14.97135							
InKind Contracts Shortterm																
One-year (26.67% bprcr+.84)																
Six Months																
Total In-Kind Royalties	285.0824	357.5940	376.2821	405.3408	380.6346	370.7287	429.2092	406.2721	381.4074	114.6188	106.0322	98.65588	91.01463	84.98243		
In-Value Royalties	110.5105	143.6937	153.2472	166.4221	156.3580	152.9008	177.7049	168.0003	158.9013	499.4093	461.9966	429.8568	396.5629	370.2798		
TOTAL ROYALTIES	241	346	529.5293	571.7629	536.9926	523.6296	606.9141	575.0724	540.3088	614.0281	568.0288	528.5127	487.5775	455.2622		
(Estimated InKind Premium MMS)	-119.361	-122.567	29.80902	29.08094	27.12836	25.03875	27.44044	24.63543	22.15113	0	0	0	-5.7e-14	-5.7e-14		
	429	446	463	494	455	436	519	482	443	546	492	445	399			
Kuparuk River Prod. (MMbbl/yr)	91	82	84	84	76	67	60	52	48	41	35	29	24	21		
Kuparuk River Price (\$/bbl)	5.294688	7.624373	9.138571	10.51833	10.95011	11.99229	13.14535	14.37595	15.63876	16.8152	18.16137	19.63043	21.12795	22.65316		
WELLS (Sept. 86)	254	259	278	278	275	275	253	253	219	220	196	177	158	142		
TOTAL DAILY OUTPUT	249315.1	224657.5	230137.0	230137.0	208219.2	183561.6	164383.6	142465.8	131506.8	112328.8	95890.41	79452.05	65753.42	57534.25		
TOTAL MONTHLY OUTPUT	7583333.	6833333.	7000000	7000000	6333333.	5583333.	5000000	4333333.	4000000	3416667.	2916667.	2416667.	2000000	1750000		
TOTAL DAILY OUTPUT PER WELL	981.5554	867.4036	827.8309	827.8309	757.1606	667.4969	649.7374	563.1057	600.4879	510.5853	489.2368	448.8817	416.1609	405.1708		
PER	2286000	2331000	2502000	2502000	2475000	2475000	2277000	2277000	1971000	1980000	1764000	1593000	1422000	1278000		
WELL DAYS	7620	7770	8340	8340	8250	8250	7590	7590	6570	6600	5880	5310	4740	4260		
ALTERNATE ELF	.7662829	.7092353	.7007998	.7007998	.6438262	.5541673	.5046350	.3798567	.3848708	.2400713	.1667803	.0815702	.0304238	.0147940		
PRESUMED ELF	.5716097	.5216301	.5015515	.5015515	.4613367	.4004678	.3868483	.3113840	.3459093	.2571696	.2330669	.1841150	.1413275	.1264336		
NOMINAL TAX RATE	.1363	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15		
EFFECTIVE TAX RATE CURRENT ELF	.0779104	.0782445	.0752327	.0752327	.0692005	.0600702	.0580272	.046707								

