ALASKA LEGISLATURE COMMITTEE FILES 1983-1984

2946 HSA HB 120 - HB 122

2946

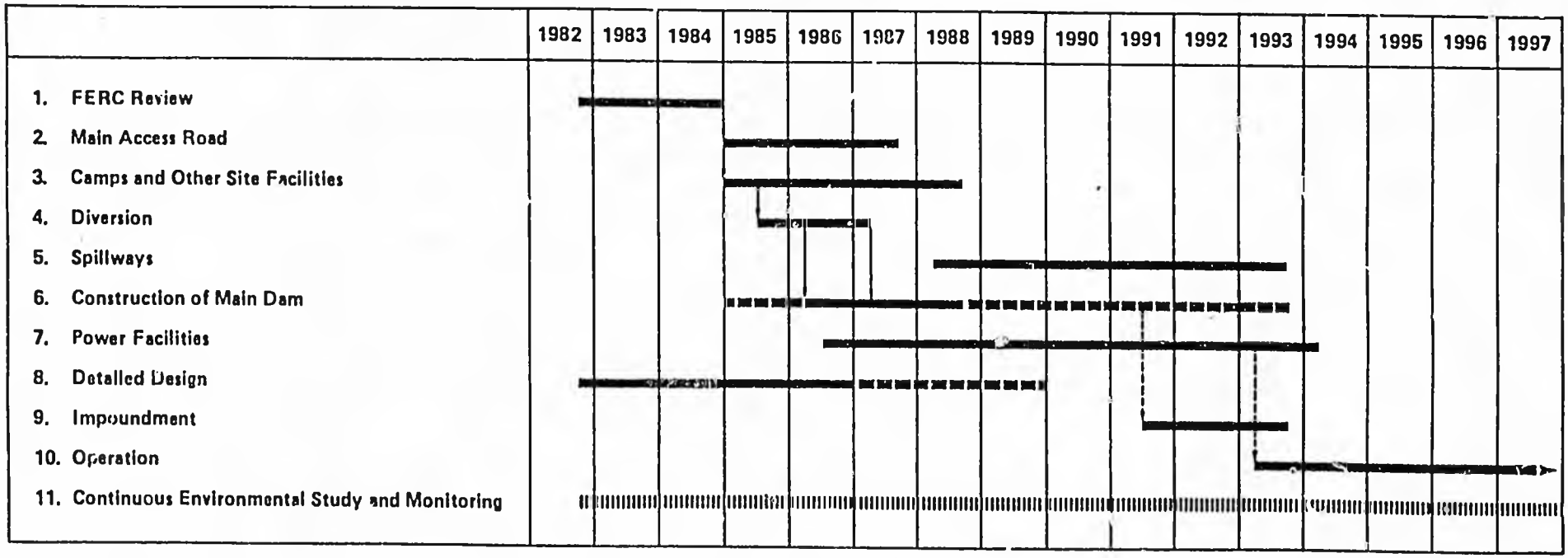


EXHIBIT B -- WATANA CONSTRUCTION SCHEDULE

ACRES

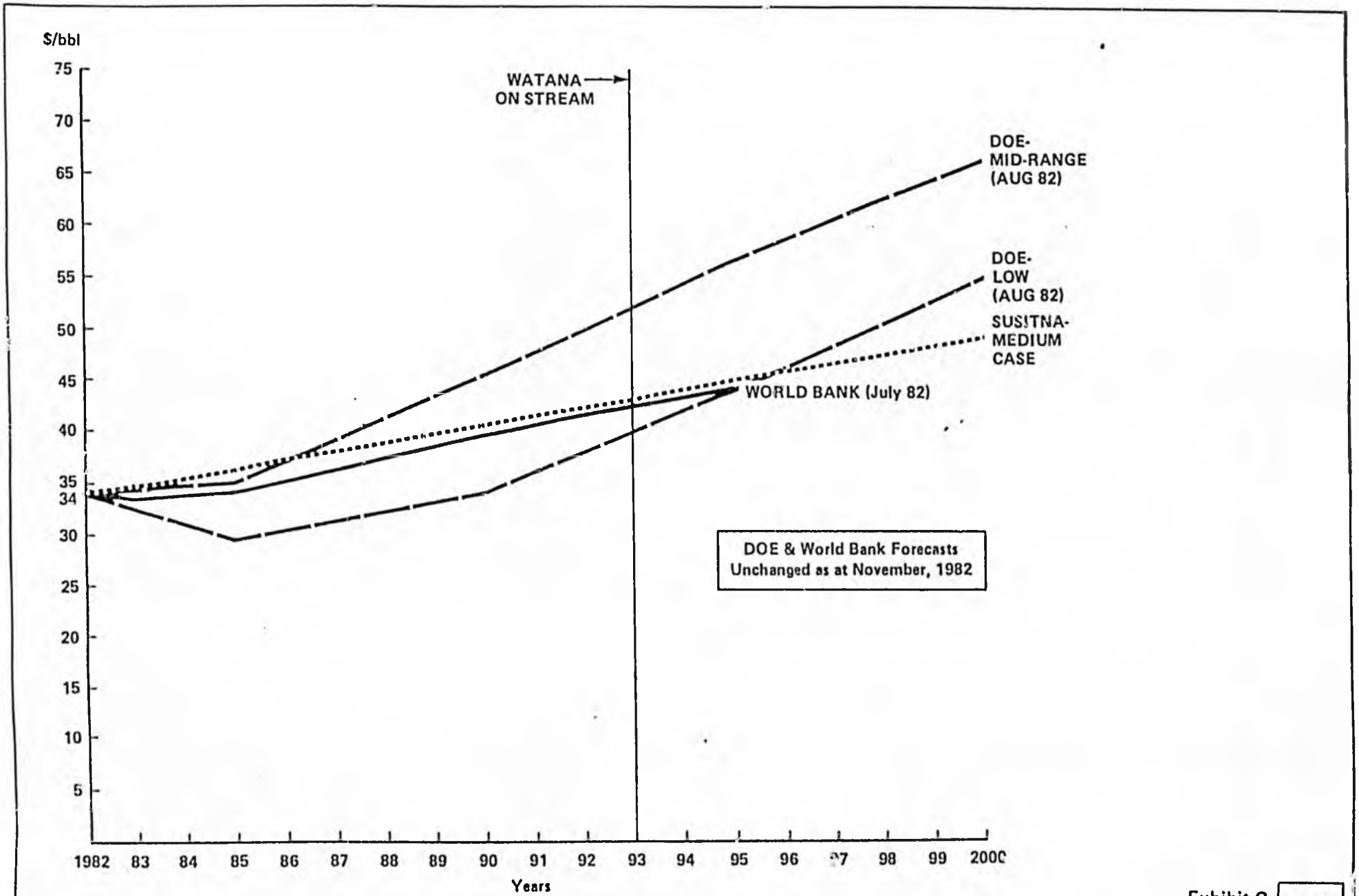
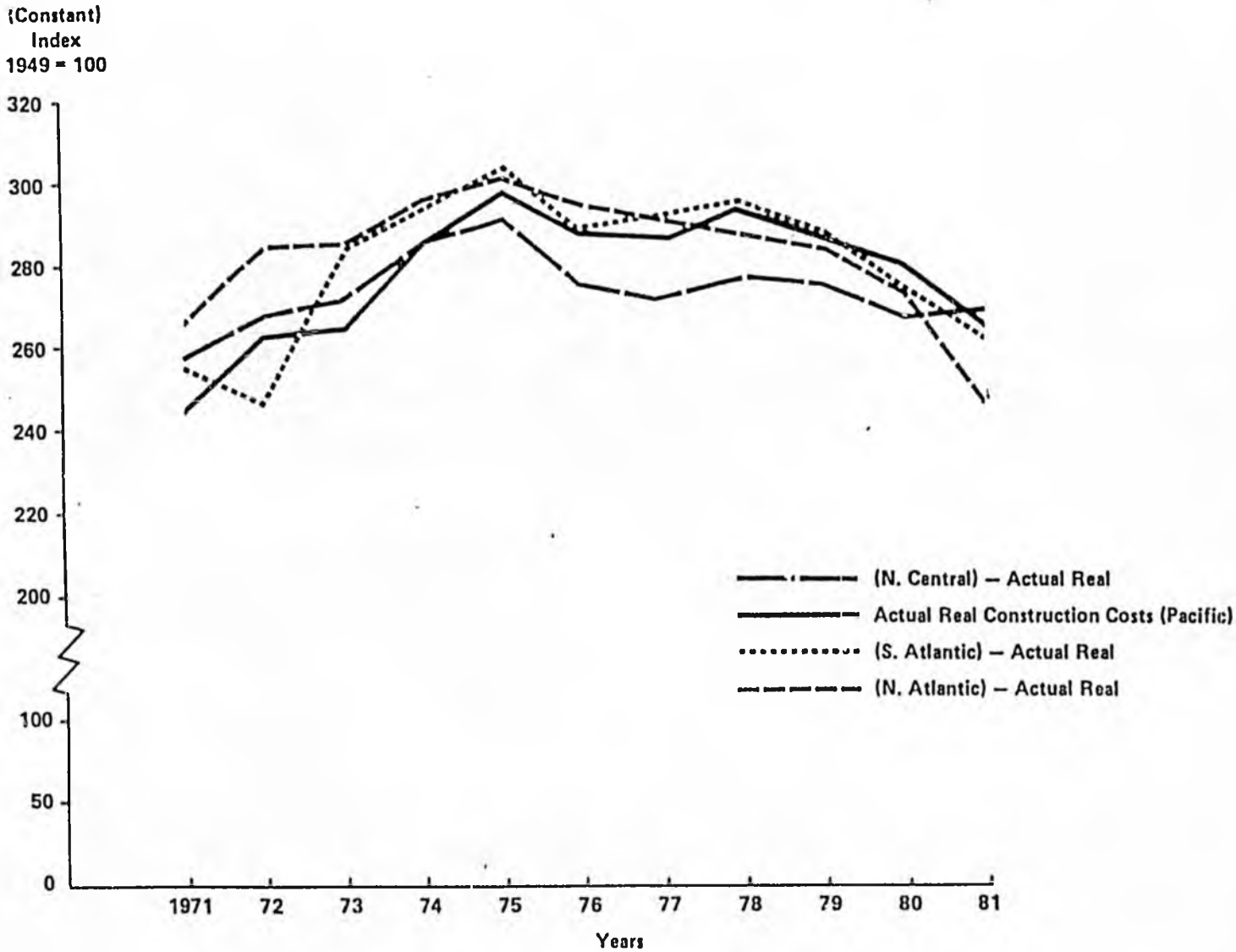


Exhibit C
WORLD OIL PRICE FORECASTS
(Constant 1982 Dollars)

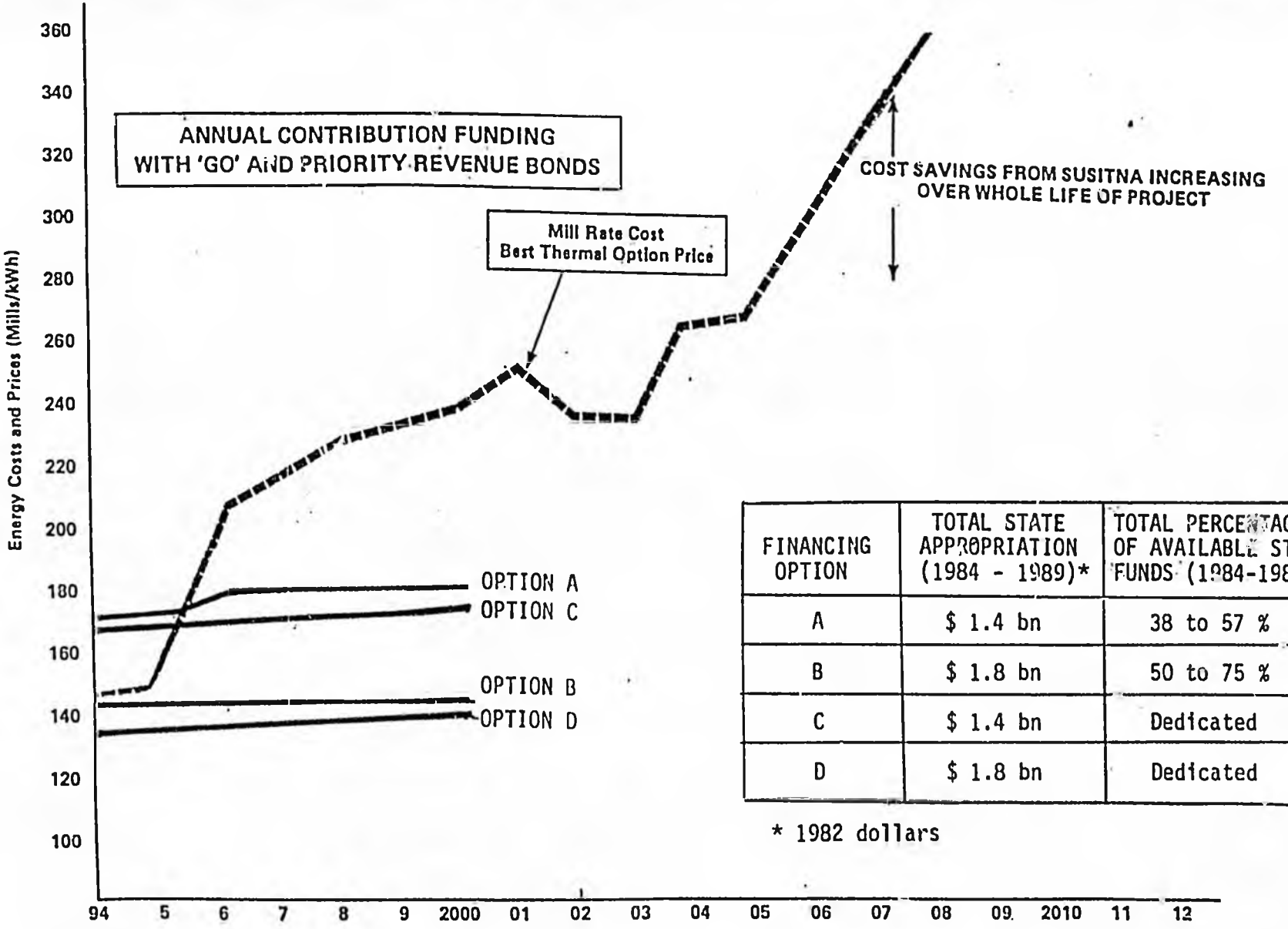
ACRES



Source: ENR Utilities, December 17, 1981 for nominal costs;
Monthly Labor Review, US Dept. of Labor November, 1982 for Consumer Price Index

EXHIBIT D -- US HYDROELECTRIC PLANT CONSTRUCTION COST INDEXES

ACRES



FINANCING OPTION	TOTAL STATE APPROPRIATION (1984 - 1989)*	TOTAL PERCENTAGE OF AVAILABLE STATE FUNDS (1984-1989)*
A	$ 1.4 bn	38 to 57 %
B	$ 1.8 bn	50 to 75 %
C	$ 1.4 bn	Dedicated
D	$ 1.8 bn	Dedicated

* 1982 dollars

EXHIBIT E
ENERGY COST COMPARISON
WITH VARIOUS FINANCING OPTIONS

ACRES

FINANCIAL ANALYSES

ACRES

DATA1OMS.D11 WATANA (ON LINE 1993)- STATE FUNDS TO 1989 ($1.4 BN)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3.647 BN 8-JAN-93

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
					CASH FLOW SUMMARY						
					===($MILLION)===						
73	ENERGY GWH	0	0	0	0	0	0	0	0	3387	3387
521	REAL PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.93	61.60
466	INFLATION INDEX	122.62	129.98	137.78	146.05	154.81	165.65	177.24	189.65	202.92	217.13
520	PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103.34	133.76
	-----INCOME----------										
516	REVENUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.1	453.0
170	LESS OPERATING COSTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	27.3
517	OPERATING INCOME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.9	425.7
214	ADD INTEREST EARNED ON FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
550	LESS INTEREST ON SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6
551	LESS INTEREST ON LONG TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	439.7	469.3
548	NET EARNINGS FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-114.7	-59.0
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-114.7	-59.0
448	STATE CONTRIBUTION	375.7	436.1	437.2	447.4	208.2	0.0	0.0	0.0	0.0	0.0
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	632.6	1464.8	1341.6	957.8	411.1	102.0
248	WORCAP DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
549	TOTAL SOURCES OF FUNDS	375.7	436.1	437.2	447.4	840.8	1464.8	1341.6	957.8	387.8	58.5
320	LESS CAPITAL EXPENDITURE	375.7	436.1	437.2	447.4	840.8	1464.8	1341.6	957.8	296.4	25.7
448	LESS WORCAP AND FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
260	LESS DEBT REPAYMENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	57.4
371	OTHER WORKING CAPITAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	49.4
454	CASH SURPLUS RETAINED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
370	CUM. CAPITAL EXPENDITURE	375.7	811.8	1248.9	1696.3	2537.1	4002.0	5343.5	6301.3	6597.7	6623.4
465	CAPITAL EMPLOYED	375.7	811.8	1248.9	1696.3	2537.1	4002.0	5343.5	6301.3	6889.1	6730.3
461	STATE CONTRIBUTION	375.7	811.8	1248.9	1696.3	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5
462	RETAINED EARNINGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-114.7	-173.8
555	DEBT OUTSTANDING-SHORT TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	106.8
554	DEBT OUTSTANDING-LONG TERM	0.0	0.0	0.0	0.0	632.6	2097.4	3439.0	4396.8	4807.9	4892.7
542	ANNUAL DEBT DRAWNDOWN $1982	0.0	0.0	0.0	0.0	408.6	884.3	756.9	505.0	202.6	47.0
543	CUM. DEBT DRAWNDOWN $1982	0.0	0.0	0.0	0.0	408.6	1292.9	2049.8	2554.9	2757.5	2804.5
519	DEBT SERVICE COVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.84

Option A -- $1.4 Billion Drawn From Uncommitted State Funds Available For Capital Construction

ACRES

DATA1OM5.DIR WATANA (ON LINE 1993)- STATE FUNDS TO 1989 ($1.4 BN)- INFLATION 6%/7%-INTEREST 10%-CAPCOST $3.647 BN 8-JAN-83

