

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672
1511 SCOMM 55: JNT. SPEC. COMM. ON STATE TAX POLICY, 1986-1987 1311

Summary and Analysis

All four of the proposed changes in the severance tax result on average in increased State revenues. Average expected oil production, however, is lower due to the negative impact of potentially higher taxes on expected profitability.

The effect of each of these proposed changes is analysed using the Monte Carlo simulation model. This type of model evaluates many possible combinations of variables effecting oil production revenues including high prices where taxes are not so important in determining development feasibility and low prices where taxes may be an important consideration in deciding whether or not a project is viable. The output of the model is determined not only by the scenarios of the prices and costs and quantities entered as input into the model but also by the probability assigned to each scenario. The model results, in this case State petroleum production revenue by year to the year 2005, are depicted as the probability distribution of possible outcome. Another way of looking at the output is to say many possible outcomes are evaluated and this is what to expect on average will occur. The analysis of these changes in severance tax law is of course only as good as the input into this model. Department of Revenue analysts have weighted the inputs into the model which may or may not correspond to the way in which the different producing oil companies would weight them. Further the feasibility part of the model uses a hurdle rate 8% real and assumes no budget constraints and no competing global investment alternatives. Those caveats aside the results of this analysis are summarized as follows.

1. Fixing the severance tax floor at \$0.80 per barrel has the least impact on expected State revenues and has the least negative impact on expected North Slope production.

2. Eliminating the ELF entirely, generates the largest average expected increase in State revenue.
3. Increasing the fixed floor to \$1.50 and indexing it to account for inflation has the greatest negative effect on average expected production.
4. Because the real upside potential for State revenue continues to depend on the share of the value of Prudhoe Bay production taken by the State, modifying the ELF to reflect total field productivity is the most efficient alternative in terms of dollars gained for every barrel foregone (\$80 per barrel as opposed to \$7 per barrel for the fixed \$.80 per barrel ELF alternative). This is because this tax increases revenues while at the same time mitigating the negative effect on average expected production. The ranking of ELF alternatives using this type of revenue maximizing criteria is as follows.

- | | |
|--------------------------|----------|
| 1) Modified Exponent ELF | \$80/bbl |
| 2) Eliminate ELF | \$49/bbl |
| 3) Indexed Floor | \$10/bbl |
| 4) Fixed \$.80/bbl Floor | \$7/bbl |

5. The production disincentives are generally associated with development of the so called marginal fields, and enhanced recovery investment in Prudhoe Bay and Kuparuk although in some very low price cases no doubt potentially higher taxes cause even these already producing fields to be shut-in.

The above analysis says nothing about the impact of any of these hypothetical tax changes on Cook Inlet. Currently Cook Inlet production is roughly 50 thousand barrels per day. Because much of current production is from a large number of wells with average daily production less 300 barrels, the ELF under current law is zero or nearly zero for most oil producing leases. As a result FY 1986 oil severance collections are estimated to be less than \$2 million or roughly \$.12 per barrel. If a minimum tax of \$.80 per barrel were levied, assuming no fields were abandoned,

severance taxes would increase to \$12.73 million. Although there is a considerable difference in terms of well productivity and profitability among the Cook Inlet fields, given the economics of field abandonment it is likely that the bulk of production would continue even with higher taxes burden. On the other hand additional investment in further production would no doubt be much much lower than it would be under the current tax regime. It may be important to note that Cook Inlet oil production is an integral part of the regional economic base on the Kenai Peninsula. Eliminating the ELF would probably shutin Cook Inlet production. The modified exponent ELF would have no negative impact on Cook Inlet because all these fields produce much less than 100,000 bbls/day.

on Super Calc - got from
Tom Chester

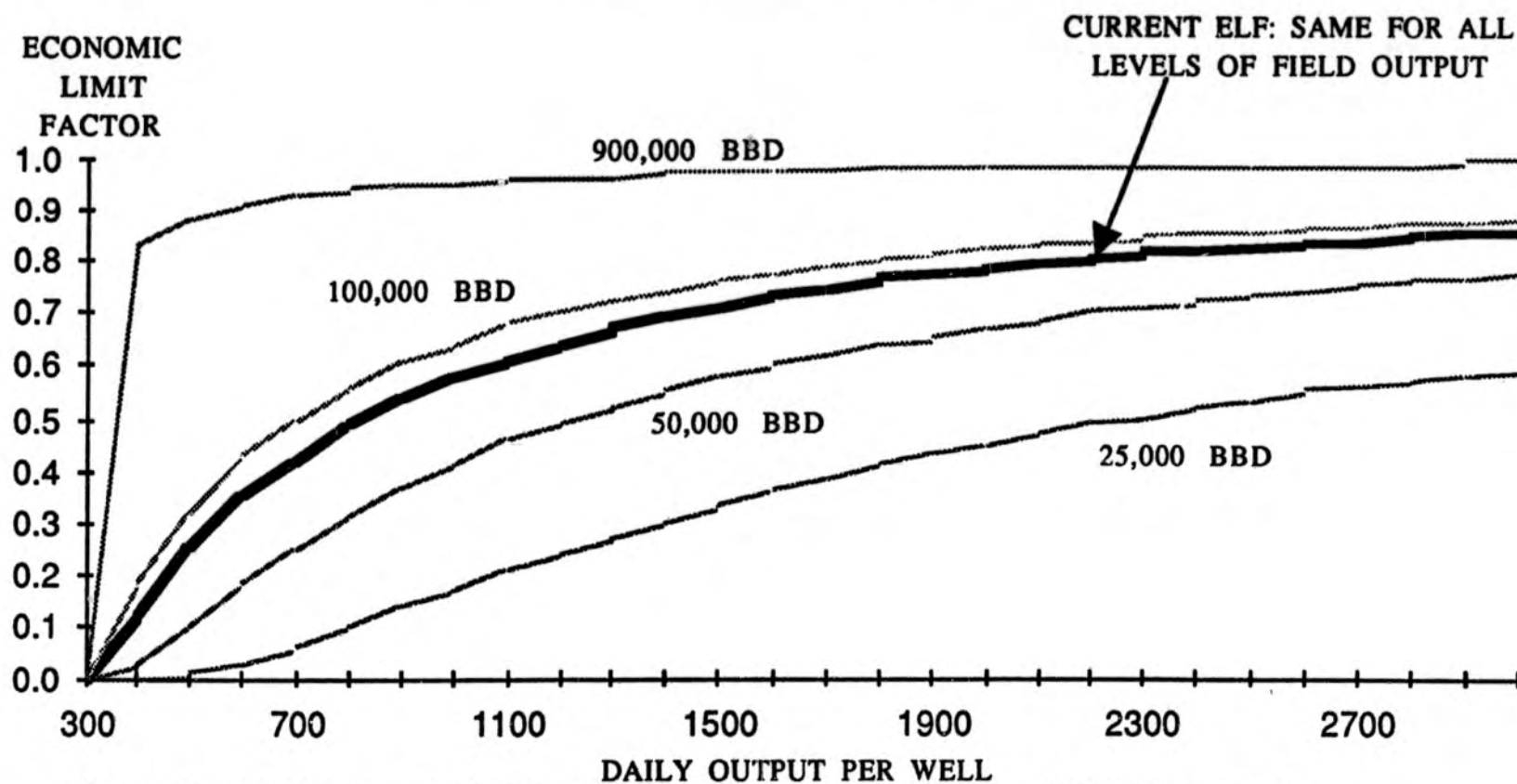
ALTERNATIVE ELF (Options 2 &4)

The existing ELF formula is based on average daily well productivity and does not take account of the average daily production of the entire field. A modification of the ELF formula that incorporates overall field production characteristics could increase the effective severance tax rate on large, productive fields such as Prudhoe Bay and Kuparuk, and reduce the effective tax rate on the small, marginal fields that most need the economic benefits of the lower tax burden.

Modification of the ELF formula to include total field productivity would improve the chances of a small, marginal field being brought into commercial production since it would result in a lower severance tax rate. These fields may have good well productivity characteristics but high costs because of the inability to spread fixed costs over a large number of producing wells (as in the case of Prudhoe Bay and Kuparuk).

One such alternate Economic Limit Factor, which reduces the effective severance tax rate at marginal fields, is presented in the accompanying material.

**THE ECONOMIC LIMIT FACTOR (ELF):
CURRENT AND ALTERNATE FOR VARIOUS LEVELS OF
WELL OUTPUT AND FIELD PRODUCTION**



NOTE: BBD FIGURES REPRESENT DAILY FIELD PRODUCTION IN BARRELS PER DAY

COMPUTING THE ALTERNATE ELF

The alternate Economic Limit Factor formula is:

$$\text{Alternate ELF} = (1 - \text{PEL}/\text{TP})\text{EXP}\{(45,500,000 * \text{WD})/(\text{PEL} * \text{TP}/\text{Days})\}$$

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). For example:

300 barrels * 541 wells * 30 days = 4,869,000 barrels per month at the Economic Limit

TP (Total Production for the field) =

(average number of operating wells during the month)*

(number of days of production for the month)*

(average daily production per well). For example:

541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels of production per month

WD (Well Days) =

(average number of operating wells during the month)*

(number of days of production for the month). For example:

541 wells * 30 days = 16,230 well days

TP/Days =

(average number of operating wells during the month)*

(average daily production per well). For example:

541 wells * 2477 barrels per well = 1,340,057 barrels of production per day

CALCULATION EXAMPLE

Current ELF

$$(1 - 4,869,000/40,201,710)\text{EXP}\{460 * 16,230/4,869,000\} = .82$$

Alternate ELF

$$(1 - 4,869,000/40,201,710)\text{EXP}\{(45,500,000 * 16,230)/(4,869,000 * 1,340,057)\} = .98$$

$$= (1 - .1211)\text{EXP}(.1132)$$

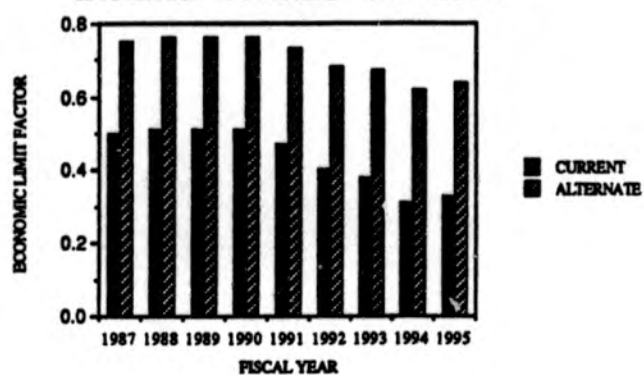
$$= (.8789)\text{EXP}(.1132)$$

$$= .98$$

PRUDHOE BAY - COMPARISON OF ELF'S



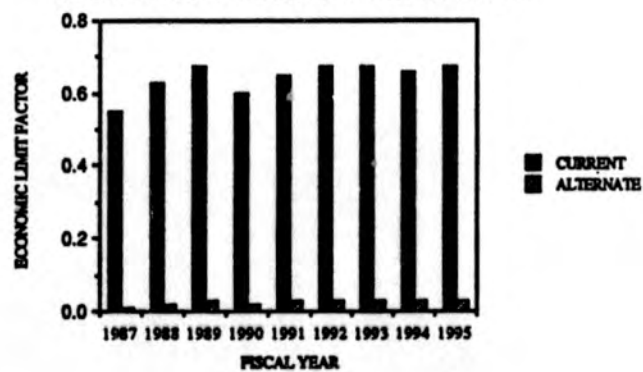
KUPARUK - COMPARISON OF ELF'S



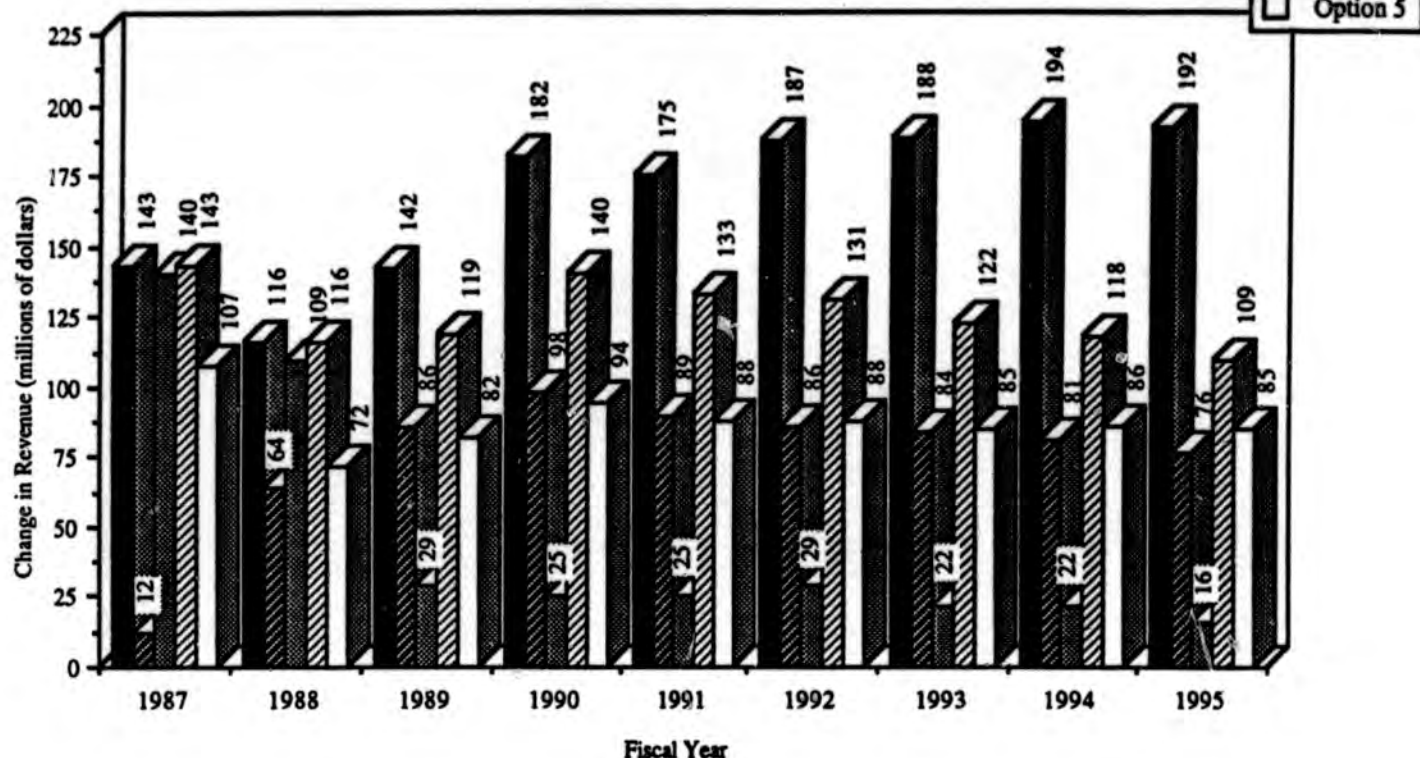
ENDICOTT - COMPARISON OF ELF'S



MILNE POINT - COMPARISON OF ELF'S



INCREASE IN GENERAL FUND REVENUE RESULTING FROM VARIOUS CHANGES IN THE ECONOMIC LIMIT FACTOR



Option 1: Repeal of the current Economic Limit Factor.

Option 2: Adoption of an Alternative Economic Limit Factor (explained below).

Option 3: Adoption of an 80 cent per barrel minimum severance tax which is not subject to the current Economic Limit Factor.

Option 4: Adoption of an 80 cent per barrel minimum severance tax which is not subject to the alternate Economic Limit Factor.

Option 5: Sets the effective Economic Limit Factor (current law) to 1 for all fields which have a computed Economic Limit Factor above .7 (seven-tenths).

The Alternative Economic Limit Factor mentioned in Options 2 and 4 is a modification of the existing Economic Limit Factor that incorporates overall field production characteristics. The inclusion of overall field production in the Economic Limit Factor increases the effective severance tax rate on large, productive fields (Prudhoe Bay and Kuparuk) and reduces the effective tax rate on the small, marginal fields (all but Prudhoe and Kuparuk). The alternative Economic Limit Factor =

$$(1 - \text{PEL}/\text{TP}) \text{EXP}\{ (45,500,000 \times \text{WD}) / (\text{PEL} \times \text{TP}/\text{Days}) \}.$$

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A B C D E F G H I J K L M N O P

Alaska North Slope Oil Revenue

Fiscal Years

1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

JUNE 1986 PRICE/OUTPUT ASSUMPTIONS													
World Oil Price (30TH PERCENTILE)	11.111	12.26	13.97	14.79	15.19	15.51	15.3	15.9	16.45	16.25	17.22	18.54	19.87
Average Rate of Inflation	4.2	5.01	5.01	5.01	5.01	5.01	5.78	5.78	5.78	5.78	5.78	6.4	6.4
Compound Inflation Factor	1.042	1.094204	1.149024	1.206590	1.267040	1.330519	1.407423	1.488772	1.574823	1.665848	1.762134	1.874910	1.994904
World/ANS Qual. & Mktg Differential	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
Trans-Alaska Pipeline Tariff (JUNE 86)	4.54	4.33	4.11	3.415	3.85	3.727	3.588	3.607	3.647	3.699	3.856	4.224	4.938
Successful Effort Mean Price (\$/bbl)	3.836	5.119	7.39	8.867	8.63	9.179	9.306	10.065	10.686	10.915	12.753	16.117	19.271
Success Ratio	1	1	.996	.9933333	.9913333	.9826667	.9746667	.9686667	.9653333	.942	.9033333	.8086667	.7413333
ANS Netback Price PS#1 (\$/bbl)	3.836	5.119	7.36044	8.807887	8.555207	9.019897	9.070248	9.74963	10.31555	10.28193	11.52021	13.03328	14.28623