	Fiscal Years													
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
98 Milne Point Prod. (MMbbl/d)	7.4	9.05	10.3	9.97	9.97	9.97	9.06	8.03	7.07	5.78	4.35	3.21	2.19	1.37
99 Milne Point Price (\$/bbl)	6.484688	8.014373	10.32857	11.70833	12.14011	13.18229	14.33535	15.56595	16.82876	18.0052	19.35137	20.82043	22.31795	23.04316
100 Wells (Sept. '86)	22	22	30	30	30	30	26	23	19	17	15	14	12	11
101 TOTAL DAILY OUTPUT	20273.97	24794.52	28219.18	27315.07	27315.07	27315.07	24821.92	22000	19369.86	15835.62	11917.81	8794.521	6000	3753.425
102 TOTAL MONTHLY OUTPUT	616666.7	754166.7	858333.3	830833.3	830833.3	830833.3	755000	669166.7	589166.7	481666.7	362500	267500	182500	114166.7
103 TOTAL DAILY OUTPUT PER WELL	921.5442	1127.024	940.6393	910.5023	910.5023	910.5023	954.6891	956.5217	1019.466	931.5068	794.5205	628.1800	500	341.2204
104 PEL	198000	198000	270000	270000	270000	270000	234000	207000	171000	153000	135000	126000	108000	99000
105 WELL DAYS	660	660	900	900	900	900	780	690	570	510	450	420	360	330
106 ALTERNATE ELF	.0291970	.1030736	.0840681	.0698256	.0698256	.0698256	.0629852	.0444999	.0378421	.0115029	.0007232	.0000015	1.01e-12	6.19e-44
107 PRESUMED ELF	.5466796	.6221531	.5549143	.5417807	.5417807	.5417807	.5607889	.5615440	.5860187	.5510128	.4833430	.3695251	.2453729	.0391311
108 NOMINAL TAX RATE	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
109 EFFECTIVE TAX RATE CURRENT ELF	.0669683	.0762138	.0679770	.0663681	.0812671	.0812671	.0841183	.0842316	.0879028	.0826519	.0725015	.0554288	.0368059	.0058697
110 EFFECTIVE TAX RATE ALTERNATIVE ELF	.0035766	.0126263	.0102983	.0083536	.0104738	.0104738	.0094478	.0066750	.0056763	.0017254	.0001085	.0000002	1.51e-13	9.28e-45
111 ROYALTY PERCENTAGE	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625
112 SEVERANCE TAX CURRENT ELF	2.710437	5.091646	6.056536	6.488351	8.237917	8.945107	9.149811	8.817611	8.759094	7.203831	5.111313	3.102521	1.506611	.1605766
113 SEVERANCE TAX NO ELF	4.958	8.183912	10.91436	11.97597	15.20526	16.51057	16.31596	15.70244	14.94678	13.07380	10.57492	8.395969	6.140087	4.103558
114 SEVERANCE TAX PER BARREL CUR. LAW	.4373437	.6717765	.7021053	.7770597	.9865917	1.071286	1.205866	1.311144	1.479296	1.488164	1.403002	1.154051	.8214332	.1399513
115 CUR SEV. TAX NO ELF ON CENTS/BBL	4.958	6.0635	6.901	6.6799	8.237917	8.945107	9.149811	8.817611	8.759094	7.203831	5.111313	3.102521	1.506611	.9179
116 SEVERANCE TAX ALTERNATIVE ELF	.1447588	.8435449	.9175501	.8362296	1.061717	1.152860	1.027664	.6987571	.5656179	.1503864	.0076483	.0000128	6.18e-12	2.54e-43
117 SEV TAX ALT ELF NO ELF ON CENTS/BBL	4.958	6.0635	6.901	6.6799	6.6799	6.6799	6.0702	5.3801	4.7369	3.8726	2.9145	2.1507	1.4673	.9179
118 CONSERVATION TAX	.0077469	.0094742	.0107828	.0104373	.0104373	.0104373	.0094847	.0084066	.0074014	.0060509	.0045539	.0033605	.0022927	.0014342
119 Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 ROYALTIES	7.797837	12.96264	17.28745	18.96895	19.66850	21.35695	21.10523	20.31161	19.33414	16.91138	13.67900	10.86046	7.942401	5.308084
121 TOTAL OIL PROD REVENUES	10.50827	18.05428	23.34398	25.45730	27.90642	30.30206	30.25504	29.12923	28.09324	24.11522	18.79031	13.96298	9.449012	5.468661
122														
123 Endicott Prod. (MMbbl/yr)	0	9.57	31.1	30.8	30.8	30.8	30.8	23.7	21.5	16.7	13.04	10.19	7.81	5.73
124 Endicott Price (\$/bbl)	4.994688	7.324373	8.838571	10.21833	10.65011	11.69229	12.84535	14.07595	15.33876	16.5152	17.86137	19.33043	20.82795	22.35316
125 Wells (Sept. '86)	13	34	111	111	111	111	111	100	90	81	73	66	59	53
126 TOTAL DAILY OUTPUT	0	26219.18	85205.48	84383.56	84383.56	84383.56	84383.56	64931.51	58904.11	45753.42	35726.03	27917.81	21397.26	15698.73
127 TOTAL MONTHLY OUTPUT	0	797500	2591667	2566667	2566667	2566667	2566667	1975000	1791667	1391667	1086667	849166.7	650833.3	477500
128 TOTAL DAILY OUTPUT PER WELL	0	771.1523	767.6169	760.2123	760.2123	760.2123	760.2123	649.3151	654.4901	564.8571	489.3976	422.9971	362.6654	296.2006
129 PEL	1170	306000	999000	999000	999000	999000	999000	900000	810000	729000	657000	594000	531000	477000
130 WELL DAYS	3.9	1020	3330	3330	3330	3330	3330	3000	2700	2430	2190	1980	1770	1590
131 ALTERNATE ELF	0	.0328699	.3474449	.3392962	.3392962	.3392962	.3392962	.1767546	.1511323	.0497795	.0081908	.0003466	.0000004	0
132 PRESUMED ELF	0	.4697857	.4676749	.4632013	.4632013	.4632013	.4632013	.3865144	.3905492	.3130736	.2332531	.1504723	.0677438	0
133 NOMINAL TAX RATE	0	.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15
134 EFFECTIVE TAX RATE CURRENT ELF	0	.0575488	.0572902	.0567422	.0567422	.0567422	.0694802	.0579776	.0585824	.0469610	.0349880	.0225708	.0101616	0
135 EFFECTIVE TAX RATE ALTERNATIVE ELF	0	.0040266	.0425620	.0415638	.0415638	.0415638	.0508944	.0265132	.0226698	.0074669	.0012286	.0000320	.0000001	0
136 ROYALTY PERCENTAGE	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438
137 SEVERANCE TAX CURRENT ELF	0	3.453771	13.48335	15.29014	15.93625	17.49570	23.53602	16.56004	16.54135	11.08953	6.977282	3.806613	1.415251	0
138 SEVERANCE TAX NO ELF	0	7.351801	28.83063	33.00971	34.40458	37.77127	50.81165	42.84424	42.35408	35.42149	29.91292	25.29777	20.89123	16.44978
139 SEVERANCE TAX PER BARREL CUR. LAW	0	.4215085	.5063633	.5798099	.6043104	.6634457	.8924978	.8160897	.8985813	.7755709	.6249330	.4363042	.2116446	0
140 CUR SEV. TAX NO ELF ON CENTS	0	6.555067	21.30226	21.09677	21.09677	21.09677	23.53602	16.56004	16.54135	11.43883	8.931878	6.979742	5.349538	3.924821
141 SEVERANCE TAX ALTERNATIVE ELF	0	2.416530	10.01705	11.20007	11.67334	12.81565	17.24020	7.572918	6.401067	1.763262	.2450122	.0087676	.0000092	0
142 SEV TAX ALT ELF NO ELF ON CENTS/BBL	0	6.555067	21.30226	21.09677	21.09677	21.09677	21.09677	16.23355	14.72664	11.43883	8.931878	6.979742	5.349538	3.924821
143 CONSERVATION TAX	0	.0102423	.0332848	.0329637	.0329637	.0329637	.0329637	.0253649	.0230104	.0178732	.0139561	.0109058	.0083587	.0061325
144 Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145 ROYALTIES	0	10.07955	39.52768	45.25737	47.16977	51.78561	56.89259	47.97167	47.42285	39.66059	33.49278	28.32530	23.39141	18.41843
146 TOTAL OIL PROD REVENUES	0	13.53332	53.01103	60.54752	63.10602	69.28131	80.42861	64.53171	63.96420	50.75012	40.47006	32.13192	24.80667	18.41843
147														
148 Lisburne Prod. (MMbbl/yr)	7.01	10.73	14.88	19.03	28.13	28.13	36.46	35.71	35.35	35.04	34.8	26.94	20.92	16.22
149 Lisburne Price (\$/bbl)	5.844688	8.174373	9.688571	11.06833	11.50011	12.54229	13.69535	14.92595	16.18076	17.3652	18.71137	20.18043	21.67795	23.20316
150 Wells (Sept. '86)	13	20	40	60	90	90	115	115	115	115	115	105	94	84
151 TOTAL DAILY OUTPUT	19205.48	29397.26	40767.12	52136.99	77068.49	77068.49	99890.41	97835.62	96849.32	96000	95342.47	73808.22	57315.07	44438.36
152 TOTAL MONTHLY OUTPUT	584166.7	891166.7	1240000	1585833.3	2344167	2344167	3038333.3	2975833.3	2945833.3	2920000	2900000	2245000	1743333.3	1351667
153 TOTAL DAILY OUTPUT PER WELL	1477.345	1469.863	1019.178	868.9498	856.3166	856.3166	868.6123	850.7445	842.1680	834.7826	829.0649	702.9354	609.7348	529.0280
154 PEL	117000	180000	360000	540000	810000	810000	1035000	1035000	1035000	1035000	1035000	945000	846000	756000
155 WELL DAYS	390	600	1200	1800	2700	2700	3450	3450	3450	3450	3450	3150	2820	2520
156 ALTERNATE ELF	.1161464	.2430380	.2109207	.2282847	.3614404	.3614404	.4623819	.4456619	.4374349	.4302455	.4246129	.2542589	.1172261	.0329992
157 PRESUMED ELF	.7060689	.7046652	.5859127	.5223827	.5161648	.5161648	.5222186	.5133720	.5090118	.5051960	.5022022	.4760149	.3539724	.2770107
158 NOMINAL TAX RATE	.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15	.15
159 EFFECTIVE TAX RATE CURRENT ELF	.1225	.1225	.0717743	.0639919	.0632302	.0774247	.0783328	.0770058	.0763518	.0757794	.0753303	.0639022	.0530959	.0415516
160 EFFECTIVE TAX RATE ALTERNATIVE ELF	.0142279	.0297722	.0258378	.0279649	.0442764	.0542161	.0693373	.0668493	.0656152	.0645368	.0636919	.0381388	.0175839	.0049499
161 ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
162 SEVERANCE TAX CURRENT ELF	4.391607	9.401526	9.053984	11.79380	17.89799	23.90200	34.22485	35.91396	38.23228	40.34625	42.92030	30.39850	21.06923	13.68340
163 SEVERANCE TAX NO ELF	4.907	9.401526	15.45279	22.57693	34.67496	46.30691	65.53741	69.95698	75.11080	79.86255	85.46417	71.35548	59.52224	49.39664
164 SEVERANCE TAX PER BARREL CUR. LAW	.7159743	1.001361	.6953905	.7082830	.7271542	.9710831	1.072795	1.149384	1.236041	1.315925	1.409534	1.289575	1.15010	.9641286
165 CUR SEV. TAX NO ELF ON CENTS/BBL	4.907	9.401526	10.416	13.321	19.691	23.90200	34.22485	35.91396	38.23228	40.34625	42.92030	30.39850	21.06923	13.68340
166 SEVERANCE TAX ALTERNATIVE ELF	.5699305	2.284928	3.259312	5.153967	12.53293	16.73719	30.30331	31.17716	32.85608	34.36051	36.28919	18.14277	6.977562	1.630050
167 SEV TAX ALT ELF NO ELF ON CENTS/BBL	4.907	7.511	10.416	13.321	19.691	19.691	30.30331	31.17716	32.85608	34.36051	36.28919			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Fiscal Years															
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000		
190 West Sak Sands Prod. (MMbbl/yr)	.01	.01	0	12.19	14.97	20.35	20.55	20.89	20.91	21.13	22.17	22.23	22.25	17.76		
191 West Sak Sands Price (\$/bbl)	4.334688	6.664373	8.178571	9.558325	9.990112	11.032229	12.18535	13.41595	14.67876	15.8552	17.20137	18.67043	20.16795	21.69316		
192 WELLS (Sept. #6)	6	6	34	130	157	256	260	263	267	268	269	269	271	177		
193 TOTAL DAILY OUTPUT	27.39726	27.39726	0	33397.26	41013.70	55753.42	56301.37	57232.88	57287.67	57890.41	60739.73	60904.11	60958.90	48657.53		
194 TOTAL MONTHLY OUTPUT	833.3333	833.3333	0	1015833.	1247500	1695833.	1712500	1740833.	1742500	1760833.	1847500	1852500	1854167.	1480000		
195 TOTAL DAILY OUTPUT PER WELL	4.566210	4.566210	0	256.9020	261.2337	217.7868	216.5437	217.6155	214.5606	216.0090	225.7982	226.4093	224.9406	274.9013		
196 PEL	54000	54000	306000	1170000	1413000	2304000	2340000	2367000	2403000	2412000	2421000	2439000	2439000	1593000		
197 WELL DAYS	180	180	1020	3900	4710	7680	7800	7890	8010	8040	8070	8070	8130	5310		
198 ALTERNATE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
199 PRESUMED ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
200 NOMINAL TAX RATE	0	.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15		
201 EFFECTIVE TAX RATE CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
202 EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
203 ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125		
204 SEVERANCE TAX CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
205 SEVERANCE TAX NO ELF	.007	.0071434	0	12.48906	16.03010	24.06435	32.86619	36.78401	40.28494	43.97142	50.05276	54.47448	58.89672	50.56677		
206 SEVERANCE TAX PER BARREL CUR. LAW	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
207 CUR SEV. TAX NO ELF ON CENTS	.007	.007	0	8.533	10.479	14.245	14.385	14.623	14.637	14.791	15.519	15.561	15.575	12.432		
208 SEVERANCE TAX ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
209 SEV TAX ALT ELF NO ELF ON CENTS/BBL	.007	.007	0	8.533	10.479	14.245	14.385	14.623	14.637	14.791	15.519	15.561	15.575	12.432		
210 CONSERVATION TAX	.0000109	.0000109	0	.0133328	.0163734	.0222578	.0224766	.0228484	.0228703	.0231109	.0242484	.0243141	.0243359	.019425		
211 Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
212 ROYALTIES	.0054184	.0083305	0	14.56450	18.69400	28.06338	31.30113	35.03239	38.36661	41.87755	47.66929	51.88046	56.09212	48.15882		
213 TOTAL OIL PROD REVENUES	.0054184	.0083305	0	14.56450	18.69400	28.06338	31.30113	35.03239	38.36661	41.87755	47.66929	51.88046	56.09212	48.15882		
214	0	0	0	1.38	9.85	9.83	9.93	9.99	10.01	10.01	11.32	8.78	6.88	6		
215 Unspecified Onshore Prod. (MMbbl/yr)	0	0	0	1.38	9.85	9.83	9.93	9.99	10.01	10.01	11.32	8.78	6.88	6		
216 Unspecified Onshore Price (\$/bbl)	4.194688	6.524373	8.038571	9.418325	9.850112	10.89229	12.04535	13.27595	14.53876	15.7152	17.06137	18.53043	20.02795	21.55316		
217 WELLS (Sept. #6)	.08	.07	.08	34	51	51	51	51	51	51	51	51	46	38		
218 TOTAL DAILY OUTPUT	0	0	0	3780.822	26986.30	26931.51	27205.48	27369.86	27424.66	27424.66	31013.70	24054.79	18849.32	16438.36		
219 TOTAL MONTHLY OUTPUT	0	0	0	115000	820833.3	819166.7	827500	832500	834166.7	834166.7	943333.3	731666.7	573333.3	500000		
220 TOTAL DAILY OUTPUT PER WELL	0	0	0	111.2006	529.1432	528.0688	533.4408	536.6640	537.7384	537.7384	608.1117	522.9303	438.3562	432.5883		
221 PEL	720	630	720	306000	459000	459000	459000	459000	459000	459000	459000	414000	387000	342000		
222 WELL DAYS	2.4	2.1	2.4	1020	1530	1530	1530	1530	1530	1530	1530	1380	1290	1140		
223 ALTERNATE ELF	0	0	0	0	.0036412	.0035365	.0040824	.0044376	.0045607	.0045607	.0187490	.0016342	.0000162	.0000023		
224 PRESUMED ELF	0	0	0	0	.2771317	.2760006	.2816264	.2849662	.2860737	.2860737	.3525703	.2705495	.1706336	.1631280		
225 NOMINAL TAX RATE	0	0	0	.1225	.1225	.1225	.125	.125	.15	.15	.15	.15	.15	.15		
226 EFFECTIVE TAX RATE CURRENT ELF	0	0	0	0	.0339486	.0338101	.0344992	.0349084	.0429110	.0429110	.0528855	.0405824	.0255950	.0244692		
227 EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	0	.0004460	.0004332	.0005001	.0005436	.0006841	.0006841	.0028123	.0002451	.0000024	.0000004		
228 ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125		
229 SEVERANCE TAX CURRENT ELF	0	0	0	0	2.882092	3.167574	3.610657	4.051059	5.464352	5.906513	8.937280	5.777315	3.085949	2.768790		
230 SEVERANCE TAX NO ELF	0	0	0	1.393147	10.39972	11.47669	12.82074	14.21593	19.10121	20.64683	25.34893	21.35400	18.08524	16.97312		
231 SEVERANCE TAX PER BARREL CUR. LAW	0	0	0	0	.3343979	.3682691	.4155555	.4634416	.6238735	.6743557	.9022998	.7520097	.5126161	.5273886		
232 CUR SEV. TAX NO ELF ON CENTS/BBL	0	0	0	.966	6.895	6.881	6.951	6.993	7.007	7.007	8.937280	6.146	4.816	4.2		
233 SEVERANCE TAX ALTERNATIVE ELF	0	0	0	0	.0378671	.0405869	.0523396	.0630841	.0871147	.0941637	.4752665	.0348973	.0002928	.0000397		
234 SEV TAX ALT ELF NO ELF ON CENTS/BBL	0	0	0	.966	6.895	6.881	6.951	6.993	7.007	7.007	7.924	6.146	4.816	4.2		
235 CONSERVATION TAX	0	0	0	.0015094	.0107734	.0107516	.0108609	.0109266	.0109484	.0109484	.0123813	.0096031	.007525	.0065625		
236 Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
237 ROYALTIES	0	0	0	1.624661	12.12795	13.38390	14.95130	16.57834	18.19163	19.66364	24.14184	20.33715	17.22404	16.16487		
238 TOTAL OIL PROD REVENUES	0	0	0	1.624661	15.01004	16.55147	18.56195	20.62940	23.65598	25.57016	33.07912	26.11446	20.30999	18.93366		
239	0	0	0	0	0	0	0	0	0	0	1.96	2.92	2.94	2.99		
240 Seal Island Prod. (MMbbl/yr)	0	0	0	0	0	0	0	0	0	0	1.96	2.92	2.94	2.99		
241 Seal Island Price (\$/bbl)	4.544688	6.874373	8.388571	9.768325	10.20011	11.24229	12.39535	13.62595	14.88876	16.0652	17.41137	18.88043	20.37795	21.90316		
242 WELLS (Sept. #6)	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	22	64	65	65		
243 TOTAL DAILY OUTPUT	0	0	0	0	0	0	0	0	0	0	5369.863	8000	8054.795	8191.781		
244 TOTAL MONTHLY OUTPUT	0	0	0	0	0	0	0	0	0	0	163333.3	243333.3	245000	249166.7		
245 TOTAL DAILY OUTPUT PER WELL	0	0	0	0	0	0	0	0	0	0	244.0847	125	123.9199	126.0274		
246 PEL	180	180	180	180	180	180	180	180	180	198000	198000	576000	585000	585000		
247 WELL DAYS	.6	.6	.6	.6	.6	.6	.6	.6	.6	.660	.660	1920	1950	1950		
248 ALTERNATE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
249 PRESUMED ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
250 NOMINAL TAX RATE	0	0	0	0	0	0	0	0	0	.1225	.1225	.1225	.1225	.1225		
251 EFFECTIVE TAX RATE CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
252 EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
253 ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125		
254 SEVERANCE TAX CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
255 SEVERANCE TAX NO ELF	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.66	5.91	6.42	7.02		
256 SEVERANCE TAX PER BARREL CUR. LAW	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
257 CUR SEV. TAX NO ELF ON CENTS/BBL	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.37	2.04	2.06	2.09		
258 SEVERANCE TAX ALTERNATIVE ELF	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
259 SEV TAX ALT ELF NO ELF ON CENTS/BBL	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
260 CONSERVATION TAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
261 Gathering & Cleaning Charge	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
262 ROYALTIES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.27	6.89	7.49	8.19		
263 TOTAL OIL PROD REVENUES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.27	6.89	7.49	8.19		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000		
273 NORTH SLOPE Prod. (MMbbl/yr)	640.42	598.36	575.28	569.37	542.72	500.08	521.80	459.32	410.84	425.66	376.64	322.27	274.99	235.07		
274 AVG. NORTH SLOPE PRICE (\$/bbl)	6.00	8.31	9.78	11.11	11.50	12.52	13.69	14.91	16.15	17.36	18.68	20.13	21.62	23.15		
275 AVG. NOMINAL TAX RATE	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15		
276 AVG. EFFECTIVE TAX RATE	.14	.12	.11	.10	.10	.10	.10	.10	.09	.10	.09	.09	.08	.08		
277 AVG. ROYALTY PERCENTAGE	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13		
278 SEVERANCE TAX	472.88	506.99	542.14	586.07	549.94	531.84	629.44	577.87	546.40	634.16	575.05	502.26	435.11	386.83		
279 SEVERANCE TAX NO ELF	502.94	646.76	724.52	810.53	796.16	803.25	932.57	893.91	869.26	968.59	921.23	849.33	778.08	712.21		
280 SEVERANCE TAX - ALTERNATIVE ELF	478.69	592.25	641.84	697.83	656.18	632.69	733.80	672.16	632.29	720.86	657.03	580.68	513.61	465.28		
281 SEV TAX CUR LAW NO ELF ON CENTS/BBL	502.94	525.66	560.43	603.73	574.19	558.07	649.12	601.29	562.58	655.83	598.95	529.95	465.81	414.28		
282 SEV TAX ALT LAW NO ELF ON CENTS/BBL	502.94	609.01	666.27	731.24	695.71	670.53	763.99	707.06	666.34	762.94	702.17	626.39	563.26	510.26		
283 SEV TAX CUR LAW NO 10 YEAR LIM. P.B.	472.88	600.50	647.70	704.85	671.57	657.40	761.27	712.18	682.01	772.94	716.18	644.66	578.05	529.77		
284 CONSERVATION TAX	.70	.65	.63	.62	.59	.55	.57	.50	.45	.46	.41	.35	.30	.26		
285 ROYALTIES	428.96	576.62	666.30	755.65	748.16	754.34	861.70	827.77	804.41	892.30	850.35	784.45	718.57	656.94		
286 TOTAL OIL PROD REVENUES	902.54	1084.26	1209.06	1342.34	1298.70	1286.73	1491.72	1406.15	1351.26	1526.93	1425.82	1287.06	1153.98	1044.03		
287 TOTAL OIL PROD REV. ALT. ELF	908.55	1169.52	1308.77	1454.10	1404.93	1387.58	1596.08	1500.44	1437.15	1613.63	1507.79	1365.48	1232.47	1122.48		
288																
289 REVENUE CHANGE FROM NO ELF	30.06	139.77	182.38	224.46	246.22	271.40	303.13	316.04	322.86	334.43	346.18	347.07	342.96	325.37		
290 Prudhoe Bay	.00	93.52	105.56	118.79	121.63	125.56	131.82	134.31	135.61	138.78	141.13	142.41	142.93	142.93		
291 Kuparuk	27.29	39.25	50.22	57.80	58.84	63.22	63.47	67.56	64.44	67.22	63.98	60.96	57.15	54.54		
292 Milne Point	2.25	3.09	4.86	5.49	6.97	7.57	7.17	6.88	6.19	5.87	5.46	5.29	4.63	3.94		
293 Endicott	.00	3.90	15.35	17.72	18.47	20.28	27.28	26.28	25.81	24.33	22.94	21.49	19.48	16.45		
294 Lisburne	.52	.00	6.40	10.78	16.78	22.40	31.31	34.04	36.88	39.52	42.54	40.96	38.45	35.71		
295 West Sak	.01	.01	.00	12.49	16.03	24.06	32.87	36.78	40.28	43.97	50.05	54.47	58.90	50.57		
296 Unspecified	.00	.00	.00	1.39	7.52	8.31	9.21	10.16	13.64	14.74	16.41	15.58	15.00	14.20		
297 Seal Island	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.66	5.91	6.42	7.02		
298 REVENUE CHANGE FROM ALT. ELF	6.01	85.26	99.71	111.76	106.24	100.84	104.36	94.29	85.89	86.70	81.98	78.42	78.49	78.45		
299 Prudhoe Bay	.00	84.44	94.03	105.04	105.95	107.40	114.07	113.40	111.14	116.42	114.44	110.98	105.97	100.40		
300 Kuparuk	12.40	15.39	20.07	23.11	19.93	16.21	12.19	6.72	3.84	-1.55	-5.53	-7.66	-7.38	-6.97		
301 Milne Point	-2.57	-4.25	-5.14	-5.65	-7.18	-7.79	-8.12	-8.12	-8.19	-7.05	-5.10	-3.10	-1.51	-1.16		
302 Endicott	.00	-3.21	-3.47	-4.09	-4.26	-4.68	-6.30	-8.99	-10.14	-9.33	-6.73	-3.80	-1.42	-0.00		
303 Lisburne	-3.82	-7.12	-5.79	-6.64	-5.37	-7.16	-3.92	-4.74	-5.38	-5.99	-6.63	-12.26	-14.09	-12.05		
304 West Sak	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
305 Unspecified	.00	.00	.00	.00	-2.84	-3.13	-3.56	-3.99	-5.38	-5.81	-8.46	-5.74	-3.09	-2.77		
306 Seal Island	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
307 REV CHANGE FOR CUR ELF NO ELF ON CENTS/	30.06	18.68	18.29	17.66	24.25	26.23	19.68	23.41	16.18	21.67	23.90	27.69	30.69	27.44		
308 Prudhoe Bay	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
309 Kuparuk	27.29	14.60	8.27	.64	2.81	4.67	1.95	5.85	.00	5.43	5.06	6.54	7.39	6.81		
310 Milne Point	2.25	.97	.84	.19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.76		
311 Endicott	.00	3.10	7.82	5.81	5.16	3.60	.00	.00	.00	.35	1.95	3.17	3.93	3.92		
312 Lisburne	.52	.00	1.36	1.53	1.79	.00	.00	.00	.00	.00	.00	.00	.00	.00		
313 West Sak	.01	.01	.00	8.53	10.48	14.25	14.39	14.62	14.64	14.79	15.52	15.56	15.58	12.43		
314 Unspecified	.00	.00	.00	.97	4.01	3.71	3.34	2.94	1.54	1.10	.00	.37	1.73	1.43		
315 Seal Island	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.37	2.04	2.06	2.09		
316 REV CHANGE FOR ALT ELF NO ELF ON CENTS/R	30.06	102.03	124.13	145.17	145.77	138.69	134.54	129.19	119.94	128.78	127.12	124.13	128.14	123.43		
317 Prudhoe Bay	.00	84.44	94.03	105.04	105.95	107.40	114.07	113.40	111.14	116.42	114.44	110.98	105.97	100.40		
318 Kuparuk	27.29	15.39	20.07	23.11	19.93	16.21	12.19	6.72	3.84	5.43	5.06	6.54	7.39	6.81		
319 Milne Point	2.25	.97	.84	.19	-1.56	-2.27	-3.08	-3.44	-4.02	-3.33	-2.20	-.95	-.04	-.76		
320 Endicott	.00	3.10	7.82	5.81	5.16	3.60	-2.44	-.33	-1.81	.35	1.95	3.17	3.93	3.92		
321 Lisburne	.52	-1.89	1.36	1.53	1.79	-4.21	-3.92	-4.74	-5.38	-5.99	-6.63	-11.54	-6.43	-2.33		
322 West Sak	.01	.01	.00	8.53	10.48	14.25	14.39	14.62	14.64	14.79	15.52	15.56	15.58	12.43		
323 Unspecified	.00	.00	.00	.97	4.01	3.71	3.34	2.94	1.54	1.10	-1.01	.37	1.73	1.43		
324 Seal Island	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
325 REV CHANGE CUR ELF NO 10 YEAR LIMIT	.00	93.52	105.56	118.79	121.63	125.56	131.82	134.31	135.61	138.78	141.13	142.41	142.93	142.93		
326 Prudhoe Bay	.00	93.52	105.56	118.79	121.63	125.56	131.82	134.31	135.61	138.78	141.13	142.41	142.93	142.93		
327 Kuparuk	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
328 Milne Point	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
329 Endicott	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
330 Lisburne	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
331 West Sak	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
332 Unspecified	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
333 Seal Island	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
334																
335																
336 PRESENT VALUE OF CHANGES IN NET REVENUE																
337 RESULTING FROM CHANGES IN THE SEVERANCE TAX																
338 1988 THROUGH 2000																
339 IN MILLIONS OF DOLLARS																
340 NO ELF	1867.50															
341 ALTERNATE ELF	670.01															
342 ALTERNATE ELF - NO ELF ON CENTS/BBL	911.99															
343 CURRENT ELF - NO ELF ON CENTS/BBL	154.73															
344 CURRENT ELF - NO 10 YEAR LIMIT	879.26															

