

DCNO

3568

003568

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

WATANA FEASIBILITY ESTIMATE
PHASE I

Contract NO. 5225

Work Order NO. 5

Diversified Engineers & Constructors, Inc.
P. O. Box 487
Cottonwood, Arizona 86326 247

ESTIMATE
SUMMARY



RECORD COPY

DECON

RECEIVED BY
DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

Mining & Industrial Construction - JAN 28 1986 3:04

P.O. BOX 487 • COTTONWOOD, ARIZONA 86326 • (602) 634-6529

January 22, 1986

Mr. Remy Williams, Cost Estimator
Alaska Power Authority
P. O. Box 190869
Anchorage, Alaska 99519-0869

Re: Susitna Hydroelectric Project
Work Order No. 5

Subject: Summary of Estimates (Revised and Final)
Our Letter Dated January 3, 1986

Dear Remy:

Enclosed herewith is the original and one (1) copy of the above
subject Summary of Costs.

These Summary of Costs are broken down into seven (7) classi-
fications and are as follows:

1. Construction Costs

These costs were prepared by both Diversified and R. W.
Beck

2. Recreational Costs

Prepared by R. W. Beck

3. Feasibility and Licensing Costs

R. W. Beck states that based on the magnitude of this
project, compared to projects of similar costs, a percentage
factor of one percent (1%) of Construction Costs would
be appropriate.

4. Engineering and Design Costs

As Item 3 above and a percentage factor of 4 per cent (4%)
of Construction Costs.

TUNNELING • MINE DEVELOPMENT • MINING
PLANT AND INDUSTRIAL CONSTRUCTION • CONSULTING
A COMPARATIVELY NEW COMPANY WITH MORE EXPERIENCE THAN MOST OLD ONES

Alaska Power Authority
Summary of Estimates
page 2

5. Construction Management Costs

As Item 3 above and a percentage factor of six per cent (6%) of Construction Costs.

6. Power Authority Costs

10 people at \$5,000.00 per month	\$ 50,000.00
5 vehicles at \$1,000.00 per month	5,000.00
Board of Consultants per month	10,000.00
Air transportation per month	5,000.00
Supplies per month	5,000.00
	<u>\$ 75,000.00</u>

Duration:

PHASE I	144 Months
PHASE II	132 Months
PHASE III	84 Months

7. Contingency

As Item 3 above and a percentage factor of fifteen per cent (15 %) of all costs.

We are proceeding with the Schedules and Cash Flow and expect them to be completed at an early date.

Very truly yours,



Arthur O. Lee
President

AOL:jl

S U M M A R Y

SUSITNA HYDROELECTRIC PROJECT

PHASE I	-	WATANA	\$ 2,468,774.021.00
PHASE II	-	DEVIL CANYON	1,582,304,381.00
PHASE III	-	WATANA	1,165,722,409.00
TOTAL ALL PHASES, 1985 LEVEL			\$ 5,216,800,811.00

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
WATANA - STAGE I

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 1,923,168,455.00
2. Recreation Costs	1,119,850.00
3. Feasibility & Licensing Costs	19,242,883.00
4. Engineering & Design Costs	76,971,532.00
5. Construction Management Costs	115,457,298.00
6. Power Authority Costs	10,800,000.00
7. Contingency	322,014,003.00
Project Cost 1985 Level	\$ 2,468,744,021.00

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
DEVIL CANYON - PHASE II

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 1,229,145,913.00
2. Recreational Costs	1,499,900.00
3. Feasibility & Licensing Costs	12,306,458.00
4. Engineering & Design Costs	49,225,833.00
5. Construction Management Costs	73,838,749.00
6. Power Authority Costs	9,900,000.00
7. Contingency	206,387,528.00
Project Cost 1985 Level	<u>\$ 1,582,304,381.00</u>

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
WATANA - PHASE III

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 906,820,486.00
2. Recreational Costs	721,550.00
3. Feasibility & Licensing Costs	9,075,420.00
4. Engineering & Design Costs	36,301,681.00
5. Construction Management Costs	54,452,523.00
6. Power Authority Costs	6,300,000.00
7. Contingency	152,050,749.00
Project Cost 1985 Level	\$ 1,165,722,409.00

SUMMARY ALL PHASES
SUSITNA HYDROELECTRIC PROJECT

PHASE I	-	WATANA	\$ 2,219,060,639.00
PHASE II	-	DEVIL CANYON	1,582,591,277.00
PHASE III	-	WATANA	<u>845,628,013.00</u>
TOTAL ALL PHASES, 1985 LEVEL			\$ 4,666,779,929.00

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
WATANA - STAGE I

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 1,727,544,967.00
2. Recreational Costs	1,119,850.00
3. Feasibility & Licensing Costs	17,286,648.00
4. Engineering & Design Costs	69,146,593.00
5. Construction Management Costs	103,719,889.00
6. Power Authority Costs	10,800,000.00
7. Contingency	<u>289,442,692.00</u>
Project Cost 1985 Level	\$ 2,219,060,639.00

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
DEVIL CANYON - PHASE II

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 1,228,978,969.00
2. Recreational Costs	1,499,900.00
3. Feasibility & Licensing Costs	12,304,789.00
4. Engineering & Design Costs	49,219,155.00
5. Construction Management Costs	73,828,732.00
6. Power Authority Costs	9,900,000.00
7. Contingency	206,359,732.00
Project Cost 1985 Level	\$ 1,582,091,277.00

S U M M A R Y
SUSITNA HYDROELECTRIC PROJECT
WATANA - PHASE III

1. Construction Costs, Including Adjustments to Land & Land Rights and Mitigation	\$ 671,728,910.00
2. Recreational Costs	721,550.00
3. Feasibility & Licensing Costs	6,724,505.00
4. Engineering & Design Costs	26,898,078.00
5. Construction Management Costs	40,347,028.00
6. Power Authority Costs	6,300,000.00
7. Contingency	117,908,002.00
Project Cost 1985 Level	\$ 865,628,013.00

THUR & MONDAY, DEATTLE 43283

COST & ESTIMATE SUMMARY

EST. BY	ART L
TRACTS	TOTAL DIRECT COST

[illegible]

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO. _____
 FOR _____ DATE _____
 EST. BY ART LEE SHEET 1 OF _____

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		TOTAL COST		BID	
			Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount
	1	LS															L.S. 14184.000	L.S. 14184.000			L.S. 14184.000	-
	123730	CY	3251	402246.2	1156	1430319	1124	1390725	1024	1242249	1181	1473624	265	329740.5			1031	1285678.4			132	16381852
	39293	LF	485	166321	037	12688	202	19272	067	22976	129	44238	131	44924			1051	360419			1340	45952
	30960	CY	10398	3204026	1080	334589	1573	487220	1359	420977	1798	556687	7326	2271418	1600	495360	25084	7770277			320	9907200
	35855	LF	297	106489	023	8247	120	43026	043	15418	086	30835					569	204015			725	259949
	1	LS															L.S. 1407000	L.S. 1407000			L.S. 1792900	-
	1	LS															L.S. 579550	L.S. 579550			L.S. 738520	-
	1	LS															L.S. 740870	L.S. 740870			L.S. 944090	-
	3850	LF	9098	3734462	37429	1442941	32464	1249864	4920	1664355	3621	1390659	18048	2619848			3143	12102129			4005	15449250
per Access	320	LF	59909	191869	22245	71184	1685	53424	32813	105002	77001	17869	44722	159110			2026	148458			7382	826240
vation	460	LF	2653	121960	11411	52491	6059	37071	3508	16137	6782	31013	1893	31708			63126	290380			804	369840
Excavation	94420	CY	119	112360	002	1888	068	64206	071	67038	083	78369					343	323861			440	415448
vation	71790	CY	680	445098	253	181629	278	199576	151	112710	234	167989					1542	1107002			1960	1407084
H.S.	560	LF	34898	193749	14249	77724	10831	60654	44993	27961	9584	53670	17635	109956			70820	525784			196	669760
	600	CY	20254	121528	3281	19686	2135	12813	2126	12759	2466	14799	7610	45663	1600	9600	39472	236848			503	301800
	3059	CY	10950	518501	12711	39063	2933	87120	2344	71703	3600	110124	7722	736216			31826	1065327			444	1358196
ug Concrete	5288	CY	5437	287509	271	14230	1532	82069	1205	13720	1743	92170	5724	273601			15382	813399			196	1096446
	2	EA															8400	108900	8400	108900	1900	138800

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ Date _____ Location _____
 BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA _____

