To: Senate Finance Committee

Attn: Senator Bert Stedman, Co-Chairman

From: David Wood

Date: 2 March, 2010

Re: Answer to Question & Request Raised by Senator Thomas during My Testimony (25 February 2010) – Fiscal Years 2008 and 2009

The very pertinent and perceptive question asked earlier today by Senator Thomas sought information with respect to how might the gas dilution / cross subsidy effect identified in Alaska's current production tax rules have impacted the production taxes actually paid in recent periods had a gas line been in operation at the time?

In order to provide an indicative answer to this question I have taken the data for price, volume and costs (excluding Cook Inlet Gas) for fiscal years 2008 and 2009 (i.e. July 2007 to June 2008 and July 2008 to June 2009), which are available from the Alaska Department of Revenue (DOR), Fall 2008 and 2009 Revenues Sources Books (RSB), (Dec 2008and Dec 2009). These two periods encompass the wide range of oil prices that prevailed since the ACES rules were in place. The six tables attached (three for each fiscal period) to this document provide the necessary data and calculations to establish the impact of the cross subsidy effect.

Note that in this calculation the annual figures for production volumes and costs are distributed pro rata according to days / month across each month of the year. This assumption was necessary as DOR do not publish a monthly breakdown of the production tax calculation. This approximation is responsible for the small difference between the actual production tax paid and that calculated in the tables that follow. For fiscal year 2008 the calculated production tax shown in Table 1 is 2.7% higher than the actual production tax paid (\$6867.3 million). For fiscal year 2009 the calculated production tax shown in Table 1 is 4.5% higher than the actual production tax paid (\$3112.0 million). These slight differences are not considered significant in the context of the purpose of this analysis.

Fiscal Year 2008

Table 1 calculates the production tax for oil based on actual data showing the components of that calculation. As no gas is exported the calculations are based upon oil barrels only. This results in total production tax of **\$ 7.462 billion** which is reduced by investment credits of \$411.5 million to \$ 7.050 billion. The calculation shown essentially reproduces the figures from the RSB (2.7% difference attributed to monthly pro rata production and cost allocations).

Table 2 assumes a 4.5 bcf/day gas line and calculates production tax for this hypothetical gas stream on a stand-alone basis (i.e. not combined with oil). The calculation uses the U.S. wellhead natural gas prices from the EIA's records for the months in question. There would be some small differentials between these prices and AECO prices in Alberta, but I believe they are close enough for the purpose. I have also assumed gas transportation costs of \$4.5/mcf (\$27/boe) and field costs (capital costs plus operating costs) of \$400 million (\$1.46/boe) which are those used by Commissioner Galvin in the examples he provided from the DOR in his testimony of 24 February 2010. This data computes a total production tax of **\$ 1.140 billion** to which no investment credits are applied.

By adding the computed production taxes in tables 1 and 2 the stand-alone oil and gas production tax for this FY 2008 (assuming 4.5 bcf /day) would be **\$8.599 billion** (reduced to \$8.187 billion by the deduction of \$411.5 million investment credits).

Table 3 calculates the production tax by combining the revenue cost and volume streams from tables 1 and 2 to provide a combined oil and gas production tax calculation of **\$6.776 billion** (reduced to \$6.365 billion by the deduction of \$411.5 million investment credits).

For this period the loss to the State in production tax revenue caused by the cross subsidy effect of combining oil and gas in the production tax calculation would have amounted to:

\$6.776 billion less \$8.599 billion = -\$1.822 billion.

This calculation is in line with the figures of potential loss in fiscal revenue discussed during the testimonies.

Fiscal Year 2009

Table 4 calculates the production tax for oil based on actual data showing the components of that calculation. As no gas is exported the calculations are based upon oil barrels only. This results in total production tax of **\$ 3.601 billion** which is reduced by investment credits of \$350 million to \$ 3.251 billion. The calculation shown essentially reproduces the figures from the RSB (4.5% difference attributed to monthly pro rata production and cost allocations).

Table 5 assumes a 4.5 bcf/day gas line and calculates production tax for this hypothetical gas stream on a stand-alone basis (i.e. not combined with oil). The calculation uses the U.S. wellhead natural gas prices from the EIA's records for the months in question. There would be some small differentials between these prices and AECO prices in Alberta, but I believe they are close enough for the purpose. I have also assumed gas transportation costs of \$4.5/mcf (\$27/boe) and field costs (capital costs plus operating costs) of \$400 million (\$1.46/boe) which are those used by Commissioner Galvin in the examples he provided from the DOR in his testimony of 24 February 2010. This data computes a total production tax of **\$ 0.583 billion** to which no investment credits are applied.