ELF

TRANSCRIPT OF PRESENTATION ON ELF
given by Gregg Erickson
TAX POLICY COMMITTEE MEETING - September 11, 1986

TAPE 2, SIDE 1, COUNTER #238

The ELF was established in 1977 and as Mr. Monkman told you, the ELF is a tax break. The purpose of the ELF as it was established in 1977 was to reduce the tax rate. Oil producers like the ELF. Any proposal to [increase] the ELF is [not] going to win favor with the oil producers and give them more money, allow them to keep more of the proceeds of the production of oil than they keep now.

The ELF can reduce the tax rate by a lot or it can reduce the tax rate by a little depending on one major factor. And that is the average per well productivity. If the average well in a field produces 300 B per day, that field will pay a lower tax rate under the ELF, other things being equal, than if the average per well productivity in the field is 1000 B per day. The average per well productivity is always the major factor in establishing the ELF and it needs to be kept in mind. We'll be coming back to that again later.

The ELF is always a number, and the number is always between zero and one. If you like, you can think of the ELF as a percentage that's applied to the regular nominal percentage tax rate. That's another important concept.... Right now, Alaska has a nominal percentage severance tax rate of 15% for some fields and 12.25% for some fields, and some fields change around from 15 to 12.25% because of amendments to the severance tax law that were adopted in 1981 and we'll talk about those later. That nominal tax rate gets reduced by the ELF by multiplication of this number (between zero and one, remember) times the nominal percentage rate. So, if the ELF is .5 (one-half) then the nominal tax rate is reduced by a half. So, [if] the ELF is .5 and our nominal percentage rate is 15%, the effective percentage rate is half of 15%, or 7.5%. Oil companies like the ELF, it reduces their tax rate.

I think that we can understand how this works best now by taking you to the never-never land of charts and graphs. (*) I know that it's a hard thing for some people to grasp the kind of geometric concepts we are going to be dealing with, so, Mr. Chairman, if it's alright with you, I'd be appreciative if people would interrupt me and say that they don't understand a particular concept that I'm trying to get across.

This is a picture of the Economic Limit Factor. Start out by looking at the two axes here, the two lines. The lower axis right here is...daily output per well. [It] starts out here at 50, but you can imagine it going even further down here, to zero. That means 50 B of oil per day, per well. It goes way on up here to 2500, 2800 B per day per well. The other axis on this chart is the ELF. And as I told you before, if you recall, it's a number between zero and one. [Y]ou see those numbers here, starting at 0 at the bottom, .5 in the middle and 1 at the top. If you have an oil field and the ELF is 1.0, you get no tax reduction because your nominal tax rate is multiplied times 1 which means it's not changed at all. If your ELF is .5, it's multiplied by one-half, it means you pay half of the nominal tax rate. If your ELF is 0, you pay no tax at all. Oil companies like the ELF.

You notice that fields have different average daily production, some fields have very high productivity in comparison to others. Prudhoe Bay field has, or had, because this graph was originally made about nine months ago, an average

(* Refer to charts attached to transcript.)

daily productivity as calculated for the ELF of around 2500 B per day per well. Milne Point, on the other hand, has a lower productivity and Kuparuk has a lower productivity still. If we applied the ELF in exactly the same manner to Prudhoe Bay, to Milne Point, and Kuparuk, it affects them differently. Prudhoe Bay, because it has the highest productivity, gets the least tax break. Kuparuk, because it has the lowest per well productivity, gets the biggest tax break from the ELF. And if we had a field down in this region, it would get an even bigger tax break from the ELF.

Now we say that the ELF is a function. [T]hat means it depends on the daily output per well. That means that if you know the daily output per well you can, or at least you have been able to in the past, determine what the ELF is going to be, what number between zero and one gets multiplied times that nominal tax rate to produce the effective tax rate, which is what Mr. Nelson and his oil company people are really concerned about, the effective tax rate. And it's really what the State of Alaska is concerned about too. In terms of all the factors that we're concerned about on severance taxes, it's the effective rate that people have to pay that makes the difference, not whether the nominal rate is 15% or 30% or 2%.

Now, you'll notice that this curve has a shape that puts every point out here as we move to the right along this lower axis, we also move at every point up on the fractions of the ELF axis. Except for this region down here at the bottom, we'll be coming back to this as we calculate the ELF, but that region is the economic limit region.

The framers of the legislation in 1977, that christened the ELF, that created the ELF, decided that they wanted to insure that fields of relatively low productivity such as they expected to develop among the Cook Inlet fields at that time, would not be forced to shut down before the cost of [operating] the fields exceeded the value of the oil that was being produced. And there was a problem that Milton Lipton and many others spoke to the Legislature about and they called it the premature shut-down effect. If you had too high a tax burden at these low productivity, and presumably low profitability fields,...those fields would shut down, even though they could continue to make profits if the taxes were reduced and continue to make, at least if not profits, at least enough money to bear their operating costs and to keep the jobs and keep the economic activity represented by those fields. Economist and experts and business people alike agreed that it didn't make much sense to shut a field down before the actual cost of production exceeded the value of the oil. Taxes, and royalties too, were dead weight that had to be carried by the production of those fields and so this device was created to, at least as far as the severance tax is concerned, eliminate that dead weight drag on those fields that might otherwise shut [them] down.

We'll come back to that concept so it's not necessary that everybody grasp that in its entirety. But, I'd like to stop right now while we've got this graph in front of us and ask any member of the committee, with your permission, Mr. Chairman, if they have any questions or if there's anything I've covered so far that doesn't compute.

COUNTER #377

(QUESTION from Sen. Eliason: Just a general question, the lower level of production, there, and in fact what they're paying is only $7\frac{1}{2}\%$ or is it the 15%, is that what we're saying.)

We're saying that Prudhoe Bay, under these assumptions, which are a little bit out of date right now, is paying 83% of, in the case of Prudhoe Bay, 15%. And Tom Chester, our expert, or maybe Mr. Nelson who probably knows a lot about Prudhoe Bay too, can give you the exact number.

(QUESTION from Sen. Eliason: The question of course, or the point was, in other words, that's the 7½%, that low production field is paying 7½% rather than the 15.)

If the nominal rate on Kuparuk was 15% that would be true. However, the nominal rate on Kuparuk is, if I am correct, 12.25%. [They're] paying half of that, that's correct.

(COMMENT from George Nelson: I want to make one correction because in Prudhoe Bay we're paying, based on one, 15% simply because of the fact that for the first ten years, by the law, the factor cannot, if it calculates out above .7, it's always going to be 1. So it's July 1987 before Prudhoe Bay can really use ELF to the advantage of reducing that percent.)

Mr. Nelson is absolutely correct. The reason, and I'm sorry I gave the misrepresentation if I did, that Prudhoe Bay's actual tax rate was reflected by this calculation, because as he says, there's a special exception in the law for Prudhoe Bay which was established in the 1981 tax amendments. But, the ELF by itself works this way, and if the ELF applies, which it does not right now to Prudhoe Bay, Prudhoe Bay would be paying 83% of whatever its nominal rate would be.

(QUESTION from Rep. Grussendorf: The ELF is based on the output per well, or site. What are advantages or disadvantages if we went by field?)

The output per well was chosen, it's my opinion anyhow, that in 1977, it was chosen by the legislature as the factor to determine the ELF because they believed that that was the most readily measurable indicator of field profitability and they wanted to have lower taxes for fields that had lower profits and higher taxes for fields that had a higher profit. But they wanted to retain the concept of a severance tax, as Mr. Monkman mentioned to you. They didn't want to create an income tax here and call it a severance tax, although, they in effect got a little bit close to that perhaps at times.

They chose this one factor recognizing, I think, that there were a lot of other factors that affect profits as well. And for example, we have here Kuparuk, which may well be a more profitable field than Milne Point, and yet the Milne Point has a very small number of relatively high productivity wells, or at least was anticipated to have that situation. And Kuparuk has a relatively larger number of lower productivity wells. As a consequence, Kuparuk gets a bigger tax break than Milne Point. That shows in effect, the arbitrariness, if you will, of just using daily output per well as the indicator of relative profitability. Because if the situation I just described is true, if Kuparuk is a more profitable field than Milne Point, then this ELF factor has not produced the results that I think the framers of the legislation in 1977 wanted to produce. And it might well be that that problem is a consequence of the failure of this ELF factor to reflect total field size. [T]here are a number of factors, indeed, besides daily output per well and total field size, that could be taken account of in an ELF kind of calculation. And the framers chose daily output per well.

(QUESTION from Rep. Sund: How is the curve generated?)

We're going to take you all through that, in excruciating detail, I'm afraid.

(QUESTION from Sen. Eliason: Could also the ELF be construed as an incentive to put more wells in a field?)

Indeed, it could be. However, there are technical provisions in the law which say that you really don't look at number of wells, you look at the number of days that a well operates multiplied. So, it's really well days that are used to try to prevent the incentive, or eliminate any incentive for gold-plating or over-drilling a field. Now, I don't know that any studies have been made to indicate whether or not there is any residual incentive or not. My

suspicion is that its minor if it is. You'll see those technical provisions when we go through the actual translation of the ELF which is coming next.

(QUESTION from Bart Garber: On your graph, the figures on the bottom line, those are constants for the formula, they don't ever change?)

The figures on the bottom line change for every field, from day to day.

(QUESTION from Bart Garber: No, I understand that, what I'm saying is as far as the formula itself goes, to determine the ELF rate, the number of barrels pumped per well don't change?)

[I don't] know if I understand your question correctly. Let me rephrase it and tell me if I'm getting back to you. Does a well this year pumping at 1300/bbl per day get exactly the same ELF this year as it will five years from now if the law doesn't change?

(QUESTION from Bart Garber: No, that's not what I meant. My question is are those figures constant there. Will you always use those figures. In other words, if a well is pumping at 1300/bbl daily output per day, I'm not saying will that well remain constant, I'm saying will that figure remain constant at wherever you're at on ELF?)

Like at .7. If you'd asked me that question last year, or 13-14 months ago, I would have said yes, absolutely. But, I would have been wrong because, as Mr. Monkman mentioned, there is a provision in the law which [was never] really thought [much about], to change this production-at-the-economic-limit number. You'll see how that enters into it later on. And it's nobody's fault but my own that I would have misanswered your question, but I think there were a lot of people who would have made the same mistake a year and a half ago.

(QUESTION from Gordon Harrison: I see a question, Gregg, to follow up on, Sen. Eliason's question about the number of wells. Is well spacing regulated, the number of wells that is, by the Oil and Gas Conservation Commission?)