FOR _____

EST. BY _____ ART LEE _____

COST & ESTIMATE SUMMARY

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
331.13	ACCESS SHAFT										
131	Rock Excavation 23' Diameter	740	LF	224 ⁴⁶	726 260 26 ²⁰	196 988 197-	145 780 124 ²⁶	974 32 227 ⁴⁰	168 306 440 ²⁰	303 548	228 ³⁶ 1154 334
134	Concrete Lining 20' I.D.	740	LF	114 ¹⁹	247 072 100 ⁷¹	745 28 120 ³²	69 043 116 ⁶²	863 04 143 ⁶²	106 286 307 ⁶²	241 997 100 ⁴¹	444 32 2013 ²³ 1489 662
138	Misc. Metalwork	50	TNS							2750	137 500 2750 137 500
139	Elevators	1	LS							L.S.	312 950 L.S. 312 950
14	Fire Protection Headtank	1	LS							L.S.	1064 94 L.S. 1064 94
331.15	BUS TUNNELS										
151	Excavation Horizontal 22 x 22	104	LF	1037 ⁴⁹	107 446 290 ⁸²	30 214 245 ¹⁸	358 99 272 ³⁸	304 08 369 ⁸⁵	38 464 459 ⁹²	47 833	271 ⁸⁰ 290 764
152	Excavation Inclined 16 x 16	188	LF	371 ⁹¹	699 19 171 ⁴⁶	32 234 127 ²⁴	239 31 107-	20 116 134 ⁹²	253 65 272 ³⁵	43 682	1144 ²³ 215 241
154	Bus Tunnel Slab Concrete	233	CY	160 ¹⁹	37 324 18 ³⁵	42 76 23 ⁰³	53 66 19 ⁸⁵	464 8 26 ⁸⁹	62 77 70 ⁸²	21 170 16 ⁰⁰	372 8 355 ²² 827 87
331.16	TRANSFORMER GALLERY										
161	Excavation	18610	CY	28 ²⁴	535 782 12 ¹¹	225 367 945	175 865 10 ⁷⁷	2004 30 10 ⁴⁷	194 847 76 ⁶⁵	49 595 7	98 ²⁴ 182 824 3
164	Concrete Slab	1550	CY	251 ¹⁶	289 794 28 ⁰⁴	43 462 26 ⁴²	409 51 24 ⁸⁴	285 02 31 ⁵⁹	489 65 25 ⁸⁴	133 207 16 ⁰⁰	248 00 443 ¹ 719 631
167	Drain Holes	5900	LF	29 ⁷	17 523 0 ²³	135 7 1 ⁵⁰	7080 0 ⁴³	253 7 0 ⁸²	507 4		569 33 571
331.17	BUS SHAFTS										
171	Excavation 10.5' Diameter	560	LF	319 ²⁰	17 875 296 ⁸¹	54 214 84 ⁶¹	473 82 112 ⁸⁷	632 07 107 ¹⁵	600 04 35 ⁵⁸	47 925	202 ²² 451 484
174	Concrete Lining 9.0' Diameter	560	LF	513 ⁵¹	287 566 46 ²	257 66 51 ⁸⁵	29 036 50 ⁵⁸	28 327 62 ⁴⁵	349 73 124 ²⁴	69 440 18 ¹²	104 32 847 ²² 485 40
177	Miscellaneous Metalwork	9	TNS							5500	49 500 5500 49 500
178	Enclosures (Architectural)	1	LS							L.S.	638 00 L.S. 638 00
179	Manhoist	1	EA							L.S.	169 400 L.S. 169 400
331.18	CARE OF WATER	1	LS			246 298	263 10	202 587		L.S.	477 195
331.19	INSTRUMENTATION	1	LS							L.S.	154 000 L.S. 154 000
331.20	MISCELLANEOUS BUILDINGS & STRUCTURES	1	LS							L.S.	1336 500 L.S. 1336 500
SUBTOTAL - ACCOUNT 331 POWERHOUSE TRSF.				164 24 29.2	437 7 255	468 8 271	443 7 226	500 3 194	104 74 40.8	57 548 16	511 79 662

COST & ESTIMATE SUMMARY

	TOTAL	TOTAL COST	BID
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COST & ESTIMATE SUMMARY													TOTAL COST		BID	
QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID				
										Unit Cost	Amount	Unit Cost	Amount			
740	LF	284.46	726.280	21.00	196.988	197.00	145.780	12.25	93.432	277.00	168.306	40.00	303.548	284.46	208,230.00	
740	LF	114.09	247.072	106.71	745.28	120.35	89.043	116.62	863.04	113.52	106.286	327.25	241.997	444.32	258,128.00	
50	TNS								270.00	137.500	270.00	137.500		354.00	115,200.00	
1	LS								1.5	312.950	1.5	312.950		1.5	312,770.00	
1	LS								1.5	106.494	1.5	106.494		1.5	135,735.00	
104	LF	1037.94	1079.46	270.00	3021.4	345.18	3569.9	272.00	3040.8	329.05	38.144	459.25	4783.3	2775.00	510,115.00	
188	LF	371.91	699.19	171.46	3223.4	127.00	2393.1	107.00	2011.6	184.12	2536.5	72.25	436.82	1144.25	277,292.00	
233	CY	160.09	3732.4	18.25	427.6	23.00	536.6	19.85	467.8	26.00	62.71	90.00	211.70	16.00	185,547.00	
18610	CY	28.79	5357.82	12.11	22536.7	9.45	17586.5	10.27	20043.0	10.47	19784.7	26.65	47595.7	98.25	232,625.00	
1550	CY	25.16	3297.94	12.21	427.6	23.00	536.6	19.85	467.8	26.00	62.71	90.00	211.70	16.00	185,547.00	
5900	LF	27.77	1752.3	0.63	135.7	1.00	1080.0	0.43	253.7	0.82	507.4			5.00	42,175.00	
560	LF	319.20	11675.2	26.81	5421.4	84.61	47382	112.00	6320.7	107.15	10004	35.58	47925	206.22	575,120.00	
560	LF	613.51	25756.6	46.00	25766	51.85	29936	50.88	28327	42.45	34973	124.00	67440	18.65	610,800.00	
9	TNS								550.00	47500	550.00	44500		700.00	63072.00	
1	LS								1.5	63800	1.5	63800		1.5	31,300.00	
1	EA								1.5	169400	1.5	169400		1.5	215866.00	
1	LS				27624.8		26310		202587				1.5	477195	408070.00	
1	LS								1.5	154000	1.5	154000		1.5	196242.00	
1	LS								1.5	1336500	1.5	1336500		1.5	1907331.00	
			164124	27.2	1377255		463307.1		142722.6		500373.4		1040160.2		6521823.00	
STRUCTURES																
OWERHOUSE																
TRSF.																

DIVERSIFIED CONSTRUCTORS, INC.