		1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
					CASH FLOW SUMMARY						
					===($MILLION)====						
73	ENERGY GWH	3387	3387	3387	3387	3387	3387	3387	3387	3387	37257
521	REAL PRICE-MILLS	60.24	71.94	67.56	63.34	59.44	55.81	52.45	49.36	46.51	0.00
466	INFLATION INDEX	232.33	248.59	265.99	284.61	304.53	325.85	348.66	373.07	399.18	0.00
520	PRICE-MILLS	139.96	178.84	179.71	180.28	181.02	181.87	182.87	184.15	185.64	0.00
	-----INCOME----------										
516	REVENUE	474.0	605.7	608.6	610.6	613.1	615.9	619.3	623.7	628.7	6202.6
170	LESS OPERATING COSTS	29.8	32.6	35.6	38.8	42.3	46.2	50.4	55.1	60.1	443.3
517	OPERATING INCOME	444.2	573.1	573.1	571.8	570.7	569.7	568.9	568.6	568.7	5759.3
214	ADD INTEREST EARNED ON FUNDS	5.7	6.3	6.8	7.5	8.1	8.9	9.7	10.6	11.6	80.5
550	LESS INTEREST ON SHORT TERM DEBT	32.4	42.8	43.2	42.4	41.9	41.5	41.3	41.7	42.4	390.1
391	LESS INTEREST ON LONG TERM DEBT	467.6	465.7	463.6	461.3	458.7	456.0	452.9	449.5	445.8	5030.1
548	NET EARNINGS FROM OPERS	-50.1	70.9	73.1	75.6	78.2	81.2	84.5	88.0	92.0	419.7
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	-50.1	70.9	73.1	75.6	78.2	81.2	84.5	88.0	92.0	419.7
446	STATE CONTRIBUTION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1904.5
143	LONG TERM DEBT DRAWDOWNS	96.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5006.6
248	WORCAP DEBT DRAWDOWNS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
549	TOTAL SOURCES OF FUNDS	54.3	95.5	83.6	86.8	88.4	91.1	98.0	102.4	107.3	7555.0
320	LESS CAPITAL EXPENDITURE	27.5	29.4	31.5	33.7	36.1	38.6	41.3	44.2	47.3	6953.0
448	LESS WORCAP AND FUNDS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
260	LESS DEBT REPAYMENTS	19.0	22.1	24.3	26.8	29.4	32.4	35.6	39.2	43.1	289.2
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	0.0	19.3	17.3	15.1	12.8	10.2	7.6	4.7	1.6	88.6
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	62.7	68.4	74.7	81.5	88.9	97.1	105.9	115.6	126.2	126.2
371	OTHER WORKING CAPITAL	51.9	70.8	75.0	79.4	82.2	83.9	88.6	93.3	98.0	98.0
454	CASH SURPLUS RETAINED	0.0	19.3	36.6	51.7	64.5	74.7	82.3	87.0	88.6	88.6
370	CUM. CAPITAL EXPENDITURE	6631.0	6680.4	6711.9	6745.6	6781.7	6820.3	6861.6	6905.7	6953.0	6953.0
465	CAPITAL EMPLOYED	6765.5	6838.9	6898.2	6958.2	7017.2	7076.0	7138.3	7201.6	7265.8	7265.8
461	STATE CONTRIBUTION	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5	1904.5
462	RETAINED EARNINGS	-223.8	-152.9	-79.8	-4.2	74.0	155.2	239.7	327.7	419.7	419.7
555	DEBT OUTSTANDING-SHORT TERM	114.6	139.2	149.7	160.9	171.1	181.0	194.5	208.9	224.2	224.2
554	DEBT OUTSTANDING-LONG TERM	4970.2	4948.1	4923.8	4897.0	4867.6	4835.2	4799.6	4760.5	4717.4	4717.4
542	ANNUAL DEBT DRAWDOWN $1982	41.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2846.0
543	CUM. DEBT DRAWDOWN $1982	2846.0	2846.0	2846.0	2846.0	2846.0	2846.0	2846.0	2846.0	2846.0	2846.0
519	DEBT SERVICE COVER	0.86	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	0.00

ACRES

DATA1OM5.D11 WATANA (ON LINE 1993)- STATE FUNDS TO 1989 ($1.8 BN)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3.647 BN 8-JAN-83

CASH FLOW SUMMARY
===($MILLION)====

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
73	ENERGY GWH	0	0	0	0	0	0	0	0	3387	3387
521	REAL PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.93	61.60
466	INFLATION INDEX	122.62	129.98	137.78	146.05	154.81	165.65	177.24	189.65	202.92	217.13
520	PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103.34	133.76
	-----INCOME----------										
516	REVENUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0	453.0
170	LESS OPERATING COSTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	27.3
517	OPERATING INCOME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.9	425.7
214	ADD INTEREST EARNED ON FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
550	LESS INTEREST ON SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4
391	LESS INTEREST ON LONG TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	357.3	386.9
548	NET EARNINGS FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-32.3	31.6
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-32.3	31.6
446	STATE CONTRIBUTION	375.7	436.1	437.2	447.4	827.4	0.0	0.0	0.0	0.0	0.0
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	13.3	1402.9	1273.5	882.9	328.7	8.3
268	WORCAP DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
549	TOTAL SOURCES OF FUNDS	375.7	436.1	437.2	447.4	840.8	1402.9	1273.5	882.9	387.8	55.4
320	LESS CAPITAL EXPENDITURE	375.7	436.1	437.2	447.4	840.8	1402.9	1273.5	882.9	296.4	25.7
148	LESS WORCAP AND FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
260	LESS DEBT REPAYMENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	57.4
371	OTHER WORKING CAPITAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	49.4
454	CASH SURPLUS RETAINED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
370	CUM. CAPITAL EXPENDITURE	375.7	811.8	1248.9	1696.3	2537.1	3940.0	5213.5	6096.4	6392.8	6418.5
465	CAPITAL EMPLOYED	375.7	811.8	1248.9	1696.3	2537.1	3940.0	5213.5	6096.4	6404.1	6525.3
461	STATE CONTRIBUTION	375.7	811.8	1248.9	1696.3	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8
462	RETAINED EARNINGS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-32.3	-0.7
555	DEBT OUTSTANDING-SHORT TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	106.8
554	DEBT OUTSTANDING-LONG TERM	0.0	0.0	0.0	0.0	13.3	1416.3	2689.7	3572.6	3901.3	3895.4
542	ANNUAL DEBT DRAWNDOWN $1982	0.0	0.0	0.0	0.0	8.6	846.9	718.5	465.5	162.0	3.8
543	CUM. DEBT DRAWNDOWN $1982	0.0	0.0	0.0	0.0	8.6	855.5	1574.0	2039.5	2201.5	2205.4
517	DEBT SERVICE COVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	1.04

Option B -- $1.8 Billion Drawn From Uncommitted State Funds Available For Capital Construction

ACRES

DATA1ON5.[illegible] LINE 1993)- STATE FUNDS TO 1989 ($1.8 BN)- INFLATION 6%.7%-INTEREST 10%-CAPCOST $3.647 BN 8-JAN-83

		1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
					CASH FLOW SUMMARY						
					===($MILLION)====						
73	ENERGY GWH	3387	3387	3387	3387	3387	3387	3387	3387	3387	37257
521	REAL PRICE-MILLS	60.24	57.33	54.00	50.76	47.76	44.98	42.39	40.03	37.85	0.00
466	INFLATION INDEX	232.33	248.59	265.99	284.61	304.53	325.85	348.66	373.07	399.18	0.00
520	PRICE-MILLS	139.96	142.51	143.63	144.46	145.45	146.54	147.81	149.34	151.08	0.00
	-----INCOME----------										
516	REVENUE	474.0	482.6	486.4	489.3	492.6	496.3	500.6	505.8	511.7	5242.3
170	LESS OPERATING COSTS	29.8	32.6	35.6	38.8	42.3	46.2	50.4	55.1	60.1	443.3
517	OPERATING INCOME	444.2	450.1	450.9	450.5	450.2	450.1	450.1	450.7	451.6	4799.0
214	ADD INTEREST EARNED ON FUNDS	5.7	6.3	6.8	7.5	8.1	8.9	9.7	10.6	11.6	80.5
550	LESS INTEREST ON SHORT TERM DEBT	14.7	14.9	16.3	16.4	16.9	17.5	18.3	19.7	21.5	179.6
391	LESS INTEREST ON LONG TERM DEBT	383.5	383.9	382.2	380.3	378.2	375.9	373.4	370.6	367.5	4141.5
548	NET EARNINGS FROM OPERS	49.7	57.6	59.3	61.2	63.3	65.6	68.2	71.0	74.1	569.4
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	49.7	57.6	59.3	61.2	63.3	65.6	68.2	71.0	74.1	569.4
446	STATE CONTRIBUTION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2523.8
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3909.7
248	WORCAP DEBT DRAWDOWNS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
549	TOTAL SOURCES OF FUNDS	57.4	82.2	69.8	72.4	73.5	75.6	81.7	85.4	89.4	7227.0
329	LESS CAPITAL EXPENDITURE	27.5	29.4	31.5	33.7	36.1	38.6	41.3	44.2	47.3	6748.0
448	LESS WORCAP AND FUNDS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
260	LESS DEBT REPAYMENTS	15.7	17.4	19.2	21.1	23.2	25.5	28.1	30.9	34.0	229.2
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	6.5	10.7	8.6	6.4	4.1	1.6	-1.1	-4.0	-7.1	25.5
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	62.7	68.4	74.7	81.5	88.9	97.1	105.9	115.6	126.2	126.2
371	OTHER WORKING CAPITAL	51.9	70.8	75.0	79.4	82.2	83.9	88.6	93.3	98.0	98.0
454	CASH SURPLUS RETAINED	6.5	17.2	25.8	32.2	36.3	37.8	36.7	32.6	25.5	25.5
370	CUM. CAPITAL EXPENDITURE	6446.0	6475.4	6506.9	6540.6	6576.7	6615.3	6656.6	6700.8	6748.0	6748.0
465	CAPITAL EMPLOYED	6567.0	6631.8	6682.4	6733.8	6784.1	6834.1	6887.8	6942.3	6997.8	6997.8
461	STATE CONTRIBUTION	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8	2523.8
462	RETAINED EARNINGS	49.0	106.6	163.9	227.1	290.4	356.1	424.3	495.3	569.4	569.4
555	DEBT OUTSTANDING-SHORT TERM	114.6	139.2	149.7	160.9	171.1	181.0	194.5	208.9	224.2	224.2
554	DEBT OUTSTANDING-LONG TERM	3879.7	3862.2	3843.1	3822.0	3798.8	3773.3	3745.2	3714.4	3680.4	3680.4
542	ANNUAL DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2205.4
543	CUM. DEBT DRAWDOWN $1982	2205.4	2205.4	2205.4	2205.4	2205.4	2205.4	2205.4	2205.4	2205.4	2205.4
519	DEBT SERVICE COVER	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	0.00

ACRES

DATA1OMS.D11 WATANA (ON LINE 1993)-$1.4 BN STATE FUNDS (PER 30% SCHED)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3.647 8-JAN-83

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
					CASH FLOW SUMMARY						
					($MILLION)*						
73	ENERGY GWH	0	0	0	0	0	0	0	0	3387	3387
521	REAL PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.93	61.60
466	INFLATION INDEX	122.62	129.98	137.78	146.05	154.81	165.65	177.24	189.65	202.92	217.13
520	PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103.34	133.76
	-----INCOME----------										
516	REVENUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0	453.0
170	LESS OPERATING COSTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	27.3
517	OPERATING INCOME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.9	425.7
214	ADD INTEREST EARNED ON FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
550	LESS INTEREST ON SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1
391	LESS INTEREST ON LONG TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	424.9	454.6
548	NET EARNINGS FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	-42.8
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	-42.8
446	STATE CONTRIBUTION	806.8	413.3	475.3	115.4	0.0	0.0	0.0	0.0	0.0	0.0
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	521.8	1453.8	1329.4	944.4	396.4	85.3
248	WORKCAP DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	-15.5
549	TOTAL SOURCES OF FUNDS	806.8	413.3	475.3	115.4	521.8	1453.8	1329.4	944.4	387.8	57.9
320	LESS CAPITAL EXPENDITURE	373.3	390.3	389.2	390.9	811.8	1453.8	1329.4	944.4	296.4	25.7
448	LESS WORKCAP AND FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
260	LESS DEBT REPAYMENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	433.5	22.8	86.1	-275.5	-290.0	0.0	0.0	0.0	0.0	0.0
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	57.4
371	OTHER WORKING CAPITAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	49.4
454	CASH SURPLUS RETAINED	456.6	479.4	565.5	290.0	0.0	0.0	0.0	0.0	0.0	0.0
370	CUM. CAPITAL EXPENDITURE	373.3	763.8	1153.0	1543.9	2355.7	3809.4	5138.8	6083.2	6379.6	6405.3
465	CAPITAL EMPLOYED	829.9	1243.2	1718.5	1833.9	2355.7	3809.4	5138.8	6083.2	6471.0	6512.1
461	STATE CONTRIBUTION	806.8	1220.1	1695.4	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8
462	RETAINED EARNINGS	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1	-76.9	-119.7
555	DEBT OUTSTANDING-SHORT TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	106.6
551	DEBT OUTSTANDING-LONG TERM	0.0	0.0	0.0	0.0	521.8	1975.5	3304.9	4249.3	4645.7	4714.2
542	ANNUAL DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	337.0	877.6	750.0	498.0	195.7	39.3
543	CUM. DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	337.0	1214.6	1964.7	2462.6	2658.0	2697.2
519	DEBT SERVICE COVER	.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.87

Option C -- $1.4 Billion Dedicated From
Permanent Fund Income

ACRES

DATA1DH5.DII WATANA (OIL LIKE 1993)-$1.4 BN STATE FUNDS (PER 30% SCHED)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3.6@7 8-JAN-83

		1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
					CASH FLOW SUMMARY						
					===($MILLION)====						
73	ENERGY GWH	3387	3387	3387	3387	3387	3387	3387	3387	3387	37257
521	REAL PRICE-MILLS	60.24	69.32	65.13	61.09	57.35	53.87	50.65	47.69	44.96	0.00
466	INFLATION INDEX	232.33	248.59	265.99	284.61	304.53	325.85	348.66	373.07	399.18	0.00
520	PRICE-MILLS	139.96	172.33	173.25	173.87	174.65	175.55	176.60	177.92	179.46	0.00
	-----INCOME----------										
516	REVENUE	474.0	583.7	586.7	588.9	591.5	594.5	598.1	602.6	607.8	6030.7
170	LESS OPERATING COSTS	29.8	32.6	35.6	38.8	42.3	46.2	50.4	55.1	60.1	443.3
517	OPERATING INCOME	444.2	551.1	551.2	550.1	549.2	548.3	547.6	547.5	547.7	5587.4
214	ADD INTEREST EARNED ON FUNDS	5.7	6.3	6.8	7.5	8.1	8.9	9.7	10.6	11.6	80.5
550	LESS INTEREST ON SHORT TERM DEBT	29.2	37.8	38.4	37.8	37.4	37.2	37.2	37.7	38.7	350.5
391	LESS INTEREST ON LONG TERM DEBT	452.9	451.0	449.0	446.8	444.3	441.6	438.7	435.4	431.8	4871.0
548	NET EARNINGS FROM OPERS	-32.2	68.5	70.6	73.0	75.6	78.4	81.5	85.0	88.8	446.4
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	-32.2	68.5	70.6	73.0	75.6	78.4	81.5	85.0	88.8	446.4
446	STATE CONTRIBUTION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1810.8
143	LONG TERM DEBT DRAWDOWNS	70.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4809.1
248	WORCAP DEBT DRAWDOWNS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
549	TOTAL SOURCES OF FUNDS	53.7	93.1	81.1	84.2	85.7	88.3	95.0	99.4	104.1	7290.5
320	LESS CAPITAL EXPENDITURE	27.8	29.4	31.5	33.7	36.1	38.6	41.3	44.2	47.3	6734.9
448	LESS WORCAP AND FUNDS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
260	LESS DEBT REPAYMENTS	18.4	21.3	23.4	25.7	28.3	31.1	34.3	37.7	41.4	278.4
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	0.0	17.8	15.7	13.5	11.2	8.7	3.0	3.1	0.0	53.0
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	62.7	68.4	74.7	81.5	88.9	97.1	105.9	115.6	126.2	126.2
371	OTHER WORKING CAPITAL	51.9	70.8	75.0	79.4	82.2	83.2	80.6	93.3	98.0	98.0
454	CASH SURPLUS RETAINED	0.0	17.8	33.5	47.1	58.3	67.0	73.0	76.1	76.1	76.1
370	CUM. CAPITAL EXPENDITURE	6432.8	6462.3	6493.8	6527.5	6563.5	6602.1	6643.4	6687.6	6734.9	6734.9
465	CAPITAL EMPLOYED	6547.4	6619.2	6677.0	6735.5	6792.9	6850.1	6910.9	6972.6	7035.2	7035.2
461	STATE CONTRIBUTION	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8	1810.8
462	RETAINED EARNINGS	-151.9	-83.4	-12.7	60.2	135.8	214.2	295.8	380.7	469.5	469.5
555	DEBT OUTSTANDING-SHORT TERM	114.6	139.2	149.7	160.9	171.1	181.0	194.5	208.9	224.2	224.2
554	DEBT OUTSTANDING-LONG TERM	4773.9	4732.6	4729.3	4703.5	4675.2	4644.1	4609.8	4572.1	4530.7	4530.7
542	ANNUAL DEBT DRAWDOWN $1982	33.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2730.9
543	CUM. DEBT DRAWDOWN $1982	2730.9	2730.9	2730.9	2730.9	2730.9	2730.9	2730.9	2730.9	2730.9	2730.9
519	DEBT SERVICE COVER	0.89	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	0.00

ACRES

DATA10M5.D11 WATANA (ON LINE 1993)-$1.8 BN STATE FUNDS (PER 30% SCHED)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3,647 8-JAN-83

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
					CASH FLOW SUMMARY						
					===($MILLION)====						
73	ENERGY GWH	0	0	0	0	0	0	0	0	3387	3387
521	REAL PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.93	61.60
466	INFLATION INDEX	122.62	129.98	137.78	146.05	154.81	164.10	174.04	184.48	202.92	217.13
520	PRICE-MILLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103.34	133.76
	-----INCOME----------										
516	REVENUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0	453.0
170	LESS OPERATING COSTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	27.3
517	OPERATING INCOME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	324.9	425.7
214	ADD INTEREST EARNED ON FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
550	LESS INTEREST ON SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7
391	LESS INTEREST ON LONG TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	340.2	369.8
548	NET EARNINGS FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-15.2	50.4
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-15.2	50.4
446	STATE CONTRIBUTION	806.8	413.3	475.3	532.1	156.4	0.0	0.0	0.0	0.0	0.0
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	1275.1	1259.3	867.3	311.6	0.0
248	WORCAP DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
549	TOTAL SOURCES OF FUNDS	806.8	413.3	475.3	532.1	156.4	1275.1	1259.3	867.3	387.8	65.9
320	LESS CAPITAL EXPENDITURE	373.3	370.5	389.2	390.9	768.1	1390.1	1259.3	867.3	296.4	25.7
448	LESS WORCAP AND FUNDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	15.5
260	LESS DEBT REPAYMENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	433.5	22.8	86.1	141.2	-611.7	-115.0	0.0	0.0	0.0	11.1
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	57.4
371	OTHER WORKING CAPITAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	49.4
454	CASH SURPLUS RETAINED	456.6	479.4	565.5	726.7	115.0	0.0	0.0	0.0	0.0	11.1
370	CUM. CAPITAL EXPENDITURE	373.3	743.8	1133.0	1543.9	2312.0	3702.1	4961.4	5828.8	6125.2	6150.9
465	CAPITAL EMPLOYED	829.9	1243.2	1718.5	2270.6	2427.0	3702.1	4961.4	5828.8	6216.5	6268.8
461	STATE CONTRIBUTION	806.8	1220.1	1695.4	2247.5	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9
462	RETAINED EARNINGS	23.1	23.1	23.1	23.1	23.1	23.1	23.1	23.1	7.9	58.3
555	DEBT OUTSTANDING-SHORT TERM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.4	106.8
554	DEBT OUTSTANDING-LONG TERM	0.0	0.0	0.0	0.0	0.0	1275.1	2534.4	3401.8	3713.4	3699.7
542	ANNUAL DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	0.0	769.7	710.5	457.3	153.6	0.0
543	CUM. DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	0.0	769.7	1480.3	1937.6	2091.2	2091.2
519	DEBT SERVICE COVER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	1.10