Yes it is. Indeed, the Alaska Oil and Gas Conservation Commission establishes regulations and when the oil companies wish to change the average spacing, they need to get permission. However, the Commission grants or withholds that permission based on generally a reference to engineering practice rather than economic analysis. Or at least that is to my understanding.

COUNTER #523

(QUESTION from Rep. Grussendorf: Gregg, that was the concept of the formula?)

We go from the general, and that can be called general, to the formula itself. Now folks, don't automatically assume that you can't figure this out. This is the formula, the ELF here equals this mathematical construction. We're going to take you through this mathematical construction and it's not nearly as complicated as it seems. The only thing that you may find unfamiliar, and I think most of you will have had some familiarity with it, is the use of the exponent. This little 'exp' in the formula means that the expression following it is, taken together, an exponent. If you recall what any...exponent says, you raise the number to a power, and if the exponent is two, that means you multiply the number by itself. So, four squared ([a four] with a little two above it) means four times four, and that's all we're doing here, but a little more complex than that because we use fractional exponents. But, that's the principle.

The formula has in it abbreviations because if you wrote the whole thing out it would just be too long. And one of those abbreviations, the first one,... ELF,... is an abbreviation [that] stands for Economic Limit Factor. The second abbreviation is PEL. It stands for Production at the Economic Limit. Now you recall the graph we showed you just a moment ago, had a zero tax rate at [an] average daily per well production of from zero to 300 B. The concept

behind that was that it would probably take about, it's a real rough and arbitrary kind of number, but nevertheless, take about 300 B a day for an average well in the average field to make its expenses. Now there's all sorts of things that vary. [O]bviously the cost of the well can vary enormously. [A]s we've discovered, the amount of money you get from the oil can vary enormously, and all these affect how many barrels you have to produce to just cover your operating expenses. Incidentally, the operating expenses in the statute were defined very, very narrowly. But, as a rough approximation...the law says you will take 300 B unless a showing is made otherwise. And up to now, everyone has calculated their ELF using 300 B, so we use it here today in our calculation. [I]t's defined in the law as times the number of wells and times the number of days the well is operating, actually defined as well days. So that the production at the economic limit for this month for this hypothetical field which is similar to Prudhoe Bay,...would be 4,869,000 B. The concept there is that if the Prudhoe Bay owners could get 4,869,000 barrels [per month], they would at least make their expenses. So we plug that number, 4,869,000, into the formula at this point, and at the bottom down here....

The second factor in the formula is the total production for the field for the month. Since we're talking about 300 B per day, and yet the tax gets paid on a monthly basis, we have to calculate in the total number of barrels in the field per the whole month. And that's just simply the monthly production, but we've also shown it here as the result of multiplying the average number of operating wells during the month times the number of days of production for the month times the average daily production per well. And in the example here, we show 541 wells, assuming each of them operated for 30 days, and the average per well productivity was 2,477 B per well, that means they actually produced forty million barrels in that month. So, they actually produced, if this example is correct, roughly 20-25 times as much oil as is necessary under this very rough calculation to meet their operating expenses that we calculated up here in this calculation.... Remember this may not actually be enough to meet their operating expenses, or maybe much more. [I]t's what the statute says you use, and I'm explaining not anything that's in the statute when I say operating expenses, but the concept. Well, actually it is in the statute elsewhere, but it's the concept here that we're talking about.

Then we have to plug in the number of well days in the exponent, and that's calculated simply as the number of operating wells during the month times the number of days each well operates. For example, in our case here,...541 wells [times] thirty days gives us [about] 16,000 well days.

Now we come to the calculation. But let me stop right here and talk about these definitions.... Does anybody have anything that they don't understand about these definitions so far?

END OF TAPE 2, SIDE 1, COUNTER #638

TAPE 2, SIDE 2, COUNTER #001

(Beginning of tape unintelligible.)

...show us that it should be more. Up to now, it has been 300 B a day because the operators have either not come in, or if they have, have not satisfied the requirements that they satisfy.

(QUESTION from Sen. Abood: Where do the numbers (tape unintelligible) to break even?)

Three hundred. It's in the statute itself. It says "it shall be presumed to be 300/bbl per day per well, unless..." etc.

(QUESTION from Rep. Martin: Is it possible to look at this formula as a disincentive for oil production. To me, the more they produce, the more tax burden that they have. In a way, it may be worthwhile for production companies

to say let's keep it at a certain level, and therefore we know that our tax factor will be decreased.)

That's entirely possible. The formula is based, however, on the assumption that these more productive fields are more profitable. Now if that assumption doesn't hold or the higher profits are not more than enough to counterbalance the higher taxes, then your supposition could be correct.

(QUESTION from Rep. Martin: Especially at the lower price market, I can see where they want to produce as much as they want at the high prices, because they get more and more percentage of the profit. But in this flexibility we have now, what's to say that a company won't say hey, now it's our turn to pay less taxes and get more profit at the lower price market?)

Well, if I was an oil company, I [c]ould certainly say that.

Now, we have to go and plug these numbers in where...these acronyms [were]. Let's go back up and look at the formula again one more time.

* * * *

[There are] two parts to the ELF formula: the exponent, which is everything within these parentheses starting here and going over to here, and the inverse function, which is everything within these parentheses starting here and going over to here.

In calculating, let's go through the inverse function first. We plug in the PEL right here, the Production at the Economic Limit, which we calculated up here, and that's 4,800,000 some barrels. We plug in the Total Production here, and that's 40 million, and we divide 40 million into 4,800,000. Now, 4,800,000 is a lot smaller number than 40 million, so the result is less than 1. It's a fraction and in this case it's .12, a little over 1/10th. After we make this division, we plug that number in right there.

Now the formula says that you take that little fraction and subtract it from 1. So we do that here, and we get the result of .8789. Now if there was no exponent, that would be the ELF. And indeed, as you will see, as we go back over the history of the 1977 session, that as originally proposed...was all there was to the ELF, was just that calculation we just made. And if that had been the case, and the ELF applied to this particular field, then the nominal tax rate would be multiplied times .8789 to produce the effective tax rate. The effective tax rate would be 88 percent, roughly, [of] the nominal rate. But for reasons that we'll come back to later, the exponent got added.

The exponent is calculated by a constant here, which is 460 (that's a dimensionless constant, it's in the formula, it's in the statute, it's plugged into anything you do with the ELF under this current law) times the number of well days, and that's 16,230, so we plug that in right there, times the PEL, which we calculated up here as some 4,800,000. We can multiply or divide these in any order we want. And [when] we do that,...divide the 16,000 by the formula, and you get a very small number, and you multiply it by 460, it gets large enough so it's always generally over 1. And the results here, if you'd want to take a calculator and do it, multiply 460 times 16,000, and divide the results by some 4,800,000, you get this number. Let me stop right there and see if people have followed me so far.

COUNTER #59

(QUESTION from Rep. Sund: Where does the 460 come in and what's the theory behind it?)

I'd like to defer that until we get into the discussions in the free conference committee in 1977, because I think that's the easiest place to bring that in, but I'll tell you right now that it was a means of...changing the shape of this curve, and it was a means basically of pushing this curve this way. We'll get back to that.

So we've got now this inverse function which has been reduced down to .87, and if it wasn't for the exponent, that would be the ELF, and we've got this exponent. Now normally, this exponent is written just a little bit above the number to which it applies, but because the exponent is so large, we use this different notation, this 'exp'. And if you look in the statute, 43.55, you will find that formula just exactly as we've written it here. The number comes out to 1.5 and probably most of you are not familiar with raising a number to a fractional power, but you can think of it like this. Suppose this exponent was 2, that would look a lot more familiar. It would say .87 squared, with a little tiny 2 right above here and that would be the same thing as we've got written here, except with this being a 2 instead of a 1.5.

Well now what happens when you multiply, usually you think when you square a number it gets bigger, like 4 squared, raised to the second power is 16, that's a bigger number than 4. Now if the number being raised to the power is less than 1 however, you're multiplying a fraction times a fraction and when you multiply a fraction times a fraction you get a number that is smaller. And, in fact, if you multiplied, if the number here was just .8, and the exponent here was 2, you would be multiplying 8 times 8, which is 64, which would make this number here not 64, but .64. In other words, it would reduce it. And that's indeed what happens here. Because this exponent is greater than one, and so if the exponent was one, it would have no effect on this number, and if it was smaller than this number it would make it bigger. But we don't have to worry about that. Basically, if you've got a calculator, plug it in and press the exponent button and it will do it for you.

The result of raising .8789 to the 1.5 power is .82. It's higher than it would be if we were raising .8 to, squaring it, and you can see how that relationship goes, I hope. This is the one part that involves mathematics that most people probably aren't familiar with, but fortunately we have calculators now [so] we [don't] have to be familiar with it.

Does anybody have any questions about the basic calculation about the ELF.

Okay, what happens when we change some of these numbers. Well I ran through three examples here just to show you quickly the results of some adjustments to this ELF calculation. [I]n this case we've increased the exponential constant. It was 460, [and] it is 460 in the statute. What if that number were 1000. Well, we've run through here, and I won't take you through it at any length because you have in front of you the printed copy of this. I've highlighted with bold numbers every number that has changed from our previous example. This number is changed, this number is changed, and this number is changed.

The result of an increase in the exponential constant is a decrease in the tax. The exponent gets larger, you take a larger exponent and apply it to the same basic ELF and the result is a smaller number. Like raising a number to the third power instead of to the second power. So, just to go over it again, if the exponential constant is increased, the tax gets decreased, and in 1977, as you'll see, this was one of things that the free conference committee which met for almost two weeks argued and argued and argued about.

COUNTER #119

(QUESTION from Sen. Abood: Was that where your 460 came in?)

The 460 was the number that previously took the place of 1000. Yes, the answer to your question is yes.

(QUESTION from Sen. Abood: I understand that. In the free conference they argued this 1000 to 460?)

Well, 1000 wasn't one of their options, but they argued the difference between 750 and 300.

(QUESTION from Sen. Abood: This was an arbitrary figure that they were trying to work out?)

They wanted this curve, as you'll see, to look the way they wanted it to. And that number, this 1000 or 460 or 300, makes a significant difference on how that curve looks and who gets hit with a tax jab and who doesn't.

(COMMENT from Sen. Abood: So more is less.)

In this case, more is less. An increase in the exponential constant means a decrease in the tax. And you may not be surprised to learn that the Senate, in 1977, wanted a bigger exponent and the House wanted a smaller one.

(COMMENT from Sen. Abood: I wasn't there at the time.)

(QUESTION from Sen. Eliason: Do you have the names of the free conference committee members?)

I certainly do. (Pause) Let's take a look here at the results if the exponential constant is reduced. [It's] just the opposite, I've run it here from 460 down to 300. I've run through the calculations in exactly the same way. The exponent here becomes 1. And if you recall our earlier discussion, an exponent of 1 means that the number to which it is applied is unchanged. The result is an increase in the taxes you would expect. What happens if, remember there's another constant in the calculation, and that was the PEL here, the 300/bbl per day in our other calculation, here I show in Case 4, the results of changing that 300 to 400. Now this change could come about as...a consequence of the law being changed. The law currently says the production at the economic limit is assumed to be this calculation right here with 300. If they change the law to make it 400, the result would be as we'll show you here now. It could also come about as a consequence of the oil companies petitioning and the Dept. of Revenue approving a higher PEL allowance for a particular field. The result, I won't carry you all the way through this, just go down to the bottom, is in this case, a very small decrease in the tax. Basically we're saying here this is the amount of oil you get for free, and naturally that reduces the tax.

Now if this had been, the result here is reduction from .822, I believe, to .816, a very small reduction. But if this had been a much smaller field, and if this factor in the calculation right here had been smaller, the result could have been much more significant in terms of a tax reduction. But the principle [still] holds, and that is when the PEL constant is increased, the tax decreases. And that tends to be more important for the smaller fields, but it holds true for all fields. And I won't show you another example, because it's just the other way around. If the PEL constant is decreased, the tax increases.

That is how the tax is calculated and now it seems like the best way is to run this sort of backwards to show you how [the legislature got to this point] ([though] nobody really knows what went through the collective collegial bodies' minds when they make a decision like this). [W]hat was in the minds of the legislators who grappled with these problems in 1976 and 1977, [what were] some of things that they were thinking about? [T]o do that, I'd like to start with the tax law as it existed in 1977. This chart is actually from the 1977 session, and the axes here are the average barrels per day, the same axes that we had on our other chart, and the percentage tax rates, not the ELF here, this is the total percentage tax paid. So it's similar to what the ELF is but in this case we didn't have an ELF at the time and we're looking at the effective tax rate which, in the case of the '77 law, was the same as the nominal rate.

Let's focus on this scalloped curve right here. This is the law as it existed in 1977. It had been adopted in the 1973 special session. Some people call it the pipeline session. The law provided that the first 300/bbl of oil produced from a well during a day were taxed at 5%. And with what's an increasing block structure, which is very similar to the kind of structure that

you pay [on] your electric bills in most areas, except reversed. With electric bills, you usually pay less for the higher consumption, and in this case, the more you produce, the higher was your tax rate. Now those blocks produced this kind of scalloped appearance when they're applied to the average daily production and the rate that you're actually paying. For the next 700 B the rate was 6%. So you paid 5% on the first 300 B and 6% on the next 700 B, which meant that the average rate, which is what we're talking about here, never quite got up to 6%, because you always had this low price block down here. The next block, the final block, which was everything over 1000 B was taxed at 8% flat tax. So that if you've got it way, way out here, you eventually got close to 8%, and it was about 7.5% here around 3,500 B per day. That was the tax as it stood, so the effective rate, if you had 4,000 B per day of production, was about 7.6%. The top marginal block was 8%. Nobody was taxed more than 8%. If you were very, very productive in terms of average daily per well production, your tax rate was approaching 8%.

COUNTER #206

Okay, what was wrong with that? Why did the legislature want to change it? Well, I think there were two things in the minds of this special oil and gas and pipeline impact committee when they proposed what became known as House Bill 144. They wanted to reduce the tax rate for low productivity fields. This is the same kind of declining block structure under the bill that was introduced by the special committee that was formed to study this. And that bill reduced the tax rate for fields with productivities of less than about 1200-1300 B per day and increased the tax rate, substantially increased the tax rate for the high productivity fields. It was a device, a proposal that would have increased the taxes for the fields that have high average daily production and would have decreased the taxes for fields with low average daily production. Why did they want to do that? Well, clearly one thing that was in their mind and that they said in their report was that they were fearful that a 5% rate on these low blocks would cause Cook Inlet fields to shut down in some future year. They were seeing the gradual decline in productivity of the Cook Inlet fields and there was concern that that was something that they didn't want to see, they didn't want to see those jobs lost, and they didn't want to see the dead weight economic loss of shutting down a field when it was actually producing enough oil to make its cost. So they proposed that the first 100 B of oil paid absolutely no tax at all, and the next 200 B pay tax at the rate of 3% and so on, on up, so that the maximum tax rate was, if I recall correctly, 12%, it may be 12½%, I don't recall the top block. But as you can see, this was a very hefty tax increase for these more productive fields.