JOB WATANA

FOR ART LEE

EST. BY ART LEE

COST & ESTIMATE SUMMARY

BIDS OPENED AT
COMPLETION TIME Date Location
BID BOND

PRICE & MURRAY, BEATTIE #7203

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
332.1	RESERVOIRS, DAMS and WATERWAYS Reservoir Clearing	21,000	Ac	709 ⁹⁰ 14,907,900	16 ¹¹ 33,831.0	93 ⁸⁹ 1,971,490	10 ⁶¹ 1,274,010	97 ⁵⁴ 2,048,340			918 ¹¹ 20,540,310
	SUBTOTAL - ACCOUNT 332.1, RESERVOIR, DAMS & WATERWAYS			14,907,900	33,831.0	1,971,490	1,274,010	2,048,340			20,540,310
332.2	DIVERSION TUNNELS										
201	Access Tunnel to Gate Chamber - 15' x 20'	2100	LF	381 ⁹⁴ 3,020,74	188 ⁴³ 39,570.3	116 ⁸⁷ 2,454,27	89 ⁷⁹ 1,885,559	120 ¹⁴ 2,522,94	267 ⁸⁶ 5,425,06		116 ⁸² 2,446,563
202	Diversion Tunnel, Excavation - 39' Dia.	7220	LF	1114 ⁸⁹ 8,047,340	426 ²⁰ 3,077,164	349 ⁵¹ 2,523,402	479 ⁸⁶ 3,464,589	402 ⁴⁹ 2,905,833	157 ¹⁹ 1,134,912		292 ⁸² 21,153,300
203	Diversion Tunnel, Excavation - 40' Dia.	760	LF	1580 ⁶² 1,201,271	470 ⁹⁷ 5,099,37	512 ⁶¹ 3,895,84	455 ⁹⁸ 4,681,45	573 ⁵⁹ 4,359,13	314 ²⁸ 2,389,29		428 ¹³ 32,437,115
204	Portals, Common Excavation	67100	CY	1 ¹⁹ 79,849	0 ²² 1,342,068	456 ²⁸ 4,562,80	0 ²¹ 4,702,41	0 ⁸³ 5,569,93			3 ⁴³ 230,155
205	Portals, Rock Excavation	85550	CY	6 ²⁰ 530,410	2 ⁵⁸ 2,164,42	27 ⁸ 237,829	15 ⁷ 1,343,13	2 ³⁴ 200,187			15 ⁴² 1,319,18
206	Emergency Release Chambers, Rock Excav.	4700	CY	31 ¹⁷ 1,744,99	13 ²⁶ 61,382	130 ¹ 6,114,7	10 ⁸⁴ 5,104,2	13 ⁶⁵ 6,415,5	26 ⁵⁵ 12,525,5		114 ⁴⁰ 53,710
207	Temporary Cofferdam Fill for U/S Portals	34540	CY	0 ²⁸ 96,71	0 ²³ 1,036,020	690 ⁸ 0 ¹⁰	345 ⁴ 0 ¹³	4490			0 ⁷⁴ 2,555
208	Tunnel Concrete Lining 36' I.D.	7220	LF	987 ⁸ 14,352,453	182 ⁵⁵ 13,160,33	201 ¹⁶ 1,495,059	192 ¹⁸ 1,389,767	248 ⁸⁶ 1,796,777	472 ⁰⁴ 3,119,376	2 ⁶¹ 16,000,523	23,486,15
209	Tunnel Concrete Lining 45' I.D.	760	LF	2333 ¹² 1,913,632	757 ⁵⁵ 19,573,9	259 ²⁶ 1,963,973	244 ⁵⁹ 1,858,90	313 ¹⁸ 2,380,20	531 ¹⁵ 4,021,87	9 ¹⁵ 2,420,413	31,827,15
210	Portal Concrete	18525	CY	202 ⁵⁴ 3,520,54	372 ⁸¹ 1,073,05	21 ³⁵ 895,509	21 ²⁶ 893,842	24 ⁴⁶ 4,569,27	76 ¹⁰ 1,409,753	16 ²⁰ 296,400	34,772,731
211	Mass Concrete	200	CY	303 ⁹⁷ 2,079,4	31 ⁰³ 62,07	31 ⁵⁵ 681,0	29 ³⁴ 5,629	37 ²⁰ 7,581	15 ¹⁷ 13,135	10 ³⁹ 73,499	99,997
212	Flip Bucket Concrete	2000	CY	62 ²⁹ 1,245,80	62 ⁸ 12,540	13 ⁵⁰ 27,040	10 ⁹⁰ 21,800	15 ¹⁷ 302,40	62 ²⁰ 12,418,0	8 ²⁰ 16,000,743	25,450
213	Emergency Release Chamber Concrete	15300	CY	57 ¹³ 879,149	5 ²⁰ 76,500	12 ²⁰ 1,973,70	10 ³⁴ 1,582,02	14 ²⁵ 21,955,5	36 ⁸¹ 8,291,93	8 ²⁰ 122,400	14,473,252,026
214	Suspended Metal Roof, Emerg. Release Chmb	2775	SF							31 ³⁵ 26,996	26,997
215	Lower Diversion Tunnel Plug Concrete	5570	CY	97 ⁸² 5,448,57	11 ⁹³ 2,245,0	14 ³¹ 797,07	12 ⁶⁴ 7,242,5	16 ⁴² 9,145,9	45 ⁵⁹ 2,539,36	15 ⁶ 8,689,200	11,115,550
216	Diversion Tunnel Mechanical		LS							1.5 5361,956	1.5 5,361,956

Location
HND BOND

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO.
FOR DATE
EST. BY ART LEE SHEET 3 OF

	QUANTITY	UNIT	CONSTRUCTION	CONSTRUCTION	EQUIPMENT	EQUIPMENT	EQUIPMENT	PERMANENT	SUB-CONTRACTS	TOTAL	TOTAL COST		BID	
			LABOR & INSURANCE	SUPPLIES	REPAIR LABOR	RENT	SUPPLIES	MATERIALS		DIRECT COST	Unit Cost	Amount	Unit Cost	Amount
WAYS	21000	Ac	709 ⁹⁰ 144907900	16 ¹¹ 338310	97 ⁸⁹ 1971190	60 ⁶¹ 1274070	97 ⁸⁴ 1048340			978 ¹¹ 20540310			146 ⁴¹ 26174517	
ESERVOIR.			14 707900	3381210	17191690	1714071	2042340			20540310			26174517	
15' x 20'	2100	LF	81 ⁹⁴ 802074	138 ⁴³ 395703	116 ⁸⁷ 245427	89 ⁷⁹ 188559	120 ¹⁴ 252294	127 ⁸⁶ 562506		165 ⁰³ 2446563			1185 ³¹ 3116420	
Dia.	7220	LF	114 ⁵³ 8047340	426 ²⁰ 3077164	349 ⁵¹ 2523462	479 ⁸⁸ 3464589	402 ⁴¹ 2905833	157 ¹⁹ 1134912		298 ⁰² 21153300			3784 ²⁶ 26959480	
Dia.	760	LF	1580 ⁶² 1261271	470 ⁸⁷ 509937	512 ⁶¹ 289584	45 ⁹⁸ 466145	573 ⁵⁷ 435913	514 ³⁸ 238929		428 ¹³ 3243779			589 ⁴¹ 4123640	
	67100	CY	11 ⁹ 79849	0 ⁶² 1342	0 ⁶⁸ 45628	0 ⁷¹ 47641	0 ⁸³ 55693			3 ⁴³ 230153			437 ²⁹ 293227	
	85550	CY	6 ²⁰ 530410	2 ⁵³ 216442	2 ⁷⁸ 237829	1 ⁵⁷ 134213	2 ³⁴ 200187			15 ⁴² 1319181			19 ⁶⁵ 1681058	
ck. Excav.	4700	CY	31 ¹⁷ 174699	130 ⁶ 61382	132 ¹ 61147	10 ⁸⁴ 51042	13 ⁶⁵ 64155	21 ⁵ 125255		114 ⁴⁰ 537680			14 ⁶ 680200	
S. Portals	34540	CY	6 ²⁸ 9671	0 ⁰³ 1036	0 ²⁰ 6908	0 ¹⁰ 3454	0 ¹³ 4490			0 ⁷⁴ 25559			1 ⁹⁴ 32468	
	7220	LF	188 ¹⁹ 14352453	12 ⁵⁵ 1318033	207 ¹⁶ 1495759	172 ¹⁷ 1369767	442 ⁸⁵ 1796777	772 ⁰⁴ 3119376	22 ⁶¹ 16200	213 ¹¹ 23488165			445 ²⁹ 29226900	
	760	LF	222 ⁷⁶ 1963132	229 ⁵⁵ 195939	359 ²⁴ 196393	244 ⁵⁹ 128890	312 ¹⁰ 238020	34 ⁴⁵ 406187	3 ¹⁵ 2420	418 ¹² 3188761			518 ⁴ 4062960	
	18525	CY	202 ⁵⁴ 3752054	32 ⁸¹ 607625	21 ³⁵ 395509	21 ²⁶ 393842	24 ⁴⁶ 456827	76 ¹⁰ 1408753	16 ⁰⁰ 296400	341 ⁷² 7312190			50 ⁸ 9318275	
	200	CY	303 ⁹⁷ 60794	310 ³ 6207	31 ⁵⁵ 6310	24 ³⁴ 5869	37 ⁹⁰ 7581	65 ⁷ 13135	0 ³⁹ 78499	85 ⁵ 99974			637 ¹ 127400	
	2000	CY	12 ²⁹ 124580	6 ²⁸ 12510	13 ⁵⁸ 27040	10 ⁹⁰ 21200	15 ¹⁷ 30340	62 ⁰² 124180	8 ⁰⁰ 16000	172 ²⁵ 356500			227 ¹ 454100	
crete.	15300	CY	57 ⁵³ 877149	5 ²⁰ 76500	12 ⁹⁰ 197370	10 ³⁴ 158202	14 ³⁵ 219555	76 ⁸¹ 869193	6 ²⁰ 122400	164 ⁷³ 2520369			210 ¹ 3213000	
lease Chmb	2775	SF							31 ³⁵ 86996	71 ³⁵ 86996			40 ¹ 111000	
crete	5570	CY	77 ⁸² 544257	11 ⁰³ 60450	14 ³¹ 78707	12 ⁶⁴ 70425	16 ⁴³ 91459	45 ⁵⁹ 253936	1 ⁵⁶ 8689	200 ⁷¹ 1115503			255 ¹ 1420350	
		LS							1.5 5361	256 1.5 5361			354 1.5 6831903	