Option D -- $1.8 Billion Dedicated From
Permanent Fund Income

ACRES

DATA1OM5.D11 WATANA (ON LINE 1993)-$1.8 BN STATE FUNDS (PER 30% SCHED)- INFLATION 6%,7%-INTEREST 10%-CAPCOST $3.647 8-JAN-03

		1995	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
					CASH FLOW SUMMARY						
					($MILLION)*						
73	ENERGY GWH	3387	3387	3387	3387	3387	3387	3387	3387	3387	37257
521	REAL PRICE-MILLS	38.08	34.51	31.39	48.34	45.52	42.89	40.46	38.24	36.19	0.00
466	INFLATION INDEX	232.33	248.59	265.99	284.61	304.53	325.85	348.66	373.07	399.18	0.00
520	PRICE-MILLS	134.94	135.52	136.69	137.57	138.61	139.77	141.08	142.66	144.46	0.00
	-----INCOME----------										
516	REVENUE	457.0	459.0	462.9	465.9	469.5	473.4	477.8	483.2	489.2	5040.9
170	LESS OPERATING COSTS	29.8	32.6	35.6	38.8	42.3	46.2	50.4	55.1	60.1	443.3
517	OPERATING INCOME	427.2	426.4	427.4	427.1	427.1	427.1	427.4	428.1	429.2	4597.5
214	ADD INTEREST EARNED ON FUNDS	5.7	4.3	6.8	7.5	8.1	8.9	9.7	10.6	11.6	80.5
550	LESS INTEREST ON SHORT TERM DEBT	11.1	10.8	12.4	12.7	13.4	14.1	15.2	16.8	18.8	135.9
391	LESS INTEREST ON LONG TERM DEBT	348.5	347.8	345.3	343.5	341.5	339.3	336.9	334.2	331.3	3957.3
548	NET EARNINGS FROM OPERS	53.4	54.9	56.6	58.4	60.4	62.6	65.0	67.7	70.6	584.9
	-----CASH SOURCE AND USE----										
548	CASH INCOME FROM OPERS	53.4	54.9	56.6	58.4	60.4	62.6	65.0	67.7	70.6	584.9
446	STATE CONTRIBUTION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2403.9
143	LONG TERM DEBT DRAWDOWNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3713.4
248	WORCAP DEBT DRAWDOWNS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
549	TOTAL SOURCES OF FUNDS	61.1	79.6	67.1	69.6	70.6	72.5	78.5	82.1	86.0	6926.3
320	LESS CAPITAL EXPENDITURE	27.5	29.4	31.5	33.7	36.1	38.6	41.3	44.2	47.3	6480.4
448	LESS WORCAP AND FUNDS	7.7	24.6	10.5	11.2	10.2	9.9	13.5	14.4	15.3	224.2
260	LESS DEBT REPAYMENTS	15.0	16.6	18.2	20.0	22.1	24.3	26.7	29.3	32.3	218.1
395	LESS PAYMENT TO STATE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	CASH SURPLUS(DEFICIT)	10.8	8.9	6.9	4.6	2.3	-0.2	-2.9	-5.8	-8.9	3.6
249	SHORT TERM DEBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
444	CASH RECOVERED	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-----BALANCE SHEET----------										
225	RESERVE AND CONT. FUND	62.7	68.4	74.7	81.5	88.9	97.1	105.9	115.6	126.2	126.2
321	OTHER WORKING CAPITAL	51.9	70.8	75.0	79.4	82.2	83.9	88.6	93.3	98.0	98.0
454	CASH SURPLUS RETAINED	21.9	30.8	37.7	42.3	44.6	44.4	41.4	35.6	26.7	26.7
370	CUM. CAPITAL EXPENDITURE	6178.4	6207.8	6239.3	6273.0	6309.1	6347.7	6389.0	6433.2	6480.4	6480.4
45	CAPITAL EMPLOYED	6314.9	6377.8	6426.7	6476.3	6524.8	6573.1	6624.9	6677.6	6731.3	6731.3
461	STATE CONTRIBUTION	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9	2403.9
462	RETAINED EARNINGS	111.7	166.6	223.2	281.6	342.0	404.6	469.6	537.3	608.0	608.0
555	DEBT OUTSTANDING-SHORT TERM	114.6	139.2	149.7	160.9	171.1	181.0	194.5	208.9	224.2	224.2
554	DEBT OUTSTANDING-LONG TERM	3684.7	3668.2	3649.9	3629.9	3607.8	3583.6	3556.9	3527.6	3495.3	3495.3
542	ANNUAL DEBT DRAWDOWN $1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2091.2
543	CUM. DEBT DRAWDOWN $1982	2091.2	2091.2	2091.2	2091.2	2091.2	2091.2	2091.2	2091.2	2091.2	2091.2
519	DEBT SERVICE COVER	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	0.00

ACRES

initiative drive for dam project

12/5

By ANN CONY
Daily News business reporter

The Anchorage Chamber of Commerce is launching a ballot initiative drive and a $250,000 advertising campaign aimed at winning statewide voter approval for construction of the proposed $5.1 billion Susitna hydroelectric project.

The ballot initiative would have voters approve or reject a financing scheme for the controversial two-dam Susitna River project that is designed to provide electrical power to the Railbelt.

"What the chamber will accomplish is to act as a catalyst to see that construction is actually started in 1984," said Bob Penney, chairman of the chamber's energy committee. "No more studies: Let's pour some concrete."

The chamber will conduct a petition drive if the legislature fails to adopt a bill that would automatically put Susitna on the statewide general election ballot in November, he said.

Dave Rose and Eric Wohlforth are drafting a Susitna bill that Sen. President Jalmar Kerttula has agreed to sponsor in the legislative session that begins next month, according to Penney. Rose is a member of the chamber energy committee and executive director of the state Permanent Fund. Wohlforth is a private attorney and state bond counsel.

"The problem with Susitna is that because of the cost, it's hard to get the legislature to bite into spending such a massive amount of money," Penney said. "So we decided to bring the issue of constructing Susitna — including the financing — to a vote of the people."

The chamber's financing plan would allow the state to digest the cost of Susitna over 12 to 20 years, he said.

Voters would be asked to approve or reject a plan calling for direct state appropriations of $200 million per year for the next 12 years, with additional funds needed for construction of the first-phase Watana dam to be raised from state bond sales. The initiative would propose that the second-phase Devil Canyon dam be funded in 10 years, or whenever the added power is needed, solely through bond financing.

Consultants have estimated that construction of the 1020-megawatt Watana dam will cost $3.6 billion and that construction of the 600-megawatt Devil Canyon dam will cost $1.5 billion, in January 1982 dollars.

Penney said the chamber intends to raise money for its Susitna advertising campaign from business and industry sources.

"We estimate it'll take $250,000 or more to put on a public education effort beginning next year — probably in February — so the public can understand both sides of the issue," he said.

A kick-off for the campaign actually will begin earlier, with television spots and double-page newspaper advertisements scheduled for Jan. 2-15.

The chamber already has raised $25,000 for the pilot program with equal donations from the International Brotherhood of Electrical Workers and the Associated General Contractors of Alaska, Penney said.

Cartoonist Jerry Flu has created a beaver dubbed Susitna Sam to serve as the lead mascot in a cast of animated cartoon characters.

Acres American, the consulting firm that has analyzed the proposed project most recently, has said the state needs to make a direct investment of at least $2.3 billion, in January 1982 dollars, to assure that electricity generated by the dams will not cost consumers more than alternative power sources prior to the year 2006.

Appropriations of $200 million for 12 years would amount to $2.4 billion.

While Susitna supporters claim the project is the best investment the state could make, Susitna critics have maintained that it's a potential boondoggle.

The critics point to Acres' conclusion that Watana dam by itself would not be the most economical source of power and, in light of failing state revenue predictions, question the validity of Acres' projections for power demand that would justify construction of the Devil Canyon dam.

Penney expressed confidence Friday that a majority of voters favor Susitna.

Chamber's Susitna plan may focus future debate

By ANN CONY
Daily News business reporter

The Anchorage Chamber of Commerce may unveil as soon as next week the draft of a legislative bill aimed at setting aside state funds for construction of the Susitna hydroelectric project.

Meanwhile, critics this week threw out arguments likely to shape debate on the issue in the coming months.

The chamber energy committee announced last Friday that it would pursue a statewide ballot initiative that would ask voters to authorize construction of the controversial dam project backers say would carry the Railbelt into the 21st century with "cheap" electricity.

According to Bob Penney, chairman of the energy committee, the chamber wants to see the legislature appropriate $200 million annually for 12 years for Susitna construction. That $2.4 billion would be supplemented liberally by bond sales to build the first dam, and construction of the second dam would be financed solely by bond

See Page D-4, SUSITNA

Myers and Tussing argued that even if bond financing were possible, the state could not afford it.

"It's putting all the eggs in one basket," Tussing said, warning that bonding Susitna could preclude bonding for other projects that might prove more beneficial to the state economy.

Myers questioned, as Tussing and Erickson have, whether the Railbelt will need the full capacity of power that would be generated by the Watana and Devil Canyon dams, saying the state risks ultimate bankruptcy for a project that could turn out to be a white elephant.

"The dialogue has been dominated by proponents of the project who have dismissed any consideration about less costly, more moderately scaled alternatives," Myers said. "Let's evaluate the project on its merits and not confuse the desire for a massive construction project with a rational plan for future energy development and the Railbelt."

Tussing claimed that much of the impetus for Susitna comes from groups such as contractors and unions who see the proposed project as a "big Christmas tree" and are more enamored with it the more it costs.

Penney claims the project enjoys broad based support because it will ensure present and future Railbelt residents of cheap, reliable power.

"It would be a gift to all of us," he said.

Power generated from the dams will be "one of the best electric buys in the nation," Penney argued, saying that once the project is built the cost of electricity in the Railbelt will be inflation-proof.

"Anything's cheap if somebody else pays for it," Tussing countered. "It would probably be some of the most expensive power generated anywhere in North America when you consider the capital costs."

Penney expressed confi-

Susitna

Continued from Page D-1

sales.

The advance dedication of state revenues would require an amendment to the state constitution.

The dams are estimated to cost $5.1 billion in January 1982 dollars; assuming an inflation rate of 10 percent, the project would cost $14.5 billion when finished.

Criticisms raised this week by Eric Myers of the Northern Alaska Environmental Center and economists Arlon Tussing and Gregg Erickson were that:

- Such a commitment of funds could potentially bankrupt the state;
- The bond market probably would reject such an offering as too risky;
- If the bonds could be sold, they might absorb virtually all of the state's bonding capacity for the next 12 years or longer;
- The legislature shouldn't tamper with the state constitution just to build Susitna, and
- Susitna power would seem "cheap" to some only because the money for it would come from the state rather than directly from the ratepayer's pocket.

"It represents an enormous incumbence on the state's economy and the future fiscal policy of the state," said Tussing. "It's hard to believe that the investment community isn't going to perceive that."

The bond market would perceive the issue as too risky because of the state economy's reliance on oil prices and state spending, he said.

According to Erickson, 44 percent of Alaskans' personal income is the result of state spending.

Penney countered that the economists have been wrong before, and "if everything goes according to our preliminary plans, we'll be able to show Mr. Tussing he's incorrect."

Susitna hydro a good investment?

By ANN CONY
Daily News business reporter

The proposed Susitna River hydroelectric project could be the best investment the state will ever make, or the worst, depending on who you believe.

The pros and cons of the $5.1 billion two-dam project were argued Thursday by Wayne Beckwith and Eric Myers, respectively, at a luncheon meeting of the Anchorage Woman's Club.

Beckwith, co-chairman of the Anchorage Chamber of Commerce energy committee, justified the need for the 1,620-megawatt project on grounds that the cost of natural gas — which fuels more than 90 percent of electricity generation in Southcentral Alaska — is rising while the supply is falling. Though Susitna would require a large capital investment, operating costs would be mininimal and the cost of hydro power would be constant after the capital investment is made, while "constantly increasing fuel costs must be passed on to the consumer."

Eric Myers

Wayne Beckwith

Susitna hydro power would be cheaper than fossil-fuel power shortly after the turn of the century, Beckwith said.

Quoting Susitna feasibility study projections that the project would create an average of 1,450 jobs a year for 16 years, he urged the audience to think about the "ripple effects" that would have on local businesses.

Myers, consultant to the Northern Alaska Environmental Center, argued that Susitna could put the state in a fiscal straitjacket and urged a careful reexamination of the project in light of outdated economic feasibility assumptions.

Rational planning to meet future state energy needs in recent years has become confused with desires for creation of new jobs and distribution of oil wealth, according to Myers.

Once a commitment to construction is made, "We've totally lost all our flexibility in dealing with energy planning for the future," he said. "If we made a commit-

See Page B-6, SUSITNA

Susitna hydro proposal's merits debated

Continued from Page B-5

ment to Susitna now, it could involve more than 50 percent of the state's capital spending revenues until the end of the century."

Myers quoted state Division of Budget and Management calculations that while Susitna is estimated to cost $5.1 billion in 1982 dollars, it will end up costing $10 billion to $15 billion, depending on inflation rates. He urged consideration of smaller-scale hydro projects as alternatives.

The recent decline in oil prices and state revenue projections lowers the outlook for the state economy and population growth, thus lowering anticipated increases in power demand, Myers said.

Beckwith argued that forecasts for power demand used in the Susitna feasibility study were reasonable, and that even under a 2.8 percent annual "low growth" scenario, Susitna will prove economical as a replacement for fossil-fuel power generation.

Saying Susitna is "one of the finest investments this state will ever make" and "more important than any project ever developed in the history of the Railbelt," he predicted revenues from Susitna power sales would pay off revenue bonds and provide the state a return on its investment.

Myers, on the other hand, warned that if power demand does not increase as previously forecast, Susitna would strap the state economically and tax consumers.

"I'm not saying the Susitna project is a horrible idea and we ought to walk away from it . . . Susitna may be the best thing that ever happened to the Railbelt, but probably not until the year 2050," he said.

The state has at least until the end of the century to make a commitment to construction, Myers argued, ar "I don't think we should stampeded into making that kind of decision now."

Environmental group asks delay of Susitna licen

by Steve Hansen
Times Writer

A statewide environment group is asking the Alaska Power Authority to delay its license request for the Susitna hydroelectric project until an alternate site at Lake Chakachamna is "adequately evaluated."

Eric Myers, an energy consultant and spokesman for the Northern Alaska Environmental Center, sent a letter to APA executive director Eric Yould on Dec. 13 saying a recent engineering study indicated the Lake Chakachamna site would be "even more economically attractive than previously thought."

He urged the APA executive to "commit the financial resources presently at its disposal toward the development of a comprehensive feasibility studye of a quality and detail equal to the Susitna studies."

Myers said the issue "is not whether you are for or against the Susitna project, but how to provide responsibly for Railbelt power needs. Many people have forgotten that."

Myers said the Chakachamna project "is the most significant and likely hydro alternative to Susitna and a comprehensive evaluation of this potential hydro option is central to the ongoing Railbelt power studies."

The letter asked Yould to defer filing of the Susitna license application with the Federal Energy Regulatory Commission until further studies have been completed.

"Chakachamna is especially attractive economically because a project the size of Chakachamna would not be vulnerable to the uncertainty of furter of electrical demand growth."

If constructed, the Chakachamna project would provide 330 megawatts while Susitna would provide 1,600 megawats.

"We can reasonably assume the need for the 330 megawatts Chakachamna could provide but we can't safely assume the need for all 1,600 megawatts from Susitna," Myers said.

Myers said a recent Railbelt electricity demand forecast for the year 2010 are 44 percent lower than previous projections which led to the Susitna proposal. Susitna would cost an estim
In 1982 dollars w
kachamna project
estimated $1.2 billio

The most vocal
nents have "confuse
nomic power plann
sire for a massive
project . . . they s
pour concrete. The
a $15 billion white e
nancial ruin for the
said.

Dam builder praises state hydro plans

by Carl Gidlund
Times Writer

The president of a firm selected to design Watana Dam, first phase of the proposed giant Susitna power network, said today the project is the most attractive hydroelectric project in North America.

"Down south, there just isn't the potential that you have in Alaska," said Harza Engineering Co.'s Richard D. Harza. "Either the water's been used for hydro already or it can't be used because of national parks or similar barriers."

Speaking before the Anchorage Chamber of Commerce today, Harza compared the proposed Watana dam, which at 885 feet is to be the largest earth-filled structure in North America, to another project in which his firm is engaged, the Guri project in Venezuela.

Both, he said, are large projects with small, economical beginnings. Also, he said, both Susitna and Guri — which may become the world's largest power project, generating 20,000 megawatts — are conceived for eventual full-scale use of the hydro resource but are designed and built to meet smaller needs during construction.

Finally, Garza said, Guri is an example of "how to 'upgrade' revenue from a depleting resource, oil, into a non-depleting, clean, almost permanent hydro energy resource."

Although the design contract with the state has not been formally signed, the Alaska Power Authority voted unanimously in October to award it to Harza's Chicago-based company and a joint venture firm, Ebasco Services Inc. of Bellview, Wash., and New York.

The legislature has approved $25.6 million for preliminary design work on the million-kilowatt Watana dam and will be asked to appropriate more during the upcoming session. Total costs will exceed $3 billion in 1982 dollars, according to most estimates.

"It doesn't appear the project would have grave environmental impacts," Harza said. "We don't have to displace people, roads or railroads and other physical impacts are relatively minimal when looking at a project of this scale."

Harza described hydroelectric power as the most economical, least polluting source of energy, and he said industrial countries with hydro potential — the U.S., Soviet Union, Japan and European nations — have almost fully developed their potential.

He said high initial investment costs "are more than offset by the absence of fuel costs, and of fuel cost escalation" during the life of such projects, which may be as long as a century.