The Dept. of Revenue had, through 1976 and 1977, been conducting a major study of oil and gas taxes and it to this day remains a very, very useful piece of work. I have a copy with me in my briefcase back there right today in case questions come up that I can't answer, because it is even now, though somewhat out of date, a very useful document. It is primarily authored by John Messenger and his associate Tom Williams. As a result of that study and discussions within the administration and the Dept. of Law and the Dept. of Revenue, and Governor Hammond at that time, they came forward and introduced a proposed legislation that would have looked, had it been adopted, like this curve shown here. It contained an Economic Limit Factor without the exponent. Remember, in most cases, the exponent was a factor that when raised, reduces the tax.

The problem, I think, that some people saw with that was that it created too high a tax, too soon. In other words, a field here with, let's say 300/bbl of productivity would be paying tax of around 7%. That was even higher than the existing tax here and it was exactly those kinds of fields that the special oil

and gas committee was concerned with in terms of providing some tax breaks for them. Their proposal provided substantial tax breaks for every field producing less than 1300/bbl per day, that is a break in comparison with the laws that stood at that time. So there were attempts made to adjust the Economic Limit Factor...in the administration's bill. And that intent, since there were really only two factors you could adjust in that bill, one was the Production at the Economic Limit, which in their bill was 100. They said well if you don't want to lower that, let's just increase it, and so here was a, this was never introduced as a bill but was discussed as a proposal, Economic Limit Factor of 1000. Well, without the exponent, what happens is that this curve gets pushed this way, it actually gets pushed, this point gets moved to here and this curved area gets pushed down to here. That didn't produce the result that people were comfortable with either because it was felt that the result was even too big a tax break for the fields that were in this region right here. And, as well, when you gave that tax break, the result was the depression of the curve over in this region here. You couldn't avoid it if the calculation of the formula was such that if you moved this over here, this part came down as well. So, I think the desire was, and this is my guess, there was some evidence in the written record to indicate that this was what in fact was in the minds of some legislators, they wanted to give this break here, but they didn't want to give this big a break out here, and they couldn't figure out a way to do it with the Economic Limit Factor that the Dept. of Revenue had presented. And legislators kept saying, well, I'd like to use the Dept. of Revenue's formula because it's always good to get the administration's bill passed and put your amendments on the administration's ideas rather than try to do it the other way around, but they were saying, "We want a curve that incorporates the administration's formula, but one that more closely approximates what we've got here in our own bill. Can you give us an ELF factor that produces this?" And the result was the exponent because the exponent allowed you to push this part of the curve this way, to push the curve inward without pushing this part down very much, pushing this outer edge down very much.

It's interesting, some people say that these kinds of complications in law wouldn't happen if the legislature and the administration didn't have a bloated bureaucracy to dream up crazy ideas like this. And I think that's absolutely true, but it wasn't the bureaucracy that dreamed up the idea because they wanted to complicate the law, it was because the legislators and the policy makers came and said I want to accomplish a result, how do we do it? And that's how it happened that the ELF got an exponent.

COUNTER #302

The two bills that...ended up in free conference committee then had three things that they could adjust. The nominal rate, the exponential constant and the Production at the Economic Limit, and they also had a cents-per-barrel factor which I can get into if you like. I think it's probably worthwhile covering, but I think I'd like to reserve it for a little bit later.

In terms of the nominal rate, the house bill suggested 12.5% of value, the Senate wanted 11.5% of value, two different nominal rates which meant that the senate bill's curve headed up towards 11.5, never quite got to it, and the house bill was above it, was headed up towards 12.5, also never quite reaching it. The presumed Production at the Economic Limit in the house bill was 300/bbl per day and in the senate bill was 100/bbl per day, which was to say that the house bill gave a bigger tax break under the PEL, than did the senate bill. I think that reflected the greater concern in the House with the production problems that might in the future occur in Cook Inlet, or that were seen as a potential future problem in 1977.

The final factor that the free conferees were arguing about for those two weeks was the exponential constant, and the Senate wanted 750 and the House wanted 300. And to make a long story short, they compromised. In the very last minutes, as often does, it came together very quickly with a compromise which was a very small reduction in the House's proposed nominal rate from 12.5 down to 12.25, and they got to the end where they were arguing about hundredths of a percentage point, and they compromised on the House's part, or really a willingness on the Senate's part to adjust that exponential constant downward and there was some disagreement among the various oil companies as to their reactions to that and I don't think any of that disagreement ever got on the record, but it least it was said that some of the smaller oil companies operating in Cook Inlet felt that some advantage for the larger oil companies had been gained at their expense. I don't know if that's true, but that was an interesting side light on the negotiations and discussions.

COUNTER #348

There were probably ten or, there were a multitude of curves of this nature drawn and I think that's about all I can tell you about what went on in 1977 free conference. But the formula we worked through today arose out of those kinds of political compromises and I think it's the fact that the free conferees had to get in to this material as deeply as they did and as we have done today that has persuaded Gordon Harrison to ask me to go into as deeply as I have.

There are a whole lot of additional things that probably should be talked about, including the cents-per-barrel differences in 1977. The House proposed a cents-per-barrel tax...with an annual adjustment to the cents-per-barrel, based on the GNP deflator, basically based on inflation. So, had the House provision in that regard been adopted, the cents-per-barrel floor would have risen each year to keep pace with inflation and we haven't calculated what it would have been. The House proposed 93¢ per barrel, so it clearly would have been somewhere well above \$1.00 by now as a floor for the severance tax.

There's another interesting side light. The Dept. of Revenue initially proposed in 1977 and later retracted, or withdrew, a proposal to provide a royalty credit against severance tax, and it was a cute little device that would have, had it been legal, or had it been adopted, would have protected royalty revenues with a floor of sorts, in effect, using the severance tax as a means of providing a floor under royalty revenues as well. Senator Ferguson, who was around all this time, and Sen. Eliason haven't said anything about these, I hope that your memory ... accords with mine on these points.

The Senate had proposed a cents-per-barrel floor of 75¢ per barrel and had said that there would be no escalator. They compromised on that at 80¢ per barrel and that's where the 80¢ per barrel comes from that's in our law today. That's a good stopping place, I think, for the moment. There are a whole lot of other things to go into, but now is probably a good time to pause.

What comes next, if we want to go into it, Mr. Chairman, is the procedure for establishing the Production at the Economic Limit. The 1981 amendments, which of course gave us the tax system we have and which substantially changed the applicability of the ELF, as Mr. Nelson pointed out earlier, the ELF doesn't at this moment apply to Prudhoe Bay and that's because of what was done in 1981. Do you want to go on to those right now, Mr. Chairman, or do you want to pause at this point?

COUNTER #398

(QUESTION from Rep. Grussendorf: What would be your timing on that, Gregg?)

I think the 1981 amendments we could probably get through before lunch, and probably finish up this whole thing before lunch, unless you want to take an early lunch. I guess I'm getting a little hoarse, but that's alright.

(QUESTION from Rep. Grussendorf: Are there any objections to continuing?)

(QUESTION from Sen. Abood: One question, Mr. Chairman, I want to be sure it's straight. The only two fields that are affected are the Milne Point and the Kuparuk at this present time, is that correct?)

Affected by the ELF? I don't believe that's correct, but I would defer to my colleague, Tom Chester, who's probably looked into it. Cook Inlet fields, of course, are affected as well. And I think...

(QUESTION from Sen. Abood: But you were saying, if I may, Prudhoe Bay is not effected by it, but Kuparuk and Milne Point according to this graph, is affected by it?)

The Kuparuk field does have the ELF applied in calculation if its taxes, and the Milne Point field does as well, yes.

(QUESTION from Sen. Abood: So everything but Prudhoe Bay is affected by it?)

At this time, that's correct. (tape unintelligible) It appears that that would be the case, yes, unless the law is altered.

In 1981, let me back up, because there's one thing I should really say that I am not really the expert to talk, or the person to profess any expertise on, and that is the procedures under which the Production at the Economic Limit can be modified. And I am going to defer to Mr. Monkman or Ms. Vogt or Dr. Logsdon, if you want to go into more detail on those procedures. They're dealing with them on a daily basis. But the 1977 law, both versions, the House version and the Senate version, had a provision that said if the oil companies came in and could show that the costs of their production, and the bill defined costs very narrowly, although it left some ambiguities which I think may be a matter of some concern, if the oil companies could come in, or any oil company, any producer, could come in and show that its costs or the revenue from the production of the given 300 B was not enough to cover its narrowly defined costs, then the company would be entitled to, and the Dept. of Revenue was directed to grant, a higher Production at the Economic Limit. That factor, that provision was, I must say in my memory, not particularly a matter of concern to either side in the negotiations. There was concern that the language be written very tightly and of course, as usually often happens in this case, the concern of those of us who were drafting at the direction of the committee was to define those costs very narrowly. It turns out that that wasn't the problem, and as is often the case, it's the problem you don't think about is the one that comes back and grabs [you]. So, if there are further questions on that, I think I'd like to defer and have them direct it to the Dept. of Revenue, since they're in administrative hearings and are thinking a lot about it, if it's alright with Mr. Monkman.

COUNTER #458

(QUESTION from Rep. Grussendorf: Any last questions of Gregg, here on PEL?)

Let's go on to 1981 then. In 1981, I don't think we want to go through the long history of the 1981 situation, but in brief, the state had been sued with respect to the constitutionality of its oil and gas corporate income tax. And as a result of the deliberations in the 1981 session, there were attempts to settle that lawsuit legislatively, that is to remove the provisions of the petroleum corporate income tax that was passed in '78, which offended the oil companies, and thus settle the law suit. Those efforts came to naught, but there were efforts and concern on the part of the administration of Governor

Hammond to limit the state's liability by substituting another kind of tax that would not be so legally, at least would not be subject to the legal vulnerabilities that some people thought the oil and gas corporate income tax, that was then called, by shorthand, separate accounting, was supposedly vulnerable to.

The legislature decided to repeal the separate accounting tax and substitute a different tax which, it was felt, would be less subject to legal threat. The result of that change was a substantial reduction in revenue to the state. And to counterbalance that reduction, significant changes were made in the 1977 severance tax. The effect of those changes were to increase the tax rate at Prudhoe Bay from what was then about 11% up to 15%. This was done by establishing in the law, what I call in a shorthand way, the ten-year ELF trigger. And the ELF trigger says that any time a field has been in production for ten years, if that field began production before 1981, that it, the ELF goes into effect only after ten years of production. That is why Prudhoe Bay does not have the ELF applied in calculating its effective tax rate right now. Now there was also another trigger in the 1981 law and that's the .7 trigger. And I know this sounds very confusing and it is because the 1981 amendments were confusing. They were, in my opinion anyhow, kind of jury-rigged to produced the revenue result that was needed to balance the losses of revenue resulting from the change in the separate accounting to modified apportionment tax in the income tax side.

The theory behind it however, there was a theory behind those changes, and the theory behind the changes was that a field would be entitled in general (and this wasn't in the law this was sort of the theory behind it) to five years of production with a tax rate of 12.25% and that thereafter the tax rate would go up to 15%. Since Prudhoe Bay had already producing for five years in 1981, it meant that Prudhoe Bay had about five years to go without, actually in terms of the effective date about seven years to go, and with a tax rate that was not affected by the ELF. In addition, that unfortunately didn't get enough money to make up the difference, and so it was rather arbitrarily the law was designed so as to apply a 15% rate to Prudhoe Bay during the present time on the distinction that it came into production earlier and that they were going give a better tax situation to the smaller fields that were expected to come on after 1981.

COUNTER #536

So the result is that Prudhoe Bay has a calculated ELF of about .8 right now, which being above .7, doesn't trigger the .7 trigger, which if it did would cause the ELF to be applied. As a result, Prudhoe Bay pays a full 15% tax and will do so until it has been in production for ten years, which happens next year. That change means that there will be a significant reduction in the amount of severance taxes that the Prudhoe Bay field will produce for the State of Alaska.

That reduction sometimes gets caught in a kind of semantic difficulty. [I]t certainly is a reduction from the tax that is currently being paid by the oil companies on their Prudhoe Bay properties and their Prudhoe Bay production. It is not, however, a reduction from the current tax law, so I think it's useful in discussing this to remember that semantic distinction there. Usually we can say current tax and compare it with something else, in this case the word current tax can have two quite different meanings. So that is...one kind of ELF legacy, if you will, that is left over from the 1981 session: the ten years is running out and Prudhoe Bay is waiting to get its ELF.

The second legacy, and one that really works the other way, is that the five years that fields are allowed to produce at 12.25%, and this only applies to the newer fields, means that in the 1990's or late 1980's some of these newer

fields are going, actually they'll all be in the 1990's, are going to have a significant tax increase. Endicott for example, is going to be subjected to about an increase from, I don't know what the effective rates are, but it's about a 20% severance tax increase in about 1991-1993 (I don't have that sheet in front of me, but Tom Chester will talk to you later about the revenue effects of these things and show that to you) because the nominal rate changes from 12.25 to 15% in that year. Now if those fields are marginal, it's probably [not] something you want to hit with an extra tax burden at that time. That is another legacy left by the 1981 amendments.