Prudhoe Bay Prod. (MMbbl/yr)	545	496	443	419	380	340	337	293	256	262	227	194	167
Prudhoe Bay Price (\$/bbl)	3.834	5.119	7.36044	8.807887	8.555207	9.019897	9.070248	9.74963	10.31555	10.28193	11.52021	13.03328	14.28623
Wells	525.9	539.81	524.7	504.86	488.88	465.37	446.17	419.65	393.19	372.82	353.41	333.05	317.55
TOTAL DAILY OUTPUT	1493151	1358904	1213699	1147945	1041096	931506.8	823287.7	702739.7	601369.9	571808.2	521917.8	453506.8	457534.2
TOTAL MONTHLY OUTPUT	45416667	41333333	36916667	34916667	31666667	28333333	28083333	24416667	21333333	21833333	18916667	16166667	12166667
TOTAL DAILY OUTPUT PER WELL	2839.229	2517.375	2313.129	2273.789	2129.553	2001.648	2069.363	1912.879	1783.794	1925.348	1759.763	1595.877	1440.826
PEL	4733100	4836290	4722300	4543740	4399920	4188330	4015330	3776830	3538710	3355380	3180690	2997450	2857950
WELL DAYS	15777	16194.3	15741	15145.8	14666.4	13961.1	13383.1	12589.5	11795.7	11184.6	10602.3	9991.5	9526.5
ALTERNATE ELF	.988834	.9861412	.9850416	.9817494	.9784425	.9742915	.9749718	.9687491	.9615381	.9635583	.9560980	.9431622	.9266324
PRESUMED ELF	.8426277	.8731900	.8081591	.8049664	.7792950	.7796015	.7865083	.7698430	.7540114	.7712654	.7508217	.7266618	.6990889
NOMINAL TAX RATE	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
EFFECTIVE TAX RATE CURRENT ELF	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
EFF. TAX CUR. ELF NO 10 YEAR LIMIT	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
EFFECTIVE TAX RATE ALTERNATIVE ELF	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
SEVERANCE TAX CURRENT ELF	274.3939	274.3255	345.8627	389.9086	338.0651	313.7997	315.5380	288.6405	261.3423	272.6962	257.7047	241.1499	218.9102
SEVERANCE TAX PER BARREL CUR. LAW	.5754	.6320864	.8922610	1.063508	1.016737	1.054789	1.070074	1.125853	1.166707	1.189514	1.297443	1.420618	1.498102
SEVERANCE TAX NO ELF	381.5	347.2	427.9636	484.3787	426.6909	402.5129	401.1884	374.9342	346.6025	353.5699	343.2303	331.8599	313.1364
CUR SEV. TAX NO ELF ON CENTS/BBL	381.5	347.2	427.9636	484.3787	426.6909	402.5129	401.1884	374.9342	346.6025	353.5699	343.2303	331.8599	313.1364
CUR SEV. TAX ALT ELF NO 10 YEAR LIMIT	381.5	347.2	427.9636	484.3787	426.6909	402.5129	401.1884	374.9342	346.6025	353.5699	343.2303	331.8599	313.1364
SEVERANCE TAX PER BARREL CUR. LAW	.5754	.6320864	.8922610	1.063508	1.016737	1.054789	1.070074	1.125853	1.166707	1.189514	1.297443	1.420618	1.498102
SEVERANCE TAX ALTERNATIVE ELF	274.3939	328.6285	420.7060	475.5385	417.4926	392.1649	391.1474	363.2172	333.2716	341.3216	328.1618	312.9977	290.1623
SEV TAX ALT ELF NO ELF ON CENTS/BBL	381.5	347.2	427.9636	484.3787	426.6909	402.5129	401.1884	374.9342	346.6025	353.5699	343.2303	331.8599	313.1364
CONSERVATION TAX	0	0	484.5313	.4582813	.415625	.371875	.3685938	.3204688	.28	.2865625	.2482813	.2121875	.1826563
Gathering & Cleaning Charge	.7261	.7366066	.7945126	.8343177	.8761170	.9200105	.9661030	1.021944	1.081012	1.143495	1.209589	1.279503	1.361391
Royalties if Taken InValue	0	0	363.5882	471.6157	364.7568	344.2452	341.3871	319.6515	295.5053	299.2838	292.5639	285.0291	269.8061
InKind Contracts Longterm	0	0	67.86992	77.95507	68.08805	64.25922	63.72571	59.66839	55.16108	55.86640	54.61202	53.20553	50.36390
MAPCO (18.6667% exhibit B 2003)	0	0	104.0682	117.0287	103.1913	97.17414	96.83707	90.29805	83.33803	83.33803	83.33803	83.33803	83.33803
Tesoro (24.533% in-vr.30 '95)	0	0	59.20732	66.51228	58.65704	55.22126	55.02813	51.29389	47.32775	47.32775	47.32775	47.32775	47.32775
Tesoro (13.867% in-value + 0.35)	0	0	40.72290	45.79445	40.37974	38.02518	37.89328	35.33450	32.61098	32.61098	32.61098	32.61098	32.61098
Chevron (9.6% in-value + 0.30)	0	0	11.31206	12.72084	11.21674	10.56268	10.52604	9.815261	9.058718	9.058718	9.058718	9.058718	9.058718
GVEA (2.6667% in-value + 0.30)	0	0	11.31206	12.72084	11.21674	10.56268	10.52604	9.815261	9.058718	9.058718	9.058718	9.058718	9.058718
InKind Contracts Shortterm	0	0	283.1804	320.0113	281.5328	265.2425	264.0102	246.4101	227.4966	227.4966	227.4966	227.4966	227.4966
One-year (26.67% bprice+.84)	0	0	111.5001	128.0685	111.8585	105.5683	104.6918	98.02625	90.62142	90.62142	90.62142	90.62142	90.62142
Six Months	0	0	394.6806	448.0798	393.3913	370.8108	369.7021	344.4363	318.1180	299.2838	292.5639	285.0291	269.8061
Total In-Kind Royalties	241	346	394.6806	448.0798	393.3913	370.8108	369.7021	344.4363	318.1180	299.2838	292.5639	285.0291	269.8061
In-Value Royalties	0	0	31.09234	38.46417	28.63458	26.56538	27.31495	24.78483	22.61270	22.61270	22.61270	22.61270	22.61270
TOTAL ROYALTIES	241	346	394.6806	448.0798	393.3913	370.8108	369.7021	344.4363	318.1180	299.2838	292.5639	285.0291	269.8061
(Estimated InKind Premium MM\$)	0	0	31.09234	38.46417	28.63458	26.56538	27.31495	24.78483	22.61270	22.61270	22.61270	22.61270	22.61270

Kuparuk River Prod. (MMbbl/y/c)	86	88	88	88	77	67	59	52	47	40	34	29	24	20
Kuparuk River Price (\$/bbl)	3.016	4.299	6.54044	7.987887	7.735207	8.199897	8.250248	8.92963	9.495552	9.46193	10.70021	12.21328	13.46623	14.31084
WELLS	282.49	283.85	283.85	283.85	275.63	275.63	253.37	253.97	220.11	220.17	196.63	178.16	160.28	144.03
TOTAL DAILY OUTPUT	235616.4	241095.9	241095.9	241095.9	210958.9	183561.6	161643.8	142465.8	128767.1	109589.0	93150.68	79452.05	65753.42	54794.52
TOTAL MONTHLY OUTPUT	7166667	7333333	7333333	7333333	6166667	5583333	4916667	4333333	3916667	3333333	2833333	2416667	2000000	1666667
TOTAL DAILY OUTPUT PER WELL	834.0700	849.3778	849.3778	849.3778	765.3699	665.9712	637.9754	560.9350	585.0126	497.7474	473.7359	445.9590	410.2410	380.4382
PEL	2542410	2554650	2554650	2554650	2480670	2480670	2280370	2285730	1980990	1981530	1769670	1603440	1442520	1296270
WELL DAYS	8474.7	8515.3	8515.3	8515.3	8268.9	8268.9	7601.1	7619.1	6603.3	6605.1	5898.9	5344.8	4808.4	4320.9
ALTERNATE ELF	.7542573	.7590596	.7590596	.7590596	.7300814	.6850998	.6695290	.6172002	.6352920	.5593600	.5322421	.4960505	.4394140	.3797921
PRESUMED ELF	.5048248	.5126822	.5126822	.5126822	.4663249	.3993200	.3775073	.3092992	.3320009	.2428235	.2147879	.1804001	.1333321	.0923158
NOMINAL TAX RATE	.1363	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
EFFECTIVE TAX RATE CURRENT ELF	.0688076	.0769023	.0769023	.0769023	.0699487	.0598980	.0566261	.0463949	.0498001	.0364235	.0322182	.0270600	.0199998	.0138474
EFFECTIVE TAX RATE ALTERNATIVE ELF	.1028053	.1138589	.1138589	.1138589	.1095122	.1027650	.1004293	.0925800	.0952398	.0839040	.0798363	.0744076	.0659121	.0569688
ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
SEVERANCE TAX CURRENT ELF	30.39045	31.58123	38.72908	47.30011	36.45445	28.79411	24.11813	18.85016	19.44718	12.06229	10.25605	8.386222	5.655767	3.467930
SEVERANCE TAX PER BARREL CUR. LAW	.4038599	.4101458	.5029751	.6142871	.5410680	.4911575	.4671794	.4142891	.4728798	.3446368	.3447413	.3304915	.2693222	.1981674
SEVERANCE TAX NO ELF	60.2	61.6	75.54208	92.26009	78.17393	72.10785	63.88786	60.94472	58.57569	49.67513	47.74969	46.48680	42.41864	37.56596
CUR SEV. TAX NO ELF ON CENTS/BBL	60.2	61.6	75.54208	92.26009	78.17393	72.10785	63.88786	60.94472	58.57569	49.67513	47.74969	46.48680	42.41864	37.56596
SEVERANCE TAX ALTERNATIVE ELF	45.40629	46.75807	57.34095	70.03091	57.07333	49.40107	42.77477	37.61510	37.21266	27.78628	25.41439	23.05980	18.63935	14.26726
SEV TAX ALT ELF NO ELF ON CENTS/BBL	60.2	61.6	75.54208	92.26009	78.17393	72.10785	63.88786	60.94472	58.57569	49.67513	47.74969	46.48680	42.41864	37.56596
CONSERVATION TAX	.0940625	.09625	.09625	.09625	.0842188	.0732813	.0645313	.056875	.0514063	.04375	.0371875	.0317188	.02625	.021875
Gathering & Cleaning Charge	.4005	.4010006	.4015019	.4020038	.4025063	.4030094	.4035132	.4040175	.4045226	.4050282	.4055345	.4060414	.4065480	.4070572
ROYALTIES	28.11663	42.87799	67.52832	83.44471	70.57724	63.29894	57.86967	55.41648	53.40980	45.28453	43.75237	42.80124	39.17906	34.75947
TOTAL OIL PROD REVENUES	58.50708	74.45922	106.2574	130.7448	107.0317	94.09305	81.89678	74.26664	72.85698	57.34680	54.00842	51.18746	44.83482	38.22740

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Fiscal Years

1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

7.7	9.4	10.8	7.5	7.5	7.5	6.6	5.9	5.3	4.7	3.7	2.8	2	1.3
4.246	5.489	7.73044	9.177887	8.925207	9.389897	9.440248	10.11963	10.68555	10.65193	11.89021	13.40328	14.65623	15.86084
22.45	22.45	22.45	19.48	17	15.52	13.98	12.61	11.24	10.2	9.21	8.25	8.05	7.92
95.89	27533.42	29589.04	20547.95	20547.95	20547.95	18082.19	16164.38	14520.55	12876.71	10136.99	7671.233	5479.452	3561.644
666.7	783333.3	900000	625000	625000	625000	550000	491666.7	441666.7	391666.7	308333.3	233333.3	166666.7	108333.3
6.6933	11.146	1317.997	1054.823	1208.703	1323.966	1293.433	1281.870	1291.864	1262.423	1100.650	929.8464	680.6773	449.7025
02050	202050	202050	175320	153000	139680	125820	113490	101160	91800	82890	74250	72450	71280
673.5	673.5	673.5	584.4	510	465.6	419.4	378.3	337.2	306	276.3	247.5	241.5	237.6
53340	.0161050	.0296386	.0105018	.0205319	.0301784	.0274614	.0264618	.0273247	.0248181	.0131235	.0049860	.0003729	.0000004
45090	.6282333	.6729916	.5986241	.6456899	.6743629	.6672248	.6644400	.6668495	.6596507	.6138804	.5502962	.4102150	.1841544
.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15
79274	.0769586	.0824413	.0733313	.0968535	.1011544	.1000837	.0996660	.1000274	.0989476	.0920821	.0825444	.0615323	.0277732
006534	.0019729	.0036307	.0012865	.0030798	.0045268	.0041192	.0039633	.0040987	.0037227	.0019685	.0007479	.0000559	.0000001
.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625	.1625
60712	3.956615	5.764458	4.227456	5.429747	3.966118	5.222465	4.983661	4.744350	4.148741	3.392744	2.594629	1.510567	.4687149
5.159	6.298	8.563424	7.061954	8.409218	8.847044	7.827146	7.500543	7.114574	6.289299	5.526718	4.714604	3.682379	2.531481
36072	.5025868	.6373088	.6730278	.6644373	.9498297	.9448151	1.008583	1.068848	1.053983	1.094875	1.106366	.9018312	.4305074
5.159	6.298	7.236	5.025	5.429747	3.966118	5.222465	4.983661	4.744350	4.148741	3.392744	2.594629	1.510567	.871
75180	.1014294	.2535675	.0761535	.1726370	.2669898	.2149440	.1984778	.1944039	.1560885	.0725301	.0235072	.0013733	.0000009
5.159	6.298	7.236	5.025	5.025	5.025	4.422	3.953	3.551	3.149	2.479	1.876	1.34	.871
00609	.0098406	.0123063	.0078516	.0078516	.0078516	.0069094	.0061766	.0055484	.0049203	.0038734	.0029313	.0020938	.0013609
0	0	0	0	0	0	0	0	0	0	0	0	0	0
62758	8.384448	13.56692	11.18355	10.87760	11.44394	10.12467	9.702195	9.202932	8.135412	7.148989	6.098493	4.763276	3.274553
23469	12.34106	19.33138	15.41301	16.30734	17.41006	15.34713	14.68586	13.94728	12.28415	10.56173	8.692921	6.273844	3.743268
0	9.56	31.1	30.8	30.8	30.8	30.8	23.7	21.3	16.5	12.9	10.1	7.76	5.69
2.716	3.999	6.24044	7.687887	7.435207	7.899897	7.950248	8.62963	9.195552	9.16193	10.40021	11.91328	13.16623	14.01084
1	62.36	111.46	111.46	111.46	111.46	111.46	100.02	90.52	81.56	73.18	65.81	59.56	53.78
0	26191.78	85201.48	84383.56	84383.56	84383.56	84383.56	64931.51	58356.16	45205.48	35342.47	27671.23	21260.27	15589.04
0	796666.7	2591667	2566667	2566667	2566667	2566667	1975000	1775000	1375000	1075000	841666.7	646666.7	474166.7
0	420.0093	764.4489	757.0748	757.0748	757.0748	757.0748	649.1852	644.6770	554.2604	482.9525	420.4716	356.9556	289.8669
9000	561240	1003140	1003140	1003140	1003140	1003140	900180	814680	734040	658620	592290	536040	484020
30	1870.8	3343.8	3343.8	3343.8	3343.8	3343.8	3000.6	2715.6	2446.8	2195.4	1974.3	1786.8	1613.4
0	.0008597	.4184052	.4102941	.4102941	.4102941	.4102941	.2414403	.2025989	.0772495	.0170732	.0012719	.0000034	0
0	.1464877	.4657698	.4612840	.4612840	.4612840	.4612840	.3864156	.3828616	.3027382	.2257357	.1471054	.0599538	0
0	.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15
0	.0179447	.0570568	.0563073	.0565073	.0565073	.0691924	.0579623	.0574292	.0454107	.0338603	.0220658	.0089931	0
0	.0001053	.0512546	.0502610	.0502610	.0502610	.0615441	.0362160	.0303898	.0115874	.0025610	.0001908	.0000005	0
.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438	.1438
0	.9592331	9.921946	11.45612	11.72054	14.50662	10.14990	9.630874	5.877663	3.889542	2.273253	.7866948	0	0
0	6.548218	21.30226	24.83528	24.01901	25.82016	31.44835	26.26679	23.15498	19.41500	17.23052	15.45323	13.12169	10.23866
0	.1171901	.3726158	.4344217	.4201434	.4464018	.5500984	.5001936	.5280935	.4160500	.3521547	.2628762	.1184048	0
0	.9592331	9.921946	11.45612	11.72054	14.50662	10.14990	9.630874	5.877663	3.889542	2.273253	.7866948	0	0
0	.0056292	8.912975	10.18977	9.854857	10.47077	12.90307	6.341862	5.096371	1.499798	.2941806	.0196553	.0000444	0
0	6.548218	21.30226	21.09677	21.09677	21.09677	21.09677	16.23555	14.58965	11.30184	8.835984	6.918096	5.315290	3.897422
0	.0102316	.0332848	.0329637	.0329637	.0329637	.0329637	.0253649	.0227963	.0176591	.0138062	.0108095	.0083051	.0060897
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	5.497537	27.90837	34.04996	32.93083	34.98896	35.21197	29.41030	28.16542	21.73851	19.29260	17.30261	14.69204	11.46398
0	6.456770	37.83032	45.50667	44.01041	46.76101	49.71859	39.56019	37.79630	27.61617	23.18214	19.57586	15.47874	11.46398
5.52	7.57	13.27	18.96	28.03	27.9	33.64	35.23	34.9	34.63	34.41	26.64	20.67	16.04
3.566	4.849	7.09044	8.537887	8.285207	.749897	8.800248	9.47963	10.04555	10.01193	11.25021	12.76328	14.01623	14.86084
50.56	79.47	104.24	116.87	116.87	116.87	116.87	105.42	94.57	85.11	77.04	69.5	62.04	53.78
23.29	20739.73	36356.16	51945.21	76794.52	76438.36	92164.38	96520.55	95616.44	94876.71	94273.97	72986.30	56630.14	43945.21
50000	630833	1058333	1580000	2335833	2325000	2803333	2935833	2908333	2885833	2867500	2220000	1722500	1336667
8.261	260.97	48.7736	444.4700	657.0935	654.0460	788.6060	825.8796	907.0047	1003.243	1107.672	947.3819	814.8221	708.3366
58550	7152	938160	1051830	1051830	1051830	1051830	1051830	948780	851130	765990	693360	625500	558360
528.5	2384.1	3127.2	3506.1	3506.1	3506.1	3506.1	3162.6	2837.1	2553.3	2311.2	2085	1861.2	1661.2
0	0	.0003823	.0407890	.3067284	.3027381	.4611704	.4980600	.5345489	.5719860	.6065393	.4592834	.2986760	.1546652
0	0	.0489764	.1784989	.3925590	.3902052	.4799751	.5005191	.5402073	.5799708	.6161177	.5577526	.4945901	.4297291
.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15	.15	.15	.15	.15
0	0	.0059996	.0218661	.0480885	.0585308	.0719963	.0750779	.0810311	.0869956	.0924177	.0836629	.0741885	.0644594
0	0	.0000468	.0049966	.0375742	.0454107	.0691756	.0747090	.0801823	.0857979	.0909809	.0688925	.0448014	.0231998
.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
0	0	.4939407	3.097194	9.771820	12.30258	18.64958	21.93936	24.87559	26.39221	31.30461	24.89072	18.80687	13.44441
3.864	5.299	10.08529	17.35133	24.89262	32.04103	38.85529	43.83322	46.0491	45.50610	50.80946	44.62681	38.02517	31.28579
0	0	.0425398	.1866904	.3984229	.5121383	.6335850	.7117104	.8140021	.8709941	1.039718	1.067813	1.039844	.9579204
1.358	3.864	5.299	9.289	13.272	19.621	23.548	24.661	24.85759	26.39221	31.30461	24.89072	18.80687	13.44441
0	0	.0038560	.7077430	7.635273	9.700041	17.91891	21.83157	24.59722	26.02885	30.81794	20.49635	11.35720	8.88823
3.864	5.299	9.289	13.272	19.621	23.548	24.661	24.59722	26.02885	30.81794	20.49635	11.35720	8.888	7.92599
50375	.0082797	.0145141	.0207375	.0306578	.0305156	.0367938	.0385328	.0381719	.0378766	.0376359	.0291375	.0226078	.0175438
0	0	0	0	0	0	0	0	0	0	0	0	0	0
16054	4.580366	11.76127	20.23479	29.02929	30.51527	37.00504	41.74592	43.82372	43.33914	48.36997	42.50172	36.21445	29.79599
16054	4.580366	12.25521	23.33199	38.00111	43.017848								