Hydro power's only drawback, he said, is its transportability. Natural gas can be shipped economically via pipeline or tanker 2,000 to 5,000 miles, and oil can be sent 10,000 miles or more, but the economic limit for sending electricity over power lines is about 800 miles, Harza said.

In addition to its Venezuela project, Harza's firm is designing hydroelectric projects in Central America, Iceland, Jordan, Egypt, Senegal and Pakistan. It also is engaged in two other Alaska projects, one near Bethel and on at Black Bear Lake, which would serve the Southeast communities of Craig, Klawok and Hydaburg.

Harza said his firm will establish a small Watana project office in Anchorage with Ebasco. Ten to 20 personnel from the two companies will be engaged in field investigation work, he said, but the principal design office, employing 50-60 people, will be in Bellview.

RICHAR
Involved in

Susitna engineer touts hydropower

y ANN CONY
ily News business reporter

Alaska may not have any mon-
eys and Venezuela may not have
ny moose, but the two places do
ave at least one thing in common:
xtensive oil and gas resources
ombined with plenty of hydroe-
ctric power potential.

That was the message delivered
y Richard Harza, president of
ne of two firms selected by the
laska Power Authority to design
ie Watana Dam of the proposed
usitna River hydroelectric
oject.

In touting the advantages of
ydropower before the Anchorage
hamber of Commerce Monday,
e president of Harza Engineer-
g Co. of Chicago traced his
m's work on the Guri hydroelec-
ic project on the Rio Caroni in
stern Venezuela.

The first stage of that project
as completed in 1968, with an
tension of the initial power
nt giving it an installed capaci-
ty of 2,000 megawatts in 1978. A
second expansion is under way
now, and — when completed in
1987 — will make Guri the second
largest hydro project in the world,
after the Parana River project in
Brazil.

In addition, Guri has been de-
signed for the possible ultimate
expansion to a total capacity of
20,000 megawatts, Harza said.

The current expansion will
bring the dam height to 475 feet,
compared to a height of 885 feet
envisioned for the 1,020-megawatt
Susitna Watana Dam.

The Guri and the proposed Sus-
itna projects differ in that Susitna
is not intended to provide power
to heavy industry, Harza said.

In Venezuela and other coun-
tries "double blessed" with fossil
fuels and hydro potential, the pat-
tern has been one of simulta-
neous, coordinated development of
both resources, he said.

"When possible, the fossil ener-
gy has been exported while the
hydro energy has served the devel-
oping domestic or local market."

According to Harza, countries
such as Venezuela have chosen to
invest part of their fossil fuel
export revenues in long-term hy-
dro power to meet future energy
needs.

"In general, wherever it is
available, hydro power is the most
economical, least polluting power
source," he said.

Harza acknowledged that capi-
tal costs for constructing the dams
are high. But, he maintained, the
high initial costs are "more than
offset" by the long life expectancy
of the dams and the absence of
escalating fuel costs.

A useful life of 100 years has
been assumed for the proposed
Susitna hydroelectric project in
economic analyses.

In an interview after his speech,
Harza said that Susitna would last
longer than 100 years, though he

See Page D-6, SUSITNA

Susitna

Continued from Page D-1

could not say how much long-
er.

Harza said his company
along with Ebasco Services
Inc. of New York and Belle-
vue, Wash., are just beginning
to design the Watana dam.
About 100 employees of both
firms will work on the
project, primarily in Bellevue
with a secondary office in
Anchorage, Harza said.

The legislature has appro-
priated $25.6 million to begin
Watana design, and the power
authority will seek additional
design funds in the coming
legislative session.

The total cost of designing
Watana has been projected to
be about $70 million. Adding
construction costs, Watana
dam has been estimated to
cost $3.6 billion, while the
second-phase, Devil Canyon
dam would cost an estimated
$1.5 billion, both in January
1982 dollars.

Susitna engineer touts hydropower

y ANN CONY
ally News business reporter

Alaska may not have any mon-
eys and Venezuela may not have
ny moose, but the two places do
ave at least one thing in common:
xtensive oil and gas resources
ombined with plenty of hydroe-
ctric power potential.

That was the message delivered
y Richard Harza, president of
ne of two firms selected by the
laska Power Authority to design
ie Watana Dam of the proposed
usitna River hydroelectric
oject.

In touting the advantages of
ydropower before the Anchorage
hamber of Commerce Monday,
e president of Harza Engineer-
g Co. of Chicago traced his
m's work on the Guri hydroelec-
ic project on the Rio Caroni in
stern Venezuela.

The first stage of that project
is completed in 1968, with an
tension of the initial power
nt giving it an installed capaci-
ty of 2,000 megawatts in 1978. A second expansion is under way now, and — when completed in 1987 — will make Guri the second largest hydro project in the world, after the Parana River project in Brazil.

In addition, Guri has been designed for the possible ultimate expansion to a total capacity of 20,000 megawatts, Harza said.

The current expansion will bring the dam height to 475 feet, compared to a height of 885 feet envisioned for the 1,020-megawatt Susitna Watana Dam.

The Guri and the proposed Susitna projects differ in that Susitna is not intended to provide power to heavy industry, Harza said.

In Venezuela and other countries "double blessed" with fossil fuels and hydro potential, the pattern has been one of simultaneous, coordinated development of both resources, he said.

"When possible, the fossil energy has been exported while the hydro energy has served the developing domestic or local market."

According to Harza, countries such as Venezuela have chosen to invest part of their fossil fuel export revenues in long-term hydro power to meet future energy needs.

"In general, wherever it is available, hydro power is the most economical, least polluting power source," he said.

Harza acknowledged that capital costs for constructing the dams are high. But, he maintained, the high initial costs are "more than offset" by the long life expectancy of the dams and the absence of escalating fuel costs.

A useful life of 100 years has been assumed for the proposed Susitna hydroelectric project in economic analyses.

In an interview after his speech, Harza said that Susitna would last longer than 100 years, though he

See Page D-6, SUSITNA

Susitna

Continued from Page D-1

could not say how much longer.

Harza said his company along with Ebasco Services Inc. of New York and Bellevue, Wash., are just beginning to design the Watana dam. About 100 employees of both firms will work on the project, primarily in Bellevue with a secondary office in Anchorage, Harza said.

The legislature has appropriated $25.6 million to begin Watana design, and the power authority will seek additional design funds in the coming legislative session.

The total cost of designing Watana has been projected to be about $70 million. Adding construction costs, Watana dam has been estimated to cost $3.6 billion, while the second-phase Devil Canyon dam would cost an estimated $1.5 billion, both in January 1982 dollars.

.awmakers hear plea for Susitna dam

ANN CONY
ly News business reporter

Calling 1983 the most critical islative year for the proposed sitna hydroelectric project since 79, a spokesman for Susitna wer Now urged Wednesday that wmakers authorize construction the $5.2 billion project in the ming legislative session.

In a speech before the Anchore Chamber of Commerce's anal breakfast with local legislars, Dave Hutchens urged that e legislature authorize construcn either of the entire project or least the first dam of the assive two-dam Susitna River oject designed to carry the Railit into the 21st century with heap" electricity.

In addition, Hutchens said, the legislature should devise a plan for financing Susitna and should approve the Alaska Power Authority's request for a $47 million appropriation for continued engineering work.

Distributed at the chamber's breakfast meeting attended by 15 legislators here was a Nov. 30 letter to Gov.-elect Bill Sheffield from Hutchens in the latter's capacity as executive director of the Alaska Rural Electric Cooperative Association Inc., a trade group representing 16 electric authorities in the state.

In the letter, Hutchens lambasted a report by economists Arlon Tussing and Gregg Erickson, who have argued that projections for Railbelt power demand — as presented in the Susitna feasibility study — should be lowered in light of falling world oil prices and the impact that will have on local population and economic growth.

Referring to the study by Tussing and Erickson as a "doomsday report," Hutchens told Sheffield: "If you believe that, maybe you shouldn't build Susitna. But if you do believe that, you ought to sell your hotels."

Hutchens sited Acres American's Susitna feasibility study, which predicts a 3.5 percent annual growth rate for power demand. He presented statistics showing that electricity supplied by five of six Railbelt utility companies grew by double-digit figures between the first nine months of 1981 and the first nine months of 1982.

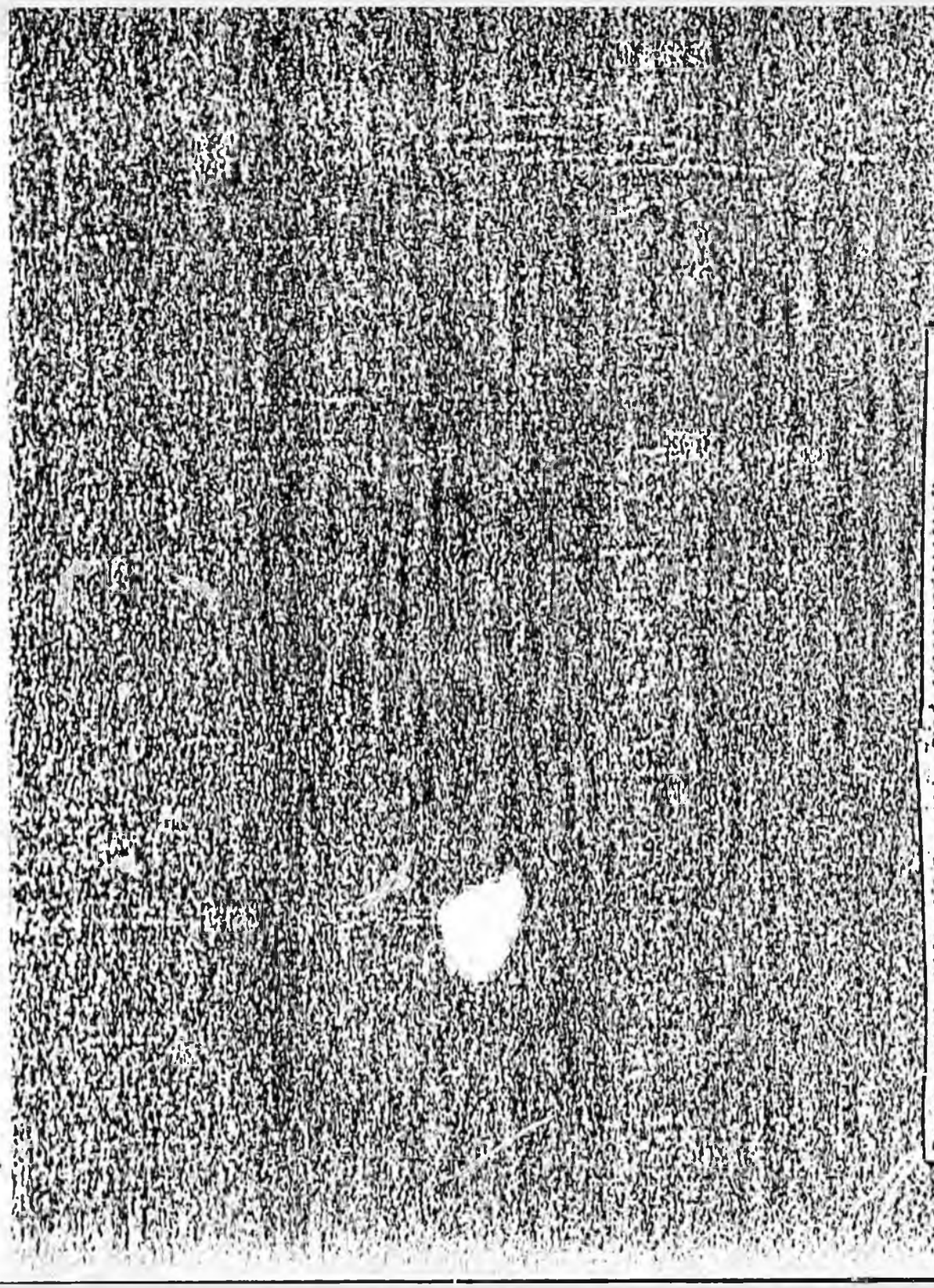
By the end of this year, growth in power demand will be nearly three years ahead of Acres' projections, according to Hutchens.

"It is ludicrous for the opponents to contend that those projections are significantly too high," he wrote to Sheffield.

Asked to respond Wednesday afternoon, Tussing defended his and Erickson's position.

"This year there has been a big jump (in electric demand), but the problem is that it's atypical," Tussing said.

See Page D-3, SUSITNA



Susitna dam proponents call 1983 critica

Continued from Page D-1

Hutchens conceded that much in his letter to Sheffield. But while he maintained that the 3.5 percent projection for increased electric demand was well within reason, Tussing argued that "there's no ground for confidence in it" because the projection was based on a state spending outlook that has dimmed considerably since Acres concluded its Susitna feasibility study.

Tussing maintained that the Railbelt has plenty of natural gas and coal for future electric generation and that Susitna could prove to be a painfully expensive mistake if the 3.5 percent growth projection does not materialize.

Hutchens said that due to high capital construction costs, the cost of electricity from Susitna in its first few years of operation would be about twice as high as power from other sources.

But that problem could be solved, he maintained, if the state subsidizes construction by making an "equity investment in Susitna large enough so the rates to the consumers will not jump when it comes on line."

Acres American has pegged that figure at $2.3 billion, in January 1982 dollars.

Susitna hydroelectric power will be much cheaper in the long run than other power sources, Hutchens told legislators Wednesday.

In a packet of position papers distributed at the breakfast meeting, the chamber argued that the cost of natural gas now used to gen electricity for 90 percen Southcentral Alaska wil crease by as much as six times when current low- gas contracts expire and renegotiated, beginnin 1984.

"Energy costs, and quently the cost of doin ness and living in An.ho will escalate dramatic Hydroelectric power is best alternate energy so to relieve our dependenc fossil fuel," the position per on hydroelectric p said.

In addition to financin Susitna, the chamber is l ing continued state fun for hydroelectric pro statewide.

Economist ups Susitna estimates

by Bill Wh...
Times Juneau Bureau

Juneau — The two massive Susitna River dams proposed to bring cheaper power to the Railbelt region of Alaska may cost between $10 billion and $25 billion, according to a state economist.

The $5.2 billion estimate commonly used for the project is computed in 1982 dollars, not the inflated money the state will actually pay, said Ron Ripple, an economist with state budget office.

That estimate is found in a $35 million state-funded study of the Susitna dams released last March by a Buffalo, N.Y., firm, Acres American Inc.

Ripple recently took Acres' projections of how much construction money would be needed each year to build the dams, and added inflation rates to compute his estimates.

Two dams are being studied for the Susitna River northeast of Talkeetna. They are expected to provide for the power needs of the state's population center into the next century, if the dams are built.

Ron Lehr, Ripple's boss and a director of the Alaska Power Authority, which would build the dams, said many people are comparing the $5.2 billion Susitna figure with the estimated cost of moving the state capital to Willow from Juneau, $2.8 billion.

But the capital move figure is in inflated dollars. The Susitna number isn't.

If the dams are to be built, the state had better start saving, Lehr said. "If you really don't want Susitna the easiest thing to do is sit back and wait."

Ripple estimated 1991 would be the year the largest amount of cash would be needed. Depending on the inflation rate, the legislature might need to find between $1.1 billion and $2.1 billion for Susitna alone. The state budget for this year comes to $3 billion.

Ripples' lowest cost estimate — $10.5 billion — would come if inflation were 7 percent per year, the rate Acres projected.

But many economists believe that inflation rate is too low. A project the size of Susitna in a state whose economy is as small as Alaska's could whip up its own inflation, they say.

So Ripple computed Acres' figures at four higher inflation rates:

- $12.2 billion if inflation hits 8.4 percent a year, the rate used by the Capital Site Planning Committee in estimating capital move costs.
- $14.5 billion if prices rise 10 percent annually, the figure used by the state transportation department in estimating construction costs.
- $18.1 billion with a 12 percent inflation rate.
- $25.4 billion with 50 percent inflation.

Ripple assumes the state would pay cash to build the dams.

But Acres said the state could sell bonds to finance up to half the project, pay off the bonds with income from selling electricity produced by the dams and still have reasonable power rates.

Bonding would cut the amount of cash the state needs. However, it would jack up electrical rates and the cost of building the dams because the state would pay interest on the bonds.

Anchoring one of the seven volumes of Acres' Susitna report are two cost projections using bonds and cash.

In both cases inflation is estimated at 7 percent and the interest rate on the bonds is 10 percent.

If the state paid $3 billion in cash (1982 dollars) and bonded the rest, total construction costs would come to $16.1 billion by the year 2013, Acres said. The state would pay $4.8 billion cash, sell $9.1 billion in bonds and use $4.1 billion from the sale of electricity.

If the state paid $2.3 billion in cash (1982 dollars), the construction tab would hit $16.2 billion. Of that, the state would pay $3.5 billion (inflated dollars), sell $10.1 billion in bonds and use $5 billion from selling electricity.

Outside firms win contrac for Susitna dam design w

Alaska Power Authority directors on Friday awarded a Susitna hydroelctric engineering design contract worth at least $70 million to Harza Engineering Co. of Chicago and Ebasco Services Inc. of New York.

Those firms will be responsible for designing the proposed 885-foot-high Watana dam, the first phase of the $5.1 billion two-dam project northeast of Talkeetna that has been proposed for the Susitna River to carry the Railbelt into the 21st century with "massive amounts of "cheap" electricity.

The legislature last appropriated $25.6 milli designing Watana, would be one of the earthfill dams in the But that appropriation cover the bill, and the authority plans to ask million in additional funds during the coming lative session.

In other action at Fr board meeting, power a ity directors voted mously in favor of over the $500 million B Lake hydroelectric p

See Back Page,

10/23

Firms win contracts for design work on Susitna dam

Continued from Page A-1

from the Army Corps of Engineers after hearing endorsement of that plan from Anchorage Mayor Tony Knowles, representatives of utility companies, environmental groups and others.

The 135-megawatt Bradley Lake dam project near Homer is primarily intended to serve the Kenai Peninsula, but it would generate excess power that could supply Anchorage area utilities as well.

Many Bradley Lake backers say they support the project not as an alternative to the Susitna project but as an interim power source to meet growing electricity demand before Susitna can be built.

Yet to be answered, however, is the question of how the Susitna project will be financed.

The Anchorage Chamber of Commerce's energy committee is considering a ballot initiative drive aimed at allowing state residents to vote next year on a proposal that would require the legislature to dedicate funds for the project.

Power Authority Director Ron Lehr, who also is Gov. Jay Hammond's budget director, cited projections by his staff that while the Susitna project is estimated to cost $5.1 billion in 1982 dollars, the final cost of the project would likely be $15.6 billion by 2002, assuming an annual inflation rate of more than 10 percent but less than 12 percent.

Lehr was part of a two-director revolt that sought unsuccessfully Friday to buck the power authority staff and a majority of the board to overturn last month's choice of an access route.