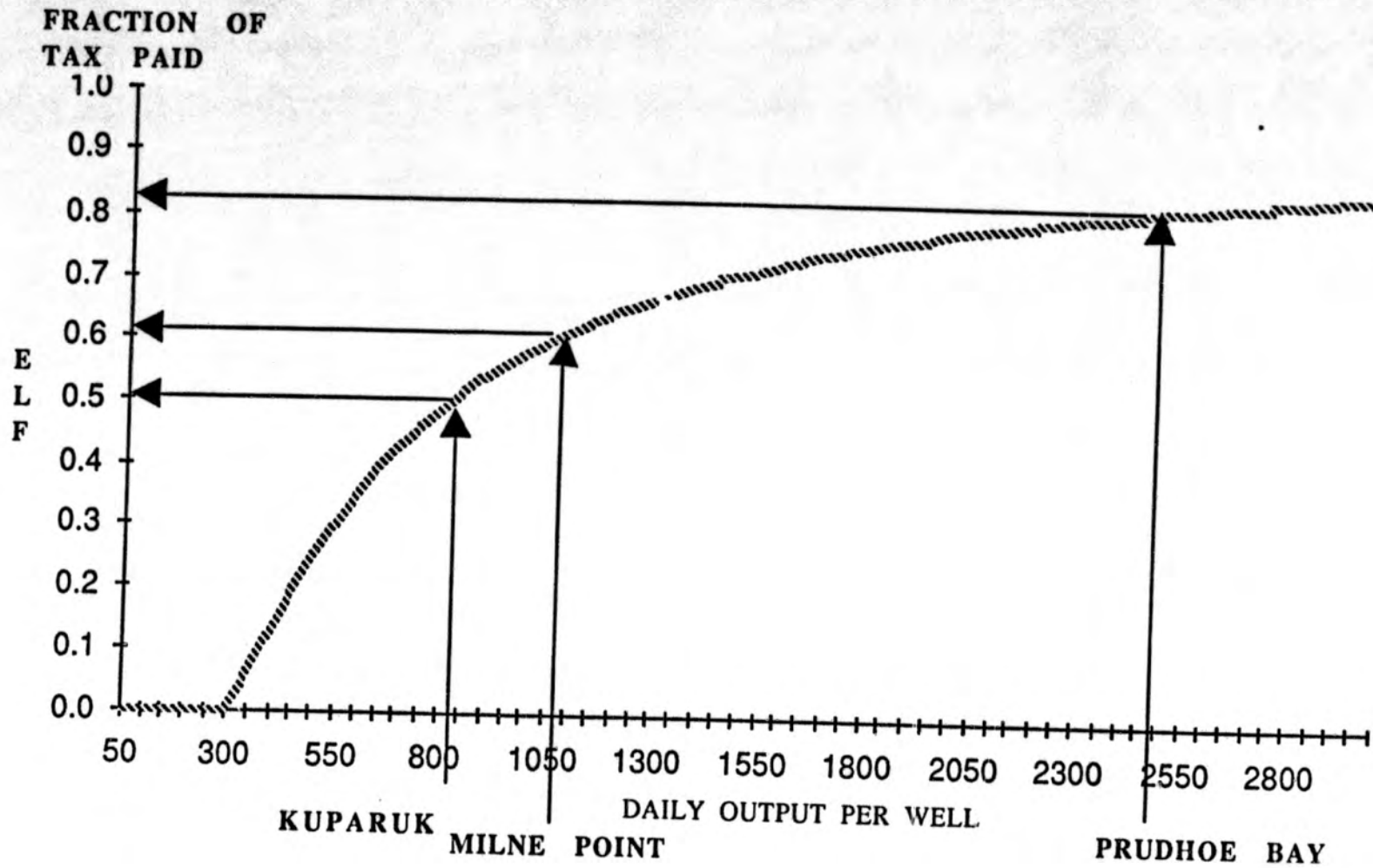
There is, of course, the legacy of the 1977 session, in what Mr. Monkman has descriptively called the "trap door in the floor." That is the application of the ELF to the cents-per-barrel which means that the tax rate could in fact fall to zero. Something that I don't think was contemplated or thought about one way or the other very much at the time the bill was drafted, although others may have a different opinion on that. So there are at least these two legacies from the 1981 amendments, and those may or may not be something you'll be interested in looking at further.

That concludes my presentation, and I am to be followed, presumably this afternoon, by my colleague, Tom Chester, who will discuss with you the revenue implications of these legacies, if you will, and the ways that those revenue implications could be altered, some of the ways that those revenue implications could be changed.

(QUESTION from Rep. Grussendorf: Before we break, do we have any questions of Gregg? When we come back, we'll be dealing with revenue effects of ELF and then the previous proposals to change ELF. Will coming back at 1:00 be acceptable with you? Let's recess until 1:00.)

END OF TAPE 2, SIDE 2, COUNTER #633

ECONOMIC LIMIT FACTOR



CASE 1

HOW THE ELF IS CALCULATED

$$\text{ELF} = (1 - [\text{PEL}/\text{TP}])\exp(460 * \text{WD}/\text{PEL})$$

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

$$\text{PEL} = 300 \text{ barrels} * 541 \text{ wells} * 30 \text{ days} = 4,869,000 \text{ barrels per month}$$

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

$$\text{TP} = 541 \text{ wells} * 30 \text{ days} * 2477 \text{ barrels per well} = 40,201,710 \text{ barrels per month}$$

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

$$\text{WD} = 541 \text{ wells} * 30 \text{ days} = 16,230 \text{ well days}$$

CALCULATION EXAMPLE

$$\text{ELF} = (1 - [\text{PEL} / \text{TP}])\exp(460 * \text{WD} / \text{PEL})$$

$$\text{ELF} = (1 - [4,869,000/40,201,710])\exp(460*16,230/4,869,000)$$

$$\text{ELF} = (1 - .1211) \exp (1.533)$$

$$\text{ELF} = (.8789) \exp (1.533)$$

$$\text{ELF} = .82$$

CASE 2

WHAT HAPPENS WHEN THE EXPONENTIAL CONSTANT IS INCREASED?

$$ELF = (1 - [PEL/TP])\exp(1000*WD/PEL)$$

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

$$PEL = 300 \text{ barrels} * 541 \text{ wells} * 30 \text{ days} = 4,869,000 \text{ barrels per month}$$

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

$$TP = 541 \text{ wells} * 30 \text{ days} * 2477 \text{ barrels per well} = 40,201,710 \text{ barrels per month}$$

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

$$WD = 541 \text{ wells} * 30 \text{ days} = 16,230 \text{ well days}$$

CALCULATION EXAMPLE

$$ELF = (1 - [PEL / TP])\exp(1000*WD / PEL)$$

$$ELF = (1 - [4,869,000/40,201,710])\exp(1000*16,230/4,869,000)$$

$$ELF = (1 - .1211) \exp (3.333)$$

$$ELF = (.8789) \exp (3.333)$$

$$ELF = .65 \quad \text{RESULT: A DECREASE IN THE TAX}$$

CASE 3

WHAT HAPPENS IF THE EXPONENTIAL CONSTANT IS REDUCED?

$$ELF = (1 - [PEL/TP])\exp(300*WD/PEL)$$

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

$$PEL = 300 \text{ barrels} * 541 \text{ wells} * 30 \text{ days} = 4,869,000 \text{ barrels per month}$$

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

$$TP = 541 \text{ wells} * 30 \text{ days} * 2477 \text{ barrels per well} = 40,201,710 \text{ barrels per month}$$

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

$$WD = 541 \text{ wells} * 30 \text{ days} = 16,230 \text{ well days}$$

CALCULATION EXAMPLE

$$ELF = (1 - [PEL / TP])\exp(300*WD / PEL)$$

$$ELF = (1 - [4,869,000/40,201,710])\exp(300*16,230/4,869,000)$$

$$ELF = (1 - .1211) \exp(1)$$

$$ELF = (.8789) \exp(1)$$

$$ELF = .8789 \quad \text{RESULT: AN INCREASE IN THE TAX}$$

CASE 4

WHAT HAPPENS WHEN THE PEL CONSTANT IS INCREASED?

$$ELF = (1 - [PEL/TP])\exp(460*WD/PEL)$$

PEL = (Production at the Economic Limit) =
(400 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

$$PEL = 400 \text{ barrels} * 541 \text{ wells} * 30 \text{ days} = 6,492,000 \text{ barrels per month}$$

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

$$TP = 541 \text{ wells} * 30 \text{ days} * 2477 \text{ barrels per well} = 40,201,710 \text{ barrels per month}$$

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

$$WD = 541 \text{ wells} * 30 \text{ days} = 16,230 \text{ well days}$$

CALCULATION EXAMPLE

$$ELF = (1 - [PEL / TP])\exp(460 * WD / PEL)$$

$$ELF = (1 - [6,492,000/40,201,710])\exp(460*16,230/6,492,000)$$

$$ELF = (1 - .1615) \exp (1.150)$$

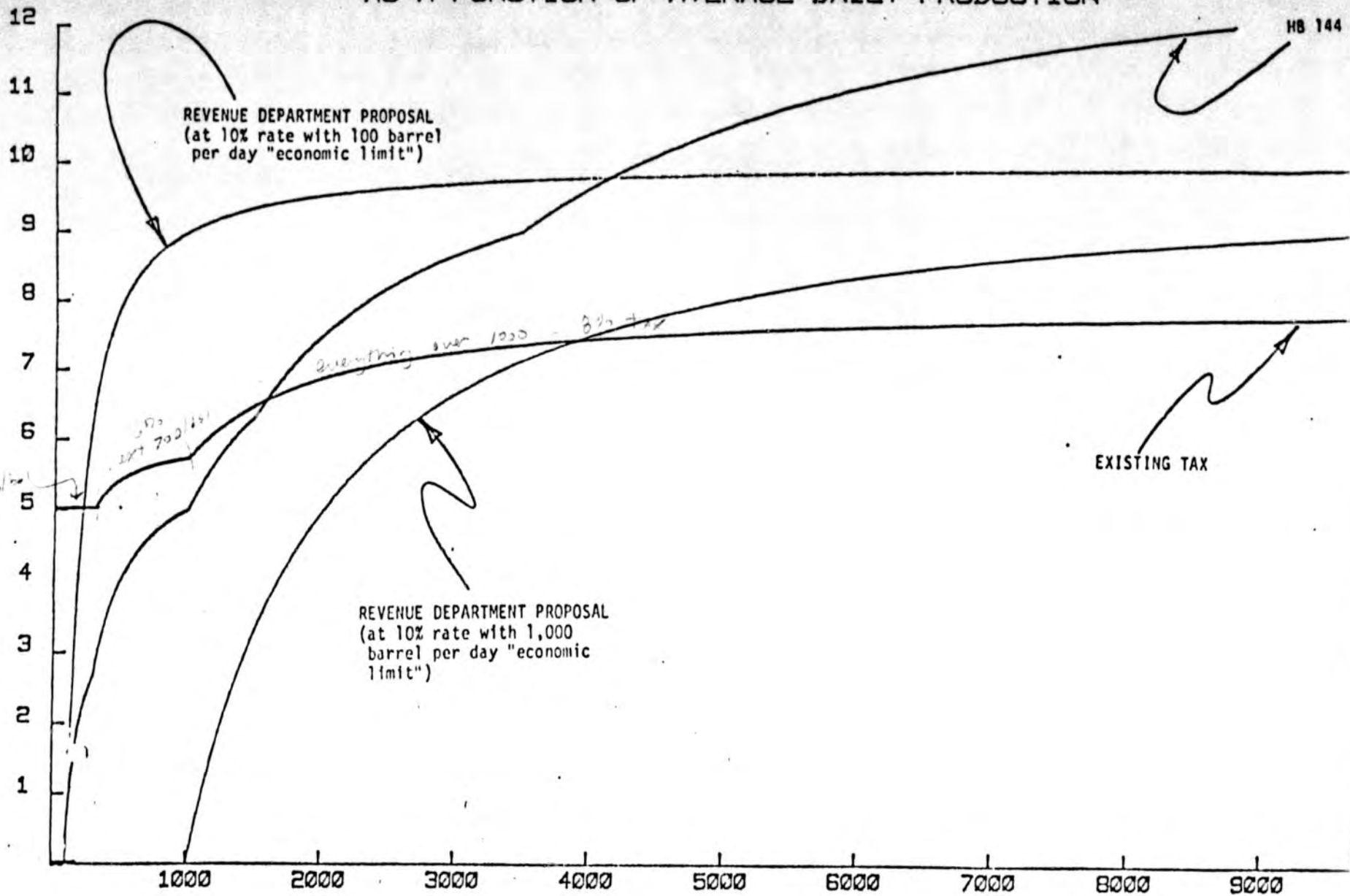
$$ELF = (.8385) \exp (1.150)$$

$$ELF = .816 \quad \text{RESULT: A DECREASE IN THE TAX}$$

EFFECTIVE SEVERANCE TAX RATE AS A FUNCTION OF AVERAGE DAILY PRODUCTION

EFFECTIVE SEVERANCE TAX RATE

(PERCENT)



AVERAGE DAILY PRODUCTION
(BARRELS PER DAY)

DOR Y=10*(X-100)/X; INTEGRAL F(X)=45114.03 .

DOR Y=10*(X-1000)/X; INTEGRAL F(X)=67665.60

LEGISLATIVE AFFAIRS AGENCY
RESEARCH DIVISION
15 February 1977

REF ID: A11111

Standard Alaska
Production Company
900 East Benson Boulevard
P.O. Box 196612
Anchorage, Alaska 99519-6612
(907) 564-5423

G.N. Nelson
President

STANDARD
ALASKA PRODUCTION

October 16, 1986

Senator Frank Ferguson
Co-Chairman
Joint Special Committee on the State's Tax Policy
P.O. Box 131
Kotzebue, Alaska 99752

Representative Ben Grussendorf
Co-Chairman
Joint Special Committee on the State's Tax Policy
Pouch V
Juneau, Alaska 99811

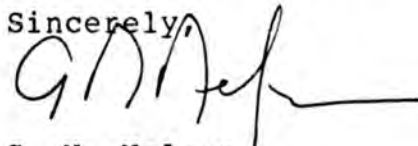
Dear Senator Ferguson and Representative Grussendorf:

Standard Alaska Production Company would like to submit the attached memorandum for the consideration of the Joint Special Committee members.

This memorandum was prepared by Mr. G. J. Abraham, Vice President Prudhoe Bay Unit Programs, and addresses Standard Alaska's concerns regarding the proposed changes to the economic limit factor under consideration by the Committee. Mr. Abraham has been involved in various aspects of Prudhoe Bay development since 1971 and currently is in charge of the geoscience and engineering activities directed to the achievement of the optimum economic recovery from the Prudhoe Bay Unit.

If you have any questions or comments on this memorandum, please contact me at Standard Alaska's offices in Anchorage.

Sincerely,



G. N. Nelson

Attachment

Office Correspondence

STANDARD
ALASKA PRODUCTION

TO: G. N. Nelson

DATE: October 16, 1986

FROM: G. J. Abraham

CC NO:

SUBJECT: Proposed Severance Tax Changes

YOUR REF:

I have some serious concerns with the proposals before the Joint Special Committee on State's Tax Policy (Committee) to alter the Economic Limit Factor (ELF). Implementation of the proposals to amend or eliminate the ELF presented by OMB at the September 11, 1986 meeting could result in decreased recovery at Prudhoe Bay and could significantly impact future exploration and production activities in Alaska.