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Fiscal Years

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
West Sak Sands Prod. (MMbbl/yr)	.01	.01	.01	12.03	14.75	20.03	20.42	20.44	21.04	21.28	22.37	22.31	22.59	18.47
West Sak Sands Price (\$/bbl)	2.036	3.339	5.58044	7.027887	6.775207	7.239897	7.290248	7.96963	8.535552	8.50193	9.74021	11.25328	12.50623	13.35084
WELLS	1	89.67	163.23	163.86	248.1	269.76	270.49	272.32	273.36	275.11	275.74	256.77	237.94	219.12
TOTAL DAILY OUTPUT	27.39726	27.39726	27.39726	32958.90	40410.96	54876.71	55945.21	57095.89	57443.44	58301.37	61287.67	61123.29	61890.41	50602.74
TOTAL MONTHLY OUTPUT	833.3333	833.3333	833.3333	1002500	1229167	1669167	1701667	1736667	1753333	1773333	1864167	1859167	1882500	1539167
TOTAL DAILY OUTPUT PER WELL	27.39726	3055343	1678443	201.1406	150.7309	203.4279	206.8291	209.6647	210.7173	211.9202	222.2662	238.0468	260.1093	230.9362
REL	8000	807030	1469070	1474740	2412900	2427840	2434410	2450880	2462040	2475990	2481460	2310930	2141460	1972080
WELL DAYS	30	2690.1	4896.9	4915.8	8043	8092.8	8114.7	8169.4	8206.8	8253.3	8272.2	7703.1	7138.2	6573.6
ALTERNATE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRESUMED ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOMINAL TAX RATE	0	.1225	.1225	.1225	.1225	.1225	.13	.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
EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
SEVERANCE TAX CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEVERANCE TAX NO ELF	.007	.007	.007	9.062218	10.71171	15.54381	19.53878	21.79893	23.57093	23.74589	28.59787	32.95172	37.08020	32.36495
SEVERANCE TAX PER BARREL CUR. LAW	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUR. SEV. TAX NO ELF ON CENTS	.0191110	0	0	0	0	0	0	0	0	0	0	0	0	0
SEVERANCE TAX ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEV TAX ALT ELF NO ELF ON CENTS/BBL	.007	.007	.007	8.421	10.315	14.021	14.294	14.588	14.728	14.896	15.659	15.617	15.813	12.929
CONSERVATION TAX	.0000109	.0000109	.0000109	.0131578	.0161318	.0219078	.0223344	.0227938	.0230125	.0232715	.0244672	.0244016	.0247078	.0202016
Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROYALTIES	.00237	.0041738	.0069756	10.56818	12.49179	18.12689	18.60836	20.76089	22.44850	22.61513	27.23606	31.38259	35.31448	30.82376
TOTAL OIL PROD REVENUES	.00237	.0041738	.0069756	10.56818	12.49179	18.12689	18.60836	20.76089	22.44850	22.61513	27.23606	31.38259	35.31448	30.82376
Unspecified Onshore Prod. (MMbbl/yr)	0	0	0	7.54	7.7	8.09	8.28	8.49	8.51	9.65	7.7	6.24	5.49	4.4
Unspecified Onshore Price (\$/bbl)	1.916	3.199	5.44044	6.887887	6.635207	7.099897	7.150248	7.82963	8.395552	8.36193	9.60021	11.11328	12.36623	13.21084
WELLS	1	1	1	33.07	33.07	33.07	33.07	33.07	33.07	33.07	33.07	33.07	33.07	33.07
TOTAL DAILY OUTPUT	0	0	0	20657.53	21095.89	22164.38	22684.93	23260.27	23315.07	24438.36	21095.89	17095.89	15041.10	12054.79
TOTAL MONTHLY OUTPUT	0	0	0	628333.3	641666.7	674166.7	690000	707500	709166.7	741666.7	641666.7	520000	457500	366666.7
TOTAL DAILY OUTPUT PER WELL	0	0	0	628.6608	637.9163	670.2263	685.9671	703.3648	705.0217	799.4665	637.9163	512.0063	441.3467	229.7026
REL	9000	9000	9000	297630	297630	297630	297630	297630	297630	297630	297630	300510	306720	472320
WELL DAYS	30	30	30	992.1	992.1	992.1	992.1	992.1	992.1	992.1	992.1	1001.7	1022.4	1574.4
ALTERNATE ELF	0	0	0	.0089830	.0113187	.0185799	.0229592	.0284536	.0290127	.0705439	.0113187	.0004751	.0000138	0
PRESUMED ELF	0	0	0	.3666111	.3774597	.4025110	.4140437	.4263119	.4274550	.4861273	.3774597	.2587303	.1744927	0
NOMINAL TAX RATE	0	0	0	.1225	.1225	.1225	.1225	.1225	.1225	.15	.15	.15	.15	.15
EFFECTIVE TAX RATE CURRENT ELF	0	0	0	.0449099	.0462388	.0493076	.0507204	.0522232	.0641182	.0729191	.0566189	.0388095	.0261739	0
EFFECTIVE TAX RATE ALTERNATIVE ELF	0	0	0	.0011004	.0013865	.0022760	.0028125	.0034856	.0043519	.0105816	.0016978	.0000713	.0000021	0
ROYALTY PERCENTAGE	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
SEVERANCE TAX CURRENT ELF	0	0	0	2.040831	2.067092	2.478121	2.627494	3.037530	4.008377	5.148529	3.662194	2.354905	1.554842	0
SEVERANCE TAX NO ELF	0	0	0	5.566747	5.476326	6.156654	6.345934	7.125135	9.377307	10.59091	9.702212	9.101777	8.910645	7.629262
SEVERANCE TAX PER BARREL CUR. LAW	0	0	0	.3093340	.3068041	.3500789	.3626631	.4088884	.5383081	.6097444	.5435538	.4313013	.3236726	0
CUR. SEV. TAX NO ELF ON CENTS/BBL	0	0	0	6.032	6.16	6.472	6.624	6.792	6.808	7.72	6.16	4.992	4.392	3.52
SEVERANCE TAX ALTERNATIVE ELF	0	0	0	.0500058	.0619849	.1143898	.1456976	.2027360	.2720609	.7471241	.1098165	.0043247	.0001228	0
SEV TAX ALT ELF NO ELF ON CENTS/BBL	0	0	0	5.278	5.39	5.663	5.796	5.943	5.957	6.755	5.39	4.368	3.843	3.08
CONSERVATION TAX	0	0	0	.0082469	.0084219	.0088484	.0090563	.0092859	.0093078	.0105547	.0084219	.006825	.0060047	.0048125
Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROYALTIES	0	0	0	6.491833	6.386386	7.179771	7.400507	8.309195	9.930768	10.08658	9.240202	8.668359	8.486329	7.265964
TOTAL OIL PROD REVENUES	0	0	0	8.532664	8.453479	9.657892	10.02800	11.34672	12.93915	15.23511	12.90240	10.02326	10.04117	7.265964
Seal Island Prod. (MMbbl/yr)	0	0	0	0	0	0	0	0	0	0	1.89	2.87	3.02	3.19
Seal Island Price (\$/bbl)	2.246	3.549	5.79044	7.237887	6.985207	7.449897	7.500248	8.17963	8.745552	8.71193	9.95021	11.46328	12.71623	13.56084
WELLS	1	1	1	1	1	1	1	1	1	1	20.1	56.99	61.2	61.79
TOTAL DAILY OUTPUT	0	0	0	0	0	0	0	0	0	0	5178.087	7863.014	8273.973	8739.726
TOTAL MONTHLY OUTPUT	0	0	0	0	0	0	0	0	0	0	15750	239166.7	251666.7	265833.3
TOTAL DAILY OUTPUT PER WELL	0	0	0	0	0	0	0	0	0	0	90.8599	128.4806	136.6921	141.4424
REL	9000	9000	9000	9000	9000	9000	9000	9000	9000	180900	517.10	550800	544770	556110
WELL DAYS	30	30	30	30	30	30	30	30	30	603	.09.7	1836	1815.9	1853.7
ALTERNATE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRESUMED ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOMINAL TAX RATE	0	0	0	0	0	0	0	0	0	0	.1225	.1225	.1225	.1225
EFFECTIVE TAX RATE CURRENT ELF	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	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125	.125
SEVERANCE TAX CURRENT ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEVERANCE TAX NO ELF	0	0	0	0	0	0	0	0	0	0	2.015757	3.526428	4.116325	4.636834
SEVERANCE TAX PER BARREL CUR. LAW	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUR. SEV. TAX NO ELF ON CENTS/BBL	0	0	0	0	0	0	0	0	0	0	1.323	2.009	2.114	2.233
SEVERANCE TAX ALTERNATIVE ELF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEV TAX ALT ELF NO ELF ON CENTS/BBL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONSERVATION TAX	0	0	0	0	0	0	0	0	0	0	.0020672	.0031391	.0033031	.0034891
Gathering & Cleaning Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROYALTIES	0	0	0	0	0	0	0	0	0	0	2.350737	4.112452	4.800379	5.407386
TOTAL OIL PROD REVENUES	0	0	0	0	0	0	0	0	0	0	2.350737	4.112452	4.800379	5.407386

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MEMORANDUM

State of Alaska

TO: Vincent Wright
Chief of Research

DATE: April 30, 1986

FILE NO:

TELEPHONE NO: 276-5364

FROM: Charles Logsdon
Petroleum Economist
Department of Revenue

CL

SUBJECT: Low Prices and the
ELF

It is commonly asserted that the state severance tax is insulated from low oil prices by the 80¢/barrel minimum tax. This tax is however also subject to the Economic Limit Factor, a calculated value which can be affected by wellhead price should the companies choose to ask for a hearing and submit cost and price data.

The ELF formula is as follows:

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

PEL = 300 barrels * wells/days unless successfully rebutted by the taxpayer

if challenged

PEL = Avg. direct operating cost / value at the point of production

Notice that as the value of oil at the point of production approaches zero the value of PEL becomes quite large i.e. it approaches infinity.

Notice further that as PEL gets larger the value of ELF gets smaller so that wellhead values near zero imply an ELF which is near zero.

The attached tables and graphs illustrate how the calculated value of ELF for Prudhoe Bay, Kuparuk, Milne Pt. and Lisburne change as wellhead value falls based on the cost assumptions used in the Pet Rev forecasting model.

The ELF formula is calculated for each producing oil field in the State. The ELF for Prudhoe Bay is currently subject (for FY 1986 and FY 1987) to a test to determine whether it is greater in value than 0.7. If it is greater than 0.7 it is set equal to 1.0. At wellhead prices below \$1.30/bbl (ca. \$7.05/bbl West Coast) the calculated ELF dips below the 0.7 mark. The ELF, and consequently severance taxes, fall to zero at wellhead price of \$1.00/bbl (ca. \$6.75/bbl West Coast).

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April 30, 1986
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The ELF for Kuparuk is currently estimated to be .5378 based on the presumed PEL equal to 300 times well days. The ELF falls below .5378 when wellhead price falls below \$3.67/bbl (ca. \$10.62/bbl West Coast), assuming all field costs paid by the State for royalties are applied against the producer's reported direct operating cost.

Obviously at prices below this trigger companies could lower their tax liability by filing for a redetermination of the ELF. The ELF falls to zero at a wellhead price of \$1.20/bbl (ca. \$8.15/bbl West Coast).

The ELF for Milne Pt. is currently estimated to be .4964 based on the presumed PEL equal to 300 times well days. The ELF falls below .4964 when wellhead price falls below \$4.86/bbl. (ca. \$13.72/bbl West Coast). The ELF falls to zero at a wellhead price of \$1.50/bbl (ca. \$10.36/bbl West Coast).

The ELF for Lisburne is currently estimated to .5712 based on the presumed PEL equal to 300 times well days. The ELF falls below .5712 when wellhead price falls below \$4.91/bbl (ca. \$10.66/bbl West Coast). The ELF falls to zero at a wellhead price of \$1.50/bbl. (ca. \$7.25/bbl West Coast).

To put these numbers into context, the current market price of ANS on the West Coast is approximately \$12.00/bbl. This plus the fact that the law specifies a producer must file for a redetermination of ELF by February 15 of the year or within 6 months of the commencement of production suggests that Milne Pt. producers could benefit from such a hearing. At current prices the State would lose roughly 30 thousand dollars a month due to reduced Milne Pt. severance taxes.

One possible solution to the State's downside revenue exposure would be to eliminate the application of the ELF to the 80¢/bbl tax floor. Given the cost assumptions used in the Pet Rev model and at current prices, this would cause Milne Pt. and a small amount of Cook Inlet production to be shut-in. Although we have not had time to examine in detail the revenue effect of fixing the 80¢/bbl floor, the State would lose roughly \$500 thousand a month at current prices (\$6.25/bbl at Pump Station #1) from the shut-in fields but gain approximately \$5 million per month from the Kuparuk operation.

Examination of Cook Inlet oil production suggests that the Swanson River Field will shut-in before the 80¢/bbl floor is reached. If prices fall below \$5.00/bbl at the field (the current price is roughly \$12.00/bbl) the 80¢/bbl fixed floor would cause the

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premature shut-in of McArthur River and Middle Ground Shoal fields. This would amount to about 35 thousand bbls. and including Swanson River represents nearly all Cook Inlet production. Obviously Cook Inlet is important to the State as a regional economic base so that the net gain in revenues would have to be examined in this light.

It might be pointed out that the price sensitivity of ELF also works on the rising price side, and that even at current low prices the actual PEL may be lower than the presumed 300 times well days. In other words, if producers used an ELF based on their actual operating costs their current severance tax liability would increase.

PRICE SENSITIVITY OF THE ECONOMIC LIMIT FACTOR FOR PRUDHOE BAY

						Royalty	Royalty	Royalty	Royalty		Field	Field	
						Owner	Owner	Owner	Owner		Cost	Cost	
						Field	Field	Field	Field	Nominal	Excluded	Included	
Wellhead			Total	Non-Royalty	Royalty		Cost	Cost	Cost	Cost	Tax	Effective	Effective
Price	Volume	Royalty	Oper. Cost	Oper. Cost	Costs	Wells	Excluded	Included	Excluded	Included	Rate	Tax Rate	Tax Rate
(\$/BBL)	(BBL)	Share	(\$ per BBL)		(\$/70/BBL)		PEL	PEL	ELF	ELF		(FY1987)	(FY1987)
10.00	1500000	0.125	1500000	1312500	131250	550	272.73	248.86	0.8372	0.8379	0.15	0.15	0.15
9.00	1500000	0.125	1500000	1312500	131250	550	303.03	276.52	0.8363	0.8371	0.15	0.15	0.15
8.00	1500000	0.125	1500000	1312500	131250	550	340.91	311.08	0.8351	0.8360	0.15	0.15	0.15
7.00	1500000	0.125	1500000	1312500	131250	550	389.61	355.52	0.8336	0.8347	0.15	0.15	0.15
6.00	1500000	0.125	1500000	1312500	131250	550	454.55	414.77	0.8315	0.8328	0.15	0.15	0.15
5.00	1500000	0.125	1500000	1312500	131250	550	545.45	497.73	0.8285	0.8301	0.15	0.15	0.15
4.00	1500000	0.125	1500000	1312500	131250	550	681.82	622.16	0.8236	0.8258	0.15	0.15	0.15
3.00	1500000	0.125	1500000	1312500	131250	550	909.09	829.55	0.8145	0.8178	0.15	0.15	0.15
2.00	1500000	0.125	1500000	1312500	131250	550	1363.64	1244.32	0.7915	0.7983	0.15	0.15	0.15
1.50	1500000	0.125	1500000	1312500	131250	550	1818.18	1659.09	0.7573	0.7711	0.15	0.15	0.15
1.40	1500000	0.125	1500000	1312500	131250	550	1948.05	1777.60	0.7439	0.7611	0.15	0.15	0.15
1.30	1500000	0.125	1500000	1312500	131250	550	2097.90	1914.34	0.7250	0.7476	0.15	0.15	0.15
1.20	1500000	0.125	1500000	1312500	131250	550	2272.73	2073.86	0.6958	0.7284	0.15	0.1044	0.15
1.10	1500000	0.125	1500000	1312500	131250	550	2479.34	2262.40	0.6409	0.6979	0.15	0.0961	0.1047
1.00	1500000	0.125	1500000	1312500	131250	550	2727.27	2499.64	0	0.6374	0.15	0	0.0956
0.90	1500000	0.125	1500000	1312500	131250	550	3030.30	2765.15	0	0	0.15	0	0
0.80	1500000	0.125	1500000	1312500	131250	550	3409.09	3110.80	0	0	0.15	0	0
0.70	1500000	0.125	1500000	1312500	131250	550	3896.10	3555.19	0	0	0.15	0	0
0.60	1500000	0.125	1500000	1312500	131250	550	4545.45	4147.73	0	0	0.15	0	0
0.59	1500000	0.125	1500000	1312500	131250	550	4622.50	4218.03	0	0	0.15	0	0
0.58	1500000	0.125	1500000	1312500	131250	550	4702.19	4290.75	0	0	0.15	0	0
0.57	1500000	0.125	1500000	1312500	131250	550	4784.69	4366.03	0	0	0.15	0	0
0.56	1500000	0.125	1500000	1312500	131250	550	4870.13	4443.99	0	0	0.15	0	0
0.55	1500000	0.125	1500000	1312500	131250	550	4958.68	4524.79	0	0	0.15	0	0
0.54	1500000	0.125	1500000	1312500	131250	550	5050.51	4608.59	0	0	0.15	0	0
0.53	1500000	0.125	1500000	1312500	131250	550	5145.80	4695.54	0	0	0.15	0	0
0.52	1500000	0.125	1500000	1312500	131250	550	5244.76	4785.84	0	0	0.15	0	0
0.51	1500000	0.125	1500000	1312500	131250	550	5347.59	4879.68	0	0	0.15	0	0

PRICE SENSITIVITY OF THE ECONOMIC LIMIT FACTOR FOR KUPARUK

						Royalty	Royalty	Royalty	Royalty		Field	Field	
						Owner	Owner	Owner	Owner		Cost	Cost	
						Field	Field	Field	Field	Nominal	Excluded	Included	
Wellhead			Total	Non-Royalty	Royalty		Cost	Cost	Cost	Cost	Tax	Effective	Effective
Price	Volume	Royalty	Oper. Cost	Oper. Cost	Owner	Wells	Excluded	Included	Excluded	Included	Rate	Tax Rate	Tax Rate
(\$/BBL)	(BBL)	Share	(\$1.26/BBL)		Costs		PEL	PEL	ELF	ELF	(FY1987)	(FY1987)	(FY1987)

10.00	220000	0.125	277200	242550	11550	244	113.61	109.85	0.5797	0.5804	0.13625	0.0790	0.0791
9.00	220000	0.125	277200	242550	11550	244	126.23	122.06	0.5772	0.5780	0.13625	0.0786	0.0789
8.00	220000	0.125	277200	242550	11550	244	142.01	137.31	0.5740	0.5749	0.13625	0.0782	0.0783
7.00	220000	0.125	277200	242550	11550	244	162.30	156.93	0.5698	0.5709	0.13625	0.0776	0.0778
6.00	220000	0.125	277200	242550	11550	244	189.34	183.08	0.5640	0.5654	0.13625	0.0768	0.0770
5.00	220000	0.125	277200	242550	11550	244	227.21	219.70	0.5555	0.5573	0.13625	0.0757	0.0759
4.00	220000	0.125	277200	242550	11550	244	284.02	274.62	0.5419	0.5442	0.13625	0.0738	0.0741
3.67	220000	0.125	277200	242550	11550	244	309.55	299.32	0.5353	0.5379	0.13625	0.0729	0.0733
3.00	220000	0.125	277200	242550	11550	244	378.69	366.17	0.5160	0.5197	0.13625	0.0703	0.0708
2.00	220000	0.125	277200	242550	11550	244	568.03	549.25	0.4470	0.4553	0.13625	0.0609	0.0620
1.50	220000	0.125	277200	242550	11550	244	757.38	732.33	0.3286	0.3497	0.13625	0.0448	0.0477
1.40	220000	0.125	277200	242550	11550	244	811.48	784.64	0.2711	0.3020	0.13625	0.0369	0.0412
1.30	220000	0.125	277200	242550	11550	244	873.90	845.00	0.1600	0.2217	0.13625	0.0218	0.0302
1.20	220000	0.125	277200	242550	11550	244	946.72	915.41	0	0	0.13625	0	0
1.10	220000	0.125	277200	242550	11550	244	1032.79	998.63	0	0	0.13625	0	0
1.00	220000	0.125	277200	242550	11550	244	1136.07	1098.50	0	0	0.13625	0	0
0.90	220000	0.125	277200	242550	11550	244	1262.30	1220.55	0	0	0.13625	0	0
0.80	220000	0.125	277200	242550	11550	244	1420.08	1373.12	0	0	0.13625	0	0
0.70	220000	0.125	277200	242550	11550	244	1622.95	1569.28	0	0	0.13625	0	0
0.60	220000	0.125	277200	242550	11550	244	1893.44	1830.83	0	0	0.13625	0	0
0.59	220000	0.125	277200	242550	11550	244	1925.53	1861.86	0	0	0.13625	0	0
0.58	220000	0.125	277200	242550	11550	244	1958.73	1893.96	0	0	0.13625	0	0
0.57	220000	0.125	277200	242550	11550	244	1993.10	1927.19	0	0	0.13625	0	0
0.56	220000	0.125	277200	242550	11550	244	2028.69	1961.60	0	0	0.13625	0	0
0.55	220000	0.125	277200	242550	11550	244	2065.57	1997.27	0	0	0.13625	0	0
0.54	220000	0.125	277200	242550	11550	244	2103.83	2034.25	0	0	0.13625	0	0
0.53	220000	0.125	277200	242550	11550	244	2143.52	2072.64	0	0	0.13625	0	0
0.52	220000	0.125	277200	242550	11550	244	2184.74	2112.49	0	0	0.13625	0	0
0.51	220000	0.125	277200	242550	11550	244	2227.58	2153.92	0	0	0.13625	0	0