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ DATE _____ LOCATION _____
 BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA

FOR _____

EST. BY _____ ART LEE

COST & ESTIMATE SUMMARY

TRACY & MURRAY, SEATTLE 47263

ESTIMATE SUMMARY															
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST				
217	Granular Backfill	8245	CY	586	48316	020	1679	245	28445	282	23251	356	29352	158	131101
SUBTOTAL - ACCOUNT 332.2 DIVERSION TUNNELS				22569.49	63477.49	59270.18	660476.9	6789476	92573.62	59103.19	7261703				
332.22	U/S COFFERDAM														
221	Common Excavation	1300	CY	119	1547	022	26	068	484	071	923	083	1079	343	445
222	Impervious Fill	67600	CY	427	275132	013	3788	103	19628	077	52052	133	23148	723	48527
223	Rock & Gravel Fill	407000	CY	086	358160	021	4070	055	273550	053	211640	063	256410	253	105413
224	Filters	42900	CY	552	251334	020	8580	365	148005	282	120978	356	152724	158	6363
225	Cut-Off Wall U/S	35900	SF												
226	Care of Water	1	LS	342311	8250	157269	22187	165601							
SUBTOTAL - ACCOUNT 332.22 U/S COFFERDAM				12796.44	591	1	59763.1	468290	658962	789800	276545				
332.23	D/S COFFERDAM														
231	Common Excavation	5000	CY	3	5950	002	100	068	3400	071	3550	083	4150	343	17150
232	Impervious Fill	47250	CY	427	123305	013	6142	103	42665	077	36352	133	58118	723	3415
233	Rock & Gravel Fill	42800	CY	086	37614	021	428	055	23540	053	22256	063	26924	253	11027
235	Cutoff Wall D/S	29500	SF												
236	Removal of Cofferdam	90000	CY	087	80100	002	1822	055	49500	050	40000	021	54900	257	22120
SUBTOTAL - ACCOUNT 332.23 D/S COFFERDAM				516032	8470		125108	102189	104132	647000	134917				
332.3	MAIN DAM														
311	Excavation, Common	3496000	CY	420	13384020	024	239040	075	2822020	085	2971620	125	4370020	729	2478000
312	Excavation, Rock	389000	CY	425	1703320	003	789070	071	1077530	192	746580	051	976390	1321	529429
313	Impervious Fill	6300000	CY	155	9302365	021	73029	070	568738	127	6301373	114	7214018	467	2358000

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DIVERSIFIED CONSTRUCTORS, INC.

WATANA - STAGE 1

JOB _____ NO. _____

FOR _____ DATE _____

EST. BY ART LEE SHEET 4 OF _____

COST & ESTIMATE SUMMARY

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		TOTAL COST		BID			
			Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount
332.2 DIVERSION TUNNELS	8245	CY	5.86	48316	0.20	1649	3.45	28445	2.82	23251	3.56	29352					15.89	131013			20	164900		
				325691.49		65479.49		573701.8		660676.9		678847.6		87573.62		59103.19		726170.42				925359.61		
	1300	CY	1.19	1547	0.22	26	0.68	884	0.71	923	0.83	1079					3.43	445.9			4.37	5681		
	67600	CY	4.07	275132	0.13	8788	1.03	69628	0.77	52052	1.23	63148					7.23	48874.8			9.21	622591		
	407000	CY	0.88	358160	0.01	4070	0.55	223850	0.52	211640	0.63	256410					2.59	1054130			3.30	1343100		
	42900	CY	5.86	251394	0.20	8580	3.45	14800.5	2.82	12097.8	3.56	152724					15.89	181681			20.25	868725		
	35900	SF													22.00	189800	22.00	189800			28.04	1006136		
		LS		392311		8250		15726.9		22687		165601					1.51	74661.8			1.51	95155.7		
332.22 U/S COFFERDAM				19790.44		3974.1		57963.6		40829.0		65876.2				7878.0		37165.436				479829.5		
	5000	CY	1.19	5950	0.22	100	0.68	3400	0.71	3550	0.83	4150					3.43	17150			4.37	21850		
	47250	CY	4.07	192308	0.13	6142	1.03	4866.8	0.77	36382	1.23	5811.8					7.23	34161.8			9.21	435173		
	42800	CY	0.88	37664	0.01	428	0.55	23540	0.52	22256	0.63	26964					2.59	110852			3.30	141240		
	29500	SF													22.00	649000	22.00	649000			28.04	827180		
	90000	CY	0.89	80100	0.02	1800	0.55	49500	0.50	45000	0.61	54900					2.57	231300			3.27	294760		
332.23 D/S COFFERDAM				31603.2		8470		12510.8		10218.8		14413.2				649000		134997.0				17020.8		
	3496000	CY	4.00	13984000	0.24	239040	0.75	2622000	0.85	2971600	1.85	4370000					7.09	24786640			9.03	31568880		
	389000	CY	4.36	1703820	2.03	789670	2.77	1077530	1.92	746480	2.51	976390					13.61	5294290			17.34	6745260		
	6300000	CY	1.55	9806305	0.01	73009	0.90	65673.8	1.27	63018.73	1.74	72169.18					4.67	29584843			6.05	38101783		

BIDS OPENED _____ AT _____
 Date Location
 COMPLETION TIME _____ BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

TRICK & MURRAY, SEATTLE 47263

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIAL
314	Provide Drying Facilities for Impervious Fill	1	LS						
315	Drying Impervious Fill	1260000	CY	085 1071000 021	12400 044	554420 044	554420 054	180420 000	75
317	D/S Gravel Fill	2731700	CY	204 5587545 001	49848 137	3750965 126	5101089 220	6016157	
318	Filters	4216700	CY	164 6929737 021	49282 106	4471492 145	6138849 123	7299872	
319	Rockfill from Quarry		CY						
320	Rockfill from Stockpile	11,013,200	CY	345 40198180 147	4189404 223	24569436 251	27143132 350	35242242	
321	Rockfill Directly from Excavation	7845000	CY	049 3850078 001	128185 019	1549500 019	1491124 022	1775106	
322	Raking Rock Fill		CY						
323	Drill & Grout - Consolidation	225160	LF						
324	Drill & Grout - Curtain	282270	LF						
325	Dam Dental Concrete	48550	CY	10013 7803442 2271	1102570 1500	728250 1629	790380 1832	887436 426	207
326	Drain Holes	93975	LF	297 779106 023	21614 120	112770 043	40409 086	80819	
33	Grout Galleries and Portals								
331	Horizontal Galleries 10' x 10'	6555	LF	23950 1569923 9032	592047 7082	464225 3169	207723 6020	399200 5570	36
332	Inclined Galleries 10' x 10'	1070	LF	23950 256265 9032	96142 7082	75777 3169	33909 6020	65163 5570	5
333	Shafts 10' x 10'	995	LF	20278 980866 10265	102137 9489	94416 9989	99390 10642	105888 7757	7
334	Common Excavation - Portals	3600	CY	119 4248 002	712 068	2448 071	2556 083	2988	
335	Rock Excavation - Portals	1000	CY	620 6200 253	2530 278	2780 157	1570 234	2340	
336	Tunnel Concrete - Slabs	2590	CY	17551 454571 1950	50505 2671	69075 2171	56229 3927	87205 654	17
337	Portal Concrete	20	CY	20255 4051 3281	656 2135	427 2126	425 244	423 7610	
338	Tunnel Plug Concrete	585	CY	9320 48731 910	5324 1713	10021 1388	8120 1978	11571 5200	3

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JOB WATANA - STAGE 1 NO. _____
 FOR _____ DATE _____
 EST. BY ART LEE SHEET 5 OF _____

PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID		Unit Cost	Amount
			Unit Cost	Amount	Unit Cost	Amount		
		- 0 -				- 0 -		
02 75600		234 2948400			298 3754600	-		
		748 20505604			953 26033101	-		
		589 24489232			751 31667417	-		
		1306 45832392			1745 71347044	-		
		110 2797593			140 10983000	-		
	2860 6439576	2860 6439576			3445 8007082	-		
	2200 6209940	2200 6209940			1800 7903560	-		
4216 2075993		2756 13390596			3515 17068325	-		
		569 534718			725 181319	-		
5570 365113		81893 3596236			69950 4585723	-		
5570 59599		51895 587355			69950 748445	-		
7757 77182		2440 859879			1101 1095495	-		
		343 123112			440 15840	-		
		1542 15420			1960 19600	-		
6564 170008		3420 887593			4360 1131053	-		
7610 15221600		3220 77473 7894			583 10060	-		
5200 30420		19519 114187			298 145080	-		