On a motion by Commissioner Robert Weeden of the University of Alaska to dump the route that would provide access from Denali Highway in favor of a more environmentally acceptable route from the Parks Highway, Lehr and Weeden were overruled.

The power authority plans to apply in January for a Federal Energy Regulatory Commission license to build Susitna.

Outside firms win contract for Susitna dam design wo

Alaska Power Authority directors on Friday awarded a Susitna hydroelectric engineering design contract worth at least $70 million to Harza Engineering Co. of Chicago and Ebasco Services Inc. of New York.

Those firms will be responsible for designing the proposed 885-foot-high Watana dam, the first phase of the $5.1 billion two-dam project northeast of Talkeetna that has been proposed for the Susitna River to carry the Railbelt into the 21st century with "massive amounts of "cheap" electricity.

The legislature last appropriated $25.6 million designing Watana, wh would be one of the lar earthfill dams in the wo But that appropriation w cover the bill, and the po authority plans to ask for million in additional de funds during the coming le lative session.

In other action at Frid board meeting, power auth ity directors voted una mously in favor of tak over the $500 million Brad Lake hydroelectric proj

See Back Page, FIR

10/23

Firms win contracts for design work on Susitna dam

Continued from Page A-1

from the Army Corps of Engineers after hearing endorsement of that plan from Anchorage Mayor Tony Knowles, representatives of utility companies, environmental groups and others.

The 135-megawatt Bradley Lake dam project near Homer is primarily intended to serve the Kenai Peninsula, but it would generate excess power that could supply Anchorage area utilities as well.

Many Bradley Lake backers say they support the project not as an alternative to the Susitna project but as an interim power source to meet growing electricity demand before Susitna can be built.

Yet to be answered, however, is the question of how the Susitna project will be financed.

The Anchorage Chamber of Commerce's energy committee is considering a ballot-initiative drive aimed at allowing state residents to vote next year on a proposal that would require the legislature to dedicate funds for the project.

Power Authority Director Ron Lehr, who also is Gov. Jay Hammond's budget director, cited projections by his staff that while the Susitna project is estimated to cost $5.1 billion in 1982 dollars, the final cost of the project would likely be $15.5 billion by 2002, assuming an annual inflation rate of more than 10 percent but less than 12 percent.

Lehr was part of a two-director revolt that sought unsuccessfully Friday to buck the power authority staff and a majority of the board to overturn last month's choice of an access route.

On a motion by Commissioner Robert Weeden of the University of Alaska to dump the route that would provide access from Denali Highway in favor of a more environmentally acceptable route from the Parks Highway, Lehr and Weeden were overruled.

The power authority plans to apply in January for a Federal Energy Regulatory Commission license to build Susitna.

City / State

- The Blotter
- Tell It to Bud
- Obituaries

Official calls Susitna cost data 'obsolete'

by Bill White
Times Juneau Bureau

Juneau — Part of a two-and-a-half-year, $35 million study that endorsed building the multibillion-dollar Susitna River dams may be invalid, a high-ranking state cabinet officer has declared.

Revenue Commissioner Tom Williams said oil prices and state revenue estimates have crashed since that study was released last winter.

New, lower estimates undermine parts of the Susitna feasibility study that rely on revenue and oil price projections, Williams said in a letter to Eric Yould, executive director of the Alaska Power Authority. It is the state agency that plans to build two Susitna dams for about $5.2 billion.

"To the extent that the conclusions of the Susitna feasibility analysis are dependent on oil price levels over the long term, a radical revision in the long-range outlook for those prices may have invalidated those conclusions," Williams said.

"Certainly they have become obsolete, and the analysis supporting them should be redone using more current expectations of oil prices over the long term."

Williams referred Yould to a study done last month by Jamie Love, special assistant to the revenue commissioner. Love found that state spending helps determine population growth and electricity demands, and new revenue projections forecast much less state spending than the feasibility study had predicted.

Love also said the Susitna project will require large cash subsidies from the state up front, and that cash may not be available if the new revenue projections are true.

Yould today agreed some of the feasibility study was made using estimates that since have been lowered.

But the power agency all along planned to continue to update — while waiting to get the go-ahead to build from the Federal Energy Regulatory Commission — its assumptions on whether the dams are a good idea economically. Federal permission likely is two to three years off, Yould said.

In his letter, Williams was answering Yould's questions about the accuracy of a draft study done for the governor's office by economists Arlon Tussing and Gregg Erickson.

That study, being
form this week, re
sitna feasibility stu
cludes many of its
been canceled by a
for longterm oil price

State revenues ar
mostly by the price o

The Tussing-Erick
one of three studies
nor's Division of Po
ment and Planning
parts of the early fea
because of new inform

Report says 2 dams may be 1 too many

9/3

By Bill White
Times Juneau Bureau

Juneau — Demand for electricity in Alaska's Railbelt region might be too low to justify construction of the second of two massive dams on the Susitna River, according to a study by the governor's office.

Growth in demand should be tied to growth in population, which in turn is linked to growth in state spending, concluded the report by the governor's division of policy development and planning.

But state spending may not materialize to the extent anticipated by backers of the Susitna dams, the report said. Recent long-term revenue forecasts look with pessimism at expected state income through the rest of the century.

The $5.2 billion Susitna hydroelectric project involves building two dams on the Susitna River northeast of Talkeetna to serve the power needs from Fairbanks to the Kenai Peninsula, including Anchorage. First to be built — by 1993 — would be an 885-foot rockfill dam and powerhouse at an area called Watana. Then, by 2010, a 650-foot concrete arch dam and powerhouse would be erected downstream at Devil Canyon.

"There is little question that electricity demand will be sufficient by 1990 to absorb the output of the first half of the project — the Watana dam," the report said.

"However, it is uncertain whether demand will continue to grow between 1990 and 2010 such that the second half of the project — the Devil Canyon dam — can be justified."

A two-and-a-half-year, $35 million study for the state released in March concluded demand for electricity in the Railbelt should justify building the two dams.

But the new report from the governor's office said that justification depends on the state having extensive savings in the next decade that would allow continued growth in state spending through the year 2010.

"However, it no longer seems credible that the state will actually accumulate such savings, especially in view of the substantially lower petroleum revenue forecasts that have been issued in March and June 1982 by the Department of Revenue."

The report added that revenue estimates are just estimates, and actual income could be higher than the forecasts. Oil prices could escalate, another rich oil field like Prudhoe Bay could be found and tapped in the 1990s, or private development could offset a fall in state spending.

Also, demand should be higher if the state pays for dam construction instead of consumers. "As a result, it appears likely that the full output of both dams would still be absorbed despite today's state revenue projections."

Another recent study on Susitna for the division concluded that outdated assumptions were made in previous studies that concluded there was a need for the hydroelectric project.

Written by Arlon R. Tussing and Gregg K. Erickson, the report criticized recent studies on Susitna as "already largely obsolete."

In a related development, Standard Research Institute is expected to complete within a couple weeks what kind of inducement low-cost energy from Susitna would have in luring industry to the railbelt.

New Susitna report claims old inaccurac

by A.J. McClanahan 9/23
Times Writer

Recent studies showing a need for the two-dam $5.1 billion Susitna hydroelectric project are based on incorrect information, according to a draft report done for the governor's office.

Arlon R. Tussing and Gregg K. Erickson say in their report that outdated assumptions were made in previous studies that concluded there was a need for Susitna.

Questioning Tussing and Erickson's report, however, is the energy committee of the Anchorage Chamber of Commerce.

And the Alaska Power Authority, charged with coordinating studies on the project, has no comment yet on the Tussing-Erickson report because officials there are still studying it.

The Tussing-Erickson draft is called "Alaska Energy Planning Studies: Substantive Issues and the Effects of Recent Events," and was done for the governor's Division of Policy Development and Planning.

Tussing and Erickson criticized recent studies on the Susitna project as "already largely obsolete."

Tthe studies' "critical assumptions — regarding the future prices of various fossil fuels, the growth of population and economic activity in Alaska and the resulting growth of energy demand in the state — are based upon a 'conventional wisdom' about future energy prices that should have been suspect even in 1980 and 1981 when the study contracts were signed, and which subsequent experience has made nearly untenable," Tussing and Erickson said in the draft.

Erickson declined to be interviewed about the report, stressing that comments are still being sought on it before it is put into final form.

The main findings of the draft report are:

• Dramatic changes in oil price expectations since 1980 demand reconsideration of the level of Alaska economic activity and energy demand.

• Assumptions in previous reports concerning prices and availability of Alaska coal and natural gas for local electric power generation are not well supported.

• Recent studies did not deal with high interest rates and capital-market conditions, and so their conclusions about risks, costs and financing arrangements of the Susitna project are suspect.

• Now is not the time for major initiatives in publicly financed power development in Alaska unless those ventures are able to satisfy stricter tests of economic feasibility.

Former chamber president Bob Penney and other representatives of the chamber energy committee said an earlier report by Tussing has proven to be "very conservative" in terms of population growth estimates for railbelt communities.

And as for the current draft report there have been dramatic changes in oil tations, Penney said demand for all natur including oil, is down now. But, he sa economy improves, "we'll all use more."

Countering other findings, Penney sai

• Coal is economically feasible if the mercial development for coal already a there are no projects to commercially Beluga field, and without them Beluga's be too high to be an alternative to Susitna

• Interest rates already have fallen ment in the Susitna project by the state v ture Alaskans a return on some of today's

• Now is the time for the state to build cause gas burned today to generate elect saved for future generations for heating t

Access route for Susitna project OK'd

by A.J. McClanahan
Times Writer

9/15

An access route for the proposed $5.1 billion Susitna hydroelectric project that would go south from the Denali Highway to the Watana Dam site was narrowly approved by the Alaska Power Authority board Tuesday.

The 4-3 vote followed a public hearing which drew little comment except from a spokesman for an environmental organization that questioned the need for the massive hydroelectric project.

Selection of the access route does not mean bulldozers will be carving up the near 100 miles of roadway soon. In fact, any road construction is likely to be at least three years away. The recommended access route will be included in the licensing application to be submitted by March to the Federal Energy Regulation Commission. Processing of the application could take up to three years.

Although the Department of Natural Resources prefers an all-rail, limited-access route, department spokesman Al Carson said his agency will cooperate as much as possible with the power authority and won't fight the access route chosen.

One of the two routes not chosen went from the Parks Highway at Hurricane, through the Chulitna Pass, then north of the Susitna River and through the Upper Portage Creek drainage, including a a spur road to the Devil Canyon dam site. The second route not chosen went from the Parks Highway at Hurricane, through the Chulitna Pass, proceeding on the south side of the river to just before the Watana Dam site, including a road from Gold Creek running to the Devil Canyon site.

The route approved by the board Tuesday was a variation on one suggested by the consulting firm Acres American. That plan called for the route to have a railroad spur built on the south side of the river to the Devil Canyon dam site.

Native corporations had listed

See Susitna, page A-

Susitna

(Continued from page A-1)

the Acres suggestion as their second choice, saying they wanted as much access as possible to their lands.

Although the route approved has the greatest ease of construction, it also has the most environmental impact, power authority staff said. But they added that their suggestion — because it goes on the north side of the Susitna — reduces the the environmental impact because the north side is less sensitive.

Dr. Ernst Mueller disagrees. The commissioner of the state Department of Environmental Conservation said today he voted against the access route "because it's a more expensive route and the most environmentally harmful route."

Mueller said the road, if constructed, would eventually become a public road and the onslaught of more people coming into this area would affect caribou migration patterns.

Power authority Executive Director Eric Yould told board members that even though the board approved the route Tuesday as the one to be submitted to FERC, "It's not set in concrete." The commission may require that it be changed, or the power authority could change its mind and re-submit a route to the commission.

Raising questions about the project in general was Eric Myers of the Nothern Alaska Environmental Center. He said recent changes in world oil prices invali-

...for the Susitna project is based.

In a prepared statement submitted to the board, Myers said revised expectations about world oil prices and associated state spending trends should be taken into account in planning for the project.

The power authority board and staff told Myers that forecasts of Alaska power needs are being reevaluated to account for such things as changes in oil revenues and trends in state spending.

Voting for the route suggested by power authority staff were board members Dr. Ron Lehr, budget and management director in the governor's office; Charles Webber, commissioner of the state Department of Commerce and Economic Development; board Chairman Charles Conway, partner in a public relations firm; and Robert Ward, commissioner of the state Department of Transportation.

Joining Mueller in voting against the access route were John Schaeffer, president of NANA, a native corporation and Dr. Robert Weeden, University of Alaska wildlife sciences professor.

Also at the day-long power authority meeting, an Anchorage man who said he represented Talkeetna area residents said people in that area want construction of ... transmission intertie to be by helicopter only in their area.

Jim Sykes of Anchorage, who owns land near Talkeetna, also told the power authority that Talkeetna residents don't want the agency to use pesticides.

They want the agency to adopt an official policy against the use of insecticides, herbicides and other pesticides, he said.

Power authority spokesman George Gleason said the agency will not use any pesticides in the construction of the intertie, which would allow for power exchanges between Anchorage and Fairbanks even if the Susitna project is not built. But he added that it's too early to consider what the maintenance policy for the intertie would be.

In other action the board:

— Narrowed a list of consult-... design the Watana dam to Bechtel Civil and Minerals Inc. of San Francisco, the joint venture of Harza Engineering Co. and Ebasco Services Inc. of Bellevue, Wash. and Raymond Kaiser Engineers of Oakland, Calif. The state legislature appropriated $25.6 million to begin the design of the Watana phase of the project, and the power authority will seek additional funds during the next session to complete the project design.

— Decided to begin contract negotiations with Ebasco Services Inc. on a study of using North Slope natural gas for electrical generation in the Railbelt area.

— Decided to begin negotiations with Land Field Services Inc. of Anchorage to provide land acquisition, permitting and regulatory management services for the Susitna project.

Susitna project access road approved

9/15

The directors of the Alaska Power Authority approved by a narrow margin a 100-mile access route from the Denali Highway to the proposed $5.1 billion Susitna River hydroelectric project.

The directors voted 4-3 for a staff-recommended variation of an access route favored by consultants, with the vote reflecting, in part, disagreement over environmental impacts.

The chosen route would provide road access from the Denali Highway to the proposed Watana and Devil Canyon dam sites in two phases. It also would include construction of a rail spur from the Devil Canyon site south and west to hook up to the Alaska Railroad at Gold Creek.

Power authority spokesman George Gleason said the staff recommended the revised route — and a majority of directors approved it — partly because it was deemed more cost effective.

The initial costs would be less and construction would be far easier than under the consultant's proposed access route he said.

"We can shorten the construction of the whole project by a year to a year and a half."

The power authority staff maintained that the favored route from the Denali Highway north of the Susitna River also would pose fewer environmental problems because it would cross relatively flat, dry tundra, while the consultant's suggested route from the south would run across wetlands.

But some of the board directors and representatives of state agencies felt otherwise.

Ernst Mueller, a power authority director and commissioner of the Department of Environmental Conservation, voted against the staff recommendation, saying later that the access road eventually would be public and that the road development could disrupt caribou migration.

Mueller said he opposed the chosen route also because the final cost would be higher.

The route chosen by most of the directors is not the best alternative for wildlife, according to Karl Schneider, a Department of Fish and Game biologist who supervised big game studies for the access alternatives.

"The route that they chose ... was a segment we felt would be most detrimental to wildlife, particularly caribou," Schneider said.

The chosen route will not necessarily be devastating to caribou, he said, but "it would make an important part of their range less usable."

Eric Myers of the Northern Alaska Environmental Center said Wednesday that the chosen route was "the least environmentally acceptable."

Myers also raised broader objections to the massive hydroelectric project, saying that recent state revenue forecasts could put a significant damper on the outlook for electricity demand in the Railbelt.

The board acknowledged the need to reassess future demand and said that a reevaluation is in the works.

Directors voting with Mueller against the recommended access route were Robert Weeden, a wildlife sciences professor from the University of Alaska, Fairbanks, and John Schaeffer, president of NANA, the Kotzebue-based Native regional corportion.

The access route preferred by the majority of directors will be included in the state's Federal Energy Regulatory Commission licensing application for the project.

Though the application is expected to be submitted by March, its processing could take as long as three years.

Eric Yould, the power authority's executive director, said after the vote that the access route is "not set in concrete."

HB

1221

PROPOSED LEGISLATION: SUSITNA
HB 120, 121, 122
A REVIEW OF KEY ISSUES

HB 120/ AUTHORIZATION AND APPROVAL OF THE SUSITNA FEASIBILITY STUDY AND APPROVAL OF THE PROPOSED "PLAN" OF FINANCE

Issue — Acceptability of the APA/Acres Feasibility Study

The Susitna Feasibility Study prepared for the APA by Acres American (March 1982), concluded that Susitna could offer the most attractive long term electrical energy source for the Railbelt but only on the basis of several very critical assumptions. Most importantly, these assumptions included: 1) high electrical demand growth (forecasts), 2) rapidly increasing oil prices, 3) outdated revenue projections/multi-billion dollar cash construction subsidies, and 4) tax exempt bond financing.

The Acres report included a "sensitivity analysis" which tested how critical certain assumptions were to the conclusion that Susitna was economically viable (Attachment A).

Since the time that the Acres study was prepared, fundamental changes in world economic circumstances has invalidated the conclusion that Susitna is the most attractive Railbelt alternative, at least until well into the next century.

Electrical Demand: The "need" for Susitna was predicated on a host of assumptions about future economic activity-population growth-employment-household formation, etc. which results in electrical demand. Assumptions included the ANGTS line, an ALPETCO-like refinery in Valdez, PacAlaska, and State spending trends as before the world oil market collapsed. In light of the changed circumstances, the most recent revised projections of Railbelt electrical demand for the year 2010 (Battelle, 1982) are close to half those used by Acres a couple of years back in its design development selection work which led to the choice of the Watana/Devil Canyon proposal currently under consideration (Attachments B and C).

The ISER (1980) projections used by Acres called for a Moderate (or "most likely") demand case of 8,940 Gwh per year in 2010 which compares to the more recent Battelle (1982) Moderate demand estimate of 4,986 Gwh/year in 2010. That is, the most recent demand projections for 2010 are only about 56% of those used by Acres to arrive at the conclusion that we "need" Susitna.

Another way of considering this question is in terms of capacity requirements: how many megawatts of additional capacity are needed to replace retired capacity over time and meet expected peak (highest) demand? Acres, in its design development and selection analysis, used the ISER (1980) projections calling for a Moderate case peak demand of 1,635 megawatts (MW); this contrasts with the more recent Battelle (1982) projection of peak demand projection of 1,003 MW. Approximately 577 MW of capacity would still be in place in the year 2010. The essential issue is how large a "capacity deficit" can

be expected and how much additional capacity is needed to meet the shortfall. Using the capacity retirement schedule developed by Acres and the most recent capacity requirement projections by Battelle (including a 30% reserve capacity margin) it is evident that the Railbelt will experience a capacity shortfall of about 200 MW in the year 2000 and about 727 MW by the year 2010. This contrasts with the Susitna project at a total of 1,620 MW (Watana at 1,020 and Devil Canyon at 600). A premature commitment to Susitna would result in massive amounts of excess, idle capacity as is the case with the Lake Tyee project (Attachment D).