PRICE SENSITIVITY OF THE ECONOMIC LIMIT FACTOR FOR MILNE PT

Wellhead Price (\$/BBL)	Volume (BBL)	Royalty Share	Total Oper. Cost (\$1.78/BBL)	Non-Royalty Oper. Cost	Royalty Owner Costs (\$/.70/BBL)	Wells	PEL	ELF	Nominal Tax Rate (FY1987)	No Field Cost Effective Tax Rate (FY1987)
10.00	18000	0.2	32040	25632	0	22	145.64	0.5384	0.1225	0.0660
9.00	18000	0.2	32040	25632	0	22	161.82	0.5345	0.1225	0.0655
8.00	18000	0.2	32040	25632	0	22	182.05	0.5294	0.1225	0.0649
7.00	18000	0.2	32040	25632	0	22	208.05	0.5227	0.1225	0.0640
6.00	18000	0.2	32040	25632	0	22	242.73	0.5133	0.1225	0.0629
5.00	18000	0.2	32040	25632	0	22	291.27	0.4991	0.1225	0.0611
4.86	18000	0.2	32040	25632	0	22	299.66	0.4965	0.1225	0.0608
4.00	18000	0.2	32040	25632	0	22	364.09	0.4753	0.1225	0.0582
3.00	18000	0.2	32040	25632	0	22	485.45	0.4263	0.1225	0.0522
2.00	18000	0.2	32040	25632	0	22	728.18	0.2480	0.1225	0.0304
1.50	18000	0.2	32040	25632	0	22	970.91	0	0.1225	0
1.40	18000	0.2	32040	25632	0	22	1040.26	0	0.1225	0
1.30	18000	0.2	32040	25632	0	22	1120.28	0	0.1225	0
1.20	18000	0.2	32040	25632	0	22	1213.64	0	0.1225	0
1.10	18000	0.2	32040	25632	0	22	1323.97	0	0.1225	0
1.00	18000	0.2	32040	25632	0	22	1456.36	0	0.1225	0
0.90	18000	0.2	32040	25632	0	22	1618.18	0	0.1225	0
0.80	18000	0.2	32040	25632	0	22	1820.45	0	0.1225	0
0.70	18000	0.2	32040	25632	0	22	2080.52	0	0.1225	0
0.60	18000	0.2	32040	25632	0	22	2427.27	0	0.1225	0
0.59	18000	0.2	32040	25632	0	22	2468.41	0	0.1225	0
0.58	18000	0.2	32040	25632	0	22	2510.97	0	0.1225	0
0.57	18000	0.2	32040	25632	0	22	2555.02	0	0.1225	0
0.56	18000	0.2	32040	25632	0	22	2600.65	0	0.1225	0
0.55	18000	0.2	32040	25632	0	22	2647.93	0	0.1225	0
0.54	18000	0.2	32040	25632	0	22	2696.97	0	0.1225	0
0.53	18000	0.2	32040	25632	0	22	2747.86	0	0.1225	0
0.52	18000	0.2	32040	25632	0	22	2800.70	0	0.1225	0
0.51	18000	0.2	32040	25632	0	22	2855.61	0	0.1225	0

PRICE SENSITIVITY OF THE ECONOMIC LIMIT FACTOR FOR LISBURN

Wellhead Price (\$/BBL)	Volume (BBL)	Royalty Share	Total Oper. Cost (\$1.78/BBL)	Non-Royalty Oper. Cost	Royalty Owner Costs (\$/.70/BBL)	Wells	PEL	ELF	Nominal Tax Rate (FY1987)	No Field Cost Effective Tax Rate (FY1987)
10.00	50000	0.125	75000	65625	0	51	147.06	0.6015	0.1225	0.0737
9.00	50000	0.125	75000	65625	0	51	163.40	0.5985	0.1225	0.0733
8.00	50000	0.125	75000	65625	0	51	183.82	0.5948	0.1225	0.0729
7.00	50000	0.125	75000	65625	0	51	210.08	0.5898	0.1225	0.0722
6.00	50000	0.125	75000	65625	0	51	245.10	0.5828	0.1225	0.0714
5.00	50000	0.125	75000	65625	0	51	294.12	0.5724	0.1225	0.0701
4.91	50000	0.125	75000	65625	0	51	299.51	0.5713	0.1225	0.0700
4.00	50000	0.125	75000	65625	0	51	367.65	0.5554	0.1225	0.0680
3.00	50000	0.125	75000	65625	0	51	490.20	0.5218	0.1225	0.0639
2.00	50000	0.125	75000	65625	0	51	735.29	0.4201	0.1225	0.0515
1.50	50000	0.125	75000	65625	0	51	980.39	0	0.1225	0
1.40	50000	0.125	75000	65625	0	51	1050.42	0	0.1225	0
1.30	50000	0.125	75000	65625	0	51	1131.22	0	0.1225	0
1.20	50000	0.125	75000	65625	0	51	1225.49	0	0.1225	0
1.10	50000	0.125	75000	65625	0	51	1336.90	0	0.1225	0
1.00	50000	0.125	75000	65625	0	51	1470.59	0	0.1225	0
0.90	50000	0.125	75000	65625	0	51	1633.99	0	0.1225	0
0.80	50000	0.125	75000	65625	0	51	1838.24	0	0.1225	0
0.70	50000	0.125	75000	65625	0	51	2100.84	0	0.1225	0
0.60	50000	0.125	75000	65625	0	51	2450.98	0	0.1225	0
0.59	50000	0.125	75000	65625	0	51	2492.52	0	0.1225	0
0.58	50000	0.125	75000	65625	0	51	2535.50	0	0.1225	0
0.57	50000	0.125	75000	65625	0	51	2579.98	0	0.1225	0
0.56	50000	0.125	75000	65625	0	51	2626.05	0	0.1225	0
0.55	50000	0.125	75000	65625	0	51	2673.80	0	0.1225	0
0.54	50000	0.125	75000	65625	0	51	2723.31	0	0.1225	0
0.53	50000	0.125	75000	65625	0	51	2774.69	0	0.1225	0
0.52	50000	0.125	75000	65625	0	51	2828.05	0	0.1225	0
0.51	50000	0.125	75000	65625	0	51	2883.51	0	0.1225	0

FY87 Legislation
Prepared by Audit Division
August 28, 1986

I. Adjustments to ELF computation

Five changes are contemplated at this time. Each change has been requested as a result of problems and concerns which have been encountered when working with the ELF in the past year of declining oil prices. The fiscal impact, should the suggested changes be made to the ELF computation, are estimated based upon the June revenue forecast. These figures are as follows:

<u>FY87</u>	<u>FY88</u>	<u>FY89</u>
\$39 million	\$119 Million	\$158 Million

- A. The first change removes the ELF application to the cents-per-barrel. This establishes a floor of 80¢ per barrel originally contemplated when the production tax was instituted in 1977. Without this change, the effective tax rate can conceivably fall to zero. It is our understanding that Dick Monkman has also been working on ELF formula modifications. This change should be applied within the context of any changes he may propose.
- B. The second change would allow ANS crude to be the benchmark for determining value at the point of production. As it now stands, the cost of oil at west coast refineries is the statutory value indicator. As ANS crude has now replaced foreign oil as the predominant oil on the west coast market, it is recommended that the reference to imported foreign crude be removed.
- C. The third proposal is much more difficult to describe, but deals with the time periods which should be considered in determining value to be used in the ELF computations. The submitted draft gives the Department final authority to determine value. Language needs to be drafted to allow taxpayers to use a "pre-authorized" provisional number for value until the Department completes its audits. AS 43.55.013(e) [for oil] and AS 43.55.013(h) [for gas] require "the average monthly direct operating cost for oil or gas production operations of the lease or property shall be determined based on a period of not less than four consecutive months." There is no period of time stated to be used to establish value. This ambiguity results in the department and the taxpayer taking opposite positions.

Oil companies have taken the position that the value of crude oil one month prior to the request for the hearing should be used in the ELF computations. The Department has taken the position that

an average of several months, as is required for direct operating costs, should be used. Without a correction to the statute, the Department could be locked into the use of an unrealistic value for a period of 12 or more months depending on whether this is the first or subsequent year of production. One possible interpretation would be that legislative history was created in 1977 when it was felt that oil prices would only continue to increase. With increasing prices the State would be better off using a one month value in that it would presumably be the highest value that could be obtained. However, if prices continue to fluctuate, as they have over the past several months, the only equitable solution to all the parties, the taxpayers and the State, would be to use an average value determined over several months.

- D. This change deletes the term "only royalty: in AS 43.55.013(e). Discussion of the change follows in section E.
- E. This change deletes the term "only royalty actually and currently paid" in AS 43.55.012(h). It could be argued by the oil industry that royalty paid in value should be allowed as a direct operating expense. The Department has taken the position that the words "only royalty" in AS 43.55.013(e) refer to the direct operating costs to produce the royalty oil and not the royalty paid to the State. Without this change, the direct operating expense will be increased from 12 1/2 to 20% depending on the particular taxpayer involved.

Although royalty expenses have been incurred by paying the royalty in value, the taxpayers have retained the oil for their own use or for sale to a third party. The Department has taken the position that the value of the oil retained must be credited against the royalty expense claimed resulting in a net expense of zero.

If the royalty is paid in kind, rather than in value, a separate deduction for this oil would be allowed. It makes no sense then to allow a taxpayer a deduction if the royalty is paid in value rather than in kind.

The deletion of the above language would correct this problem.

Conclusion:

We have spent considerable time identifying problems with the way the ELF is working. Additional drafting work needs to be done, especially with respect to the issue in "C" above. We will continue to work on the proposed legislation over the next few weeks.

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Revision Date

REQUEST

Bill/Resolution No: _____
Title: Technical Changes to Compu-
tation of Economic Limit Factor
Sponsor: Governor
Requestor: _____
Date of Request: _____

FISCAL DETAIL

Agency Affected: Department of Revenue
BRU: Audit

Components:
Audit Division

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
<u>OPERATING</u>						
100 PERSONAL SERVICES	-	-	-	-	-	-
200 TRAVEL	-	-	-	-	-	-
300 CONTRACTUAL	-	-	-	-	-	-
400 SUPPLIES	-	-	-	-	-	-
500 EQUIPMENT	-	-	-	-	-	-
600 LANDS & STRUCTURES	-	-	-	-	-	-
700 GRANTS, CLAIMS	-	-	-	-	-	-
800 MISCELLANEOUS	-	-	-	-	-	-
<u>TOTAL OPERATING</u>	-	-	-	-	-	-
<u>CAPITAL</u>	-	-	-	-	-	-
<u>REVENUE</u>	-	-	-	-	-	-

FUNDING: (Thousands of Dollars)

GENERAL FUND	-	-	-	-	-	-
FEDERAL FUNDS	-	-	-	-	-	-
OTHER	-	-	-	-	-	-
<u>TOTAL</u>	-	-	-	-	-	-

POSITIONS:

FULL-TIME	-	-	-	-	-	-
PART-TIME	-	-	-	-	-	-
TEMPORARY	-	-	-	-	-	-

ANALYSIS: Fiscal impact has not been calculated at this time.

Prepared By: Steven E. Kettel
Division: Audit Division

Phone: 465-2343
Date: August 21, 1986

Approved by Commissioner: _____
Agency: Revenue

Date: _____

Distribution (by Agency preparing fiscal note):

Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

Bill Analysis
ELF Amendments
Audit Division
August 20, 1986

A. AS 43.55.011(a) is amended to read:

There is levied upon the producer of oil a tax for all oil produced from each lease or property in the state, less any oil the ownership or right to which is exempt from taxation. The tax is equal to either the percentage-of-value amount calculated under (B) of this section multiplied by the economic limit factor determined for the oil production of the lease or property under AS 43.55.013 or the cnet-per-barrel amount calculated under (C) of this section, whichever is greater.

B. AS 43.55.013(f) is amended to read:

For the purpose of calculating the economic limit, the value at the point of production of oil produced from the lease or property shall be determined on the basis of the acquisition cost C.I.F. at west coast refineries for (reported oil) ANS crude oil of like quality, minus the reasonable cost of transportation between the point of production of the oil from the lease or property and those west coast refineries. Final determination of value at the point of production will be determined by the Department upon audit of taxpayer records.

C. AS 43.55.013(i) is amended to read:

For the purpose of calculating the economic limit, the value at the point of production of gas produced from the lease or property shall be determined on the basis of the volume weighted average price paid for gas of like quality and pressure in the same field. Final determination of value at the point of production will be determined by the Department upon audit of taxpayer records.

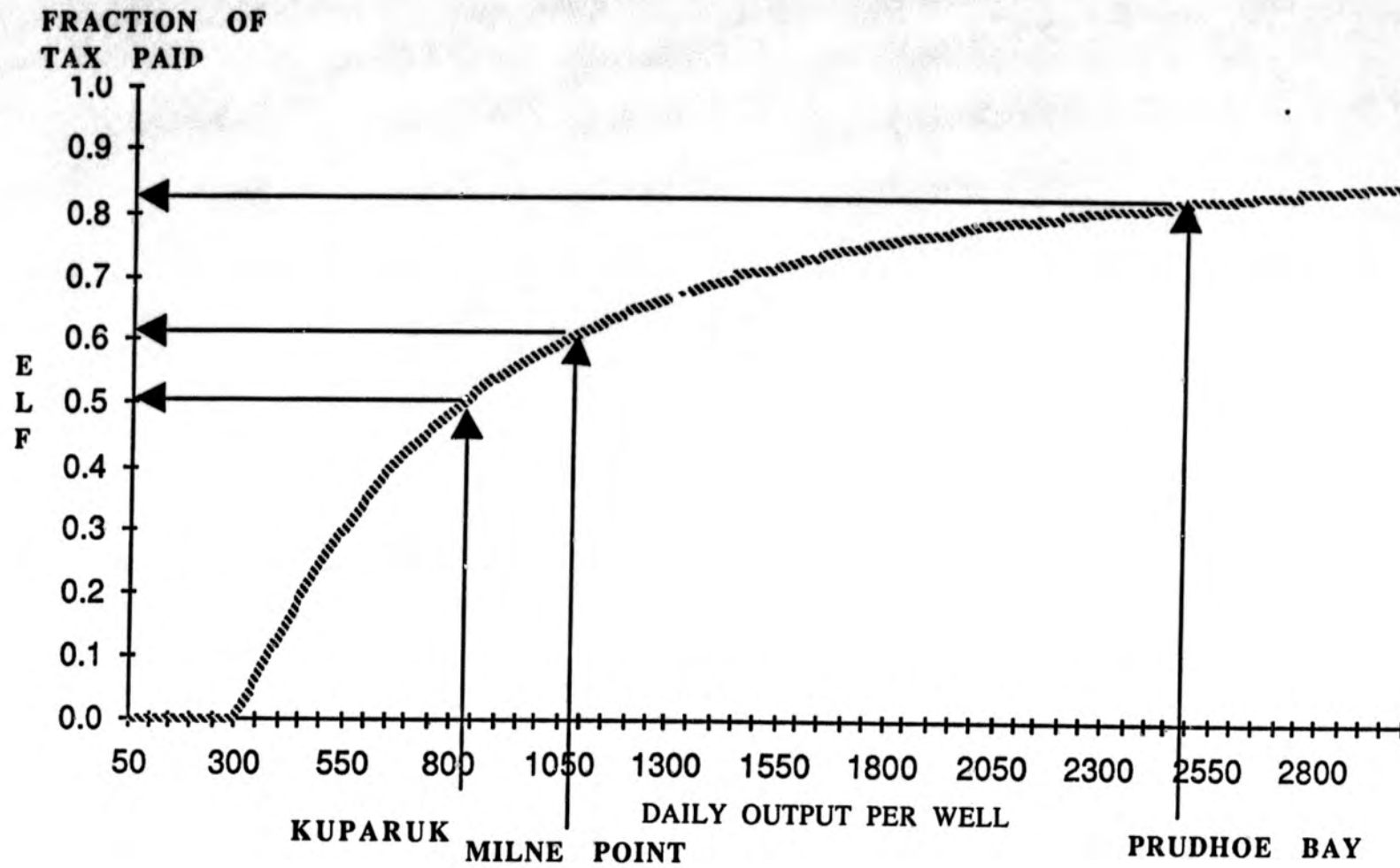
D. AS 43.55.013(e) is amended to delete:

"only royalty"

E. AS 43.55.013(h) is amended to delete:

"only royalty actually and currently paid"

ECONOMIC LIMIT FACTOR



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

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

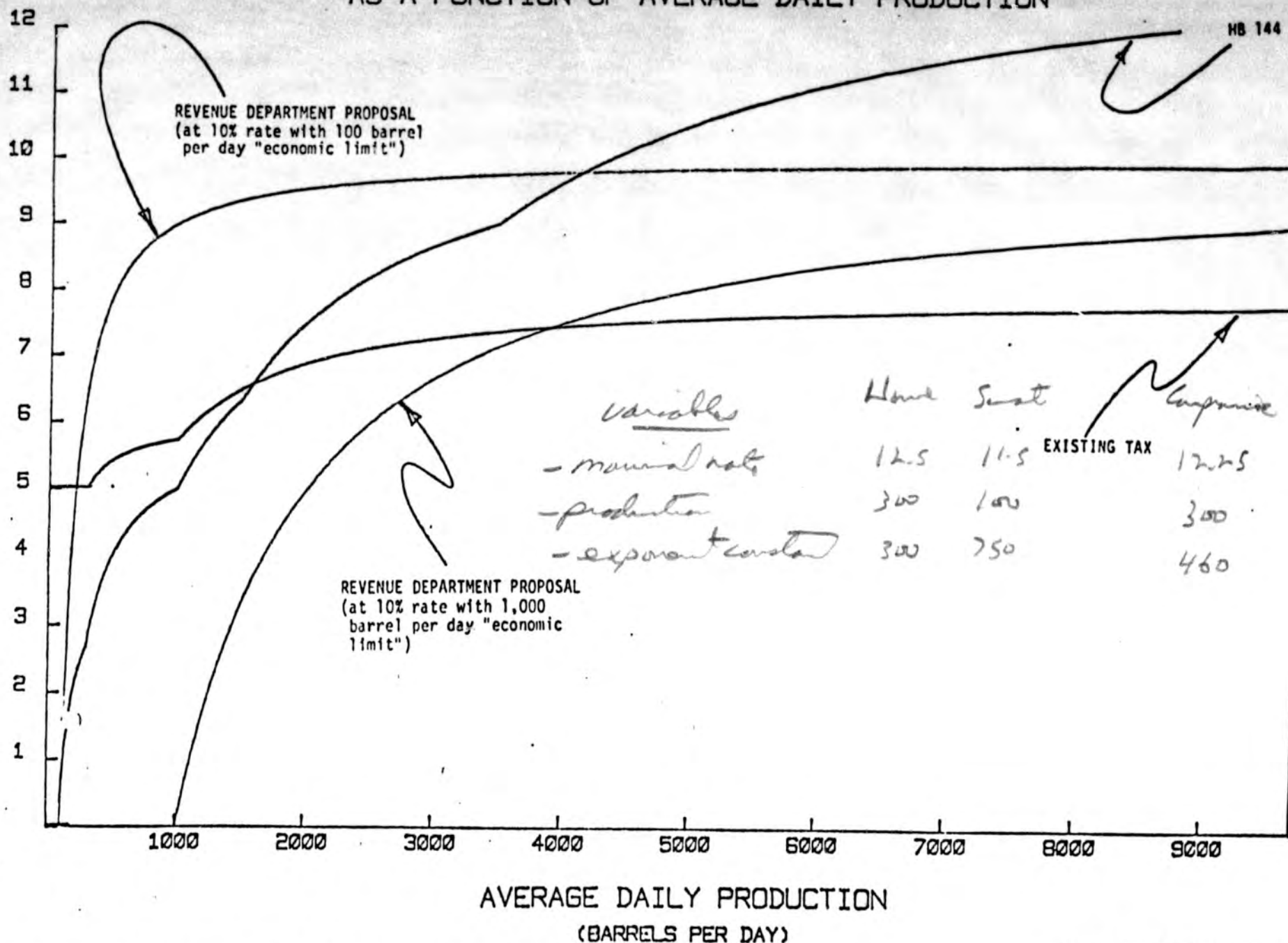
$$ELF = (1 - [6,492,000/40,201,710])\exp(460*16,230/6,492,000)$$

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

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

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

EFFECTIVE SEVERANCE TAX RATE AS A FUNCTION OF AVERAGE DAILY PRODUCTION



DON Y=10*(X-100)/X; INTEGRAL F(X)=65114.03

DON Y=10*(X-1000)/X; INTEGRAL F(X)=67005.60

LEGISLATIVE AFFAIRS AGENCY
RESEARCH DIVISION
15 February 1977

EFFECTIVE SEVERANCE TAX RATE
(PERCENT)

CASE 1

HOW THE ELF IS CALCULATED

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

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

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

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

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

$$ELF = (.8789) \exp (1.533)$$

$$ELF = .82$$

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

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

CALCULATION EXAMPLE

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

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

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

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

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

DRAFT OUTLINE
OMB Briefing to Joint Special Committee on Taxation:
The Economic Limit Factor and Alaska's Severance Tax

1. Introduction to presentation.
2. The ELF -- what it is and how it works.
 - A. Concept. *Erickson*
 - B. The formula.
3. Evolution of the current ELF.
 - A. Production taxation in Alaska before 1977. *Erickson*
 - B. Introduction of the ELF in 1977 session.
 - C. 1981 oil production tax changes.
4. Revenue effects of the ELF. *Chastler*
 - A. Effects compared with no ELF.
 - B. Effects of the ten-year switch that turns the Prudhoe ELF "on" in FY 88.
 - C. Effects of the trapdoor in the floor.
5. Previous proposals for changing the ELF.
 - A. Remove 10 year exemption switch.
 - B. End trapdoor by excluding cents-per-barrel from application of ELF.
 - C. End producer initiated modification of PEL.
 - D. Add field productivity to the ELF formula.