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ Date _____ Location _____
 BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA _____

FOR _____

COST & ESTIMATE SUMMARY

EST. BY _____ ART LEE

TRIC & MURRAY, SEATTLE 47269

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
339	Portal Doors, Architectural	2	Ea							14300	28600
340	Dam Instrumentation	1	LS							L.S.	38500
	SUBTOTAL - ACCOUNT 332.3 MAIN DAM			93938.668	7010513.5	4583225.0	5269316.3	6522219.6	285544.2	12711692.6	73321278.0
332.4	RELICT CHANNEL										
4	Relict Channel	1	LS	755643.8	26949.7	477636.1	641219.7	761885.4			L.S. 2663334.7
	SUBTOTAL - ACCOUNT 332.4 RELICT CHANNEL			755643.8	26949.7	477636.1	641219.7	761885.4			L.S. 2663334.7
332.51	OUTLET FACILITIES										
511	Tunnel - Horizontal Excavation 31' Dia	1950	LF	54701 1105670 34620	67509.0 10355	357922 15020	293845 19293	376214 74495	1452652		78523 426141
512	Inclined Shaft Excavation 31' Dia	340	LF	1276 433840 42895	145843 28096	95533 10358	62417 30712	104421 74495	253283		32158 109535
513	Tunnel Excavation - Manifold	900	LF	2440 241560 12313	110817 7949	71487 5921	53919 8115	73235 10501	9450.9		71023 44533
514	Concrete Lining - Horizontal 28' I.D.	1575	LF	14023 2345400 17821	215033 1479	237500 13219	221905 17141	267127 34889	564400 3823	64573 22125	395623
515	Concrete Lining - Horizontal Steel Lined 28' I.D.	375	LF	41613 156051 1829	6862 10085	37520 7693	28852 11729	44172 7478	1111689		1076 28514
516	Concrete Lining Manifold 8' I.D.	900	LF	52856 475709 4659	41919 6769	60923 5936	53426 8051	72465 20743	186692 2413	21992 10455	91512
517	Inclined Lining - 28' I.D.	340	LF	61250 892670 27699	100979 1751	59559 20043	68148 23216	79037 37101	126145 4118	14002 3442	13405
518	Mechanical - Inlet	1	LS							L.S. 1118634	L.S. 111823
519	Mechanical - Outlet	1	LS							L.S. 7250791	L.S. 7250791
	SUBTOTAL - ACCOUNT 332.51 OUTLET FACILITIES			5450900	1296543	920444	78253.2	103647.1	28093.70	8470292	203605
332.52	MAIN SPILLWAY										
5211	Common Excavation - Approach & Control Structure	606000	CY	131 793860 001	6060 080	484800 085	575700 098	593880			405 24522
5212	Common Excavation, Chute, Flip Bucket & Outfall	383500	CY	131 502385 001	3835 080	386400 085	344325 098	375830			405 15521
5213	River Channel, Alluvium Excavation	1096000	CY	143 1622080 002	21920 089	975440 127	1178720 110	1205600			45 23777

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO.
 FOR DATE
 EST. BY ART LEE SHEET 6 OF

COST & ESTIMATE SUMMARY																	
	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST		TOTAL COST		BID			
										Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount		
	2	Ea							14300	28600	14300	28600		1820	36444		
	1	LS							L.S.	38500	L.S.	38500		L.S.	44061		
DAM			93938668	70105135	45832250	52693163	65222196	2855442	12716926		29363780			31297792			
	1	LS	7556436	269497	4776361	6412197	7618854			L.S.	26633247			L.S.	33938374		
CT NEL			71556434	269497	4776361	6412197	7618854			L.S.	26633247			33938374			
dia.	1950	LF	56701	1125670	34625	675090	18355	357922	15020	293265	19293	276214	74425	1452652	28521	4261413	
	340	LF	1276	433540	42895	145843	28096	95533	18058	62417	30712	104421	74425	253283	32015	1095237	
	900	LF	2840	241560	12313	110817	7943	71487	5921	53919	5115	73235	10501	94509	71703	645327	
	1575	LF	14023	2345400	12827	215033	14129	237500	13218	221905	17141	287127	34589	584400	3873	64573	
ned	375	LF	416	156251	1829	6862	10005	37520	7693	28852	11779	44172	29783	111689	10272	985146	
	900	LF	52856	475709	4659	41919	6769	60923	5426	53426	8051	72465	20745	186692	2443	21992	
	340	LF	12550	892670	29699	100979	17517	59559	20013	68148	23246	79037	37101	126145	4118	14002	
	1	LS								L.S.	1118634	L.S.	1118634	L.S.	1325475		
	1	LS								L.S.	725079.1	L.S.	725079.1	L.S.	9542018		
TLET ILITIES			5450900	1296543	920444	782532	1036471	2809370	8470272		20966552			26717677			
ontrol	606000	CY	131	793860	001	606000	050	484800	085	575700	098	593880		405	2454300	516	3126760
cket 6	383500	CY	131	502385	001	383500	080	306400	085	364325	098	375830		405	1553175	516	1978800
	1096000	CY	148	1622030	002	219200	089	975440	107	1172720	110	1205400		456	4997760	581	6367760

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ Date _____ Location _____
 BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATA _____

FOR _____

EST. BY _____ ART _____

TRICK & MURRAY, SEATTLE 47263

COST & ESTIMATE SUMMARY

COST & ESTIMATE SUMMARY												EST. BY	ART
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST		
5215	Rock Excavation, Spillway Approach	2798400	CY	4 ³⁸ 1203799.2 203 5579252 274 7630616 192 5271928 251 4893484							1358 31323		
5215	Rock Excavation, Spill Control Structure	414100	CY	4 ³⁸ 1813758 203 840623 274 1134234 192 795072 251 1039391							1358 56234		
5216	Rock Excavation, Chute & Flip Bucket	8219600	CY	4 ³⁸ 18481848 203 8565788 274 11561704 192 8101632 251 10591196							1358 713021		
5217	Drill & Grout, Consolidation	10000	LF							2840 286000 2840 2860			
5220	SPILLWAY CONCRETE												
5221	Piers	21060	CY	88 ⁴⁰ 1862335 798 168058 1644 346226 1519 319901 1864 992558 7373 1552753 1600 336960 2364 49781									
5222	Deck	350	CY	48 ⁴⁷ 170439 2840 30940 3384 11844 4476 15666 4589 16040 8617 30159 2400 8400 8097 2834									
5223	Guide Walls	28870	CY	170 ⁷⁰ 4928109 1571 453547 2560 739072 2315 118340 2878 836652 8540 24711272 1600 461920 36574 10558									
5224	Slab	29470	CY	103 ³⁶ 3051913 765 225445 2152 634194 1965 579085 2484 732034 7823 2305438 1600 471520 2716 7399									
5225	Ogee	24800	CY	51 ¹⁰ 1267280 351 87048 136 338768 1198 297104 1520 376960 7157 1774936 1600 396800 1832 4538									
5226	Flip Bucket & Outlet Discharge Structure	28300	CY	63 ⁴⁰ 1794220 520 147160 1429 404401 1252 354316 1550 438650 7191 2036751 1600 452800 1888 5626									
5227	Drain Gallery & Aeration Gallery Concrete	2910	CY	120 ⁷¹ 349695 1118 32534 1926 56047 1741 50623 2128 63962 3891 957128 1725 502906 69173 2012									
5228	Gravity Retaining Wall & Flip Bucket	1000	CY	171 ³⁷ 171370 2840 26400 1855 18550 1845 18450 211 21110 7120 71300 1600 16000 3458 345									
5230	15' Rockbolts	433	Ea	32 ¹⁰ 13899 257 1113 1455 6300 492 2130 982 4252 4818 20862 1124 48									
5240	10' Rockbolts	4200	Ea	23 ⁶⁹ 99498 121 8022 1072 45024 366 15372 726 30492 3212 134904 7936 333									
5250	Half Rounds to Drainage Gallery	14350	LF	386 55391 013 1866 033 4735 015 2153 040 5740 1925 276237 2412 346									
5260	Spillway Mechanical & Electrical	1	LS										
SUBTOTAL - ACCOUNT 332.52 MAIN SPILLWAY				11014672	16701611	24597161	18607557	22672831	11631740	4398378	148075		
332.6	POWER AND OUTLET INTAKE & APPROACH												
611	Common Excavation	906600	CY	132 1196712 001 906600 725280 861270 888468						406 3686			
612	Rock Excavation - Approach	5961400	CY	439 26170546 204 12161256 225 16393850 192 11445888 251 14963114							1361 81134		