Prudhoe Bay Development

Prudhoe Bay is a field of 10 billion barrels of recoverable liquids out of 22 billion barrels in place. Approximately five billion barrels have already been produced leaving a reserve of five billion barrels. Up to four billion barrels of that remainder could be recovered under current State tax law with the wells and facilities in place. Premised on these tax laws, over \$5 billion has been spent in the last four years on the drilling of 285 new wells and projects such as Waterflood, Gas Lift, and Enhanced Oil Recovery/Natural Gas Liquids (EOR/NGL).

Recovering the remaining one billion barrels will require additional capital investment in facilities and drilling. Many of these future investment decisions are only marginally economic. This future development and some of the expected production from the current wells and facilities is jeopardized by the proposed changes to the ELF.

Additionally, Prudhoe Bay contains 12 billion barrels unrecoverable with current technology. Some of this currently unrecoverable oil could be recovered with improved technology and major capital investment. Significant increases in taxation will curtail the research necessary to pursue these thinly margined projects and further reduce potential future State revenues.

The ELF is important in decisions to continue development within the Prudhoe Bay Unit. Consider, for example, the decision to drill additional wells at Prudhoe. Removal of the ELF benefit will in many cases make additional wells uneconomic. Four hundred or more future wells will be required to realize the additional one billion barrels referenced. Preliminary studies show that elimination of the ELF could

reduce future drilling at Prudhoe Bay by over 25%, reducing ultimate recovery and industry and State revenues. From the State's perspective, direct losses accrue in the areas of royalty, production tax, income tax and annual property taxes as well as in the secondary areas of employment and economic stimulation.

An ELF modification which involves an additional total field production factor would eliminate some projects which increase field production by raising the severance tax rate on the whole field and thus making the incremental project unattractive. From a broader perspective, selectively penalizing large fields like Prudhoe will curtail their development short of their full potential as discussed above. Further, penalizing large fields discourages unitizations which are an efficient means of managing a reservoir for maximum benefit to the industry and the State.

Alaskan Development Impact

In addition to the Prudhoe Bay impacts, tax increases could have significant adverse effects on future Alaskan oil development. Decisions to proceed with exploration and development projects are based on after-tax economics. There are three tax related factors:

- Cash to finance the project,
- Competitive after-tax returns on investment, and
- Stable business environment.

Cash to Finance the Project

Standard has invested \$12 billion on Alaskan exploration, development and transportation. This investment record for TAPS, Prudhoe Bay, Endicott, Kuparuk and Mukluk, demonstrates the company's willingness to invest in Alaska when competitive after-tax returns are projected.

The oil industry, as well as the State of Alaska, has a severely constrained cash flow. Virtually all major oil companies have significantly reduced 1986 exploration and development budgets and workforce. Standard's 1986 original capital budget for Alaskan field development has been reduced from \$923 million to \$675 million. Standard's workforce was reduced in July by 172 people.

Increasing industry taxes through changes to the ELF will further reduce the industry's ability to continue to invest in Alaska.

Competitive After-Tax Returns On Investment

The future commitment of available exploration and development funds to Alaska will depend on whether the projected returns are competitive with alternative uses of the funds. The ELF is also critical in this regard.

Modification or elimination of the ELF which increases the effective tax rate on major fields will discourage exploration. Arctic exploration involves expensive, high risk ventures such as Mukluk. These risks are taken to find major, profitable fields such as Prudhoe Bay and Kuparuk. Smaller fields are generally a by-product of these efforts. Where the taxation system reduces significantly the profitability of a major field, the high cost exploration risks will not be taken and neither large nor small additional Alaskan fields will be found.

Stable Business Environment

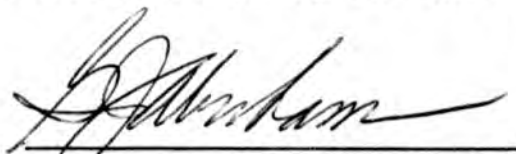
A fair and stable taxation system is a critical component in any business environment. Under the current taxation system, production taxes can be reduced by the ELF where the wellhead value closely approaches the operating costs allowing continued production. Alaska's highest in the nation production tax rate of 15% and highest in the nation production tax floor of 80¢ per barrel will be reduced for Prudhoe by about 20% after ten years of production.

The large Alaskan development expenditures outlined above were determined to be economic based on existing tax laws. Changes in these laws - which result in tax increases - send several unwelcome messages to the oil industry. One message is that the industry could expect tax increases in major fields after the major capital outlays have been made. A second message is that during hard times for the industry and the State, oil industry tax increases will be considered regardless of their impact on the industry.

It is easy to estimate the State revenues to be generated by tax increases. It is difficult to quantify the very real lost future production and the consequent losses to State revenue and the overall Alaskan economy that will be incurred as a result of the enactment of a severance tax increase.

Recommendation

In light of the adverse impacts of increased severance taxes on the Prudhoe Bay Unit and other future industry exploration and development activities, I recommend that these comments be forwarded to the Committee. Hopefully they will provide the Committee with a more balanced perspective in which to consider tax policy and the resulting longer term implications.



G. J. Abraham

MEMORANDUM

State of Alaska

TO: Vincent Wright, *VW*
Chief of Research

DATE: December 3, 1986

FILE NO.:

THRU:

TELEPHONE NO.:

SUBJECT: ELF presentation
for the Tax
Committee

FROM: Charles Logsdon, *CL*
Petroleum Economist

Per your request, enclosed is the latest draft of my presentation on the ELF for the joint Tax Committee meeting December 4, 1986. We have essentially updated the analysis prepared for the cancelled October 15, 1986 meeting using the assumptions underlying the December petroleum production revenue forecast. Unfortunately, due to the severe time constraint in preparing this updated analysis, "minor" revisions in the numbers may be necessary. As you will notice, the new input assumptions do not materially change the original analysis.

ANALYSIS OF ELF ALTERNATIVES

State of Alaska
Department of Revenue
December 4, 1986

The Effect of Four Possible Changes in the ELF on State of Alaska Severance Tax Revenues

The purpose of this brief note is to examine the effect of changing the relationship of the Economic Limit Factor (ELF) to State of Alaska Severance taxes. The ELF is a number with a value of between zero and one which is multiplied by the nominal severance tax rate or the cents per barrel tax floor to reduce the severance taxes paid as an oil or gas producing lease approaches its economic breakeven point. This analysis will specifically examine how changes in the application of the ELF and in the ELF itself impact oil revenues and production. The focus will be on the North Slope. Cook Inlet production will be considered separately since the economics of these producing fields are dominated by costs associated with the shutdown and abandonment of older low productivity oil wells located on expensive offshore production facilities.

Specifically the following four possible changes are investigated.

1. Eliminate application of the ELF to the current \$.80 per barrel tax floor.
2. Change the ELF formula to one similar to that proposed in HB545 and modified by OMB in which the exponent is modified to raise the tax rate on fields with total field productivity in excess of roughly 100,000 barrels per day and lower the tax rate on fields with production less than this amount.
3. Establish a new severance tax floor at \$1.50 not subject to the ELF and index it for inflation.
4. Eliminate the ELF entirely.

5. *Eliminate the ELF on on Production ..*

These hypothetical changes in the severance tax law are analysed using the Department of Revenue Petroleum Revenue Forecasting Simulation Model. All assumptions concerning oil prices, transportation costs, and market deliveries are the same as were used in preparing the Department's December 1986 forecast of petroleum production revenues.

The simulation model is used because it can show the changes in average expected revenues and oil production due to a change in the tax law over a wide range of price and transportation cost assumptions. Further, since it is the model used to make the official State forecast of severance tax revenues it conveniently illustrates how the current forecast would change if the severance tax law were changed.

As a general principle, any of the changes in the severance tax mentioned above will increase the average expected taxes levied on the oil producers in the State. Since higher taxes make producing oil a more costly enterprise it is likely that in some instances this higher cost will make production unprofitable. In a broad sense then, it would be nice to know the tradeoff between the increased tax revenue to the State and the reduced investment in oil production and consequently reduced tax base due to the increased cost of producing oil.

Such an investigation is possible but since so many assumptions have to be made, the results will always be subject to dispute. As a practical matter oil producing companies are not a homogenous group with respect to risk preference or financial capacity. One has only to look at the companies producing on Alaska's North Slope to appreciate this distinction i.e. Amerada Hess as compared to Exxon. It is also important to stress that the companies are the one's who make the decisions affecting production and any financial model such as the one used in this analysis can only make reasonable assumptions about the parameter values the companies themselves would choose (price, discount rate, or capital outlay). Further this analysis can only examine the relative merits of oil production in the State of Alaska, since we do not have accurate data on oil production prospects globally. Finally this analysis is done without examining the issue of budget constraints which obviously all in the oil business are facing given the current depressed price situation.

There too many unknowns for this analysis to delve in depth into the relative regional economic impact of public expenditure vs.

private expenditure in the State of Alaska so the discussion will be limited to the effect of changes in ELF on State petroleum revenues and barrels of oil and not on whether those changes make sense for the Alaskan economy.

Eliminate the application of the ELF to the cents per barrel tax floor

This would essentially guarantee the State a minimum severance tax payment for every barrel of oil produced in the State (currently \$. 80 per barrel). Tables 1 and 2 show the change in average expected revenues and production for each of the North Slope oil fields assumed to be in production between the present and 2005. Fixing the severance tax floor would increase average expected revenues between 1987 and 2005 by \$135.42 million in nominal dollar terms or \$95.98 million discounted at 8%. The disincentive to produce created by the fixed floor results in a decrease in average expected production of over 19 million barrels of oil. One way of looking at it is that the State gains an average of roughly \$7.00 for every barrel of oil production foregone.

Prudhoe Bay production is effected the most by this change in the severance tax. This is primarily because after primary recovery Prudhoe will still have a tremendous amount of oil in the ground which may be recoverable with additional investment. On the other hand Kuparuk and some of the other more marginal fields can be seen to provide the lion's share of the average expected revenue increase. This is because these fields currently have calculated ELF's which are much lower than Prudhoe so that at prices which trigger the cents per barrel tax these fields will experience a relatively larger increase in their tax bill.

Modify the ELF Exponent to Reflect Total Field Production

This proposed change in the ELF is contained in a bill submitted in the Alaska House of Representatives in the Spring of 1986. In

Table 1

Production Impact of Fixed Severance Tax Floor = \$.80/bbl
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.04	0	0	0	-.04
1988	-.77	1.01	-.08	-.08	-.08	0	0	0	-2.02
1989	-.68	-.12	-.11	-.26	-.10	0	0	0	-1.27
1990	-.60	-.12	-.16	-.29	-.13	0	0	0	-1.30
1991	-.56	-.12	-.11	-.31	-.20	0	0	0	-1.30
1992	-.52	-.09	-.11	-.27	-.20	0	0	0	-1.19
1993	-.48	-.09	-.12	-.26	-.24	0	0	0	-1.19
1994	-.45	2.22	-.21	-.19	-.24	0	0	0	1.13
1995	-.40	1.42	-.22	-.11	-.23	0	0	0	.46
1996	-.50	1.18	-.17	-.04	-.26	0	0	0	.21
1997	-.34	-.73	-.11	-.01	-.31	0	0	-2.99	-4.49
1998	-.64	-.72	-.05	.02	-.44	0	0	-1.50	-3.33
1999	-.59	-.49	-.03	.05	-.25	0	0	-.03	-1.34
2000	-.42	-.38	0	.05	-.16	0	0	-.20	-1.11
2001	-.40	-.31	0	.06	-.06	0	0	-.15	-.86
2002	-.02	-.32	0	.05	-.04	-.02	0	-.03	-.38
2003	-.02	-.25	0	.03	-.03	0	0	-.09	-.36
2004	-.01	-.23	0	.03	-.02	-.03	0	-.57	-.83
2005	-.01	-.20	0	.01	-.01	-.02	0	-.02	-.25
Total	-7.41	-.36	-1.48	-1.52	-3.04	-.07	0	-5.58	-19.16

Table 2

Revenue Impact of Fixed Severance Tax Floor = \$.80/bbl
(Millions \$)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	.10	29.66	1.70	0	.50	0	0	0	31.96
1988	9.50	8.92	.11	1.38	.27	0	0	0	20.18
1989	5.16	5.37	0	2.66	.64	0	0	0	13.83
1990	2.74	3.83	-.03	1.51	.30	0	0	0	8.35
1991	3.35	4.37	-.02	1.45	.58	0	0	0	9.73
1992	2.21	4.14	-.03	.84	.38	0	.01	0	7.55
1993	2.71	3.53	-.03	-.01	.66	0	.02	0	6.88
1994	3.12	19.80	.13	-.05	.96	0	.07	0	24.03
1995	2.70	17.43	.10	-.02	1.02	.09	.03	0	21.35
1996	1.75	15.58	.05	.04	.87	.09	.02	0	18.10
1997	1.34	-1.42	.03	.07	.66	-.01	0	0	.67
1998	.30	-2.50	.03	.09	.34	-.02	-.01	0	-1.77
1999	-.53	-3.17	.05	.14	.22	-.02	0	0	-3.31
2000	-.13	-3.51	.07	.13	.13	-.03	-.01	0	-3.35
2001	.13	-3.76	.06	.13	.13	-.06	-.01	0	-3.38
2002	.05	-3.95	.05	.10	.07	-.13	-.01	0	-3.82
2003	.01	-4.09	.05	.08	.05	-.10	0	0	-4.00
2004	-.07	-3.97	.04	.05	.04	-.14	-.01	0	-4.06
2005	-.08	-3.68	.04	.03	.03	-.16	0	0	-3.82
Total Revenue									
Nominal	34.36	82.58	2.40	8.62	7.85	-.49	.10	0	135.42
10% disc	20.07	57.69	1.63	5.21	3.64	-.06	.05	0	88.24
8% disc	22.15	62.23	1.73	5.71	4.18	-.09	.06	0	95.98

this example the formula specification is the one used in the presentation by Dr. Tom Chester at the Tax Committee's September meeting. The formula used in HB545 raises the tax rate on fields with production in excess of roughly 80,000 barrels per day and lowers the rate for lower production rates. The modification presented by Dr. Chester changes the trigger to roughly 100,000 barrels. The purpose of this change is to increase the effective tax rate over current law for "large oil fields" while at the same time keeping severance taxes from discouraging investment in smaller oil fields. Practically speaking it effectively increases revenues to the State through the impact on the prolific Prudhoe Bay field.