John R. Kemp
Division Manager

Conoco Inc.
3201 'C' Street, Suite 200
Anchorage, AK 99503

September 4, 1986

Joint Special Committee on State's Tax Policy
Senator Frank Ferguson, Chairman
1024 W. 6th Street, Suite 203
Anchorage, Alaska 99501

Dear Senator Ferguson:

The high drilling and production costs and the decline in the value of crude oil significantly impacts the development of new fields in Alaska. It also impacts the decision to continue operating any fields in the State. One of the cost factors, the State's oil and gas production tax, is directly controlled by the State. The modifications and revisions to the present production tax statutes may be the deciding factor for future oil and gas development in Alaska.

The present production tax is based on a monthly production rate at the economic limit OF 300 barrels/day times the number of well days. This is called the economic limit factor (ELF). The statutory presumption is that the ELF represents the producer's break-even point. It is presumed that the producer is making profit from the production of oil and gas before reaching the ELF. The ELF, however, may be rebutted. Rebutting the presumption allows a producer to establish by clear and convincing evidence that the break-even point is higher than 300 barrels for the field or unit. Successfully rebutting the ELF and establishing a new ELF results in a downward adjustment of the production tax payable by the producer.

The legislators who enacted the production tax statutes were farsighted and concerned that a rigidly structured production tax would force producers of economically marginal fields or units to shut down wells prematurely. See, e.g., Governor's transmittal letter for S.B. 238, March 11, 1977, 7th Journal, at 540-41. Prior to 1977, production tax liability was calculated on a rigid stair-step approach with incremental increased taxes based on the amount of production.

This approach was insensitive to the problems of marginal fields and the geographic variation of cost and production.

Early in 1977 after the introduction of the Senate and House production tax bills which would have continued the stair-step approach, the Alaska Department of Revenue published an in-depth comprehensive report titled "Alaska's Oil and Gas Tax Structure", a study with recommendations for improvement. See testimony of Sterling Gallagher, Commissioner of the Department of Revenue, before the House Finance Committee, April 14, 1977. In developing the presumptive ELF factor, the legislature has provided a mechanism to allow production tax relief to producers of marginally economic fields. The present production tax allows the producers to establish their actual break-even point and to be assessed production tax from the point of the field or unit's production at a profit. In essence, the producer is not forced to pay taxes while in a negative profit or loss situation. The provisions for this production tax relief are not automatic. The producer must request a formal hearing and prove by clear and convincing evidence that its break-even point is different than that presumed by the statute. The economic sensitivity in the current production tax statutes allow the States to grant relief to producers of marginally economic fields and allows the production operations to continue, rather than to shut-in during times of unprofitability.

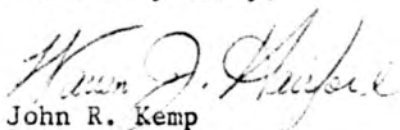
Proposals for new legislation to change the ELF provisions are now under consideration. Conoco urges the legislature to look to the future of Alaska. In the short run, the State may benefit by establishing a fixed minimum tax. It is anticipated that the minimum tax would approximate the current 80 cents per barrel resulting from the presumed ELF. A production tax at this rate could contribute to the shut-in of Milne Point Unit. Shut-ins of these types of units and the prohibitive effect of a fixed tax on the development of new fields means a reduction in the State's employment rate and a detriment to the local economy. It also means a reduction in both the State and local ad valorem taxes. Alaska's economy will stagnate.

Conoco urges the State to maintain the current tax structure. Careful and thoughtful analysis was used in the establishment of the production tax, with the ultimate goal of maximizing both income to the State and the conservation of the State's most valuable non-renewable resource. A panic-induced tampering with the existing law may produce deleterious effects in both near term and long term economic stability. In the alternative, if action on the production tax must be undertaken, Conoco strongly urges that the first 50,000 barrels per

Senator Frank Ferguson
September 4, 1986
Page 3

day of production from a unit be exempted from any proposed changes in the tax structure. This provision would maintain the original intent of maximizing resource utilization in economically vulnerable units. This type of provision will encourage the continued operation of Milne Point and other small units. It is also farsighted enough not to require yearly amendments and changes and, thus, will encourage the continued development of the oil and gas fields of Alaska.

Yours very truly,


FCR John R. Kemp
Division Manager

VV
HG/AEH
520.0

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 PRODUCTS

September 4, 1986

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

Dear Senator Ferguson:

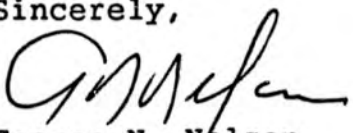
I recently received the enclosed paper on the Economic Limit Factor prepared by Tom Williams and I thought it would be of interest to you and perhaps other members of the Special Committee. The paper presents an overview of the ELF, explains how it functions and why it was originally written into Alaska's statutes.

Tom prepared the paper at the request of the Alaska Oil and Gas Association Tax Committee. I must emphasize, however, that it is not an official AOGA position paper and should not be taken as such.

A copy of this paper is being also sent to Rep. Grussendorf and I leave it to your discretion to distribute it to other committee members.

I look forward to seeing you on September 11.

Sincerely,



George N. Nelson

cc: Rep. Ben Grussendorf w/enclosure

THE ECONOMIC LIMIT FACTOR
IN ALASKA'S OIL AND GAS PROPERTIES
PRODUCTION TAX

By Thomas K. Williams

September 1986

About the Author

Thomas K. Williams may rightfully lay claim to being the "father of the ELF" since he was the one who first proposed the idea of an economic limit factor for the production tax in late 1976, when he was Director of Petroleum Revenue for the Alaska Department of Revenue. As director, he had immediate responsibility for administering the state's oil and gas tax laws, and he drafted many of the regulations that are still in effect for those taxes. Mr. Williams was director from September 1975 until April 1979, when he became Commissioner of Revenue for the remainder of Governor Hammond's second term. Prior to joining Revenue Mr. Williams was an Assistant Attorney General for the state, specializing in oil and gas matters. He is currently Vice President and General Counsel of Cook Inlet Region, Inc. Mr. Williams received bachelor's and master's degrees in history from Princeton and Harvard, respectively, and earned his law degree at Stanford. He has lived in Alaska since 1973.

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WHAT IS THE ELF?

The Economic Limit Factor, or ELF, is a mathematical formula that changes the rate of tax on oil and gas production under Alaska's Oil and Gas Properties Production Tax (the "Production Tax"), AS 43.55. Without the ELF, these rates would be the nominal rates set out in the statute -- 15 percent 1/ of the value of taxable oil production 2/ (12.25% during the first five years of production from a lease or property 3/) or \$0.80 per barrel, 4/ whichever is greater. 5/ The \$0.80 cents-per-barrel amount is for oil having an API gravity of 27 degrees, and it is increased or decreased by half a cent for each degree above or below 27 degrees, respectively, in the API gravity of the actual oil produced. 6/ This adjustment to the cents-per-barrel amount

-
- 1/ AS 43.55.011(b) (15 percent rate for oil produced after June 30, 1981).
 - 2/ AS 43.55.011(a) excludes "any oil the ownership or right to which is exempt from taxation". Such exempt oil almost invariably is state or federal royalty oil.
 - 3/ AS 43.55.011(b) ("for a lease or property coming into commercial production after June 30, 1981, the percentage-of-value amount equals 12.25 percent of the gross value . . . of taxable oil produced from the lease or property in the first five years after the start of commercial production and equals 15 percent . . . thereafter").
 - 4/ AS 43.55.011(c). This statute also specifies a cents-per-barrel rate of \$0.60 for "taxable old crude oil", referring to "old oil" under former federal oil price controls. With the expiration of those controls, there is no longer any current production to which the \$0.60 rate applies.
 - 5/ AS 43.55.011(a) requires payment of the Production Tax on the basis of the greater amount, with the percentage-of-value amount deemed to be the greater if both amounts happen to be equal. It used to be necessary to establish which amount was being used when both amounts were equal because former AS 43.55.011(d) (repealed by § 18, ch. 116, SLA 1981) called for certain payments into the Alaska Native Fund when the Production Tax was paid on the cents-per-barrel basis.
 - 6/ AS 43.55.012(b).

for API gravity is made before the ELF is applied. 7/ For taxable gas, the nominal tax rate is greater of ten percent of its value or \$0.064 per thousand cubic feet (Mcf) 8/ before applying the ELF.

The ELF ranges in value from zero to one, although the way the formula is set up, it could approach, but never actually reach, one. However, by statute, if the calculated value of the ELF under the formula is greater than 0.7 for oil during the first ten years of production from a lease or property, then the ELF is defined to have a value of one; 9/ after ten years of production, the ELF equals its calculated amount under the formula, whether it is above or below 0.7. 10/ There is no corresponding rule changing the value of the ELF for gas from its calculated value under the gas ELF formula. 11/

The actual tax rate for taxable production from a lease or property equals the nominal tax rate multiplied by the ELF for that lease or property. Thus for instance, with oil, as the ELF varies from one down to zero, the effective

7/ Under AS 43.55.011(a) "[t]he tax is equal to either the percentage-of-value amount calculated under (b) of this section or the cents-per-barrel amount calculated under (c) of this section, whichever is greater, multiplied by the economic limit factor". AS 43.44.011(c) states "[t]he cents-per-barrel amount equals . . . \$0.80 per barrel . . . as adjusted by AS 43.55.012 [providing for the API gravity adjustment]". Thus, the API gravity adjustment applies in determining the cents-per-barrel amount under "(c) of this section", and then, if that amount is greater than the percentage-of-value amount, it is multiplied by the ELF.

8/ AS 43.55.016. The reference in AS 43.55.016(c) to an "adjust[ment] by AS 43.55.012" in the \$0.064 cents-per-Mcf rate refers to provisions in AS 43.55.012 that have since been repealed. AS 43.55.012(b), the only portion of AS 43.55.012 currently remaining in effect, is applicable only to oil. The reference to AS 43.55.012 is therefore an artifact from prior versions of the statute and no longer has any application; the cents-per-Mcf rate is uniformly \$0.064 per Mcf (before applying the ELF).

9/ AS 43.55.013(b)(3).

10/ AS 43.55.013(b)(4).

11/ AS 43.55.013(c).

rate of tax can range between something at or very near its nominal rate of 15 percent (or \$0.80 per barrel, if greater), down to zero. 12/

12/ The cents-per-barrel and cents-per-Mcf rates represent, in effect, floors on the prices used for Production Tax purposes. If prices drop below these floor levels, the cents-per-barrel or cents-per-Mcf rate kicks in. However, neither of these represents any sort of floor on the actual amount of tax collected. As explained below, the purpose of the ELF is to scale down the burden of the Production Tax so that the tax does not cause the cessation of production before the property would otherwise reach its economic limit (break even point). If the amount of production needed to break even equals the amount currently being produced, the ELF makes the tax zero whether the tax is calculated on a percentage-of-value basis or on the cents-per-barrel (or cents-per-Mcf) basis.

HOW THE ELF WORKS: THE BASIC THEME

The ELF depends primarily on two things. One is the volume of production needed to "break even" so that the gross value of the production just equals the total direct operating costs (as defined in the statute) for producing that oil or gas. The other is the volume of production actually produced during the month in question.

These two factors have a determinative role in the changing economics of an oil and gas property during its productive life, and the ELF attempts to recognize the economics and set the effective tax rate at appropriate levels throughout that productive life. In general the cost of producing an additional barrel of oil or an Mcf of gas starts off relatively low and increases with time, until eventually the cost of getting the next barrel or Mcf gets so high that it is no longer profitable to continue producing. This point at which operations cease to be profitable is called the economic limit.

The ELF, which gets its name (Economic Limit Factor) from this concept of an economic limit, takes an approximation of how much production is needed to break even at the economic limit, 13/ and then compares that production rate

13/ The statute makes an approximation of the operating costs at the economic limit by specifically listing certain types of operating costs that one would reasonably expect to continue being incurred right up until the economic limit is reached. Such costs are "royalty, production supplies, purchased fuel, routine maintenance, and wages and benefits of employees working on the production operations." AS 43.55.013(e) (oil); AS 43.55.013(h) (gas). Other current costs are specifically excluded from the calculation of the operating costs at the economic limit because one would reasonably expect them to have been discontinued or no longer incurred by the time the economic limit is reached. These excluded costs are capital expenditures, tangible or intangible drilling expenses, costs of well workovers, and costs of replacement or repairs other than routine maintenance. All of these are excluded because they represent expenses or capital investments that a reasonable person would have discontinued making once the property got close enough to its economic limit that the additional cost or investment no longer promised to pay for itself. Amortization and depreciation are excluded because all past capital investments ordinarily should be fully amortized or depreciated before

(footnote continues on next page)

at the economic limit (PEL) to the volume actually being produced. This ratio is an indicator of the profitability of the lease or property. The smaller PEL is in proportion to the total production (TP) currently being produced, the more profitable the lease or property is and, theoretically, the better it can bear a greater "slice off the top" for the Production Tax. Hence the ELF approaches one (and the effective tax rate approaches its maximum possible rate) when the property is most profitable, but later as the property becomes more and more expensive to operate and less and less profitable, the ELF decreases and scales down the tax rate, until finally both the ELF and the tax are zero when the economic limit is reached.

An example will illustrate exactly how this occurs. In its simplest form, the ELF is one minus the ratio of PEL to TP. Put into algebraic terms, the formula for the ELF is:

$$ELF = 1 - [PEL/TP],$$

where PEL is the production rate needed to cover the projected direct operating costs at the economic limit, and TP is total current production. This is the present formula

(footnote continued from previous page)

the property reaches its economic limit. Taxes are excluded because (a) the ELF would have reduced the Production Tax to zero when the property reaches the economic limit and (b) ad valorem taxes, even on a replacement-cost basis of assessment, should reflect the fact that there is no remaining economic life for the assets and hence they would be fully depreciated for assessment purposes at the economic limit (the third tax, the conservation tax of one eighth of a cent per barrel, AS 43.57, is disregarded as having a minimal effect). Insurance and overhead are excluded because they were not considered to be sufficiently "direct" in nature. The costs of terminating production operations and shutting down the property are excluded because they are not costs of production, but costs of ceasing production; if anything, the financial advantage (due to the time value of money) to be gained by deferring the termination costs might be enough in itself to induce an operator to continue producing a property even after it reaches what would ordinarily be its economic limit (i.e., after its production revenue started falling short of the direct operating expenses for continuing that production). The statute also allows the Department of Revenue to adopt regulations that include additional direct operating costs that are not specifically set out in the statute; the Department has adopted no regulation including any such additional types of cost.

for the gas ELF 14/ (formerly, when there were still federal oil price controls, it was also the formula for "old oil" production 15/).

Suppose there is a gas-producing property for which the PEL is determined to be 150,000 Mcf per month. Suppose further that initial production from this property is 500,000 Mcf per month. The ELF will be:

$$\begin{aligned} \text{ELF} &= 1 - [\text{PEL}/\text{TP}] \\ &= 1 - [150,000/500,000] \\ &= 1 - [0.300000] \\ &= 0.700000 \end{aligned}$$

The effective rate of tax will be seven percent of the value of the gas (0.700000 times the nominal rate of 10% equals 7%) or \$0.0448 per Mcf (0.700000 times the nominal rate of \$0.064 equals \$0.0448), whichever is more.

Now suppose the property continues producing at 500,000 Mcf per month for five years, and then, starting in year six and each year thereafter, the rate of monthly production drops by 70,000 Mcf. The following table shows what the ELF and the effective tax rates will be during the life of this property:

Year	Production Rate	ELF	Effective Tax Rate	
			% of Value	\$ per Mcf
1 - 5	500,000	0.700000	7.00000%	\$0.044800
6	430,000	0.651163	6.51163	0.041674
7	360,000	0.583333	5.83333	0.037333
8	290,000	0.482759	4.82759	0.030897
9	220,000	0.318182	3.18182	0.020364
10	150,000	0.000000	-0-	-0-

14/ Id. ("The economic limit factor for gas production of a lease or property equals one minus the ratio of the monthly production rate at the economic limit to the production during the month for which the tax is to be paid").

15/ Former AS 43.55.013(a), repealed by § 18, ch. 116, SLA 1981 ("The economic limit factor for old crude oil production of a lease or property equals one minus the ratio of the monthly production at the economic limit to the production during the month for which the tax is to be paid").

As one can see from this table, when current production starts to decline, the ELF starts falling off too, but at a somewhat slower rate. For example, between Years 5 and 6 production in this illustration falls from 500,000 to 430,000 Mcf, a drop of 14 percent (the drop of 70,000 is 14% of 500,000), but the ELF drops from 0.700000 to 0.651163, a decline of only 6.9767 percent (the change of 0.048837 in the ELF between Year 5 and Year 6 is 6.9767% of 0.700000). However, as the table clearly shows, the ELF eventually does fall off fast enough to get to zero when the economic limit is reached.

What this means in practical terms is that the ELF operates to keep the effective tax rate from initially falling off quite as rapidly as does the profitability of the property measured by the ratio of current production to production at the economic limit. Thus the State's Production Tax collections are higher than they would be if the ELF scaled the tax rate down in direct proportion to the property's profitability.

There is one other thing that this illustration reveals about the ELF, and that is why the effective tax rate cannot ever equal the nominal rates set out in the statute (except of course where there is a special statutory rule making the ELF one if its computed value under the formula is greater than 0.7). The reason is that the ELF itself can approach, but never quite reach, the value of one. For the ELF to equal one, the ratio of production at the economic limit to current production must be zero. 16/ In mathematical terms,

16/ In the "complex" explanation of the ELF, the effects of the exponent in the oil ELF are explained. With the exponent, there is theoretically a second way for the ELF to equal one, and that is if the exponent is zero and the number to which the exponent is to be applied is not equal to zero. However, since the exponent is, in effect, the ratio of 460 barrels a day per well to the actual average daily production rate per well during the month in question, the exponent cannot be zero unless actual production were infinite (this is because 460 divided by any finite number, no matter how huge, will yield a number greater than zero; otherwise, if zero were the quotient, one would be able to reverse the process and multiply that huge but finite number by that quotient (zero) and get back to 460, but zero times any finite number is always zero). Since an infinite production rate is one of the two possible conditions that are described in the "simple" version of the ELF as making the ELF exactly equal to one, there is no practical difference between the "simple" and "complex" versions as to why the ELF is always less than one in the physical world.

if $1 = ELF$, then $1 = 1 - [PEL/TP]$.

Clearly, $[PEL/TP]$ must equal zero for this equation to be true, since if any number other than zero is subtracted from one, the result will not equal one. Thus,

$$PEL/TP = 0, \text{ or}$$

multiplying both sides of this last equation by TP,

$$PEL = 0 \times TP.$$

There is no finite number for TP which will, when multiplied by zero, yield a value for PEL other than zero. This is because zero times any finite number is always zero. And so, if the ELF is to equal one, either current production (TP) is infinite (which is possible in mathematics, but not in the physical world) or PEL equals zero (again, a practical impossibility, since no field would have costs of production equal to zero, especially at its economic limit).

Thus, the larger current production becomes in proportion to PEL, the closer the ELF comes to a value of one, but it never reaches one under the formula in the real world.

REASONS FOR THE ELF

The ELF operates to reduce the effective rate of the Production Tax as an oil and gas property nears its economic limit; i.e., the point where the income (gross value) from producing a barrel or Mcf of production from that property is just enough to cover the costs of producing that barrel or Mcf. At the end, when the property actually reaches its economic limit, the ELF makes the tax rate zero. Why has this ELF feature been included in the Production Tax?