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Location _____
 Bid Bond _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA - STAGE 1 NO. _____

FOR _____ DATE _____

EST. BY _____ ART LEE SHEET 7 OF _____

COST & ESTIMATE SUMMARY

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		TOTAL COST		BID				
			Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	
proach	27.88400	CY	4.38	120379.92	2.03	55792.52	2.74	75304.16	1.92	52769.28	2.51	68984.84					13.58	37323.272			17.30	475413.20			
Structure	91.9100	CY	4.38	181375.8	2.03	84062.3	2.74	113443.4	1.92	79507.2	2.51	108939.1					13.58	562347.8			17.30	716393.0			
Bucket	921.9600	CY	4.38	1648184.8	2.03	256578.8	2.74	1156170.4	1.92	610143.2	2.51	1059119.6					13.58	5730216.8			17.30	7299908.0			
	10000	LF														28.40	286000	28.40	286000			36.45	364500		
	21060	CY	8.89	186233.5	7.98	16805.8	16.44	34622.6	15.19	31990.1	18.64	39255.8	73.73	15527.53	16.00	336960	236.41	497879.1			241.25	634432.5			
	350	CY	4.38	17043.9	28.40	30940	33.84	11844	44.76	15666	45.82	16040	86.17	3015.9	24.00	6400	80.97	28348.8			103.2	361200			
	28870	CY	110.70	492810.9	15.71	45354.7	25.60	73907.2	23.15	68340	28.78	83665.2	85.40	2471.272	16.00	461920	365.74	105589.12			466	1345342.0			
	29470	CY	103.54	30519.13	7.65	22544.5	21.52	63419.4	19.65	57908.5	24.84	73203.4	78.23	230543.8	16.00	471520	211.45	799962.9			345.00	1019367.3			
	24800	CY	51.10	1267280	35.1	8704.8	13.66	33876.8	11.98	29710.4	15.20	376960	71.57	177493.6	16.00	396800	183.02	453889.6			233.25	578385.6			
Structure	28300	CY	63.40	179422.0	5.20	14716.0	14.29	40440.1	12.52	35431.6	15.50	43865.0	71.97	20367.51	16.00	452800	188.00	562830.4			282.43	717206.9			
Concrete	2910	CY	12.07	34969.5	11.18	3253.4	19.26	5604.7	17.41	5066.3	21.28	6396.2	328.91	95712.8	17.28	50290.6	191.72	201293.5			281.20	256516.5			
Bucket	1000	CY	171.37	171370	28.40	28400	18.55	18550	18.45	18450	21.1	21110	71.20	71300	16.00	16000	345.18	345180			439.00	439900			
	433	Ea	32.10	13899.257		1113	14.55	6300	4.92	2130	9.82	4252	48.18	2086.2			112.14	4855.6			42.00	6187.6			
	4200	Ea	23.69	9949.8	1.21	802.2	10.72	4502.4	3.66	1537.2	7.26	3049.2	32.12	13490.4			79.36	33331.2			101.10	42420			
	14350	LF	3.86	5539.1	0.13	186.6	0.33	473.5	0.15	21.53	0.40	574.0	19.25	2762.37			24.12	34612.2			30.70	44054.5			
	1	LS														L.S.	146509.2	L.S.	146509.2			L.S.	190855.5		
MAIN SPILLWAY				102160.72		1670161.1		2459716.1		1960755.7		2367283.1		11631740		439839.8		14909937.0				18868761.4			
APPROACH	906600	CY	1.32	1196712	0.01	906.6	0.00	725280	0.05	861270	0.08	88846.8				4.06	368079.6			5.17	4687122				
	5961400	CY	4.38	2617054.6	2.04	1216125.6	2.75	1639385.0	1.92	1144589.8	2.51	1496311.4				13.61	8113465.4			17.39	10337067.6				

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ Date _____ Location _____
 BID BOND _____

TRICK & MURRAY, SEATTLE 47282

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB _____ WATA
 FOR _____
 EST. BY _____ ART L

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
.613	Rock Excavation - Intake	268800	CY	439 1180082	204 548352	275 739200	192 516096	251 674688			1761 9658
.614	Concrete	87350	CY	9372 8186442	968 819343	1588 1287118	1572 1733820	182 1595384	7236 6370646	1620 1397600	24673 21045
.615	1" x 15' Rockbolts	330	Ea	3210 10593	257 848	1455 4802	492 1624	982 3240	4818 15900		1124 37
.616	Intake Mechanical & Electrical	1	LS								
.617	Intake Building	1	LS								
.618	Strand VSL Anchors Including Installation	5800	LF							L.S. 7348800	L.S. 7348
.619	Drilling 1.1" Dia Holes & Grouting	5800	LF							L.S. 71500	L.S. 71
.620	Gate Equipment									1650 95700	1650 95
.621	Power Intake									4950 287100	4950 287
.6211	Intake Gates	4	Ea								
.6212	Intake Bulkhead	1	LS							14550 574080	14550 574
.6213	Shutter Gate	1	LS							L.S. 418277	L.S. 418
.6214	Trashracks	1	LS							L.S. 518000	L.S. 518
.6215	Ice Boom	4	Ea							L.S. 452100	L.S. 452
.622	Outlet Gates									2000 120000	2000 120
.6221	Intake Gates	2	Ea								
.6222	Intake Bulkhead	2	Ea							25750 271500	25750 271
.6223	Intake Trashrack	1	LS							14550 209000	14550 209
.6224	Ice Boom	4	Ea							L.S. 226050	L.S. 226
SUBTOTAL - ACCOUNT 332.6 POWER INTAKE				36714375	13538465	19250250	14163080	18125394	6336546	12109807	12109807

DIVERSIFIED CONSTRUCTORS, INC.

JOB WATANA - STAGE 1 NO.

FOR DATE

EST. BY ART LEE SHEET 8 OF

COST & ESTIMATE SUMMARY

Location
BID BOND

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		TOTAL COST		BID	
		Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount
268800	CY	4.39	1180032	2.04	548352	275	739200	192	516096	251	674688					1361	3658308			1724	460092
87350	CY	93.72	8186442	9.68	819343	15.88	1387118	15.32	1333202	18.27	1595984	172.36	1320646	16.00	1397600	240.73	21045235			307.02	26818197
330	Ea	32.10	10593	257	848	1455	4802	4.92	1624	982	3240	4819	159.00			112.14	37007			142.98	47187
1	LS													L.S.	7348900	L.S.	7348900			L.S.	9304703
1	LS													L.S.	71500	L.S.	71500			L.S.	91112
5800	LF													16.50	95700	16.50	95700			21.03	121974
5800	LF													49.50	287100	49.50	287100			63.08	365804
4	Ea													14350	574080	14350	574080			18828	731552
1	LS													L.S.	418277	L.S.	418277			L.S.	533010
1	LS													L.S.	518000	L.S.	518000			L.S.	660087
1	LS													L.S.	452100	L.S.	452100			L.S.	576111
4	Ea													30000	120000	30000	120000			38229	152916
2	Ea													75750	271500	135750	271500			17286	345972
2	Ea													104500	209000	104500	209000			18044	264328
1	LS													L.S.	226050	L.S.	226050			L.S.	311756
4	Ea													30000	120000	30000	120000			38229	152916
POWER INTAKE			36744325		13538365		19250250		141631080		181253741		6336546		12109807		120769267				153258145

BIDS OPENED _____ AT _____
 COMPLETION TIME _____ Date _____ Location _____
 BID BOND _____

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____
 FOR _____
 EST. BY _____