Note that the Acres' "sensitivity analysis" (Attachment A) tested a "Low" demand case for 2010 as 6,300 Gwh. This supposed "Low" scenario — which renders the project marginal at best — is 26% higher than the more recent "Moderate" case and 64% higher than the revised Battelle "Low" for 2010 (3,844 Gwh).

Using Acres own analysis, the new demand projections would indicate that the project had negative net benefits (ie, was more costly than the alternatives).

Fuel Price Escalation Rate: Acres assumed that there would be constantly rising fuel prices through 2010 reflecting the constantly increasing cost of the world price of oil. The Acres projection called for real (adjusted for inflation) price increases of 2.6%/year to 2000 and 1.2%/year to 2010 (Attachment A). The "sensitivity analysis" shows that a 0% real rate of fuel price increase yields a negative net benefit in excess of $1 billion. The Alaska Department of Revenue projects a negative (declining) real price of oil throughout most of this decade and does not anticipate positive real price increases anywhere near as great as the Acres base case assumed.

Again, using Acres own analysis, it is apparent that the project would cost more than the alternatives.

Outdated Revenue Projections/ Multi-Billion Dollar Subsidies: The Energy Program for Alaska was conceived of in a time of upwardly spiraling revenues; before the collapse of the world oil market. Superabundent revenues are clearly no longer available (Attachment E) yet the financing scheme proposed by HB 121 presumes the availability of $2.3 billion in grants for the project in order to make the project's cost of power artificially competitive with the less expensive alternatives. Acres/APA acknowledges that Susitna power (at 30¢/kwh) will cost more than twice the alternatives (at 14.5¢/kwh) when/if it is brought on line as scheduled in 1993 (Attachment E). The alternatives will continue to be lower in cost until well into the next century.

Tax Exempt Financing: Acres assumed that the project could be built with tax exempt bonds. This assumption has been questioned by, among others, the APA's own bond counsel (Acres: Task 11/January 1983, pp. 11-13).

General Comment: It is especially noteworthy that the Alaska Power Authority Board of Directors never endorsed the conclusion that the Susitna project was the most attractive electrical alternative for

thr Railbelt. At least until the APA Board formally adopts that position, it would be premature for the Legislature (with vastly less information and understanding) to do so.

The Feasibility Study should not be endorsed in the absence of such action on the part of the APA Board or without a formal reconsideration and economic reevaluation of the project in light of present economic realities.

Issue — Approval of the "Plan" of Finance

There is, in fact, no "plan" per se, but rather a vague set of options that have been proposed (Acres: Task 11/January 1983). These proposals call for multi-billion dollar grant subsidies with some sort of complimentary bonding — revenue bonds? G.O. bonds? "double barrel" bonds? There is no plan, just several nebulous scenarios.

What is being sought (in the form of approval of the so-called plan) is an open-ended commitment to multi-billion dollar subsidies. That's the plan.

The most basic issue raised by this aspect of the proposed legislation is: how does this finance "plan" approval relate to the other companion proposals: $2.3 billion subsidy grants (HB 121) and $5.4 billion "double barrel" bonding (HB 122)? What specifically is being contemplated?

General Comment: A proposed plan of finance should be very specific as to the marketing of power and power sales agreements. The object is, of course, to avoid a situation like Lake Tyee where we have a $120 million project and no takers ($82 million in State appropriations, $50 million in short term debt). The APA charged ahead with the 20 MW Tyee project without power sales agreements with Wrangell and Petersburg. Now nearly completed (with $10 million cost overrun), the two communities don't want the power because it would cost significantly more than oil-fired electricity (even with about 70% grant financing).

The "Plan" of Finance (Task 11) is very vague on the relationship of power sales agreements and State expenditures and bond financing. It is absolutely critical that this relationship be clear and explicit. Power sales contracts (take-or-pay) should be an absolute prerequisite to any State expenditures on the project.

HB 121/ CONSTITUTIONAL AMENDMENT AND $2.3 BILLION SUBSIDY FUND: ADVISORY VOTE

Issue — Constitutional Amendment

One can wonder whether the framers of the Constitution would approve of an amendment to the Constitution to secure a single capital project.

Issue — Advisory Vote/Costs and Public Education

It is estimated that a special statewide election would cost about $1 million.

It has been well documented that people generally don't have even a remote idea of what the project would actually cost. The recently released Dittman poll showed that while people were mostly supportive of the project, 53% didn't have any idea as to what the project would cost while 71% either didn't know or thought that it would cost less than $500 million. The acknowledged nominal (as spent) cost of the project is $10-15 billion excluding finance charges or the possibility of cost overruns. (A cost overrun the same size as experienced on the Tyee project — 9% — would amount to about $460 million).

Certainly any popular vote or advisory vote should be preceeded by an objective and impartial educational effort designed to inform people about the true costs of the project (Attachment E). If billions are to be allocated to Susitna, as proposed by HB 121, the decision should be carefully considered in light of the opportunity costs. Susitna subsidies threaten the loan programs, municipal revenue sharing, Permanent Fund dividends, education funding, property tax relief, and would likely force the return of the personal income tax. These are the true costs of Susitna that nobody is talking about.

HB 122/DOUBLE BARREL BONDING

Issue — Change in APA Statutes/Public Vote on Susitna Bonds

Current APA statutes (AS 44.83.130(b)) expressly disallows the APA from engaging the State's credit in its bonding efforts. HB 122 would empower the APA to put the "full faith, credit and resources" of the State behind $5.4 billion of revenue bonds making them virtually indistinguishable from general obligation (G.O.) bonds. (Revenue bonds backed up by the State's general obligation are "double barrel" bonds). The basic issue to be addressed is whether the Susitna project justifies exemption from the explicit blanket prohibition to engage the State's credit.

The fiscal implications of this matter are profound. If the APA were to be empowered, by a public vote, to issue "double barrel" bonds in the amount of $5.4 billion the entire credit of the State would be at risk. It is a near certainty that that the public has little understanding of the issue and could well, in complete innocence, give over this power to the APA on the basis of a shallow understanding based on the pro-Suitna propaganda campaign.

Giving the APA autonomy to put the State into significantly greater debt is inadvisable in light of the State's presently precarious

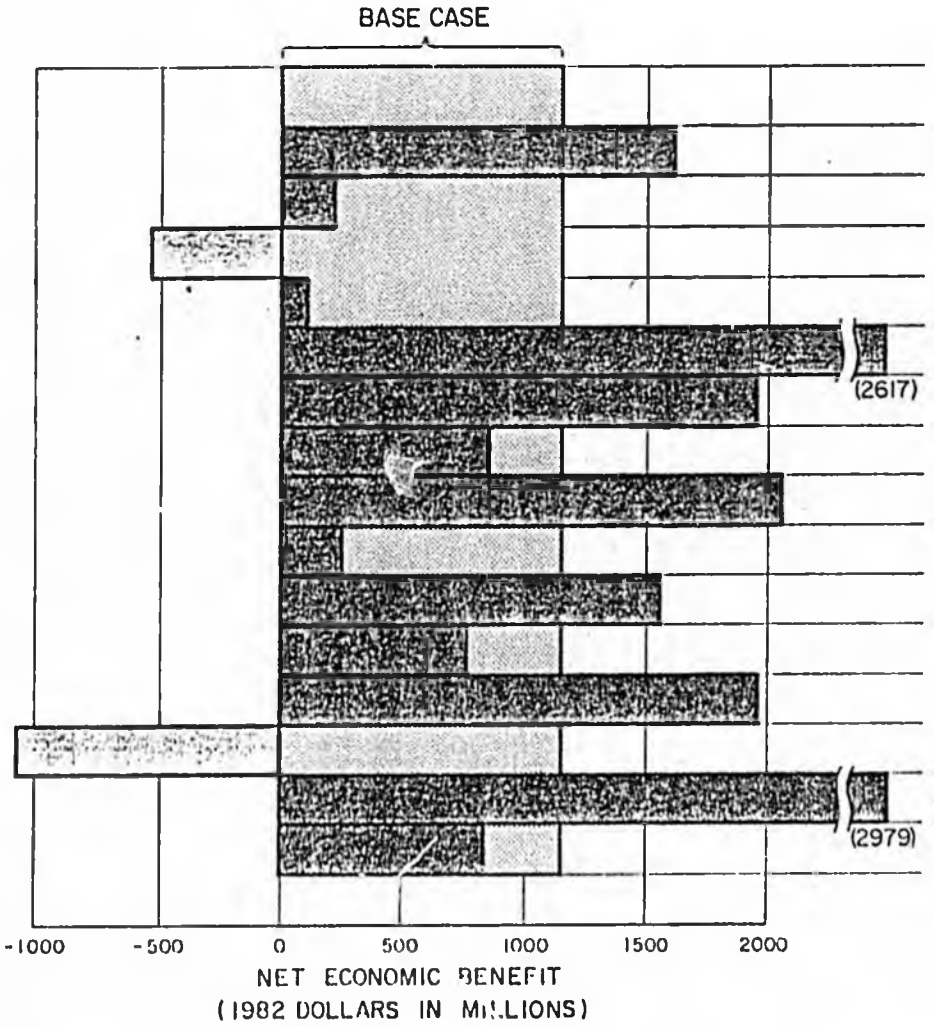
debt situation with what is perhaps the highest per capita debt for any state in the nation (Attachment G).

Again, if this measure is adopted there had better be some provision for a dispassioned educational effort in order to inform the public what the credit risks and opportunity costs are all about.

Moreover, the APA's own bond counsel has advised that if "a major portion of (Susitna's costs) were met from State G.O. Bonds, Alaska's present double A ratings would be endangered" (Acres: Task 11/January 1983, p.12). The bond counsel has also stated that the State can "only 'safely' issue about $565 million (nominal dollars, using 8% inflation) G.O. Bonds during the period fiscal 1983-1990."* Finally, the bond counsel recommends that "to the fullest extent possible" The APA should use revenue bonds secured by income derived from participating Railbelt Utilities pursuant to long term power sales contracts" (emphasis added).

* Using the December 1982/30th Percentile Department of Revenue forecasts.

ATTACHMENT A



ELEMENT TESTED	BASE CASE VALUE
HIGH LOAD FORECAST (11,400 GWH IN 2010)	7,800 GWH IN 2010
LOW LOAD FORECAST (6,300 GWH IN 2010)	7,800 GWH IN 2010
5 % REAL DISCOUNT RATE	3%
4 % REAL DISCOUNT RATE	3%
2 % REAL DISCOUNT RATE	3 %
HIGH CAPITAL COST FOR ALTERNATIVE (20 % ABOVE ESTIMATE)	BATTELLE ESTIMATE
LOW CAPITAL COST FOR ALTERNATIVE (10 % BELOW ESTIMATE)	BATTELLE ESTIMATE
LOW SUSITNA CAPITAL COSTS (83 % OF ESTIMATE)	PROJECT ESTIMATE
HIGH SUSITNA CAPITAL COSTS (117 % OF ESTIMATE)	PROJECT ESTIMATE
ZERO CAPITAL COST ESCALATION	1.8 % / ANNUM
HIGH CAPITAL COST ESCALATION (3.6 % / ANNUM)	1.8 % / ANNUM
HIGH BASE COAL PRICE ($ 2.08 / MM BTU)	$ 1.43 / MM BTU
ZERO FUEL PRICE ESCALATION	2.6 % TO 2000 1.2 % TO 2010
HIGH FUEL PRICE ESCALATION (5 % TO 2000, 2.2 % TO 2010	2.6 % TO 2000 1.2 % TO 2010
CHAKACHAMNA ALTERNATIVE	ALL THERMAL PLAN

PLATE 24 | **SENSITIVITY ANALYSIS**

ATTACHMENT B

TABLE 5.6: ISER 1980 RAILBELT REGION LOAD AND ENERGY FORECASTS USED FOR GENERATION PLANNING STUDIES FOR DEVELOPMENT SELECTION[5]

	LOAD CASE											
	Low Plus Load Management and Conservation (LES-GL Adjusted)[1]			Low (LES-GL)[2]			Medium (MES-GM)[3]			High (HES-GH)[4]		
Year	MW	GWh	Load Factor	MW	GWh	Load Factor	MW	GWh	Load Factor	MW	GWh	Load Factor
1980	510	2790	62.5	510	2790	62.4	510	2790	62.4	510	2790	62.4
1985	560	3090	62.8	580	3160	62.4	650	3570	62.6	695	3860	63.4
1990	620	3430	63.2	640	3505	62.4	735	4030	62.6	920	5090	63.1
1995	685	3810	63.5	795	4350	62.3	945	5170	62.5	1295	7120	62.8
2000	755	4240	63.8	950	5210	62.3	1175	6430	62.4	1670	9170	62.6
2005	835	4690	64.1	1045	5700	62.2	1380	7530	62.3	2285	12540	62.6
2010	920	5200	64.4	1140	6220	62.2	1635	8940	62.4	2900	15930	62.7

Notes:

(1) LES-GL: Low economic growth/low government expenditure with load management and conservation.
(2) LES-GL: Low economic growth/low government expenditure.
(3) MES-GM: Medium economic growth/moderate government expenditure.
(4) HES-GH: High economic growth/high government expenditure.
(5) Excludes reserve requirements. Energy figures are for net generation.

Source: Acres (1982) Vol. 1 Section 5.

ATTACHMENT C

Revised Moderate and Low Case Electricity Forecasts, Railbelt

	Revised Annual Energy[a] (GWh)		Old Annual Energy (GWh)	
	Moderate	Low	Moderate	Low
1980	2551	2551	2551	2551
1985	3000	2560	3136	3028
1990	3391	3001	4256	3853
1995	3884	3164	4875	4063
2000	4010	3106	5033	3988
2005	4319	3332	5421	4278
2010	4986	3844	6258	4936

	Revised Peak Demand[b] (MW)		Old Peak Demand (MW)	
	Moderate	.ow	Moderate	Low
1980	531	521	521	521
1985	615	525	643	621
1990	701	621	880	797
1995	791	652	993	837
2000	810	673	1017	815
2005	870	678	1092	870
2010	1003	780	1259	1001

(a) Revised downward based on low case annual consumption of 9.84 MWh per capita and moderate case annual consumption of 10.40 MWh per capita in the year 2000. See Appendix B, Tables B.3, B.4, B.12, and B.18. Other years consumption reduced proportionately. 1985 figures was adjusted upward judgmentally for moderate case; 1985-1995 adjusted upward for low case.

(b) Based on the ratio of peak demand to annual energy from Appendix B, Tables B.12 and B.18.

Source: Battelle NW (1982)

ATTACHMENT D

MODERATE DEMAND

PROJECTED ADDITIONAL CAPACITY NEEDS

FOR THE RAILBELT

(megawatts)

Year	Existing Installed Capacity [1]	Projected Peak Demand (w/ 30% RSRV) [2]	Required Additional Capacity
1985	1154 MW	690 MW	0 MW
1990	1242	911	0
1995	1095	1028	0
2000	853	1053	200
2005	610	1131	521
2010	577	1304	727

[1] Ebasco (1982): Assumes already planned additions of 158.4 MW of gas turbines in 1982 and Bradley Lake at 97 MW in 1988 with a capacity retirement schedule for existing plants from Acres (1981).

[2] Battelle (1982/revised): Moderate Growth Case with 30% reserve margin.

ATTACHMENT E

IMPACT OF SUSITNA SUBSIDY SCHEME
AS PROPOSED IN HB 121
ON AVAILABILITY OF STATE REVENUE

CONSTANT DOLLARS
(adjusted for inflation, in millions)

Fiscal Year	General Fund Unrestricted Revenue	Operating Budget (est.)	Surplus Revenue Available	Susitna Grant Subsidies (HB 121)
1982	3674	1600	2074	-
83	2990		1390	-
84	2329		729	230
85	2254		654	230
86	2314		714	230
87	2241		641	230
88	2341		741	230
89	2259		659	230
90	1989		389	230
91	1716		116	230
92	1558		-	230
93	1375		-	230
94	1260		-	-
95	1145		-	-
96	1024		-	-
97	989		-	-
98	959		-	-
99	957		-	-
2000	950		-	-

Note:

General Fund Unrestricted Revenue projection is net of legally required Permanent Fund contribution. Projection by Department of Revenue (February, 1983).