The reasons for the ELF are both historical and economic. Prior to the enactment of the ELF in 1977, Alaska had a "stair stepped" Production Tax on oil in which the tax depended on the average daily rate of production per well. The first 300 barrels a day per well were taxed at five percent of their gross value, the next 700 barrels a day were taxed at six percent, and average daily production in excess of 1,000 barrels a day per well was taxed at eight percent. ^{17/} In addition, there were three similarly "stair

^{17/} Former AS 43.55.010, repealed by § 9, ch. 136, SLA 1977. The three-tiered "stair step" tax (enacted in ch. 4, FSSLA 1973) replaced an earlier four-tier version, in which the four "stair steps" for percentage-of-value had been enacted first (ch. 247, SLA 1970), with the cents-per-barrel rates added later (ch. 101, SLA 1972). The four "steps" in the original progressive tax rate structure were 0 - 300 barrels a day per well (3% rate), 301 - 1,000 barrels a day per well (5% rate), 1,001 - 2,500 barrels a day per well (6% rate), and 2,500+ barrels a day per well (8% rate). When the cents-per-barrel rates were added to the Production Tax in 1972, they were coupled with a credit for royalty payments to the State, the intent and effect of which was to set a floor on combined state revenues from royalty and Production Tax, corresponding to a "wellhead" price of \$2.65 a barrel (which would have dropped to \$2.50 on July 1, 1980 if the law had remained in effect). If prices dropped under that floor, the "lost" royalty income would be made up by the corresponding reduction in the royalty credit against the cents-per-barrel rates. See ch. 101, SLA 1972; 1972 House J. 915-916 (Governor Egan's transmittal letter for House Bill 817, introducing the royalty credit concept; the House Finance Committee took the substance of HB 817 and incorporated it into a House Committee Substitute for a Senate Bill, SB 168, that had already passed the Senate; the version that became chapter 101 of the 1972 Session Laws was the Second Free Conference Committee

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stepped" cents-per-barrel rates -- \$0.16875 on the first 300 barrels a day, \$0.2025 on the next 700, and \$0.27 on anything over 1,000 barrels a day. 18/ These cents-per-barrel rates were for oil having an API gravity of 27 degrees, and they were increased or decreased by two percent for each degree of API gravity that the actual oil production was over or below 27 degrees. The actual tax to be paid was the higher of the two, percentage-of-value or cents-per-barrel. 19/ The cents-per-barrel amount would be greater when the "wellhead" price 20/ fell below \$3.375; for higher

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Substitute for SB 168, SFCCS HCS SB 168). Litigation over this and other enactments of the 1972 Legislature quickly ensued -- Amerada-Hess Corp., et al., v. State (Superior Ct. No. 72-2719 Civil), ARCO Pipe Line Co. v. Herbert (Superior Ct. No. 72-2798 Civil), Mobil Pipe Line Co. v. State (Superior Ct. No. 72-2720 Civil), consolidated. Legislation enacted by the 1973 Special Session, including repeal of the royalty credit provisions, made part of the litigation moot and allowed the remainder to be settled.

18/ Former AS 43.55.015(a), repealed by § 9, ch. 136, SLA 1977. Actually, the base cents-per-barrel rates (before any adjustment for API gravity) were not constant, but changed from month to month based on monthly changes in the Wholesale Price Index for crude petroleum from the Index for the month of December 1973. See former AS 43.55.015(c); Union Oil Co. of Cal. v. Dept. of Revenue, 560 P.2d 21 (Alaska 1977) (upholding the Department's regulation, former 15 AAC 05.694, which made the December 1973 Index the base Index). This monthly adjustment to the cents-per-barrel rates, in turn, meant that the effective floor price for the Production Tax revenue (i.e., the price at which the cents-per-barrel tax became greater than the percentage-of-value tax) also varied from month to month, depending on the Index.

19/ Former AS 43.55.010(e).

20/ The issue of what is the "wellhead" for royalty and Production Tax purposes has itself been hotly disputed. In Alaska when oil emerges from the ground at the "Christmas tree" atop the well casing, it is cleaned and dehydrated and separated from associated and dissolved gases before it is in a marketable condition. After it has gone through the surface equipment to make it marketable, it is then metered and either sold or

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prices, the percentage-of-value amount would be the greater. ^{21/} Thus, the cents-per-barrel rates, in effect, established a floor price for the value of the oil for Production Tax purposes, regardless of how low the actual "wellhead" price might fall.

To illustrate how the "stair step" tax worked, suppose a property had 10 wells and produced 450,000 barrels of 27-degree API gravity, valued at \$10 apiece during a 30-day month. The tax would be calculated as follows:

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transported away from the property through some common carrier pipeline. In a number of other states, the "wellhead" price is effective at the outlet of the tank gauge or custody transfer meter at which it is first measured in a marketable condition. In Cook Inlet and on the North Slope, it may be miles between the Christmas tree and the custody transfer meter, and the separators and dehydrators represent significant expenditures. If the incidence of the tax or the royalty is at the custody transfer meters, none of the costs incurred upstream from that point for the gathering lines, separators and dehydrators and associated equipment would be deducted in determining the price or value for purposes of paying the tax or royalty. Conversely, if the incidence of the tax or royalty is at the Christmas tree, then all those costs are deducted in determining the price or value on which the tax or royalty is computed and paid. The phrase "wellhead price," while commonly used, can therefore be misleading or at least ambiguous in the Alaskan context, since it is unclear whether it refers to the price at the custody transfer meter or a price further upstream, perhaps as far as the Christmas tree. The Production Tax is based on the "gross value at the point of production", which is specifically defined to be the point of measurement (as opposed to the Christmas tree); see AS 43.55.140(6), 15 AAC 55.210(6).

- ^{21/} Five percent of \$3.375 equals \$0.16875, which is exactly what the cents-per-barrel rate was for the first "stair step." Six percent of \$3.375 is \$0.2025, the same as the rate for the second "step," while eight percent of it is \$0.27, the rate for the third. By 1977 the escalation in the cents-per-barrel rates due to the Wholesale price Index (see note 16, above) had raised the effective floor from its original \$3.375 to approximately \$6.10.

0 - 300 bbl/day "stair step": 10 wells, times 300 barrels per well a day, times 30 days, equals 90,000 barrels in this "stair step" of the 450,000 total taxable barrels produced. Five percent of 90,000 barrels at \$10 each equals \$45,000. 90,000 barrels times the cents-per-barrel rate of \$0.16875 22/ equals \$15,187.50.

301 - 1,000 bbl/day "stair step": 10 wells, times 700 barrels per well a day, times 30 days, equals 210,000 barrels in this "stair step", of the remaining 360,000 barrels that didn't fall into the first "step". Six percent of 210,000 at \$10 each equals \$126,000, while 210,000 times the \$0.2025 cents-per-barrel rate equals \$42,525.

1,000+ bbl/day "stair step": 450,000 total barrels, minus the 90,000 barrels falling in the first "stair step" and the 210,000 barrels falling in the second, leaves 150,000 barrels to fall in this top "step." Eight percent of 150,000 at \$10 a barrel is \$120,000, and at \$0.27 a barrel the cents-per-barrel amount is \$40,500.

The total percentage-of-value amount would be \$45,000 plus \$126,000 plus \$120,000, or \$291,000. This is greater than the cents-per-barrel amount of \$98,212.50 (\$15,187.50 + \$42,525 + \$40,500), so the actual tax would be paid on the percentage-of-value basis. The effective rate of tax in this example would be 6.47 percent (\$291,000 total tax, divided by a total value of \$4,500,000 for the 450,000 barrels, equals 0.0647).

After this tax system was enacted in October 1973 (ch. 4, FSSLA 1973), factors affecting the Alaska oil and gas market changed dramatically. The Arab oil embargo of the United States in early 1974 caused oil prices, which had doubled since the previous May, to redouble. Construction of TAPS finally began in 1974, but costs for constructing

22/ For simplicity, the example uses the original rates set out in the statute. In actual practice, those rates would first have been adjusted for changes in the crude oil Wholesale Price Index (WPI). One might also note that, by having 27 degree API gravity oil in the example, the example does not show how to make the API gravity adjustment of two percent in the WPI-escalated cents-per-barrel rates per degree above or below 27 degrees would be made. For an example illustrating all these aspects of the former tax, see Alaska Department of Revenue, Alaska's Oil and Gas Tax Structure: A Study with Recommendations for Improvement (February 1977) (the "1977 Tax Study"), pp. II-6 to II-10.

that project continued to skyrocket over all earlier projections. The federal government imposed a complex system of price controls on crude oil and refined products, with a big question mark deliberately left in the system as to how Prudhoe Bay oil would fit into it all once that field came into production.

Uncertain as to what all these changes might mean in terms of the profitability of Prudhoe Bay and the appropriate level and type of state taxation, the Alaska Legislature in 1975 retained Tanzer Economic Associates, Inc. to conduct an economic analysis of Prudhoe Bay, its profits, and the effects of state taxation policy on those profits. In January 1976 Tanzer's results were released. ^{23/} The "Tanzer Report" concluded that Alaska could significantly increase the overall level of its tax burden on Prudhoe Bay and still provide a sufficient degree of profitability to reward the oil companies there for investing in the development of the field.

A flurry of legislative proposals to increase oil taxes immediately followed, ranging from "excess profit" taxes to a "separate accounting" income tax, with higher Production Tax rates as an option somewhere in between. In the face of misgivings by the Department of Revenue about some of the proposals and the lack of a clear legislative consensus about which proposal(s) to adopt, Governor Hammond prevailed upon the Legislature to give the Department a year to make a comprehensive study of Alaska's then current tax structure and make recommendations in early 1977 about any changes that should be made. ^{24/} Because of strong support in the Senate for a "separate accounting" income tax ^{25/} and be-

^{23/} Tanzer Economic Associates, Alaska's Prudhoe Bay Oil: Profitability and Taxation Potential (January 9, 1976).

^{24/} The 1976 Legislature, through a Committee Substitute for Senate Concurrent Resolution 101 (CS SCR 101), resolved that the Legislative Council, through its Interim Committee on Oil and Gas Leasing and Taxation Policy, was to cooperate with the Administration in making a comprehensive and definitive study of Alaska's oil and gas leasing and taxation policies, with recommendations for improvement.

^{25/} "Separate accounting" is one of two basic ways of determining how much of a multistate business's taxable income is attributable to its activities in a particular state for purposes of that state's income tax. It attempts to isolate the in-state activities from the rest of the business and see how much income results

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cause of criticism of the state income tax as early as 1973, 26/ the Department of Revenue and the Legislative Council engaged Professors Jerome M. Ziefman and Kenneth G. Ainsworth to make a special study of the income tax. 27/

The Department's report -- Alaska's Oil and Gas Tax Structure: A Study with Recommendations for Improvement (February 1977) (the "1977 Tax Study") 28/ -- was transmitted to the Governor on February 11, 1977. Besides incorporating the criticisms and recommendations of Professors Ziefman and Ainsworth about the income tax, the 1977 Tax Study examined the Production Tax, the state ad valorem tax on pipelines and production and exploration equipment and facilities, and the reserves tax. In its review of the Production Tax, the 1977 Tax Study noted:

. . . Typically production taxes do not reflect the expenses incurred to obtain the production. The tax is either some specified percentage of the gross value of the production or a flat fee of so

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from the in-state activities. The other way is "apportionment," in which a slice of the business's total income is attributed to its in-state activities on the basis of a prescribed formula. Of the consultants advising the Legislature in the mid-1970s, perhaps the most respected was Milton Lipton of Walter J. Levy & Associates. He and Dr. Michael Tanzer of Tanzer Economic Associates, Inc. were preeminent advocates of separate accounting as the way to reform the state income tax and even Alaska's oil and gas tax structure in general.

26/ Milton Lipton, "Testimony at the Joint Hearings of Proposed Oil and Gas Legislation before the House and Senate resources Committees" (March 23, 1973 transcript), p. 7.

27/ Ziefman and Ainsworth, The Taxation of the Petroleum Industry under Alaska's Corporate Income Tax (January 9, 1977).

28/ The principal draftsmen of the 1977 Tax Study were John R. Messenger, then Deputy Commissioner of Revenue (Taxation), and Thomas K. Williams, then Director of the Department's Petroleum Revenue Division. Important editorial review and suggestions were made by Dr. David L. T. Knudson, Petroleum Economist in the Petroleum Revenue Division. Revenue Commissioner Sterling Gallagher closely supervised the preparation of the report.

many cents per unit of production. Since it is not based on net proceeds of the production operation, the production tax simply represents another cost of doing business to the producer. 29/

. . . .

Once a discovery has been made and production begins, however, the production tax (and the landowner's royalty) can have a more significant impact on the economics of the production operation and the associated decisions. As operating costs rise during the life of the field, the profit margin shrinks. At some point the total production costs overtake the value of the oil or gas produced, and production can then be continued only by operating at a loss. As one of the costs of doing business, the production tax contributes to the total costs and tends to hasten the time when this break-even point (called the economic limit) is reached. 30/

Besides this negative economic effect of production and severance taxes in general, the 1977 Tax Study drew attention to a particular problem with the "stair step" tax as it applied to areas of Alaska where the operating costs differed greatly from each other:

The current State oil production tax contains a "stair step" feature which is intended to alleviate the adverse impact that a production tax can have on an oil well operating close to its true economic limit. . . . The "stair step" feature of the existing oil production tax schedule is an attempt to reduce the tax rate as production falls closer to the true economic limit. The tax rate declines from 8% to 6% to 5% as individual well output falls. Unfortunately, the current "stair steps" appear to be sized incorrectly.

Economic factors governing production operations vary widely in the State of Alaska. Some areas in the State are located close to the refinery market and have low operating costs. In these areas wellhead values are high. As a consequence, the true economic limit (measured in barrels per day) for these properties can be quite low: 50 to 75 barrels a day per well, or even lower, in some cases in Cook Inlet.

29/ 1977 Tax Study, p. V-19.

30/ Id., p. V-21.

Other crude oil wells in Alaska are not located close to refinery markets and could have extremely high operating costs. The netback value in the field for these isolated areas is lower than in Cook Inlet and the operating and capital costs can be much higher than in Cook Inlet. Accordingly, the true economic limit (measured in barrels per day) for these producing properties can be quite high. Depending on the property, this limit might range from 300 to perhaps 1000 barrels per day [per well]. There is, then, a rather wide range of values which can be generated regarding the minimum production level at which Alaska crude oil wells can be operated.

From this perspective, an economic flaw in the existing or any other "stair step" production tax schedule becomes obvious. By establishing a fixed schedule of "stair stepped" tax rates, the State crude oil production tax is based on the faulty assumption that production economics are similar in Cook Inlet, Prudhoe Bay, and everywhere else in Alaska. 31/

To take care of these problems, the 1977 Tax Study made the following recommendation to replace the "stair steps" with the ELF: 32/

The Department of Revenue recommends perfecting the "stair step" approach as a means of eliminating effects of the production tax on the economics of oil production operations. The key to doing so is not found by creating a series of "steps" and rates that succeed in this for any one area of the State, such as Cook Inlet. As explained in Chapter V, a well producing 1000 bar-

31/ Id., pp. V-28 to V-30.

32/ The original idea for an economic limit was by the then Director of the Petroleum Revenue Division of the Alaska Department of Revenue, Thomas K. Williams, in response to criticism, particularly by Milton Lipton, about the adverse economic effects of the Production Tax on properties as they near their economic limit. The precise formula for the ELF proposed in the 1977 Tax Study (and still the formula for the gas ELF) was developed jointly by Mr. Williams and Dr. David L. T. Knudson, Petroleum Economist in that division. The exponent for the oil ELF and the number 460 appearing in the exponent were features added during the legislative process as the result of work by Alan Latham, who was working for the Legislature.

rels a day may be quite a money maker in Cook Inlet but be mediocre or even marginal in other areas of the state such as the Interior or North Slope. Consequently the "stair steps" that succeed for the Inlet won't eliminate the economic effects of the tax elsewhere. Conversely, "stair steps" designed to eliminate those effects [for] production on the North Slope would give too much away to production in the Inlet.

To eliminate this difficulty, the Department of Revenue recommends an Economic Limit Factor (ELF), based on the ratio of the rate at the true economic limit to the current production rate, as a mechanism for scaling down the tax rate as the production declines toward the economic limit. This would be done by multiplying a basic tax rate times the difference between unity (the number, one) and the ratio of rate at limit to current rate.

. . . .

If the tax law conclusively sets the rate at the economic limit at some specific rate like 200 barrels a day per well, the ELF becomes simply one more economically rigid structure like the present "stair steps." It would not respond to the great regional differences in economic scale for production operations in Alaska. But the great advantage of the ELF over any specific set of "stair steps" is that it can be tied to the actual economic condition of a property anywhere in the state (emphasis in original) 33/

This was the first public proposal to adopt the ELF as a replacement for the "stair steps" in the Production Tax. Instead of a series of discrete "steps" in production rates at which tax rates changed, the ELF represented in effect a smooth curve, a series of an infinite number of "steps" each infinitesimally small. But beyond simply smoothing the "steps" into a continuous curve, the ELF had the additional advantage of allowing the whole curve itself to be shifted, to reflect the rate of production needed for that particular property to cover its basic operating costs at the economic limit. It could reflect the fact that in remote areas of Alaska like Prudhoe Bay, the rate of production needed merely to break even would be very much greater than the rates needed to break even in the more accessible areas like Cook Inlet and the Kenai Peninsula. Thus, the adverse economic

33/ 1977 Tax Study, pp. VI-17 and VI-19.

effects on the economic life of an oil and gas property were no longer a necessary evil of a tax based on gross production value as the Production Tax is.

Governor Hammond acted on this recommendation by introducing Senate Bill 238 to the 1977 Session of the Legislature. 34/ After much legislative wrangling, an amended version of this bill (FCCS HCS CSSB 238) finally passed, and the ELF became part of the Production Tax. 35/

34/ See 1977 Senate Journal, pp. 540-541 (Governor's transmittal letter).

35/ Ch. 136, SLA 1977.

HOW THE ELF WORKS: VARIATIONS ON THE THEME

A. Introduction to the Exponent. The ELF formula for gas production (and formerly for "old oil" under now expired federal oil price controls) is simple and straightforward in its operation. It is merely one minus the ratio of production at the economic limit (PEL) to current production (TP), or to put it into mathematical symbols:

$$\text{ELF} = 1 - [\text{PEL}/\text{TP}]$$

As current production (TP) declines toward the "break even" rate (PEL), the ratio of PEL to TP gets larger and larger, eventually equaling one when TP has declined to the point that it equals PEL. At that point, the ELF becomes $1 - 1$, or zero. The tax is then also zero.

This same formula is at the root of the ELF for oil, except that there is, in addition, an exponent that is applied to it. (For a review of how exponents work and what fractional exponents mean, see Appendix A.)

The exponent in the oil ELF is a fraction whose numerator is 460 times the number of "well days" in the month when the oil was produced, and whose denominator is the monthly production rate at the economic limit. The number of well days is simply the sum for all wells of the number of days each of them was operated during the month. If 10 wells were each operated for 30 days during a month and two others were operated for 25 days each, then the number of well days is 350 (10 times 30, plus two times 25).

Depending on what PEL is, the exponent may be greater than, equal to, or less than one. If it is greater than one, the exponent is a "net power function" -- that is, the effect of raising to a power equal to the numerator of the exponent outweighs the effect of taking the a root equal to the denominator of the fraction. Conversely, if it is less than one, the exponent is a "net root function" and the effect of taking the root outweighs that of raising to the power.

As set out in the "simple" explanation of the ELF, the value of one minus the ratio of PEL to TP is always less than one and can range all the way down to zero. For numbers between zero and one, the effect of a "net power function" is to make the result smaller than the starting number. For example, 0.9 squared is 0.81; 0.01 to the fifth power is 0.000000001; 0.5 to the "1.000001"-th power is 0.499999653. Conversely, the effect of a "net root function" on this range of numbers is to produce a larger number: the square root of 0.81 (0.81 raised to the "one half"-th power) is 0.9; the fifth root (the "1/5"-th or

"0.2"-th power) of 0.0000000001 is 0.01; and 0.5 to the "0.999999"-th power is 0.500000347.

The value of PEL therefore has an important but subtle effect on the exponent. If PEL corresponds to more than 460 barrels a day per well, the exponent becomes a "net root function" and makes the value of the ELF larger than the starting number to which the exponent is applied. On the other hand, if PEL is less than 460 barrels times the number of well days, the exponent is a "net power function" and makes the final value of the ELF less than the number to which the exponent is applied.

B. The PEL Presumption: To Rebut or Not to Rebut?
PEL appears twice in the oil ELF formula -- once in the exponent and once in the calculation of the number to which the exponent is applied:

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

For oil there is a rebuttable presumption that PEL equals 300 barrels times the number of well days in the particular month. 36/ The presumption may be rebutted only once a year, and if it is rebutted, the value that is demonstrated to be the proper PEL must be used for that entire calendar year. 37/ If the presumption is not rebutted, then the formula for the ELF is, in effect, the following:

$$\text{ELF} = (1 - ([300 \times \text{WD}]/\text{TP}))^{(460/300)}$$

The decision to rebut the presumption or not, presents some subtle trade-offs that must be carefully considered before proceeding. On the one hand, if the presumption is not rebutted, then the exponent is a "net power function," which produces a result that is smaller than the number to which the exponent is applied. On the other hand, if the presumption is rebutted and shown to be greater than 300 barrels per well day, then the ratio of PEL to current production will be made greater, leaving a smaller number to which the exponent is applied. If the demonstrated PEL is still less than 460 barrels per well day, the exponent will remain a "net power function" although, as the value for PEL approaches 460 barrels per well day, the effectiveness of the exponent in reducing the number to which it is applied will diminish. The effects of rebutting the PEL -- that is, the reduction in the difference between one and the ratio of PEL to current production (that difference being the number

36/ AS 43.55.013(d).