COST & ESTIMATE SUMMARY

PRICE & MURRAY, SEATTLE 47262

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	100 DIRECT
332.70	SURGE CHAMBER										
711	Rock Excavation	68000	CY	2093.040 12 ⁵⁴	852720 10 ⁵⁰	720800 9 ⁵³	654840 11 ²⁷	766360 25 ⁵⁹	1746920		100 ⁵¹
712	Vent. Shaft Excavation 8.5' Dia.	535	LF	326 ⁴⁵ 196051 87 ⁷⁸	46962 82 ⁰⁵	43902 95 ⁵⁹	50980 10 ²⁸	53650 56 ⁰⁰	29960		787 ²⁵
714	Concrete 6.5 I.D.	90	LF	381 ⁷⁸ 34919 42 ⁶⁰	3834 34 ⁶⁴	3118 33 ⁸¹	3043 43 ¹⁴	3883 86 ³⁰	7771 40 ⁰¹	1264 47 ²⁰	
715	Shotcrete, 2" thick		LS	307995	19146	28650	21421	45520		L.S.	265086 L.S.
716	Surge Chamber Concrete	3400	CY	102 ³¹ 552138 17 ²⁹	61166 21 ³⁹	70726 18 ¹⁴	61176 24 ¹⁷	82178 80 ¹³	272442 16 ⁰⁰	54500 370 ⁸⁹	
717	Drain Holes	10340	LF	297 30710 0 ²³	2378 12 ¹	12512 0 ⁴³	4446 0 ²⁶	8892			520
718	1" x 10' Rockbolts	270	Ea	236 ⁹ 6376 19 ¹	516 10 ⁷⁵	2895 36 ⁶	988 76	1960 92 ¹²	8672		795
719	Stoplogs, Guides and Followers, Stoplogs 90" wide x 94" high	1	LS							L.S.	173718 L.S.
	SUBTOTAL - ACCOUNT 332.7 SURGE CHAMBER			3221849	936722	884603	777394	962443	2065165	474468	
332.8	PENSTOCKS										
811	Excavation, shaft 27' Dia.	778	LF	1051 ⁵² 822751 32 ⁰⁶	253675 181 ³⁵	141090 130 ²⁶	101342 25 ³⁸	167566 515 ³¹	439811		247586
812	Excavation, Horizontal 27' Dia.	730	LF	543 ¹⁰ 396463 289 ⁵⁴	211072 190 ⁰¹	138751 138 ⁶³	116800 199 ²⁹	145555 565 ³⁰	412669		191513
813	Excavation, Horizontal 21' Dia.	460	LF	324 ¹⁴ 167504 200 ⁰⁴	92018 127 ⁴⁵	58627 106 ³⁴	48926 133 ⁶⁹	61497 341 ⁹⁷	167306		12755
814	Excavation, Horizontal 18' Dia.	800	LF	315 ¹¹ 252136 167 ⁰²	137616 110 ³¹	88248 92 ⁰⁵	13640 115 ⁷¹	92568 251 ⁶¹	201288		105 ⁸¹
815	Drill & Grout Consolidation		LS							L.S.	412500 L.S.
816	Penstock Concrete Liner Shaft 24' Dia.	778	LF	1282 ⁰⁹ 997472 116 ⁰¹	90582 120 ⁸⁹	101835 121 ⁹³	94863 158 ¹⁸	123070 344 ⁰⁵	267680 415 ²¹	36971 220 ⁵²	
817	Concrete Liner, Horizontal 24' Dia.	730	LF	1239 ⁴ 948609 122 ²¹	89628 129 ⁰¹	94985 121 ²⁵	89025 157 ¹⁴	114937 339 ⁰¹	247480 117 ⁵¹	34688 371 ⁷⁵	
818	Concrete Liner, Horizontal 18' Dia.	460	LF	195 ³⁶ 457869 34 ⁹²	43666 100 ⁴³	46223 94 ¹¹	43291 121 ⁹⁰	56077 264 ¹⁷	121522 36 ²⁵	16912 170 ⁰⁷	
819	Concrete Liner, Horizontal 15' Dia.	800	LF	337 ³⁵ 665885 78 ⁰⁸	63108 84 ⁴¹	67688 77 ⁰³	63226 106 ⁴	82112 223 ⁴⁶	175769 30 ²⁴	21599 103 ²¹	

Location
RUD ROAD

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO.
FOR DATE
EST. BY ART LEE SHEET 9 OF

QUANTITY	UNIT	CONSTRUCTION LABOR & OVERHEAD		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB CONTRACTS		TOTAL DIRECT COST		TOTAL COST		BID	
		Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount
68000	CY	10.18	692160	12.51	852120	10.60	720800	9.63	654840	11.27	766360	25.59	1746920			100.51	6834480			128.5	8709440
515	LF	76.45	394051	81.78	41962	82.05	43902	95.55	50980	100.28	53650	56.00	29960			78.75	421505			101.1	537140
90	LF	387.99	34919	422.00	3831	346.4	3118	338.1	3043	43.4	3883	86.30	7771	140.4	1264	242.5	57832			289.5	73710
1	LS		307995		17116		28050		21421		45520			L.S.	265086	L.S.	687218			L.S.	216186
3400	CY	142.51	552138	171.8	61166	21.39	72726	18.54	61476	24.17	82178	80.13	272442	1.00	51400	340.11	1157326			473.5	1574750
10,140	LF	2.71	27470	0.53	2378	1.21	12512	0.43	4416	0.86	8892					5.70	58938			7.5	74965
170	EA	23.57	4006	1.91	324	10.75	2895	3.66	988	7.26	1960	32.12	8672			74.26	21427			14.5	27270
1	LS													L.S.	173718	L.S.	173718			L.S.	221635
			2746541		786722		184603		777394		962442		2665165		471447		9413294				11995270
778	LF	105.71	822751	120.5	253675	15.25	141090	180.25	101342	20.28	167566	105.21	439811			247.88	1926235			315.5	2444590
730	LF	152.10	394383	150.0	211072	170.1	138751	155.3	116800	199.38	145555	152.20	412669			1415.12	1420310			2178.1	1809670
460	LF	26.4	121504	22.0	95206	27.15	12527	10.25	46926	33.58	61497	34.17	157306			127.45	585818			162.2	746560
800	LF	15.5	12400	16.75	13400	10.21	82248	10.55	76445	115.21	92562	25.14	201288			105.82	841496			1330.5	1072000
1	LS													L.S.	412500	L.S.	412500			L.S.	516220
778	LF	105.71	822751	120.5	253675	15.25	141090	180.25	101342	20.28	167566	105.21	439811			247.88	1926235			315.5	2444590
730	LF	152.10	394383	150.0	211072	170.1	138751	155.3	116800	199.38	145555	152.20	412669			1415.12	1420310			2178.1	1809670
460	LF	26.4	121504	22.0	95206	27.15	12527	10.25	46926	33.58	61497	34.17	157306			127.45	585818			162.2	746560
800	LF	15.5	12400	16.75	13400	10.21	82248	10.55	76445	115.21	92562	25.14	201288			105.82	841496			1330.5	1072000
1	LS													L.S.	412500	L.S.	412500			L.S.	516220
778	LF	105.71	822751	120.5	253675	15.25	141090	180.25	101342	20.28	167566	105.21	439811			247.88	1926235			315.5	2444590
730	LF	152.10	394383	150.0	211072	170.1	138751	155.3	116800	199.38	145555	152.20	412669			1415.12	1420310			2178.1	1809670
460	LF	26.4	121504	22.0	95206	27.15	12527	10.25	46926	33.58	61497	34.17	157306			127.45	585818			162.2	746560
800	LF	15.5	12400	16.75	13400	10.21	82248	10.55	76445	115.21	92562	25.14	201288			105.82	841496			1330.5	1072000
1	LS													L.S.	412500	L.S.	412500			L.S.	516220
778	LF	105.71	822751	120.5	253675	15.25	141090	180.25	101342	20.28	167566	105.21	439811			247.88	1926235			315.5	2444590
730	LF	152.10	394383	150.0	211072	170.1	138751	155.3	116800	199.38	145555	152.20	412669			1415.12	1420310			2178.1	1809670
460	LF	26.4	121504	22.0	95206	27.15	12527	10.25	46926	33.58	61497	34.17	157306			127.45	585818			162.2	746560
800	LF	15.5	12400	16.75	13400	10.21	82248	10.55	76445	115.21	92562	25.14	201288			105.82	841496			1330.5	1072000
1	LS													L.S.	412500	L.S.	412500			L.S.	516220

DIVERSIFIED CONSTRUCTORS, INC.