By adding the computed production taxes in tables 1 and 2 the stand-alone oil and gas production tax for this FY 2009 (assuming 4.5 bcf /day) would be **\$4.185 billion** (reduced to \$3.835 billion by the deduction of \$350 million investment credits).

Table 6 calculates the production tax by combining the revenue cost and volume streams from tables 4 and 5 to provide a combined oil and gas production tax calculation of **\$3.381 billion** (reduced to \$3.031 billion by the deduction of \$350 million investment credits).

For this period the loss to the State in production tax revenue caused by the cross subsidy effect of combining oil and gas in the production tax calculation would have amounted to:

\$3.381 billion less \$4.185 billion = -\$0.804 billion.

This calculation indicates a lower potential loss in fiscal revenue for fiscal year 2009 compared to fiscal year 2008. This is due to the lower prices and value of oil and gas revenue streams in fiscal year 2009. However, \$0.8 billion remains a substantial potential loss in a relative low price / value environment.

Sincerely,

David Wood

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 Table 1. Oil Stand-alone Production Tax Calculation (July 2007 to June 2008)

				(Analys	sis Based	on Actua	IUS West	Coast Pi	rices and	Cost Data)				
	US West Coast Oil Price	Per Barrel Total Costs	Per Barrel Production Tax Value	Progressivity Threshold	PTV less Progressivity Threshold	PTV Rate per Dollar of Adjusted PTV	Incremental Progressivity Rate	Volume (Millions barrels) millions	Combined Progressivity Tax (CPT)	Base Production Tax (BPT) Rate	Base Production Tax (BPT) Value	CPT + BPT Value	CPT + BPT less Investment Credits	
Month	\$/barrel	\$/barrel	PTV \$/barrel	\$/barrel	\$/barrel	%	%	barrels	\$ millions	%	\$ millions	\$ millions	\$ millions	
Α	В	С	D=	Е	F=	G	H=	1	J=	К	L=	M=	N=	
			(B + C)		(D + E)>=0		(F * G)		(D * H * I)		(D * I * K)	(J + L)	(M - P)	
nthly Ana	lysis, \$30 PT\	/ \$/boe thres	hold and 0.00	4% progressi	vity paramete	er under Curr	ent Law as en	acted in 200	7					
Jul	75.93	-22.88	53.05	-30	23.05	0.40%	9.22%	19.4	95.0	25.00%	257.5	352.5		
Aug	73.83	-22.88	50.95	-30	20.95	0.40%	8.38%	19.4	82.9	25.00%	247.4	330.3		
Sep	79.92	-22.88	57.04	-30	27.04	0.40%	10.81%	18.8	115.9	25.00%	268.0	383.9		
Oct	84.77	-22.88	61.89	-30	31.89	0.40%	12.75%	19.4	153.3	25.00%	300.5	453.8		
Nov	92.98	-22.88	70.10	-30	40.10	0.40%	16.04%	18.8	211.3	25.00%	329.3	540.6		
Dec	88.64	-22.88	65.76	-30	35.76	0.40%	14.30%	19.4	182.7	25.00%	319.3	501.9		
Jan	91.16	-22.88	68.28	-30	38.28	0.40%	15.31%	19.4	203.0	25.00%	331.5	534.5		
Feb	94.42	-22.88	71.54	-30	41.54	0.40%	16.61%	18.2	215.9	25.00%	324.9	540.8		
Mar	105.06	-22.88	82.18	-30	52.18	0.40%	20.87%	19.4	333.1	25.00%	399.0	732.1		
Apr	112.37	-22.88	89.49	-30	59.49	0.40%	23.79%	18.8	400.2	25.00%	420.4	820.6		
May	125.41	-22.88	102.53	-30	72.53	0.40%	29.01%	19.4	577.6	25.00%	497.8	1075.4		
Jun	133.78	-22.88	110.90	-30	80.90	0.40%	32.36%	18.8	674.4	25.00%	521.0	1195.5		
							Totals:	229.3	3245.3	25.00%	4216.6	7461.9	7050.4	

Table 2. Gas Stand-alone Production Tax Calculation (July 2007 to June 2008) [Assuming Gas Line Operational]