Tables 3 and 4 illustrate the field by field impact on revenue and production of this change in the severance tax law. Average expected revenues through the year 2005 increase \$2270.52 million in nominal dollar terms (\$1073.67 million discounted at 8%). As might be expected because of the upside potential of the higher effective tax rate on large fields, should oil prices grow over time the large reserves of Prudhoe contribute the most to this revenue increase. Average expected production would decrease by 28.41 million barrels under this tax regime. Once again the disincentive to produce additional barrels from the large Prudhoe Bay field accounts for the largest share of estimated production decrease. However because the tax burden is lowered for some fields, West Sak and Seal Island actually show greater average expected production. This ELF alternative increases State revenues by roughly \$80 for every barrel of oil production foregone.

Establish a New Severance Tax Floor at \$1.50 Not Subject to the ELF and Index it for Inflation.

Tables 5 and 6 show the field by field effect of this alternative on average expected production and average expected revenues. Indexing the severance tax floor from a \$1.50 base results in an increase of revenues of \$1797.17 million through 2005 in nominal dollar terms (\$1195.04 discounted at 8 percent). This alternative has a devastating impact on average expected

Table 3

Production Impact of OMB Altered Exponent
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.01	-.01	0	0	-.02
1988	-.71	-.05	0	-.02	-.01	0	0	0	-.79
1989	-.63	-.12	0	-.04	-.01	0	0	0	-.8
1990	-.57	-.12	-.01	-.04	-.01	0	0	0	-.75
1991	-.55	-.11	-.01	-.05	-.02	0	0	0	-.74
1992	-.47	-.09	-.01	-.07	-.02	0	-.13	0	-.79
1993	-.45	.09	-.02	-.07	-.03	0	-.23	0	-.71
1994	-2	.23	-.43	-.06	-1.31	0	-.24	0	-3.81
1995	-1.73	.17	-.35	-.06	-1.09	.79	-.3	0	-2.57
1996	-2.37	.15	-.28	-.05	-.9	.72	-.31	0	-3.04
1997	-3.05	-.33	.05	-.05	-.86	.77	-.29	2.99	-.77
1998	-3.19	-.2	.04	-.04	-.68	.7	-.24	1.4	-2.21
1999	-2.72	-.21	.05	-.04	-.57	.62	-.32	-.09	-3.28
2000	-2.18	-.16	.05	-.03	-.49	.61	-.26	.01	-2.45
2001	-2.04	-.13	.06	-.02	-.39	.61	-.2	.05	-2.06
2002	-1.62	-.09	.05	-.02	-.28	.77	-.17	-.07	-1.43
2003	-1.32	-.07	.03	-.01	-.22	.81	-.09	-.03	-.9
2004	-1.06	-.09	.03	-.02	-.2	.73	-.06	.45	-.22
2005	-1.17	-.08	.02	-.01	-.15	.48	-.03	-.13	-1.07
Total	-27.83	-1.21	-.73	-.7	-7.25	7.6	-2.87	4.58	-28.41

Table 4

Revenue Impact of OMB Altered Exponent
(Millions \$)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	5.94	29.29	-.35	0	-3.35	0	0	0	31.53
1988	93.85	38.51	-.7	-2.18	-5.84	0	0	0	123.64
1989	106.32	49.2	-1.92	1.06	-4.8	0	0	0	149.86
1990	114.56	55.31	-2.31	1.08	-5.18	0	0	0	163.46
1991	117.43	40.61	-2.38	1.14	-1.45	0	0	0	155.35
1992	121.4	21.83	-3.43	1.26	-1.61	0	-2.76	0	136.69
1993	124.53	17.32	-4.07	1.71	2.49	0	-3.42	0	138.56
1994	124.27	14.59	-7.22	-3.66	8.69	0	-3.35	0	133.32
1995	122.99	11.42	-7.32	-2.74	6	2.56	-3.53	0	129.38
1996	121.97	5.22	-7.15	-5.63	.76	5.32	-3.83	0	116.66
1997	121.16	2.47	-4.86	-6.91	1.21	15.03	-5.19	0	122.91
1998	123.22	-2.01	-4.39	-6.67	-6.63	17.42	-5.89	-2.87	112.18
1999	123.31	-5.48	-3.66	-5.19	-13.47	20.38	-6.2	-1.7	107.99
2000	123.55	-8.42	-2.85	-3.65	-17.84	27.9	-8.1	-1.26	109.33
2001	118.02	-9.7	-1.81	-2.21	-18.53	31.67	-8.17	-2.3	106.97
2002	112.28	-7.83	-1.49	-1.19	-16.1	41.71	-8.97	-2.37	116.04
2003	106.24	-5.79	-.61	-.45	-12.2	46.2	-10.48	-3.11	119.80
2004	99.26	-4.25	-.2	-.02	-7.99	34.3	-10.51	-4.04	106.55
2005	91.89	-3.1	.17	.06	-5.27	17.56	-9.72	-1.29	90.30
Total Revenue									
Nominal	2072.19	239.19	-56.55	-34.19	-101.11	260.05	-90.12	-18.94	2270.52
10% disc	781.96	166.60	-22.23	-9.90	-28.72	56.40	-22.67	-3.96	917.48
8% disc	927.72	179.68	-26.39	-12.54	-35.58	75.37	-29.26	-5.33	1073.67

Table 5

Production Impact of Indexed Fixed Floor
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.21	0	0	0	-.21
1988	-15.79	-2.93	-.32	-.69	-.44	0	0	0	-20.17
1989	-14.15	-2.4	-.45	-2.18	-.61	0	0	0	-19.79
1990	-12.48	-2.4	-.49	-1.97	-.79	0	0	0	-18.13
1991	-11.77	-2.17	-.44	-1.87	-1.18	0	0	0	-17.43
1992	-10.74	-1.9	-.44	-1.84	-1.18	0	.25	0	-15.85
1993	-9.35	1.68	-.45	-1.86	-1.42	0	.43	0	-10.97
1994	-8.24	-.77	-.47	-1.34	-1.44	0	.42	0	-11.84
1995	-7.15	.04	-.51	1.09	-1.43	.06	.46	0	-7.44
1996	-7.23	.1	-.45	.82	-1.45	.03	.49	0	-7.69
1997	-6.87	-1.95	-.29	.63	-1.64	0	.5	2.99	-6.63
1998	-5.93	-1.65	-.27	.47	-1.28	-.01	.52	1.5	-6.65
1999	-5.46	-1.02	-.31	.37	-.79	-.04	.54	.03	-6.68
2000	-4.12	-.93	-.21	.36	-.57	-.04	.43	.2	-4.88
2001	-3.43	-.91	-.18	.35	-.37	-.06	.36	.15	-4.09
2002	-1.93	-.79	-.08	.08	-.23	.02	.32	.03	-2.58
2003	-1.84	-.91	-.04	-.02	-.25	.03	.27	.09	-2.67
2004	-2.12	-.94	0	-.02	-.32	.06	.2	.57	-2.57
2005	-1.88	-.67	0	-.01	-.36	.06	.16	.02	-2.68
Total	-130.48	-20.52	-5.4	-7.63	-15.36	.11	5.35	5.58	-168.95

Table 6

Revenue Impact of Fixed Indexed Floor
(Millions \$)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	223.91	80.84	5.87	0	2.27	0	0	0	312.89
1988	180.5	58.65	2.21	8.56	7.33	0	0	0	257.25
1989	109.65	44.29	6.21	32.07	14.94	0	0	0	207.16
1990	77.65	37.84	7.34	32.63	16.36	0	0	0	171.82
1991	76.29	36.51	7.13	34.7	26.88	0	0	0	181.51
1992	55.19	30.8	5.4	33.15	25.8	0	4.68	0	155.02
1993	43.17	24.46	5.27	23.42	29.17	0	5.72	0	131.21
1994	34.04	36.88	4.44	17.49	27.57	0	4.36	0	124.78
1995	24.57	30.63	3.56	13.49	25.57	5.28	3.4	0	106.50
1996	15.6	25.97	2.67	9.99	22.87	5.05	2.43	0	84.58
1997	10.22	6.09	2.04	7.53	20.46	5.51	0	0	51.85
1998	1.43	2.25	1.39	5.39	14.16	3.78	-.71	.07	27.76
1999	-2.09	.32	.8	3.76	10.22	2.46	-1.18	.04	14.33
2000	-1.79	-1.03	.42	2.2	7.62	.98	-.92	.04	7.52
2001	-1.61	-2.26	.02	-.1	5.84	.86	-.87	.02	1.90
2002	-2.19	-3.08	-.05	-.15	4.29	.39	-.98	.01	-1.76
2003	-5.34	-4.78	-.07	.1	2.71	.2	-.95	0	-8.13
2004	-8.9	-5.29	.03	.07	.61	.01	-.76	-.01	-14.24
2005	-8.95	-4.84	.05	.04	-.33	-.12	-.63	0	-14.78
Total Revenue									
Nominal	821.35	394.25	54.73	224.34	264.34	24.4	13.59	.17	1797.17
10% disc	562.83	247.88	30.11	117.70	117.13	7.82	7.57	.05	1091.10
8% disc	604.33	270.22	33.57	132.65	135.90	9.72	8.60	.06	1195.04

production which is reduced by nearly 170 million barrels. This impact on production is a direct result of the increased likelihood that such a tax would cause a premature shutdown in the already producing oil fields or would make additional investment uneconomic. This alternative has a most dramatic effect on Prudhoe Bay production because it significantly increases the probability that Prudhoe Bay shuts down prematurely. As will be seen, eliminating the ELF entirely results in much greater expected revenue without as severe an effect on production. This is because with the percent of value tax the State shares in the high oil price value cases and also shares the loss in the low oil price case (down to the current \$.80/bbl floor). The fixed indexed floor fails to reflect the relative change in profitability of falling oil prices. The indexed floor increases State revenue by roughly \$10 for every barrel of production foregone.

Eliminate the ELF Entirely

This alternative would remove entirely the severance tax relief given to low productive oil wells.

Tables 7 and 8 show the revenue and production effect on a field by field basis. Total average expected revenues through the year 2005 increase by \$5032.43 million, \$2111.87 million discounted at 8 percent, while average expected production falls by 84.67 million barrels. Prudhoe Bay because it dominates North Slope production over the next ten years accounts for over half of the increased revenue. Kuparuk one of North America's largest fields because its current ELF is roughly .6 accounts for the largest relative increase.

Prudhoe Bay with its large reserves accounts for a 28 million barrels of the production loss, while the West Sak field with its relatively low productive high cost wells accounts for another 21 million barrels of the average expected decline in production. Eliminating the ELF increases State revenue by roughly \$49 for every barrel of oil production foregone.

Table 7

Production Impact of Eliminating the ELF
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.05	0	0	0	-.05
1988	-1.1	-1.01	-.08	-.15	-.09	0	0	0	-2.43
1989	-.96	-.18	-.11	-.51	-.12	0	0	0	-1.88
1990	-.85	-.18	-.16	-.55	-.15	0	0	0	-1.89
1991	-.8	-.17	-.12	-.58	-.22	0	0	0	-1.89
1992	-.72	-.14	-.12	-.6	-.22	0	-.3	0	-2.1
1993	-.67	-.13	-.13	-.62	-.27	0	-.5	0	-2.32
1994	-1.19	-.52	-.67	-.49	-4.76	0	-.5	0	-8.13
1995	-.99	-.87	-.61	-2.49	-3.9	-1.41	-.55	0	-10.82
1996	-3.2	-.73	-.5	-1.98	-3.23	-1.71	-.57	0	-11.92
1997	-2.97	-.8	-.14	-1.56	-.48	-2.13	-.58	-2.99	-11.65
1998	-2.65	-.7	-.08	-.19	-.44	-1.97	-.6	-1.92	-8.55
1999	-1.63	-.47	-.09	-.07	-.2	-1.69	-1.75	-.64	-6.54
2000	-.79	-.39	-.08	-.16	-.09	-1.55	-1.45	-.74	-5.25
2001	-1.01	-.37	-.1	-.21	.06	-1.3	-1.23	-.69	-4.85
2002	-1.75	-.39	-.08	-.1	.19	-2.93	-.34	-.55	-5.95
2003	-2.61	-.5	-.06	-.02	.17	-2.63	-.27	-.62	-6.54
2004	-2.15	-.64	-.03	.01	.95	-2.49	-.2	-1.06	-6.51
2005	-2.04	-.58	-.05	-.08	-.06	-1.15	-.14	-.8	-4.9
Total	-28.08	-8.77	-3.21	-10.35	-13.81	-20.96	-8.98	-10.01	-104.17

Table 8

Revenue Impact of Eliminating the ELF
(Millions \$)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	5.76	30.42	2.03	0	.58	0	0	0	38.79
1988	100.45	38.53	1.17	3.19	.57	0	0	0	143.91
1989	114.81	49.32	3.08	13.28	7.21	0	0	0	187.7
1990	125.23	55.31	3.9	14.88	13.53	0	0	0	212.85
1991	129.21	56.02	4.01	15.87	21.39	0	0	0	226.5
1992	134.94	59.97	5.59	17.84	23.66	0	3.2	0	245.2
1993	140.42	59.92	6.48	24.57	33.16	0	4.07	0	268.62
1994	148.74	62.93	3.18	24.04	3.76	0	3.93	0	246.58
1995	148.9	59.93	2.92	9.4	13.16	10.7	4.29	0	249.3
1996	152.12	63.71	2.91	11.01	21.54	14.22	4.86	0	270.37
1997	162.67	60.9	5.07	11.81	46.78	28.35	6.7	0	322.28
1998	167.04	60.34	4.95	22.4	47.85	33.54	7.66	-2.04	341.74
1999	169.48	58.82	4.63	22.23	47.02	39.63	-6.57	3.12	338.36
2000	171.87	57.33	4.11	20.46	46.3	55.66	-2.08	4.45	358.1
2001	167.58	54.07	3.56	15.26	45.39	64.29	2.72	5.41	358.28
2002	163.87	50.23	3.11	11.19	44.26	48.56	14.08	6.66	341.96
2003	159.23	30.89	2.54	10.03	41.89	60.19	13.48	9.99	328.24
2004	154.36	19.41	1.87	7.3	37.3	72.01	13.56	11.64	317.45
2005	147.21	12.71	.32	4.91	33.15	67.92	13.51	6.47	286.2
Total Revenue									
Nominal	2663.89	940.76	65.43	259.67	528.5	495.07	83.41	45.7	5082.43
10% disc	948.54	383.01	26.18	98.23	157.56	107.91	20.72	8.45	1750.61
8% disc	1137.24	448.57	30.79	116.89	196.10	143.89	26.70	11.68	2111.87