37/ Id.

to which the exponent will be applied), and the "net power function" nature of the exponent -- will both be working in the same direction and reduce the ELF.

If PEL equals 460 barrels per well day, the exponent becomes exactly equal to one and has no effect at all on the number to which it is applied. The effect of rebutting the presumption is then simply the reduction in the difference between one and the ratio of PEL to current production, which will still yield a lower ELF than if the presumption were not rebutted.

Beyond 460 barrels per well day, the demonstrated PEL will turn the exponent into a "net root function," which will tend to offset the advantage to be gained by reducing the difference between one and the ratio of PEL to current production. Although that advantage always outweighs the offsetting effect of the exponent (in other words, it is always worth rebutting the presumption if possible, because doing so reduces the final value of the ELF), the extent to which this happens depends on how what the current average daily production per well is. The higher the production rate, the smaller the net effect is from rebutting the presumption.

The following table illustrates this for four cases: Case 1 has current average production of 500 barrels a day per well; in Case 2 it is 1,000 barrels a day per well; in Case 3, 5,000 barrels a day per well; and in Case 4, 10,000 barrels a day per well, corresponding roughly to the expectations in early 1977 for what would be the situation with the Prudhoe Bay field by the beginning of 1978. 38/

38/ The throughput capacity of TAPS represents a physical constraint on the rate of production from North Slope fields. TAPS had been planned to start up in three phases: the first at a throughput of 600,000 barrels a day; the second and 1.2 million barrels a day; and the third at 1.5+ million. Until the third phase was implemented, TAPS's throughput capacity represented the upper limit at which the Prudhoe Bay field could be produced (Phase 3 would be at or above the maximum efficient rate for Prudhoe Bay of 1.5 million barrels a day). By early 1977 the first two phases had been "telescoped" together, so that TAPS was expected to be at 1.2 million barrels a day by the end of the year. That was, of course, before the fire and explosion at Pump Station 8 while the pipeline was being filled. However, for purposes of analyzing the ELF, the assumptions used by the Legislature and the Administration reflected the planned 1.2 million-barrel-a-day rate of production from the field into TAPS, with approximately 120 producing wells.

PEL	Case 1 (TP=500) ELF	Case 2 (TP=1,000) ELF	Case 3 (TP=5,000) ELF	Case 4 (TP=10,000) ELF
300	0.245372	0.578740	0.909486	0.954370
400	0.157103	0.555743	0.908565	0.954140
450	0.095012	0.542741	0.908095	0.954023
460	0.080000	0.540000	0.908000	0.054000
470	0.063701	0.537208	0.907905	0.953977
500	-0-	0.528509	0.907618	0.953906
600	---	0.495351	0.906644	0.953670
700	---	0.453309	0.905641	0.953430
800	---	0.396362	0.904608	0.953187
900	---	0.308240	0.903544	0.952940
1000	---	-0-	0.902446	0.952690
2000	---	---	0.889149	0.949972

As the table shows, the effect of raising PEL by 100 barrels per well day from its presumed level of 300 is greatest in Case 1, dropping the ELF from 0.245372 to 0.157103. This reduction of 0.088269 in the ELF represents a tax reduction of 35.974 percent as the result of rebutting the presumption (0.088269 is 35.974 percent of the 0.245372 value of the ELF in Case 1 if the presumption is not rebutted). The reduction from similarly raising the PEL from its presumed rate steadily drops off as the rate of current daily production per well gets larger: the ELF is reduced by 0.022997 for the 1,000 barrel-a-day Case 2 (corresponding to a tax reduction of 3.974 percent); by 0.000921 for the 5,000 barrel-a-day Case 3 (tax reduction of 0.101 percent), and by a mere 0.000230 for Case 4 (tax reduction of 0.024 percent), the case approximating Prudhoe Bay as expected after the completion of TAPS start up. In fact, in the Prudhoe-type case, even showing a PEL of 1,000 barrels a day per well (which is about what PEL was then expected to be if the Prudhoe Bay producers had rebutted the presumption) would only reduce the ELF by 0.001680 from its value with the presumed PEL. Rebuttal of the presumption thus represented a potential tax reduction of only 0.176 of one percent.

The decision to rebut or not rebut the presumed PEL is thus seen to have a rule of diminishing returns, the larger the average of current daily production per well becomes. With a property with extremely productive wells, the potential advantage from rebutting the presumption may simply be too small to be worth the effort even though the property is in a high operating cost area of the state.

C. The ELF's Incentive to Continue Development Drilling in "Mature" Fields. Recent (1986) proposals to modify the ELF so that the presumed PEL is on a field-wide or

reservoir-wide basis instead of a per-well basis have overlooked the incentive that the present ELF offers for producers to continue development drilling in mature fields that are already producing at their maximum efficient rate (MER). This incentive is best illustrated by examining a particular example, rather than trying to describe it abstractly.

Suppose there is a field that is producing at its MER, which is 1,500,000 barrels a day, or 45,000,000 barrels in a 30-day month. Since this is the MER for the field, the 45,000,000 barrel figure will not change if another development well is drilled. Suppose further that there are already 500 producing wells in the field and that the presumption for PEL is unrebutted. What happens to the tax burden if the 501st development well is drilled?

Since the presumption for PEL is in effect, PEL can be replaced in the ELF formula by the expression $[300 \times WD]$. Thus the formula becomes:

$$ELF = \{1 - ([300 \times WD]/TP)^{([460 \times WD]/[300 \times WD])}\}$$

Given how WD is in both the numerator and denominator of the exponent, it cancels itself out and the exponent can be simplified to 460/300. With 500 wells all operating every day in a 30-day month, the number of well days is 15,000. Using the simplified exponent and filling in the variables with the appropriate numerical values from this example, the ELF becomes:

$$\begin{aligned} ELF &= \{1 - ([300 \times 15,000]/45,000,000)^{(460/300)}\} \\ &= \{1 - (4,500,000/45,000,000)^{(460/300)}\} \\ &= \{1 - (0.1)^{(460/300)}\} \\ &= 0.850822 \end{aligned}$$

Now if the 501st well is drilled, the number of well days will become 15,030, and the new ELF will be:

$$\begin{aligned} ELF &= \{1 - ([300 \times 15,030]/45,000,000)^{(460/300)}\} \\ &= \{1 - (4,509,000/45,000,000)^{(460/300)}\} \\ &= \{1 - 0.100200\} \end{aligned}$$

$$= 0.850532$$

While the difference in the ELF seems small -- a reduction of 0.000290 in the value of the ELF, or 0.034 percent -- its dollars-and-cents effect is not insignificant. If the field is still in its first ten years of production, the nominal tax rate is 15 percent. If it costs \$7.00 a barrel to get the oil to market, where it fetches \$15.00, the "wellhead" value is \$8.00. Assuming a one-eighth governmental royalty interest that is exempt from the Production Tax, the annual tax burden on this field with 500 wells would be:

$$\text{Tax} = (1,500,000 \text{ B/D}) \times (365 \text{ days}) \times (1 - 1/8 \text{ tax exempt share}) \times (\$8.00/\text{Bbl}) \times (15\%) \times (\text{ELF of } 0.850822)$$

$$= \$489,116,297$$

Now with 501 wells the tax becomes:

$$\text{Tax} = (1,500,000 \text{ B/D}) \times (365 \text{ days}) \times (1 - 1/8 \text{ tax exempt share}) \times (\$8.00/\text{Bbl}) \times (15\%) \times (\text{ELF of } 0.850532)$$

$$= \$488,949,583$$

In this example, drilling the 501st well results an annual savings of \$166,714 ^{39/} in the Production Tax. One must remember that the decision to drill each additional development well is a decision that must be made on its own merits. Past expenditures in developing the field may or may not have been good investments, but they are in any event irrelevant to the decision to spend additional money for further development. In contrast, a savings in the future Production Tax burden that will result from the drilling of an additional development well is definitely a factor to be weighed in the decision to drill that additional well or not, and it is one that helps tip the balance in favor of drilling it. Other favorable factors affecting the decision will be the ability to sustain production at the MER for a longer period of time if additional wells are drilled, and the likelihood that the amount of production ultimately

^{39/} It should be apparent from the calculation that the exact amount of tax savings to be realized from drilling an additional development well is also dependent on other factors as well, particularly the "wellhead" price. If in the example the market price had been \$25 instead of \$15, the tax savings would have been considerably greater -- \$375,106. Conversely, lower prices would have meant smaller tax savings.

CORRECTION

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HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY**

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recovered from the reservoir will be greater with more wells, both of which benefit the state as well as the taxpayer.

As this example shows, if the presumption regarding PEL has not been rebutted, all of the incentive provided under the present ELF is due to the fact that the presumed PEL is based on well days, which in turn depends on the number of development wells in operation. ^{40/} In other words, the only difference between the calculation of the ELF for 500 wells and the one for 501 wells is in the fact that there are 15,000 well days in the first and 15,030 in the second.

- ^{40/} It is a slightly different story if the presumption has been rebutted and PEL is established as a fixed number of barrels per month. There is still an incentive to drill the 501st well, but this time it is due to the fact that the well-days factor still appears in the numerator of the exponent even though it is no longer a factor in PEL (the denominator of the exponent). To illustrate how the ELF provides a drilling incentive when the presumption has been rebutted, let us start with the same figures as in the example in the main text and suppose PEL has been shown to be 9,000,000 barrels per month. With 500 wells the ELF is:

$$\begin{aligned} \text{ELF} &= \{1 - 9,000,000 / (460 \times 15,000) / 9,000,000\} \\ &= \{1 - 0.200000\} \\ &= 0.842757 \end{aligned}$$

With 501 wells the ELF becomes:

$$\begin{aligned} \text{ELF} &= \{1 - 9,000,000 / (460 \times 15,030) / 9,000,000\} \\ &= \{1 - 0.200000\} \\ &= 0.842469 \end{aligned}$$

In this example the difference in the ELF between having 500 producing wells and 501 is 0.000288. It is coincidental that this figure comes out so close to the difference in the ELF from drilling the 501st well in the example in the main text with the unrebutted presumption about PEL. The point being made here is that, if the presumption is rebutted, the present ELF still provides an incentive to drill another well.

APPENDIX A

A Review of How Exponents Work

Exponents can be sorted into two kinds: whole numbered exponents (1, 2, 3 etc.) and fractional exponents ($1/2$, $1/3$, $2/3$ etc.). The whole numbered exponents are the easiest to understand. Basically, a whole numbered exponent states how many times a particular number is to be multiplied by itself. For example,

$$4^3 = 4 \times 4 \times 4, \text{ and}$$

$$6^7 = 6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 6.$$

Whole number exponents are often called "powers" -- in the two examples above, the first is four to the third power, the second is six to the seventh power.

Now suppose we want to multiply two numbers together, each of which is some power of the same number. What happens? Suppose we want to take four to the third power and multiply it by four to the second power. We already know that four to the third power is four times four times four, and four to the second power similarly is four times four. Thus,

$$\begin{aligned} 4^3 \times 4^2 &= (4 \times 4 \times 4) \times (4 \times 4) \\ &= 4 \times 4 \times 4 \times 4 \times 4 \\ &= 4^5 \end{aligned}$$

Notice that the exponent, 5, in the last line equals the sum of the two exponents, 3 and 2, of the numbers being multiplied together. One may draw from this example the following generalization: if a number, A, to the N-th power is multiplied by A to the M-th power, the product is A to the "N plus M"-th power, or

$$A^N \times A^M = A^{(N + M)}$$

(Remember, though, that it must always be the same base number that is being taken to the different powers and mul-

tiplied together, for this generalization to be true. A to the N-th power times B to the M-th power does not equal A times B taken to the "N plus M"-th power, nor does it equal just A to the "N plus M"-th power or B to the "N plus M"-th power. As a generalized statement, A to the N-th power times B to the M-th power equals A to the N-th power times B to the M-th power, and that's as simple as the statement can be made and still be a generalized statement. In limited kinds of cases it can be made into a simpler statement, but only when there are special values for A and B or special values for M and N, or both.)

Exponents have a similar property when division is involved instead of multiplication. Suppose we wish to divide five to fifth power by five to the third power (the third power of a number is called its "cube"; five to the third power is "five cubed"). The following shows what happens:

$$\begin{array}{r}
 5 \\
 5 \\
 \hline
 3 \\
 5
 \end{array}
 = \frac{5 \times 5 \times 5 \times 5 \times 5}{5 \times 5 \times 5}$$

$$= \frac{5 \times 5 \times 5 \times 5 \times 5}{5 \times 5 \times 5}$$

$$= 5^2$$

Note that the exponent of the answer equals the difference between the exponent in the dividend (five to the fifth) and that in the divisor (five cubed). The generalization to be drawn from this example is that, when different powers of the same number are divided into each other, the exponent in the result equals the difference between those powers:

$$\frac{A^N}{A^M} = A^{(N - M)}$$

This generalized equation gives meaning to two special cases: the numbers one and zero when used as exponents. If N equals M plus one, then:

$$\frac{A^1}{A^1} = A^{(1 - 1)}$$

$$= \frac{A^N}{A^M}$$

$$= \frac{A^{(M+1)}}{A^M}$$

$$= \frac{A^M \times A}{A^M}$$

$$= A$$

Thus, any number to the first power equals that number. (The preceding demonstration does not apply when A equals zero, because it would involve dividing by zero; however, the generalization still applies in the case of zero, so that zero to the first power is zero.)

Now, to get the zero-th power, N and M must be equal, and then the following happens:

$$A^0 = A^{(N-M)}$$

$$= \frac{A^N}{A^M}$$

$$= \frac{A^N}{A^N}$$

$$= 1$$

Therefore, any number (except zero itself) raised to the zero-th power equals one.

Now, what happens if a number being raised to some power is itself the power of another number? For example, four is two to the second power (the second power of a number is its "square"; two to the second power is "two squared"). What is four cubed if it is converted into powers of two?

$$\begin{aligned}
 4^3 &= 4 \times 4 \times 4 \\
 &= (2^2) \times (2^2) \times (2^2) \\
 &= (2 \times 2) \times (2 \times 2) \times (2 \times 2) \\
 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\
 &= 2^6
 \end{aligned}$$

In other words,

$$\left[\begin{matrix} 2 \\ 2 \end{matrix} \right]^3 = 2^6$$

Notice that the exponent 6 in the answer equals 2 times 3. Once again this example gives rise to a generalization: if the quantity, A to the N-th power, is itself raised to the M-th power, the result equals A to the "N times M"-th power:

$$\left[\begin{matrix} N \\ A \end{matrix} \right]^M = A^{(N \times M)}$$

When a number is raised to the N-th power, we are asking what the product is of multiplying one by that number N times. The N-th root of a number works the other direction. For a given number, it asks what number, when raised to the N-th power, will yield that given number. Thus, two is the cube root of eight, because two cubed (i.e., two times two times two) equals eight.

To show the N-th root of a number (call it A), the exponent is the fraction 1/N. The reason for having 1/N as the exponent to show the N-th root of a number is as follows: Let R stand for the N-th root of A. then by definition R to the N-th power equals A, or in mathematical terms:

$$R^N = A$$

Now let X stand for the exponent applied to A that is to be used to signify the N-th root of A; In other words, A to the X-th power equals the N-th root of A, which is R. In mathematical terms again, this is:

$$\begin{matrix} X \\ A \end{matrix} = R$$

Substituting A to the X-th power in the second equation above gives the following:

$$R^N = \left[\begin{matrix} X \\ A \end{matrix} \right]^N = A$$

Just a little bit above we showed that if the N-th power of a number is itself taken to the M-th power, the result equals that base number taken to the "N times M"-th power. Hence,

$$\left[\begin{matrix} X \\ A \end{matrix} \right]^N = A^{(X \times N)} = A^1 = A$$

Since A to the "X times N"-th power equals A to the first power, then the exponents, although expressed differently, must be equal. So, X times N equals one. Therefore, X equals one divided by N, or 1/N. Since R, the N-th root of A, equals A to the X-th power, and since X equals 1/N, then R equals A to the "1/N"-th power. Q.E.D.

It is now but a simple step to understand what fractional exponents do. If the exponent is a fraction, M/N, it simply means that the N-th root of the base number is found and then that root is raised to the M-th power, or alternatively, that the base number is first raised to the M-th power and then the N-th root is taken. In mathematical terms:

$$\begin{aligned} A^{(M/N)} &= A^{[(1/N) \times M]} \\ &= \left[A^{(1/N)} \right]^M \end{aligned}$$

or

$$\begin{aligned} A^{(M/N)} &= A^{[M \times (1/N)]} \\ &= \left[A^M \right]^{(1/N)} \end{aligned}$$

It does not matter which is done first, taking the N-th root or raising to the M-th power, as a brief example will show. Suppose we want to take eight to the two-thirds power. The cube root of eight is two, which when squared equals four. Now, reversing the order between taking the root and raising

to the power, the square of eight is 64; the cube root of 64 is four. Both ways, the answer is four.

Fractional exponents expressed in decimal terms are no different from any other fractional exponent. Thus,

$$A^{0.125}$$

is simply the 125th power of the 1,000th root (or equivalently, the 1,000th root of the 125th power) of A. If, as here, the fraction can be simplified (0.125 equals 1/8), there is no change in the result if the simpler fraction is substituted (nor would there be if a less simple form of the same fraction were substituted for a simple one). The 125th power of the 1,000th root of A is exactly equal to the eighth root of A:

$$A^{0.125} = A^{(1/8)}$$

TRANSCRIPT OF UNITARY TAX REPORT
from Alaska News Nightly 2/4/87
by Jay Baltezore

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Two weeks ago Governor Steve Cowper proposed that Alaska repeal its unitary tax formula as a way to attract foreign and multinational corporations. Under the existing tax system, the state has to take a corporation's total structure into account instead of just what it does in Alaska. The tax is calculated by determining a companies' earnings in the state and multiplying that number by whatever percentage that is of its total earnings worldwide.

The governor says having to report worldwide earnings discourages companies from doing business here. Many economists agree, both in Alaska and elsewhere. Across the country, states are looking at repealing their unitary taxes as they compete more and more aggressively for overseas investors. Jay Baltezore reports:

"What the unitary tax, I believe, to the companies out there in the international marketplace, is that it gives them essentially a choice, and its sort of a timing choice. They'll look at Alaska, and they'll look at coal or fish or timber or something else, and they'll say, "Okay, how much do I really need that particular commodity, that item, that resource?"

Dan Dixon has been one of Alaska's most vocal advocates for a change in the state's corporate tax structure. Dixon is the Director of International Trade for the Alaska Department of Commerce and Economic Development. His job: to lobby foreign corporations to invest in the state. Dixon is but one of a growing number of private and public officials who are taking this view of corporate tax and it seems this ground swell of support has come none too soon.

Alaska remains one of only three states that hasn't repealed unitary tax. So this latest move is hardly on the forefront of change. In among those who are clamoring for new legislation, only a few would say unitary tax has been bad for the state. After all, Alaska's economy in the recent past has been controlled by large multinational firms in one major industry: oil. And because they have been required to report worldwide activities as part of Alaska's tax system, the companies have been prevented from assigning most of their business costs to Alaska to avoid paying tax on their production or sales. But all that's changed now. The price of oil has taken a steep drop and the move to diversify the state's economy is gaining momentum. And the way to attract firms, particularly large multinational corporations, say officials, is to provide a tax incentive which doesn't penalize them for doing business elsewhere.

"The states that have passed the unitary tax, like Florida for example, when they did that I think they lost a big IBM plant that was going to be built there. IBM said "forget it, you're not going to take taxes on our worldwide operations just because we have one plant in Florida."

That's Roger Miller, an economist with the Center for Policy Studies at Clemson University. He's also completed a study for the National Science Foundation on why companies locate in particular areas. Florida eventually

repealed its unitary tax and regained the support of IBM. So did California just this last year after several Japanese firms balked at further expansion there under the unitary system. California officials admit they will lose tax money as a result of the change, about \$30 million next year and escalating to about \$200 million in 1990 and 1991. But they claim it will eventually be made up to added property, sales, income, and payroll taxes by incoming firms. Of course, it's fair to say Alaska is hardly in the same league as California. Yet, many observers believe the two states are trying to accomplish the same ends: attract foreign investors, particularly those from the far east.

Frank Danner is the Senior Accountant for the Anchorage office of Peat Marwick Mitchell & Co. and chairs the Alaska Korea Business Council. He says diversifying Alaska's economy won't happen overnight, but the state needs some incentives to get the process moving. "We get enough money from the oil industry. We get, from the oil industry's standpoint, too much money from them anyway. We're not going to, by repealing the unitary, we're not going to increase substantially revenues and develop mines that are not economic, and where there is no world market for the products. There's not going to be a panacea. But it does send signals that the Orientals are very interested in. They've commented on them when I've had trips over there regarding the tax structure and the potential for change."