ATTACHMENT F

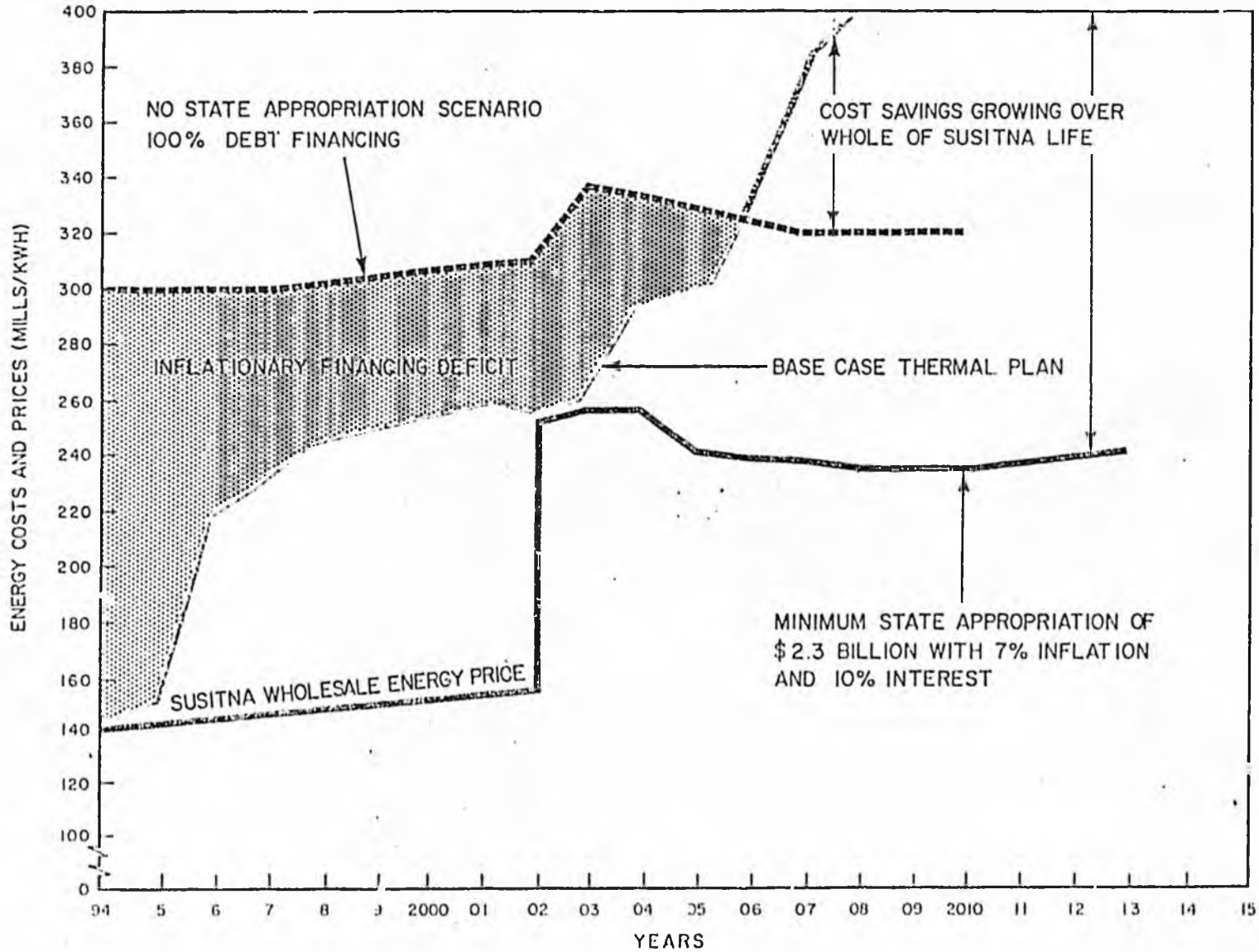


PLATE 26 | ANNUAL COST COMPARISON

ATTACHMENT G

SEATTLE BUSINESS JOURNAL February 7, 1983

STATE DEBT

State	Net Tax-Supported Debt (millions)	Per Capita
1. Alaska	$1,045	$2,610
2. Hawaii	1,424	1,476
3. Delaware	581	977
4. Connecticut	2,132	686
5. Maryland	2,851	676
6. Massachusetts	3,355	567
7. New York	9,300	557
8. West Virginia	991	508
9. Louisiana	2,116	503
10. Vermont	241	472
11. Washington	1,645	398
(National median)		203

Western States	Per-Capita Debt
Alaska	$2,610.43
Hawaii	1,476.49
Washington	398.36
New Mexico	202.67
Oregon	131.18
California	108.79
Utah	106.85
Montana	99.04
Idaho	21.90
Arizona	19.60
Wyoming	7.07
Colorado	0.28

(Information provided by Moody's Investors Service municipal department as of Feb. 26, 1982)

Alaska Environmental Lobby, Inc.
419 6th Street, Suite 328 Juneau, Alaska 99801 907-586-2345

17 February 1983

TO: Representative Mitch Abood
Chair, State Affairs Committee

FROM: Eric F. Myers, AEL Energy Specialist

I would like to offer my formal comments on the legislation you are now considering related to the proposed Susitna hydroelectric project. Some of the oral testimony I gave yesterday, particularly observations on the history and evolution of the so-called Energy Program for Alaska, are not reflected in these written comments to a great extent. You will find, however, that the specific concerns I raised about the proposals before you (HB 120,121, 122) are addressed in the attached issue paper. I hope that you will find these comments useful.

As I am sure you appreciate, the Susitna issue is enormously complex and multi-faceted. My comments — particularly those concerning the adequacy of the feasibility study — reflect an effort to summarize a great deal of data. If you have any questions about these comments, I would welcome the opportunity to meet with you or your staff to consider these issues in detail.

I have also attached two other reports which should be of use to the Committee in its consideration of this issue:

Alaska Energy Planning Studies, Policy Analysis Paper No. 82-13, Division of Policy Development and Planning (November 18,1982). This report prepared by the University of Alaska's Institute of Social and Economic Research, is a review of the three major energy studies (Acres; Battelle, Long Term Plan) and deals extensively with the Acres American feasibility study. The report is particularly useful in its analysis of the critical role played by key assumptions (eg., discount rates, fuel escalation rates, demand projections) in the Acres feasibility study which led to the questionable assumption that Susitna is the most attractive Railbelt power option. Again, it is particularly noteworthy that the Alaska Power Authority Board of Directors has not endorsed the Acres study conclusion.

State Spending and the Alaska Economy, by Gregg K. Erickson and Thomas O. Singer. An issue raised in the testimony yesterday concerned the recent surge in power demand currently being experienced by Railbelt utilities, relative to expected long term demand growth rates. Electricity demand is a function of population growth, employment, economic activity, disposable income, etc. The recent high growth rates (1982) for electricity can be understood in this context as a reflection of the massive State expenditures of the past few years. The Cash on

the Street analysis shows how the large State appropriations of the past — loan programs, capital projects, public works, etc. — have been working through the appropriations process and "on to the street" and generating the currently "boom" economy that we enjoy. As I am sure you are aware, this is particularly the case in Anchorage where there is a big building spree on at present. The significance of this analysis, with regard to electrical demand, is that in the near future (5-10 years) we can expect significant increases in electrical demand as a consequence of State spending trends. We can also expect those same short term trends to drop off dramatically with the down turn in revenues and spending. It would be especially unfortunate if the abberant demand growth rates we are experiencing presently were mistaken for anything but a temporary circumstance. A few years back the Pacific Northwest, as a result of a percieved need for massive additional capacity, embarked on the WPPSS ("woops") debacle. That region now faces what is recognized by observers such as Business Week to be "the biggest (default) in municipal bond market history." About $7,000,000,000 in bond repayments.

In reflecting on my testimony of yesterday, I would like to once again highlight what I see as the most critical issue underlying the Susitna debate. As I said yesterday, it is not whether you are "for" or "against" the Susitna project but, rather: "How can we provide responsibly for the reliable anticipated increases in Railbelt electrical demand?" The advocates of Susitna Power Now! presume to be able to predict with certainty the events of 50 to 100 years in the future. I do not share their confidence. And with upwards of $15 billion involved, gambling of such a magnitude should, I feel, be discouraged.

This is particularly true in light of the revenue picture. The Energy Program for Alaska, with its multi-billion dollar subsidy financing proposal for Susitna, is a legacy from the past when revenues were coming into the State treasury faster (almost) than we could spend them. The "problem" in those days was how to spend money creatively. Now we are being forced to reckon quite soberly with frugality. It is my hope that the House State Affairs Committee and the Legislature as a whole will embrace this responsibility and look very closely at the fiscal impacts of the proposed subsidy scheme. Are the people of Alaska willing to give up the Permanent Fund Dividend Program, cut back on education, do without sewer, water and road improvements, pay income taxes? These are the true costs of Susitna; the questions few are willing to talk about.

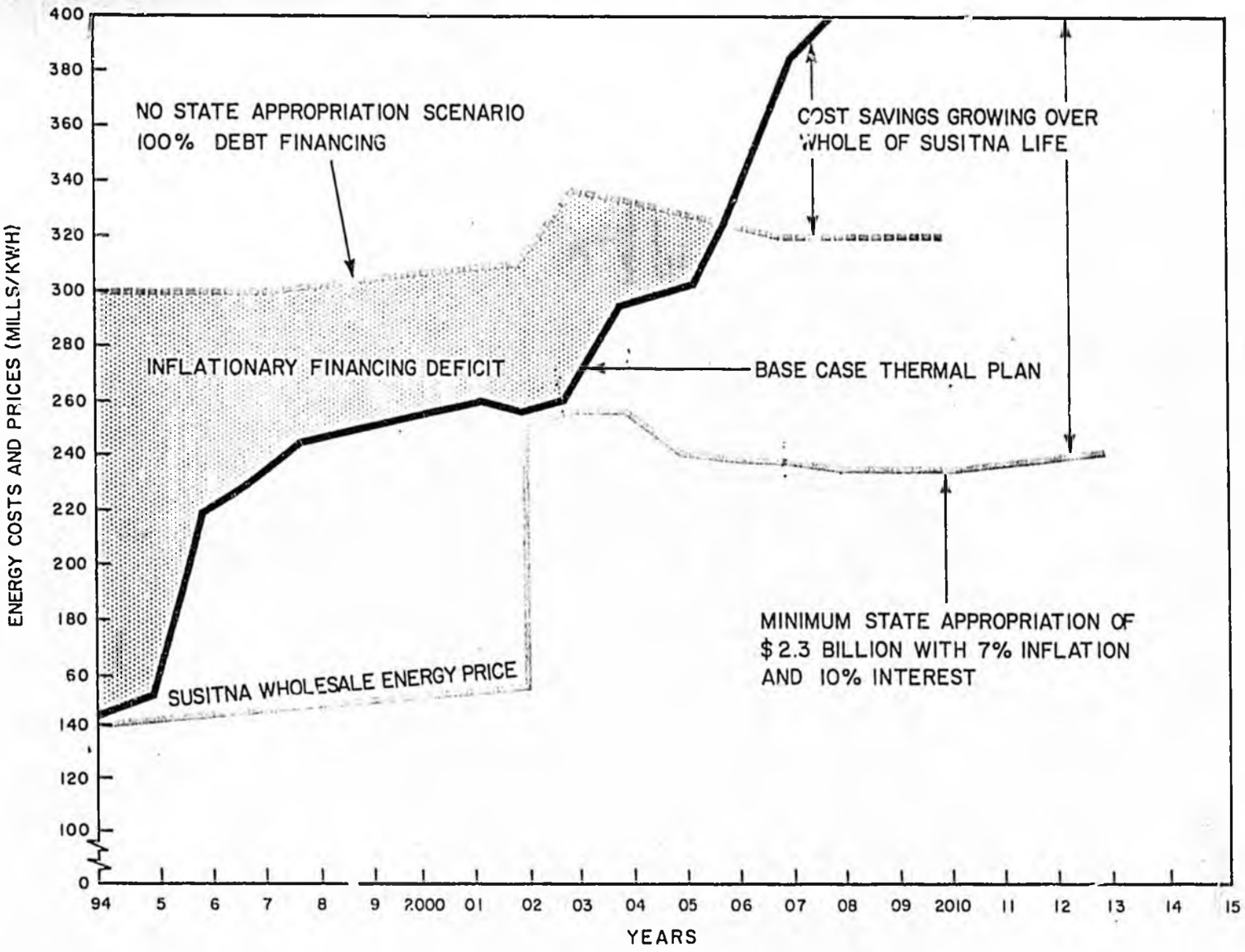


PLATE 26 | **ANNUAL COST COMPARISION**

Follow-up to Hutchin's "you don't understand..."

You understood exactly. Moreover, Hutchins' theory of "rolling in" rural projects is bullshit!

1) Anchorage people are not going to support a rural project that raises their rates (the effect of a rollin)

2) Rural projects are not capital intensive. The "energy program for Alaska" only applies, by its nature, to capital-intensive ones, not ones that use fuel.

Can his firm sign power contracts. If so sure of economics, etc, would they be willing to sign such an open power contract at this point?

Anc — Bob Penny - Anc
Mike Fenwick IBEW
Wayne Beckwith.
Tom Starr load projections

Fenwick: job market will be significant
people will come from all over the state
"capability of training"

Beckwith: gas:
Coal:

Starr — load growth +12% annually

Fai

Dave Lacy: unfair

Mike Kelly. GVEA Board supports it
.30/kwh

Betty Huffman. Bob Huffman

Jeff Wilson

Valdez — Barney Maring - Valdez Chamber of Commerce

Anc — Jim Stark
Investment in future of Alaska

Judy Zemike - AEC

Talkeetna — Larry Roberta Sheldon: not Susitna, Chakachamna

Jnu Ken Kasner: Nor Pacific Fisheries Assn Homer
protect ability fisheries

Anc Jeff Eustes - self
smaller projects as they are needed
Marketability test - not speculative
constitutional intent

Chris
attract outside capital
"Susitna blackmail"
"what do you do for rural Alaska?"

Jnu Frank Mullen. United Cook Inlet Fishermen
almost same as Kasner

DLG Gusty Tunugen. No to 120, 121, 122

Jnu Dave Hutchens Alaska Rural Electric Cooperative Assn
14 Alaska
① load growth 3½% / yr 7-12% ∴ 5%
② projected cost credible?
③ consumer benefit

double barrel bonding revenue + GO bond
④ what about rural areas?

housing
Fishing
Docks/Harbors
Airports

Anc Gilbert Susitna Valley
individual
Grant financing
against advisory vote

Chugach Electric Association
Talkeetna: Suzy Keller: [against]

HB

122

POLICY ANALYSIS PAPER NO. 82-13

Alaska Energy Planning Studies

A review of three consultant studies
submitted to Alaska state agencies
in fiscal-year 1982

November 18, 1982

STATE OF ALASKA

OFFICE OF THE GOVERNOR

Division of Policy Development and Planning

POUCH AD

JUNEAU, ALASKA 99811

(907) 465-3577

POLICY ANALYSIS PAPER NO. 82-13

Alaska Energy Planning Studies

A review of three consultant studies
submitted to Alaska state agencies
in fiscal-year 1982

November 18, 1982

ALASKA ENERGY PLANNING STUDIES
A review of three consultant studies submitted to Alaska state agencies in fiscal-year 1982

for Division of Policy Development and Planning
Office of the Governor
State of Alaska

by Arlon R. Tussing

and

Gregg K. Erickson

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF ALASKA

4 November 1982
(supersedes all previously-dated drafts)

CONTENTS

ALASKA ENERGY PLANNING STUDIES

Introduction and Summary

Introduction. During the first half of 1982, Alaska state agencies received three major energy-policy reports they commissioned in 1980 and 1981. The fir t of these is the second annual "Long Term Energy Plan" mandated by the Legislature.[1] Two others specifically address issues raised by the proposed Susitna hydropower project (hereinafter the "Acres" and "Battelle" repo'ts).[2,3]

Unfortunately, these newly-delivered reports are already largely obsolete.

Their critical assumptions regarding price trends for various fossil fuels, the growth of population and economic activity in Alaska, and the resulting growth of energy demand in the state, are based upon a conventional wisdom about future energy prices that subsequent experience has made nearly untenable.

The Division of Policy Development and Planning (DPDP) of the Governor's Office engaged the University of Alaska Institute of Social and Economic Research (ISER)[4] to review the three study reports and to identify and discuss those areas that are central to the reports' conclusions, particularly with regard to investment in new electrical-generation facilities in Alaska's "Railbelt" (roughly the corridor from Fairbanks through Anchorage to the Kenai Peninsula).

Readers should be aware that this paper is only a **review** and not intended as a successor to or substitute for any of the existing studies. The following pages are intended to cover a few crucial issues in sufficient depth to determine whether or not the reports make a solid case for their findings. In large, the answer is "no", but any new recommendations about an optimum energy-development strategy will have to await a new study or amendment of one of the existing studies.

Summary. Briefly, the findings of this review are that:

1. World Oil Prices and Alaska Energy Demand. The dramatic change in oil-price expectations since 1980 calls for reconsideration of the levels of Alaska economic activity and energy demand assumed in the Acres and Battelle studies, and to a lesser extent in the Long Term Energy Plan.

2. Alaska Coal and Natural-Gas Supply. The assumptions in the Battelle and Acres studies concerning the prices and availability of Alaska coal and natural gas for local electric power generation are not well supported.

3. Capital-Market Conditions. Recent high interest rates and capital-market conditions not dealt with by the contractors cast serious doubt on the Acres and Battelle conclusions regarding the risks, costs, and financing arrangements of the Susitna hydroelectric project, and with respect to capital-intensive energy-supply projects generally.

4. Implications for Susitna. Findings 1-3 imply significantly less favorable conclusions from those of Acres and Battelle regarding the relative economic attractiveness of the Susitna hydroelectric projects for serving electricity demand in the Railbelt region.

5. All of these findings point toward a conclusion that now is not the time for major initiatives in publicly financed power development in Alaska.

Despite the erosion of some of their fundamental assumptions, the analytical framework and much of the data presented in the reports remain useful --- even essential --- to evaluating Alaska's choices with respect to the Susitna project in particular, and energy issues in general.

Background to the Studies

Energy looms bigger in Alaska's public-policy deliberations than in any other state. Elsewhere --- even in states with a history of economic activism, like Wisconsin or California --- no one would consider as even plausible a scheme to invest public funds equivalent to two or three times expected annual state tax revenues (or about $15 thousand per capita) in all energy ventures as a class, let alone to devote such funds to a single electric-power generation project like Susitna.

Nor would the legislature of any other state countenance anything remotely similar to the energy-cost subsidy programs that Alaska now has on its books --- programs which in Fiscal-Year (FY-) 1983 can be expected to account for more than one-sixth of the state budget.[5] The sources of this unique perspective on the state's role in energy policy are not the focus of this review, but they surely include the fact that oil production has --- almost painlessly --- put unprecedented fiscal resources at the command of state policy-makers.

Regardless of its origins, the deep involvement of Alaska state government in energy decisions that would be left to the private sector in any other state has evoked a demand for information and analysis on an awesome range of engineering, economic, and financial topics. Because the responsible state agencies (including the legislature and the governor's office) do not have the experience or staff to assemble this information, evaluate it critically, or assimilate it effectively, they have had to depend on outside consultants to generate and process the relevant data, propose policies and programs, and monitor them.

The legislators and executive-branch officials who promoted and authorized these three studies viewed them as complementary to one another --- overlapping in places so that decision-makers could view

certain crucial issues from more than one perspective but, on the whole, dealing with different aspects or segments of an interrelated whole. These officials expected that, together, the various reports would put the decisions they had to make in some kind of rational order, and resolve some of the uncertainties they faced in making these decisions. One hope, for example, was that rigorous engineering and economic analysis by nationally renowned experts would give them objective and politically acceptable answers, for each of the state's regions, about ---

1. The amount of electrical-generating capacity Alaska would need over the next two decades;

2. Which generation technologies and/or specific generating projects would be most cost-effective; and

3. What was the optimum strategy for financing the chosen investments?

Most of the information sought from these three studies is clearly relevant to the issues the state intended to address. And, although the quality of the three reports varies widely, as a group they present the bulk of the requested information --- in one place or another --- in a professionally competent fashion.

Nevertheless, these studies, together with the march of events since they were commissioned, have conspired to leave the responsible state officials facing even more uncertain and contradictory signals than when the various studies were commissioned.

The Three Studies

Acres' study of the Susitna hydroelectric project. The Feasibility Study of the Susitna Hydroelectric Project prepared by Acres American Inc. was conceived as a detailed examination of the technical and economic feasibility of the the proposed project. In addition, it was to provide searching analyses of the project's environmental and social impacts. The studies leading up to the report were carried out over a two-year period at a cost to the state of nearly $40 million. The report itself is organized in three hierarchical tiers, a Summary Report of 56 pages, a main report titled Draft Susitna Hydroelectric Project Feasibility Report, consisting of three weighty volumes and four equally weighty appendices, and a multitude of "task reports" which, unlike the others, have not been widely circulated. Our review has focused on the Summary Report, volume 1 of the Feasibility Report, and the the Task 11 Reference Report: Economic, Marketing and Financial Evaluation.