						(US Gas	Price Dat	a from El	A)					
	EIA U.S. Wellhead Price	Per BOE Total Costs for Gas	Per Barrel Production Tax Value	Progressivity Threshold	Threshold	PTV Rate per Dollar of Adjusted PTV	Incremental Progressivity Rate	Volume (Millions boe)		Base Production Tax (BPT) Rate	Base Production Tax (BPT) Value	Total Production Tax (BPT + Progressivity) Value	CPT + BPT less Investment Credits	
Month A	\$/mcf B	\$/boe C	PTV \$/boe D=	\$/boe E	\$/boe F=	% G	% H=	millions boe	\$ millions	% K	\$ millions L=	\$ millions M=	\$ millions N=	
2007/2008			(B + C)	-	(D + E)>=0	•	п- (F * G)	'	(D * H * I)	"	(D * I * K)	(J + L)	(M - P)	
	lysis, \$30 PT	V \$/boe thresh	· ·	4% progressiv	·/	er under Curr	\ <i>i</i>	nacted in 2007	(- · · · · · · · · · · · · · · · · · · ·		(=,	(/	(/	
Jul	6.32	-28.46	9.46	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	55.0	55.0		
Aug	5.87	-28.46	6.76	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	39.3	39.3		
Sep	5.42	-28.46	4.06	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	22.9	22.9		
Oct	5.90	-28.46	6.94	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	40.4	40.4		
Nov	6.58	-28.46	11.02	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	62.0	62.0		
Dec	6.97	-28.46	13.36	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	77.7	77.7		
Jan	6.99	-28.46	13.48	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	78.4	78.4		
Feb	7.55	-28.46	16.84	-30	0.00	0.40%	0.00%	21.8	0.0	25.00%	91.6	91.6		
Mar	8.29	-28.46	21.28	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	123.7	123.7		
Apr	8.94	-28.46	25.18	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	141.7	141.7		
May	9.81	-28.46	30.40	-30	0.40	0.40%	0.16%	23.3	1.1	25.00%	176.7	177.9		
Jun	10.82	-28.46	36.46	-30	6.46	0.40%	2.59%	22.5	21.2	25.00%	205.1	226.3		
							Totals:	274.5	22.3	25.00%	1114.3	1136.7	1136.7	

Table 3. Oil & Gas Combined Production Tax Calculation (July 2007 to June 2008)

				(A	nalvsis A	ssumes A	Actual Oil	Plus Hyp	othetical	Gas)				
	Oil + Gas Effective BOE Price	Oil + Gas Effective Per BOE Total Costs	Per Barrel Production Tax Value	Progressivity Threshold	PTV less Progressivity Threshold	PTV Rate per Dollar of Adjusted PTV	Incremental Progressivity Rate	Oil + Gas Volume (Millions boe)	Combined Progressivity Tax (CPT)	Base Production Tax (BPT) Rate	Base Production Tax (BPT) Value	CPT + BPT Value	CPT + BPT less \$400 in credits	
Month A	\$/boe B	\$/boe C	PTV \$/boe D=	\$/boe E	\$/boe F=	% G	% H=	millions boe	\$ millions	% K	\$ millions L=	\$ millions M=	\$ millions N=	
A	В		(B + C)	-	r- (D + E)>=0	G	п– (F * G)		(D * H * I)	,	(D * I * K)	(J + L)	M - P)	
Ionthly Ana	lvsis. \$30 PT	V \$/boe thresh	\ <i>i</i>	4% progressiv	· - /	er under Curre	· -/	nacted in 2007	(- · · · · · · · · · · · · · · · · · · ·		(5 , 1,	(5 : 2)	(/	
Jul	55.22	-25.92	29.30	-30	0.00	0.40%	0.00%	42.7	0.0	25.00%	312.5	312.5		
Aug	52.79	-25.92	26.87	-30	0.00	0.40%	0.00%	42.7	0.0	25.00%	286.7	286.7		
Sep	54.09	-25.92	28.17	-30	0.00	0.40%	0.00%	41.3	0.0	25.00%	290.8	290.8		
Oct	57.87	-25.92	31.95	-30	1.95	0.40%	0.78%	42.7	10.6	25.00%	340.8	351.4		
Nov	63.83	-25.92	37.91	-30	7.91	0.40%	3.16%	41.3	49.5	25.00%	391.3	440.9		
Dec	63.13	-25.92	37.21	-30	7.21	0.40%	2.88%	42.7	45.8	25.00%	396.9	442.7		
Jan	64.34	-25.92	38.42	-30	8.42	0.40%	3.37%	42.7	55.2	25.00%	409.9	465.1		
Feb	67.66	-25.92	41.74	-30	11.74	0.40%	4.69%	39.9	78.2	25.00%	416.5	494.7		
Mar	74.92	-25.92	49.00	-30	19.00	0.40%	7.60%	42.7	158.9	25.00%	522.7	681.6		
Apr	80.37	-25.92	54.45	-30	24.45	0.40%	9.78%	41.3	219.9	25.00%	562.1	782.0		
May	89.15	-25.92	63.23	-30	33.23	0.40%	13.29%	42.7	358.6	25.00%	674.5	1033.1		
Jun	96.26	-25.92	70.34	-30	40.34	0.40%	16.14%	41.3	468.7	25.00%	726.1	1194.8		
							Totals:	503.8	1445.4	25.00%	5330.9	6776.3	6364.8	