Several states which have repealed their unitary tax have opted for a system known as the water's edge tax. Although it can take several forms, water's edge is generally viewed as a domestic unitary tax whereby a company's U.S. sales, assets and payroll are calculated with in-state figures. It tends to give some advantage to a company which has only limited U.S. investments. Another alternative is separate accounting which takes into account only in-state sales and expenses, or in the case of oil and gas firms, in-state production. Alaska repealed separate accounting in 1981 in the wake of litigation by oil companies who questioned its constitutionality. The State Supreme Court has since ruled that separate accounting is legal but the state has not chosen to reenact it.

Tax attorney, Harold Snow, says in repealing unitary tax, the state has to take some care in choosing a system to replace it. Snow is a tax partner with the Anchorage office of Robertson, Monagle, and Eastaugh and he says Alaska should tailor its tax system to fit the type of companies it wants to attract. "I think that for most of your industrial concerns, separate accounting is more favorable than the unitary tax, and so I guess the thing that the state would look at basically is how does separate accounting versus unitary accounting impact the businesses that it is trying to get here. I think the state would be foolish to try to do it on a real broad, rushed spectrum, because you're not going to get a new silicon valley up here. It's never going to work, so you have to target what is practical, pragmatic for the state and take a look at it that way."

So far, the Cowper Administration has done little beyond suggesting a change in the tax system. Officials with the Office of Management and Budget say they plan to investigate the matter later this month. In addition, some tax analysts from California have been invited here to share information on that state's program with Alaska revenue authorities. But whatever shape the Cowper plan may take, it's certain to gain the close scrutiny of Alaska's oil

and gas industry. The industry doesn't like tax changes and it's adjusted to more than a half dozen since statehood. Last year, the industry mounted a major publicity drive to discourage a move back to separate accounting and it's assumed it will also oppose a Cowper plan to delay imposition of the new economic limit factor due to take effect this summer. Although oil industry officials have been reluctant to publicly criticize Cowper's proposal to drop the unitary tax, one company person complained that it isn't responsible for the Cowper Administration to penalize oil companies to attract Mitsubishi. And it appears that whatever system is imposed to replace the unitary tax, one or more oil firms will pay more state tax.

Dan Dixon, of the Department of Commerce and Economic Development admits he may soon be locking horns with the oil giants over unitary tax. But he insists the change is needed, with or without the support of the industry. "My hope would be that when we sit down at the table, that if they are on the other side of the table, it's only because there aren't enough chairs on the side that I'm on or the governor is on. We would hope that they would, if there is a move on the part of the legislature or the governor to change that particular act, that particular tax structure with respect to the unitary tax, that they would work with us in developing a system that would cause them the least heartburn possible."

Ironically, this move away from the unitary tax comes at a time when some key lawmakers are reappraising the value of separate accounting. A report released last year by the Alaska Department of Revenue suggested the state would lose money if it reimposed that tax system because it's sensitive to low prices, even those in the current market. However, several legislators now say those figures are misleading and that the state could boost its revenues with separate accounting down to a price of \$11 per barrel of oil.

For APRN in Fairbanks, this is Jay Baltezare.

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Harold C. Heinze
President

December 2, 1986

Senator Frank Ferguson
Chairman
Joint Special Committee on State Tax Policy
1024 W. 6th Avenue, Suite 203
Anchorage, Alaska 99501

Dear Senator Ferguson:

The Joint Special Committee on State Tax Policy's recent meetings have focused in large measure on the Economic Limit Factor and its applications to the North Slope oil fields. While the presentations made to the Special Committee addressed impact on state revenues in detail, we would like to present a producers' perspective of ELF and its impact on future oil production.

The ELF statute as enacted is recognition of the simple economic fact that as production declines in a well, the cost of producing a barrel increases. As a result, ELF is a mechanism to help ensure that oil field development is not prematurely terminated and serves as an incentive to further invest in fields such as Kuparuk, Lisburne and even Prudhoe Bay to maximize total production and extend the life of the field. In short, ELF is one mechanism the State has provided to produce more oil, provide more jobs and to continue jobs longer than would be the case with a flat severance tax rate.

We do not concur with the statements made at the hearings that ELF was a tax break not contemplated by the legislature. To the contrary, we believe the legislature knew full well the ramifications of the scheduled tax impact when it enacted ELF and created a sophisticated mechanism that provided severance tax income to the State without those taxes causing premature abandonment of production.

Today, ELF is an important consideration in ARCO Alaska's investment decisions on the North Slope. Perhaps even more important in our considerations is

Senator Frank Ferguson
Page 2

the issue as to whether or not we as an industry can plan on a stable share of revenue to be provided as taxes for the privilege for operating in this great state. To us, a stable tax policy in Alaska is the single most important contribution the legislature can make to provide a business environment which is conducive to continued petroleum exploration, development and operations.

Thank you for considering my comments. I would be happy to meet with you or other committee members to discuss these issues further at your convenience.

Very truly yours,

Harold C. Heinze
Harold C. Heinze

/pfm

REPRESENTATIVE
BEN GRUSSENDORF

P.O. Box 928
SITKA, ALASKA 99835
(907) 747-8458

RULES COMMITTEE
LEGISLATIVE COUNCIL

DISTRICT 3
ELFIN COVE
PELICAN
PORT ALEXANDER
SITKA
TENAKEE

Alaska State Legislature



House of Representatives
SPEAKER OF THE HOUSE

WHILE IN JUNEAU
P.O. Box V
JUNEAU, ALASKA 99811
(907) 465-3824
(907) 465-3720

October 14, 1986

To: Rep. Ben Grussendorf

From: *Mary* Mary Halloran
Special Assistant

This paper outlines the policy issues inherent in discussion of Alaska's severance tax. These issues have been repeatedly identified since the first major discussions of the production tax in the 1970's.

1. Should the State set a floor for the severance tax, i.e. a minimum tax per barrel produced?
2. If the State sets a floor for the severance tax, should the floor be indexed for inflation?
3. Recognizing that the severance tax can impact the economic limit (breakeven point) of field production, does the State, as a matter of policy, desire to extend field production life?
4. If the State desires to extend field production by an economic limit factor, is the existing formula working to extend production on marginal fields?
5. If the existing ELF does not function as it should in terms of policy objectives, how should it be changed?
6. Should the ELF (existing or altered) be applied to the severance tax floor?
7. If the ELF is applied to the severance tax floor, should royalty barrels be exempted from the ELF?

Currently the Tax Policy Committee has before it eight alternatives suggested by the Department of Revenue and OMB:

1. Establish an 80¢ floor in the severance tax to which the existing ELF does not apply.
2. Establish an 80¢ floor in the severance tax to which the existing ELF does not apply and change the ELF formula so that the PEL is set without discretion at 300 barrels, eliminating the exponent.
3. Establish a \$1.50 floor in the severance tax to which the existing ELF does not apply and add an inflation index to the floor.
4. Eliminate the ELF on all fields.
5. Establish an alternative ELF which measures total field productivity rather than individual well productivity.
6. Establish an alternative ELF (field-based applicability) and establish a severance tax floor to which the alternative ELF does not apply.
7. Postpone the scheduled application of the existing ELF to Prudhoe Bay only.
8. Retain the current statute.

STATE OF ALASKA

DEPARTMENT OF REVENUE

BILL SHEFFIELD, GOVERNOR

STATE OFFICE BUILDING
P.O. BOX 5A
JUNEAU, ALASKA 99811

October 10, 1986

The Honorable Ben Grussendorf
Speaker of the House
P.O. Box 928
Sitka, Alaska 99835

At a recent meeting of the Special Joint Committee for State's Tax Policy, you requested this Division provide you with a basic explanation of the tax issues involved in the majority of our cases currently in appeal status. The following discussion covers the five major taxes on the petroleum industry.

AS 43.55 - Oil and Gas Properties Production Tax
AS 38.05 - Royalties

Royalty audits (with the exception of Net Profit Share Lease audits) have been tentatively curtailed pending the outcome of the Amerada Hess litigation. In prior audits, however, the value basis used for the purpose of calculating the standard royalty was, with minor exceptions, virtually identical to that used for production tax. The audit issues listed below, therefore, pertain to both. It should be noted that royalties are the responsibility of the Department of Natural Resources, and royalty audits performed by the Department of Revenue result in recommendations only and not assessments per se. (Statutory and regulatory references relate to production taxes; royalty provisions are included in the lease contract.)

Gross value:

Issues relating to the value of the production at its sales delivery point or, in the case of producers that refine their own, at the gate to the refinery. Specific issues include calculation of the full consideration received in the sale and the prevailing value of the production in a particular sales market. [AS 43.55 and 15 AAC 55.150-172]

Transportation costs:

Issues relating to the cost of transporting oil or gas from its point of production to the sales delivery point or gate to the refinery. Examples are issues relating to pipeline tariffs, canal tolls and tanker costs, including depreciation and rate of return. [AS 43.55.150 and 15 AAC 55.180-200]

AS 38.05 - Royalties: Net Profit Share Lease (NPSL)

For purposes of a NPSL the State of Alaska is a joint venturer with the leaseholder(s). NPSL audits are, therefore, joint venture audits, with issues relating primarily to the pricing of goods and services charged to a particular lease. As with other royalty audits performed on behalf of the Department of Natural Resources, results are in the form of a recommendation. [11 AAC 83.201-295]

AS 43.20 - Alaska Net Income Tax

Internal Revenue Code:

Issues relating to those sections of the Internal Revenue Code that have been adopted by the State of Alaska. [AS 43.20.021]

Unitary vs separate accounting:

Issues relating to worldwide combination, primarily involving the determination of members of the unitary group.
[AS 43.20.031(i) and 15 AAC 20.300-320]

Business income vs non-business income:

Issues relating to the differentiation of non-business income under the Multistate Tax Compact. Specific issues involve certain interest and dividend income and income arising from the sale of certain investments. [AS 43.19.010 and 15 AAC 19.011-091]

Apportionment factors:

Issues relating to the calculation of the property, payroll and sales factors under the Multistate Tax Compact. Specific issues include both the determination of whose property, payroll and sales to include (unitary type issues) as well as what type of property, payroll and sales qualifies.
[AS 43.19.010 and 15 AAC 19.141-302]

.072 issues:

Issues relating to modifications to the Multistate Tax Compact specified in AS 43.20.072 to be used by taxpayers engaged in oil or gas production or pipeline transportation in the State. Specific issues include the classification of business entities and activities into petroleum and non-petroleum business categories, the handling of Outer Continental Shelf properties, and various adjustments made to intangible drilling and development costs and depletion and depreciation deductions. [AS 43.20.072 and 15 AAC 20.410-590]

AS 43.21 - Alaska Oil and Gas Corporate Income Tax

The gross value and transportation cost calculations used for the AS 43.21 income tax are, with minor exceptions, virtually identical to those used for royalty and production tax purposes. The related audit issues are therefore identical.

Gross value:

Issues relating to the value of the production at its sales delivery point or, in the case of producers that refine their own, at the gate to the refinery. Specific issues include calculation of the full consideration received in the sale and the prevailing value of the production in a particular sales market. [AS 43.21.020 and 15 AAC 21.120-125]

Transportation costs:

Issues relating to the cost of transporting oil or gas from its point of production to the sales delivery point or gate to the refinery. Examples are issues relating to pipeline tariffs, canal tolls and tanker costs, including depreciation and rate of return. [AS 43.21.020 and 15 AAC 21.128-130]

Production expenses:

Issues relating to the calculation of certain deductible expenses pertinent to Alaskan production including royalties, production taxes, windfall profits tax, direct operating costs and certain exploration costs; the amortization of capitalized costs such as those for acquisition and development (includes the issue of oil and gas reserves calculation); and a pro rata deduction for uncapitalized interest and overhead expense. [AS 43.21.020 and 15 AAC 21.200-290]

Pipeline income:

Issues relating to taxable income from oil and gas pipelines in the State. The issue of the deductibility of uncapitalized interest on capital borrowed to acquire, construct, or enlarge the facilities of a pipeline is included in this category
[AS 43.21.030 and 15 AAC 21.300-450]

Apportionable income:

Issues involving taxable income that is not related to oil and gas production or pipeline transportation. Specific issues are similar to the first four categories listed under AS 43.20. [AS 43.21.040 and 15 AAC 21.500-550]

The Honorable Ben Grussendorf
Page 4
October 10, 1986

AS 43.56 - Oil and Gas Exploration, Production and Pipeline
Transportation Property Taxes

Taxable property:

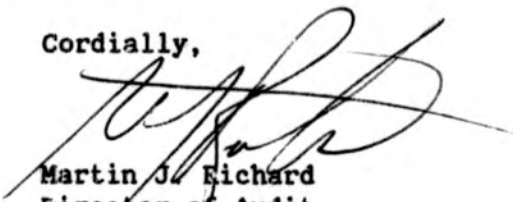
Issues relating to the taxability of certain property.
[AS 43.56 and 15 AAC 56.]

Valuation of taxable property:

Issues relating to the assessed valuation of the pertinent
property. [AS 43.56 and 15 AAC 56.]

Thank you for the opportunity to share with you the major issues
facing the Department at this time.

Cordially,



Martin J. Richard
Director of Audit
(907) 465-2320

MJR:GBC:sp

86-140

STATE OF ALASKA

DEPARTMENT OF REVENUE

BILL SHEFFIELD, GOVERNOR

STATE OFFICE BUILDING
P.O. BOX 5A
JUNEAU, ALASKA 99811

October 9, 1986

The Honorable Ben Grussendorf
Speaker of the House
P.O. Box 928
Sitka, Alaska 99835

OCT 10 1986

RE: Division of Audit Full Staffing Requirements

Dear Mr. Speaker:

At a recent meeting of the Special Joint Committee for State's Tax Policy, you requested this Division provide you with an analysis of the costs and anticipated revenues associated with funding an increase in the State's tax audit force. At the present time, given the States' fiscal crisis, it is imperative that the size of this agency's audit force be increased. Unfortunately, during the past two legislative sessions, the Audit Division has taken substantial cuts to its operating budget. In FY 85, the combined budgets for the Petroleum Revenue Division and Audit Division budgets were \$5 million. By FY 87, as recently revised, the budget stood at roughly \$4.2 million. To reach the Governor's first 15% cut, this Division was required to withhold funding of six auditor positions.

Consequently, the first step toward returning this agency to adequate funding is to restore our budget to the amount authorized by the legislature for FY 87 (\$566,100). This Division is long overdue for an increased appropriation to raise the number of audits we conduct and consequently increase revenues through additional assessments. Prior statistical results of our operations support this conclusion.

In FY 86 alone, this Division assessed nearly \$230 million, representing audits of 1,379 returns. Of these amounts, \$220 million was assessed on audits of only 201 oil and gas type tax returns. While these results represent significant revenues to the State, they also comprise only a small portion of the 733 oil and gas tax returns which are currently under audit, or are backlogged awaiting audit. With each passing month an additional 21 production tax returns are filed and placed in pending status awaiting an available auditor.

In addition to the difficulty we face in keeping current with the volume of returns we must audit, significant auditor time is necessary to assist our Appeals Branch, Hearing Officers and Attorney General's Office in defending prior audits through the appeal process. Presently we have seven auditors assigned to the Chapter 21 and 55 taxes. Often, the field work will require the presence of two or more auditors in order to

complete an audit within a reasonable period of time. With twenty or more different taxpayers, it is unavoidable that we must have our most experienced auditors act as lead auditor on one case and as an assistant on another case. With additional auditors on staff, our most experienced auditors will be able to devote themselves entirely to the larger cases and not be required to assist in a less productive capacity as an assistant.

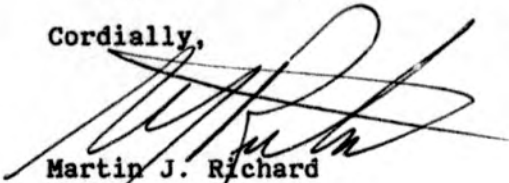
With this in mind the Department proposes to increase its audit and appeals staff to enable us to complete audits more quickly, conduct a greater number of appeals, and without a doubt return substantial revenues to the general fund. The attached schedule is not a "Christmas Wish List", but rather represents a realistic idea of the number of auditors we can utilize productively right now. It is not reasonable for us to request more staff than this for the present. Having only four lead or supervisory auditors (Revenue Auditor V) in Anchorage, these team leaders would be overburdened trying to train more than two additional auditors each for the next year along with their regular audit activities. For this plan to be successful we must be able to train additional auditors while at the same time completing a greater number of audits. Bringing on too many auditors at one time would likely be counterproductive. In future years though, we believe that doubling the size of our audit force would not result in diminished return on your investment. That question needs to be answered later in light of probable changes in tax laws and the State's economy.

Many variables make it difficult to estimate the amount of increased tax assessments which will result with additional staff. On a five-year average, petroleum auditors generate \$11 million each in additional tax assessments. By adding back the six audit positions unfunded in this year's budget, and the eight positions which we propose for the new audit teams, we estimate an additional \$96.8 million in annual State revenues. Based upon our experience in auditing prior year's returns, we anticipate an additional \$500 million in assessments just for the years currently under audit. This estimate does not include what may eventually be assessed for tax years 1984 and 1985. These estimates are predicated on the belief that the technical issues developed in audits currently under appeal are anticipated to exist in subsequently filed returns. As most of the audit issues are being appealed, future court decisions may have substantial impact on the amount of increased revenues actually received by the State.

The Honorable Ben Grussendorf
Page 3
October 9, 1986

Without additional staff however, completion of the field audit work, handling of the appeals and eventual collection may be postponed several years. We plan to submit two increments for FY 88; (a) restore the \$566,100 previously cut, and (b) additional resources for \$706,950 as shown in the attached exhibit. Thank you for the opportunity to express our concerns and suggested solutions regarding the State's audit resources.

Cordially,



Martin J. Richard
Director of Audit
(907) 465-2320

MJR/SEK/tb

86-139

ASSOCIATED COSTS

FY 88

A. 8 Revenue Auditor III
Salary Costs \$50.6 each \$404,800

Travel Costs
6 Trips each @ \$2.0 96,000

Contractual Costs

(4) Wang Portable Laptops @ \$4.1	16,600
(4) Wang Terminals @ \$2.0	8,000
(1) Wang Printer	5,975
Telephone/Communications	4,000
Space Lease Costs	28,800
16 Ports & Serial IOP	3,150
Local Attach	1,050
Electrical/Maintenance	5,000

Supplies

Software DP Supplies	3,200
Calculators, Office Equipment	<u>4,800</u>

Sub-total \$581,375

B. 2 Programmer/Analyst IV @ \$52.2 104,400

Contractual Costs

(2) Wang Terminals @ \$2.0	4,000
(1) Wang Twin Sheet Printer	5,975
Electrical/Maintenance	2,000
Space Lease Costs	7,200

Supplies

Calculator, Office Equipment, Software	<u>2,000</u>
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Sub-total \$125,575

Grand Total \$706,950

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF REVENUE

OFFICE OF THE COMMISSIONER

POUCH S
JUNEAU, ALASKA 99811
PHONE: (907) 465-2300

January 30, 1986

The Honorable Al Adams
Chairman
House Finance Subcommittee on Oil and Gas
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Re: Expedite Collection of
Disputed Taxes

Dear Representative Adams:

A proposal has been raised in the Interim Report of the House Finance Subcommittee on Oil and Gas (January 17, 1986) to require prepayment of disputed taxes at some stage in the appeal process in order to expedite the collection of disputed taxes. We appreciate the opportunity afforded us to comment on this issue.

The Department of Revenue is concerned that the proposal will have a detrimental impact on its operations, emphasis, and ability to litigate tax challenges. Rather than expedite resolution of tax disputes, it is the Department's view that the prepayment requirement concerning disputed taxes will create delays. The adverse impact will be greater the earlier the prepayment requirement is imposed. Additionally, the prepayment proposal will affect taxpayers other than oil and gas companies if it is imposed on the corporation net income tax under AS 43.20 et. seq.

Instead, we believe the collection of disputed taxes can be expedited more successfully through approaches other than the prepayment requirement. These approaches have been recently adopted and their effect is already being felt.

In this letter, we outline the handling of disputed tax controversies by examining the assessment and appeal process, discussing the reasons for delays, and the effect the prepayment requirement may have on the various levels of the Department's appeal process.

I. The Assessment And Appeal Process

There are two levels of administrative appeal within the Department, the informal conference and the formal hearing. Appeal after the formal hearing decision is to Alaska Superior Court. The appeal process can proceed through the courts to the U.S. Supreme Court. Final resolution of the appeal occurs after exhaustion or waiver of judicial appeal rights. It is only then that the disputed taxes must be paid if the final determination is against the taxpayer.