The centerpiece of the Acres study is a "multivariate risk analysis", which uses the probabilities the investigators have attached to different assumptions about the key variables (fuel prices, construction costs, interest rates, etc.) to produce an array of economic judgments (about whether the Susitna projects are the least-cost approach to serving Railbelt electrical demand, for example) ranked by their respective probabilities.

Of the three works reviewed here, the Acres study deserves the greatest praise. Not only is it physically the largest, but it is also --- particularly in the Summary Report --- the most carefully and readably written. In most areas of interest a reader has the option of delving deeply or superficially, and in either case will usually find a clear and appropriately detailed explanation of the assumptions used, the evidence supporting those assumptions, and the methodology by which they were incorporated into the analysis.

The fact that the Acres report is analytically the most interesting of the three studies --- and will clearly be the most influential --- has caused us to devote more attention to it than to the others --- and to emphasize its failings. Readers should not be misled by this concentration. The methodology by which the Acres team evaluated the project's economic feasibility is elegant, and largely sound. While the report's errors come at sufficiently critical points to invalidate Acres' "bottom line", namely the economic ranking of the various electrical generation alternatives for the Railbelt, most of these errors are correctible, and Acres' general approach will survive them.

The Battelle "Alternatives" study. Both authors of the present review were professionally involved in the process that led to the choice of Battelle to conduct a Railbelt generation-alternatives study. This involvement gives them a special insight into what was expected of the study, but it inescapably colors their assessment of the work that resulted. Readers should be aware of this fact, and draw their own conclusions taking it into account.

The Battelle study has generated several documents, but we have reviewed only two of them here: Railbelt Electric Power Alternatives Study: Evaluation of Railbelt Electric Energy Plans (February 1982), and Railbelt Electric Power Alternatives Study: Fossil Fuel Availability and Price Forecasts. Although the former volume is labeled "comment draft", we understand that it is in substance the final report.

Because Acres and the other contractors were directed to use scenarios and vital assumptions from Battelle, we have dealt with the Acres and Battelle analyses of individual issues, like load forecasting and coal prices, in one place.

"The Long Term Energy Plan". In 1978, Alaska adopted legislation requiring the state Department of Commerce and Economic Develop-

ment, in conjunction with the Alaska Power Authority, to prepare an annual "long-term energy plan". The law (AS 44.83.224) mandates that the plan shall contain: (1) an "end-use" study of Alaska energy consumption, (2) a plan for meeting "projected energy needs", (3) a review of conservation efforts, (4) an emergency energy supply plan, and (5) a review of ongoing energy research. The Division of Energy and Power Development (DEPD) has been responsible for the preparation of both the 1981 and 1982 plans, but in both cases has made extensive use of contractors. The 1982 report was largely written under a $390,000 contract with the national accounting and consulting firm of Booz, Allen & Hamilton. However, the firm's name does not appear on the cover or in the introduction, and we do not know how much of the report's content and format should be attributed to Booz-Allen, and how much to the DEPD staff.

The 1982 report was designed, in its own terms, "to focus existing energy information to support current decision-making needs and to provide a sense of priority across state projects and programs."[6] The report is well written, contains few serious errors of fact or obviously faulty analysis, and provides the mandated "existing energy information" in a convenient format.

The "plan" does not fare well in its attempt "to provide a sense of priorities," however. With respect to the really tough social and political issues raised by Susitna and the state's hydropower program generally it largely leaves the field to Acres and Battelle; the Plan's treatment of the Railbelt hydroelectric construction proposals is confined to less than two pages of text. After urging the state to continue planning for Susitna, the report warns that the project's "impact may be to severely limit the consideration of less costly alternative Alaskan based resources such as coal or residual oil."[7]

In other areas, including the treatment of Alaska's complex system of energy subsidies, the authors develop an extensive and unique data collection, but seem reluctant to draw the prescriptive conclusions that clearly follow from it. Finally, many of the study's featured findings are pedestrian, for example the conclusion that "opportunities exist to increase the completeness and accuracy of Alaska's energy data."[8]

Some of these deficiencies are probably the result of the short time in which the state's contractor was required to produce a draft report. In one of their concluding sections the authors seem to recognize these shortcomings, proposing that next year's energy plan focus on developing a "strategic energy planning process." The discussion of how that might be accomplished is one of the most interesting in the entire report.[9]

The Conceptual Framework for Considering Electrical-Generation Alternatives for the Railbelt

The Acres report sets out most clearly the conceptual framework shared by all three studies. In the Railbelt, the key issue is to identify the combination of electrical generating facilities that is most likely to be the cheapest in the long run. The main choices are: (1) a two-stage strategy involving Susitna River hydroelectric power; (2) continued reliance mainly on gas-fired combustion turbines (either "simple-cycle" or "combined-cycle" plants), or on some combination of gas turbines and coal-fired steam plants; (3) and a combination of smaller hydropower facilities with thermal generation.

The crux of the economic comparison between Susitna and thermal generation is the comparison, over time, of hydro construction costs and thermal-plant fuel costs.

The chief hydroelectric option, which centers on the Susitna River projects, involves a relatively high front-end capital expense per unit of capacity but very low continuing costs for maintenance and operation. Combustion turbines, on the other hand, are relatively cheap to install per unit of generating capacity, and the cost of the electricity they produce is principally the cost of the natural gas used as fuel. Coal-fired steam turbines would be less capital intensive than hydro, and while they would cost considerably more to build per unit of capacity than gas turbines, they might still provide the cheapest base-load power if the price of coal (per unit of electricity generated) were sufficiently below that of natural gas.

Out of the many issues that are relevant to this choice, the present review focuses on the way the various reports deal with ---

a. Future world oil prices;
b. Future Railbelt electricity demand;
c. Future Railbelt fossil-fuel prices;

d. Construction costs for hydro projects;
e. The appropriate interest or discount rate; and
f. Risk and uncertainty regarding these and other issues.

The six issues fit together as follows:

(a) World oil prices will powerfully influence Alaska economic activity, and through it electricity demand, by determining state revenues from petroleum royalties and taxes, and thus state spending. Oil prices are also a major influence on Alaska economic development and thereby on electricity demand, by way of their impact on energy-related private investment --- in oil and gas exploration, coal export projects, the Alaska Highway gas pipeline (ANGTS), petrochemicals manufacturing, and the like.

World oil prices, moreover, may influence the prices of natural gas and coal for electrical generation in the Railbelt. Indeed, the Acres and Battelle analyses seem to treat world oil prices as the crucial force determining fossil-fuel prices in the region.

(b) Electricity load growth. Susitna generating capacity would be very "lumpy" as well as capital-intensive; additions would come in multi-billion-dollar packages or not at all. Gas-turbine capacity can be added in small increments, however, with coal-fired steam turbines and some smaller hydroelectric options falling between the Susitna projects and gas turbines in "lumpiness".

If projected power demand and demand-growth rates are high, they can be expected to liquidate any excess generating capacity rapidly; high load-growth forecasts therefore improve the prospective economic ranking of the Susitna projects, all other things being equal.

With low or uncertain load growth, however, the larger hydro projects pose a greater risk than do thermal plants that underutilization

of capacity would result in high unit costs for electricity. Thus, the risk of temporary or permanent overbuilding would be least in a strategy built around gas-fired combustion turbines, with the risks somewhere in-between for smaller hydroelectric projects and for coal-fired steam generation.

(c) Future fuel costs and (d) expected construction costs. In the framework described here, the comparison of electricity costs must focus most sharply on the cost of fuel for gas-fired combustion turbines, and on the original construction cost for the proposed hydroelectric plants. The relative cost of electricity from coal-fired steam plants will depend more on capital costs than electricity from gas turbines, but more on continuing operating (fuel) expenses than hydroelectric power.

Estimates of construction costs and future fuel costs are both subject to great uncertainty --- and the treatment of this uncertainty (f) below is itself a major issue in any comparison.

(e) Discount rates. Because the Susitna plants would be capital-intensive, long-lived, and take many years to build, the long-term cost of electricity from these projects would be highly sensitive to interest rates. This would be true whether the interest rates in question were the rates the state would have to pay to borrow for Susitna construction, or the rates it could have otherwise earned on money appropriated to build Susitna. The net benefit from the Susitna option is, therefore, most sensitive to the choice of interest rates used to "discount" future costs and benefits.

(f) Treatment of risk and uncertainty. The various factors that influence future Alaska economic activity and thus electricity demand (including but not limited to future world oil prices); Susitna and other generating-plant construction costs; future Alaska fossil-fuel prices

(which may or may not be closely linked to world oil prices); and future interest rates are all unknown today. Important assumptions that the analysts plug into their models are thus essentially guesses.

These guesses may be informed or ignorant, and insightful or obtuse, but their impact on the final comparison will reflect both the raw values assumed by the analysts, and the way in which the analysts deal with the risk and uncertainty that surround them. Subsequent sections of this review reveal considerable disagreement with some of the raw values Battelle and Acres have assumed in the studies, and the probabilities they have assigned to these values, but not with Acres' design and execution of the "multivariate risk analysis" used to integrate these assumptions.

Future Oil Prices

World oil prices and Alaska state revenues. From the standpoint of Alaska policy-makers, no aspect of the current scene is more confusing than the recent radical change in the the state's official oil-price forecasts, and the forecasts of state revenues that depend directly on oil prices.

> **This change in the oil-price outlook invalidates virtually every important economic and policy conclusion in the studies reviewed here.**

Between June 1980 and January 1982, the Alaska Department of Revenue's quarterly Petroleum Production Revenue Forecast predicted that nominal-dollar ("inflated") oil revenues would increase over the four years beginning on the forecast date at a compound annual rate between 12.2 and 25.8 percent. **In its March 1982 Forecast, the Department's three-year estimate of the expected annual change in state revenues fell abruptly to a negative 0.8 percent.**[10]

Specifically, the "most likely" projection in the March Forecast was that the weighted average wellhead value for Alaska North Slope (ANS) crude oil in fiscal year (FY) 1983 would be 29 percent lower than in FY-1982, and that world prices would then resume their nominal-dollar increase, at a compound annual rate of about 7 percent. Not until the beginning of FY-1987 did the Department expect prices to regain FY-1982 levels. With respect to constant-dollar ("real") oil prices, the March Forecast boldly reported "a consensus that oil prices will continue to fall,"[11] and projected declining real oil prices through 1998.[12]

> **The authors of the present review agree that world oil markets cannot sustain the level of prices reached in early 1981, and that prices in any given year during the remainder of the century are likely to be considerably lower in real terms than they are today.**

There was, however, no consensus on the long-term oil-price outlook that one could prudently rely upon last March, and none exists today.

What has happened, instead, is that the near-consensus which did exist at the beginning of 1981 has been shattered, namely the assumption that the long-term trend in oil prices was inexorably upward.

Abrupt changes in expectations have not been a problem unique to Alaska's official revenue forecasters; a review of the energy literature generally confirms that a widespread reevaluation began in late 1981 and early 1982. Few authorities any longer confidently assume that the energy-price increases of 1973-1981 will continue unabated through the rest of the Century, and an increasing number are suggesting, as the present reviewers have done since 1980,[13] that the price rises of the 1970's may never resume. The crude-oil price slump of late 1981 and early 1982, which few industry and government forecasters anticipated, drew attention to the difficulties of predicting energy prices, but is also pushing forecasters into a more general reexamination of both the demand and supply of petroleum, and the way in which they determine oil prices in the long run.

As late as September 1980, it was possible for Cambridge economist Nicholas Kaldor to write seriously that, " . . . OPEC changed everything. By cornering oil it managed to increase the price four-fold, then double it again, and presumably it could be doubled again, without any really serious impact on consumption." (emphasis added)[14] It is now clear that the world economy has a much greater capacity and willingness both to substitute other fuels for high-priced petroleum and to economize on energy generally than had been widely supposed. Over the past six months, virtually every published authority in the area of petroleum demand has radically altered its expectations regarding future U.S. and world petroleum demand.[15]

On the supply side, so much excess oil-producing capacity now exists that it is hard to contrive any scenario in which OPEC, Saudi Arabia, or anyone else, can long function as a "price-maker" in world oil markets. To the extent that there is any consensus about world oil markets among the experts today, the managing director of Royal Dutch-Shell summarized it well when he wrote that "we are in for a period of severe and unpredictable discontinuities."[16,17]

> **An advance draft of Tussing's "Reflections on the End of the OPEC Era", included as an appendix to this review, takes a backward look at the events that led most forecasters in the late 1970s to expect ever-increasing world oil prices, and the reasons such an outlook seems untenable today.**

Consequences for Alaska. These changes in outlook have extraordinary significance for Alaska, because its economy, like that of (say) Kuwait, is a net exporter (seller) of energy. Well over half of Alaska economic activity depends directly or indirectly on crude-oil production. The largest such influence operates directly through state oil royalties and production taxes, and if prices continue to fall, resulting reductions in state revenues will make it impossible for state spending to continue its new-found role as the main prop and guarantor of Alaska's economy.

Table 1 below compares the state's June 1981 and June 1982 forecasts.

> At the same time the Department of Revenue was reducing its revenue expectations generally, it also decided to emphasize the uncertainty of petroleum-price forecasts, and began highlighting its "30-percent" rather than its "expected value" series. The different percentage figure indicates the Department's judgment about the probability that actual revenues will be less than the figure shown.

Table 1

1982-Dollar Petroleum-Revenue Projections by the Alaska Department of Revenue, June 1982 vs June 1981

Fiscal Year	Oil and Gas Revenue ($ Millions)		
	June 1981 Forecast	June 1982 Forecast	
	"Expected Value"	"Expected Value"	"30%" Series
1983	4030	2654	2399
1984	4137	2657	2250
1985	4271	2623	2177
1986	4448	2953	2411
1987	4713	3305	2644
1988	4851	3196	2507
1989	4983	3365	2595
1990	4742	3095	2246
1991	4544	2714	1862
1992	4382	2477	1668
1993	3979	2285	1427
1994	3637	2149	1265
1995	3144	1826	1059
1996	2701	1622	936
1997	2289	1608	908

Alaska Department of Revenue, Petroleum Production Revenue Forecast, Quarterly Report, June 1981, p.13; June 1982, p. 18, Personal Communication, Charles Logsdon to Erickson.

In 1981, state and local government employment directly accounted for 21 percent of Alaska non-agricultural wage and salary employment.[18] State government expenditures, in turn, were 86 percent financed in FY-1982 by oil production revenue,[19] and Alaska local governments received about two-thirds of their revenues from the state government. State aid to the City and Borough of Juneau, for example, will equal 262 percent of local property tax revenues in FY-1983.[20] Much of the revenue received by several other local governments in Alaska, moreover, comes from direct taxes on oil industry activity and property.

These illustrations do not begin to encompass the indirect effect of expectations regarding future oil prices on the state economy. These expectations largely determine the level of private-sector investment in oil and gas, coal, and other energy-extraction, conversion, and transportation ventures; energy-industry service activity; and have an added "multiplier" impact on the Alaska economy via the income flowing from such investment activity into the trade, finance, and service industries. A large, if not precisely measurable, part of the present boom in the Anchorage area reflects private investment commitments made in 1979-1981 on the basis of a bullish outlook about future oil prices. This boom is unlikely to survive long once those expectations have been shattered or drastically modified.[21]

The situation is quite different for energy-importing states like New York or California, where a radical increase or decrease in energy prices would at the most, over the short run, cause no more than a three or four percent change in the major economic indicators such as employment, gross state product, or disposable income. In these importing regions, the dominant impacts of energy price changes will operate rather diffusely, through the influence of fuel prices on the real incomes of consumers, and through the impact of changed fuel prices on production costs, and thereby on prices, sales, and profits in manufacturing, transportation, and commerce. In Alaska, the potential response is an order of magnitude larger, and is dominated by impacts on employment and population that flow directly from the primary role that petroleum production and state government spending (89 percent supported by petroleum production) play in the regional economy.

Load Forecasts

The studies reviewed here pay close attention to the usual income and price-factors that affect energy demand, and carefully evaluate the impacts of different oil price scenarios on the electrical-power costs implicit in various energy development schemes. But remarkably, they largely ignore the possibility of a major decline in oil revenues, and the direct effects such a decline would have on the Alaska economy. [22]

The Battelle reports base their forecasts of energy demand on scenarios and econometric modeling studies generated by ISER in 1980 and 1981, using its Man-in-the-Arctic (MAP) model. Acres' growth scenarios are, in turn, adapted from those of Battelle, and the Battelle reports provide the clearest explanation of the economic-development and state spending assumptions that went into the forecasts of Alaska Railbelt economic activity. Battelle offers five "scenarios", ranging from "low" to "superhigh", and a sixth scenario (tagged "fiscal-crisis") which shows very high spending in the 1980s, followed by a drastic decline in the 1990s.

The "moderate-growth" case. Battelle's "moderate" case (which the report defines as having a 50-percent probability of being exceeded) shows population in the Railbelt growing at a compound annual rate of 2.15 percent.[23] This scenario is powered by assumptions that state spending will increase from the FY-1981 level (when general-fund appropriations were about eleven thousand dollars per capita) proportionally with per-capita personal income, that the Alaska Highway gas pipeline (ANGTS) will be under construction by 1983,[24] that the PacAlaska LNG project will come on line between 1985 and 1987, that a 100,000-barrel per day refinery will be built in Valdez, and that 7 billion barrels of oil will be discovered and developed on federal outer continental shelf (OCS) acreage leased through 1989.[25]

The Acres study adopts the Battelle load-growth scenarios[26] with some modifications, which are not always described in sufficient detail to allow critical examination. Acres summarizes the outcome, however, as follows:

> *Between 1981 and 2010, the mid-range forecast suggests that electrical and energy demand will grow at an annual rate of about 3.5 percent, with the high and low range limits at about 4.6 percent and 2.8 percent, respectively. . .*
>
> *Under the mid-range forecast, currently scheduled additions are sufficient until 1993 to meet rising demand as well as to replace aging units which must be retired. Between 1993 and 2010, about 1400 megawatts of capacity must be added to the system to meet additional demand as well as to replace aging units.*[27]

The "low-growth" case. The Battelle report states that there is only a 5 to 10-percent chance economic activity will at any point dip below the values projected in the "low-growth" scenario.[28] A review of Battelle's assumptions underlying this boundary case show population increasing at a compound rate of 3.4 percent in the 1980-1985 period,[29] and constant per capita state spending (based on the exceedingly high FY-1981 base) and construction of ANGTS, but with a lower level of offshore oil activity and no Valdez refinery or Cook Inlet LNG plant.

None of Battelle's moderate-case assumptions, as listed above, now appears likely to materialize. The gas pipeline has, for example, been put on indefinite hold; with the most optimistic outlook, construction could not get under way before 1985 at the earliest. The Valdez refinery project was scuttled about a year before the Battelle report was delivered (and never did achieve much credibility among petroleum experts).[30] And Battelle itself has elsewhere virtually written off the LNG project.[31]

The most stunning discrepancy between Battelle's assumptions and what now seems realistic concerns the state government budget. Even