Table 4. Oil Stand-alone Production Tax Calculation (July 2008 to June 2009)

				(Analys	sis Based	on Actua	l US West	Coast Pr	ices and	Cost Data)				
	US West Coast Oil Price	Per Barrel Total Costs	Per Barrel Production Tax Value	Progressivity Threshold	PTV less Progressivity Threshold	PTV Rate per Dollar of Adjusted PTV	Incremental Progressivity Rate	Volume (Millions barrels)	Combined Progressivity Tax (CPT)	Base Production Tax (BPT) Rate	Base Production Tax (BPT) Value	CPT + BPT Value	CPT + BPT less Investment Credits	
Month	\$/barrel	\$/barrel	PTV \$/barrel	\$/barrel	\$/barrel	%	%	millions barrels	\$ millions	%	Ś millions	\$ millions	\$ millions	
A	В	C	D=	E	F=	G	H=	I	J=	К	L=	M=	N=	
			(B + C)		(D + E)>=0		(F * G)		(D * H * I)		(D * I * K)	(J + L)	(M - P)	
nthly Ana	lysis, \$30 PTV	\$/boe thres	hold and 0.00	4% progressi	vity paramete	er under Curre	ent Law as en	acted in 200	7					
Jul	132.87	-26.15	106.72	-30	76.72	0.40%	30.69%	18.6	607.6	25.00%	495.0	1102.5		
Aug	115.98	-26.15	89.83	-30	59.83	0.40%	23.93%	18.6	398.8	25.00%	416.6	815.5		
Sep	101.86	-26.15	75.71	-30	45.71	0.40%	18.28%	18.0	248.5	25.00%	339.8	588.3		
Oct	73.65	-26.15	47.50	-30	17.50	0.40%	7.00%	18.6	61.7	25.00%	220.3	282.0		
Nov	53.94	-26.15	27.79	-30	-2.21	0.40%	-0.88%	18.0	-4.4	25.00%	124.7	120.3		
Dec	37.70	-26.15	11.55	-30	-18.45	0.40%	-7.38%	18.6	-15.8	25.00%	53.6	37.8		
Jan	39.01	-26.15	12.86	-30	-17.14	0.40%	-6.86%	18.6	-16.4	25.00%	59.6	43.3		
Feb	42.78	-26.15	16.63	-30	-13.37	0.40%	-5.35%	16.8	-14.9	25.00%	69.7	54.8		
Mar	47.75	-26.15	21.60	-30	-8.40	0.40%	-3.36%	18.6	-13.5	25.00%	100.2	86.7		
Apr	46.56	-26.15	20.41	-30	-9.59	0.40%	-3.84%	18.0	-14.1	25.00%	91.6	77.5		
May	58.23	-26.15	32.08	-30	2.08	0.40%	0.83%	18.6	4.9	25.00%	148.8	153.7		
Jun	69.80	-26.15	43.65	-30	13.65	0.40%	5.46%	18.0	42.8	25.00%	195.9	238.7		
							Totals:	218.4	1285.3	25.00%	2315.8	3601.1	3251.1	

Table 5. Gas Stand-alone Production Tax Calculation (July 2008 to June 2009) [Assuming Gas Line Operational]

						(US Gas	Price Dat	a from El	A)					
	EIA U.S. Wellhead Price	Per BOE Total Costs for Gas	Per Barrel Production Tax Value	Threshold		PTV Rate per Dollar of Adjusted PTV	Progressivity Rate	Volume (Millions boe)		Base Production Tax (BPT) Rate	Base Production Tax (BPT) Value	Total Production Tax (BPT + Progressivity) Value	CPT + BPT less Investment Credits	
Month	\$/mcf	\$/boe	PTV \$/boe	\$/boe	\$/boe	% G	% H=	millions boe	\$ millions	% K	\$ millions	\$ millions	\$ millions	
A 007/2008	В	С	D= (B + C)	E	F= (D + E)>=0	G	H= (F * G)		J= (D * H * I)	K	L= (D * I * K)	M= (J + L)	N= (M - P)	
	veie \$20 PT	V \$/boe thresh	\ <i>i</i>	104 progressi		or under Curr	_ , ,	nacted in 2007			(D · I · K)	(J + L)	(IVI - P)	
Jul	10.62	-28.46	35.26	-30	5.26	0.40%	2.10%	23.3	17.2	25.00%	204.9	222.2		
Aug	8.32	-28.46	21.46	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	124.7	124.7		
Sep	7.27	-28.46	15.16	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	85.3	85.3		
Oct	6.36	-28.46	9.70	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	56.4	56.4		
Nov	5.97	-28.46	7.36	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	41.4	41.4		
Dec	5.87	-28.46	6.76	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	39.3	39.3		
Jan	5.15	-28.46	2.44	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	14.2	14.2		
Feb	4.19	-28.46	-3.32	-30	0.00	0.40%	0.00%	21.0	0.0	25.00%	0.0	0.0		
Mar	3.72	-28.46	-6.14	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	0.0	0.0		
Apr	3.43	-28.46	-7.88	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	0.0	0.0		
May	3.45	-28.46	-7.76	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	0.0	0.0		
Jun	3.45	-28.46	-7.76	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	0.0	0.0		
							Totals:	273.8	17.2	25.00%	566.2	583.4	583.4	

Table 6. Oil & Gas Combined Production Tax Calculation (July 2008 to June 2009)

				(A	nalysis A	ssumes A	Actual Oil	l Plus Hyp	othetical	Gas)				
		Oil + Gas									Base			
	Oil + Gas	Effective Per	Per Barrel		PTV less	PTV Rate per	Incremental	Oil + Gas	Combined	Base	Production			
	Effective	BOE Total	Production	Progressivity	Progressivity	Dollar of	Progressivity	Volume	Progressivity	Production	Tax (BPT)	CPT + BPT	CPT + BPT less	
	BOE Price	Costs	Tax Value	Threshold	Threshold	Adjusted PTV	Rate	(Millions boe)	Tax (CPT)	Tax (BPT) Rate	Value	Value	\$400 in credits	
Month	\$/boe	\$/boe	PTV \$/boe	\$/boe	\$/boe	%	%	millions boe	\$ millions	%	\$ millions	\$ millions	\$ millions	
Α	В	С	D=	E	F=	G	H=	I	J=	K	L=	M=	N=	
			(B + C)		(D + E)>=0		(F * G)		(D * H * I)		(D * I * K)	(J + L)	(M - P)	
onthly Ana	lysis, \$30 PT	V \$/boe thresh	old and 0.00	4% progressiv	vity paramete	er under Curr	ent Law as e	nacted in 2007	7					
Jul	94.41	-27.44	66.97	-30	36.97	0.40%	14.79%	41.8	414.1	25.00%	699.9	1114.0		
Aug	79.24	-27.44	51.80	-30	21.80	0.40%	8.72%	41.8	188.8	25.00%	541.4	730.2		
Sep	69.47	-27.44	42.03	-30	12.03	0.40%	4.81%	40.5	81.8	25.00%	425.1	506.9		
Oct	53.91	-27.44	26.47	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	276.7	276.7		
Nov	43.86	-27.44	16.43	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	166.1	166.1		
Dec	36.32	-27.44	8.88	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	92.8	92.8		
Jan	34.50	-27.44	7.06	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	73.8	73.8		
Feb	32.97	-27.44	5.53	-30	0.00	0.40%	0.00%	37.8	0.0	25.00%	52.2	52.2		
Mar	33.61	-27.44	6.17	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	64.5	64.5		
Apr	32.11	-27.44	4.67	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	47.3	47.3		
May	37.36	-27.44	9.92	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	103.7	103.7		
Jun	42.49	-27.44	15.06	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	152.3	152.3		
							Totals:	492.2	684.7	25.00%	2695.7	3380.5	3030.5	