WATANA

JOB

FOR

EST. BY

ART LEE

BIOS OPENED _____ AT _____
COMPLETION TIME _____ Date _____ Location _____
BID BOND _____

COST & ESTIMATE SUMMARY

TRICK & MURRAY, SEATTLE 47263

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
820	Steel Liner 800' 15' D (exclude concrete)	1820	TN								
	SUBTOTAL - ACCOUNT 332.8 PENSTOCKS			170866.7	77706.5	7372.47	66011.3	84338.2	202652.5	411921.7	11037.4
332.9	TAILRACE										
911	Tunnel Excavation - 37'	880	LF	654.12	57587.8	386.05	339.724	229.04	20155.5	191.15	1682.12
912	Portal Excavation - Common	4560	CY	120	5472	1002	9.1	0.68	3101	0.71	323.8
913	Portal Excavation - Rock	31095	CY	621	193100	253	78670	178	86444	157	4881.9
914	Tailrace Tunnel Concrete - 34' I.D.	2080	LF	178518	371379.8	141.52	33610.7	181.09	37666.7	169.21	3514.66
915	Portal Concrete	300	CY	20231	6076.2	32.81	9843	2135	6405	2126	637.8
916	Portal Rockbolts 1" x 25'	110	Ea	55.29	613.7	440	484	1521	2780	558	944
917	Tailrace Stoplogs, Guides & Followers	1	LS								
	SUBTOTAL - ACCOUNT 332.9 TAILRACE			1155516.7	76491.9	67675.2	57925.7	75197.1	178265.4	41754.4	952.39
333	WATERWHEELS, TURBINE & GENERATORS										
10	Guard Valves	4	Ea								
11	Turbines & Governors	4	Ea								
21	Generators & Exciters	4	Ea								
	SUBTOTAL - ACCOUNT 333 WATERWHEELS, TURBINES & GENERATORS										
334	ACCESSORY ELECTRICAL EQUIPMENT										
334	Accessory Electrical Equipment	1	LS								
	SUBTOTAL - ACCOUNT 334 ACCESSORY ELECTRICAL EQUIPMENT										
335	MISCELLANEOUS POWER PLANT EQUIPMENT										
335	Miscellaneous Power Plant Equipment	1	LS								

DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO.
 FOR DATE
 EST. BY ART LEE SHEET 10 OF

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST	BID										
										Unit Cost	Amount	Unit Cost	Amount									
ude concrete)	1820	TN							177 ⁸¹	3588749	177 ⁸¹	3588749	2512									
2.8 PENSTOCKS			470868.7	777665	737747	630173	813382	2026525	4114217	14031940			4571840-									
	880	LF	654 ¹⁴	575876	386 ⁰⁵	339724	229 ⁰⁴	201555	171 ¹⁵	168212	240 ²¹	211438	870 ⁵⁴	766093	2571 ⁹²	2262920			32762883584-			
	4560	CY	120	5472002		91068	3101021	3238083	3784						344	15486			438	14352		
	31095	CY	631	193100253		78670728	86444157	48819234	72762						1543	479795			1966	41328		
34' I.D.	2080	LF	1785 ⁴⁸	713798	141 ⁵³	336107	181 ⁰⁹	376667	189 ⁰¹	351666	218 ⁶²	454750	473 ²²	984298	45 ⁴³	136094	264 ⁸⁹	6353360			382	808360-
	300	CY	202 ³¹	607623281		93432135	64052126	63782466	73987610	228301600	48003472	118416							503	150900-		
	110	Ea	55 ²⁹	6127440		4842521	2780858	9441708	18798020	8833					191 ⁷²	21057			244	26840-		
Followers	1	LS												L.S.	276650	L.S.	276650			L.S.	359053-	
2.9 TAILRACE			1155516.7	764919	67675.2	57925.7	75197.1	1782054	417544	9527884			12141417-									
GENERATORS	4	Ea											517880	2071520	517880	2071520			517880	2637736-		
	4	Ea											724750	17215000	724750	17215000			724750	1937072-		
	4	Ea											715000	28600000	715000	28600000			715000	2444934-		
3 WATERWHEELS, ATORS.													47886520	47886520							6021772-	
EQUIPMENT ent	1	LS											L.S.	28541333	L.S.	28541333			L.S.	36370221-		
ACCESSORY EQUIPMENT													L.S.	28541333	L.S.	28541333					36370221-	
ANT EQUIPMENT equipment	1	LS											L.S.	7760835	L.S.	7760835			L.S.	9888132-		

DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA
FOR _____
EST. BY _____ ART LEE

BIDS OPENED _____ AT _____
COMPLETION TIME _____ Date _____ Location _____
BID BOND _____

COST & ESTIMATE SUMMARY

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
	SUBTOTAL - ACCOUNT 335 MISCELLANEOUS POWER PLANT									15 7760835	LS 7760835
336	ROADS, RAIL & AIR FACILITIES										
111	Permanent Access Roads									30000 6900000	30000 6900000
111	Upgrade Denali Highway	23	Mi								121643076936
112	Build Highway to Site	42	Mi	16502 2934284 9045	379890	57099 2398158	15671 1834434	59443 2484006	9853816738596		121643076936
113	Maintain	504	Mi	13687 22023288 1382	292528	10722 540388E	7729 4903416	13913 6709752			78843 3973687
12	Build Site Roads	11	Mi	29027 2968097 12530	137830	10183 1212013	7830 859430	10033 1199363	183587519578		1232011389631
121	Maintain Site Roads	11	Mi	50259 1284850 91591	292500	12300 1345305	10559 1172145	10177 1779765			9885711087150
13	Permanent Roads (Site)										1222 33775
131	Build Permanent Roads	27500	LF	3125 859375 121	47025	1081 297275	821 227425	1119 307725	5959 1638725		1222 33775
2	Rail Facilities										LS 61063
201	Old Rail & Storage Facilities	100	PC	2200714	92280	308501	239011	358052	2907150		LS 61063
202	Maintain Rail & Storage Facilities	90	Mo	9417 8475930 3870	348300	10352 1651680	15913 1432170	23913 2156670			15425140161
3	Airstrip										LS 9299
301	Build Temporary Airstrip	1	LS	159245	8725	55074	42128	57045	607779		LS 9299
302	Build Permanent Airstrip	1	LS	533123	29209	184377	141038	190978	2034739		LS 37136
	SUBTOTAL - ACCOUNT 336.ROADS, RAIL FACILITIES and AIRSTRIP			56438906	2032887	12856771	10851177	18243356	31446567	6900000	1297691
350	TRANSMISSION PLANT										
359	Transmission Plant (Divided by 10 to use 9 numbers)	10	LS	36099807	2865322	6327591	4234630	4941724	78619037	133880610	LS 256968

COST & ESTIMATE SUMMARY

EST. BY ART LEE SHEET 1 OF 1

Location
BID BOND

BID BOND			COST & ESTIMATE SUMMARY										EST. BY		DATE	
	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST		TOTAL COST		BID		
										Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount	
ISCELLANEOUS										15	17760835	15	17760835		9889122	
ES										WOOD	6900000	WOOD	6900000		382708792670	
	23	MI	16502	6934284	9045	379890	57099	2398158	73677	1834434	59443	2484006	9853816	738596	7335739209374	
	92	MI	16502	6934284	9045	379890	57099	2398158	73677	1834434	59443	2484006	9853816	738596	7335739209374	
	504	MI	16502	6934284	9045	379890	57099	2398158	73677	1834434	59443	2484006	9853816	738596	7335739209374	
	11	MI	16502	6934284	9045	379890	57099	2398158	73677	1834434	59443	2484006	9853816	738596	7335739209374	
	11	MI	16502	6934284	9045	379890	57099	2398158	73677	1834434	59443	2484006	9853816	738596	7335739209374	
	27500	LF	3125	859375	121	47025	1081	297275	821	227425	119	307125	5959	1638725	1562	4303750
	100	PC	2200	714	92880	308501	239011	358052	2907150							
ties	90	Mo	94177	8475930	3870	348300	18352	1651280	15913	1432170	23813	2156670				
	1	LS	159245	8725	55074	42128	57045	607779								
	1	LS	533123	29209	184377	141038	190978	2034739								
ROADS, RAIL d AIRSTRIP			50431906	2032887	12856771	10881777	15243356	31446567	6900000							
by 10. to use	10	LS	56099267	2865322	6327591	4234630	4941724	48619037	133880610							

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DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1

NO.

FOR

DATE

EST. BY ART LEE

SHEET 12 OF

Location
BID BOND

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID	
										Unit Cost	Amount	Unit Cost	Amount
ANT		56,099.867	786,932.2	637,571	423,463.0	117,417.24	8,617,037	13,880,611.0	L.S. 26,968,781			327,455,318.-	
	LS							L.S. 5,000,000	L.S. 5,000,000			L.S. 6,371,500.-	
								5,000,000	5,000,000			6,371,500.-	
HER RTY													
ITIES t Village								L.S. 280,500.0	L.S. 280,500.0			L.S. 357,441.15	
1800	U							L.S. 7,500,000.0	L.S. 7,500,000.0			L.S. 9,557,250.-	
310	U							L.S. 358,579.32	L.S. 358,579.32			L.S. 450,937.63	
92	U							L.S. 3,500,000.0	L.S. 3,500,000.0			L.S. 440,000.0	
1	LS												
1123000	MD							38 ⁵⁰ 432,355.00	38 ⁵⁰ 432,355.00			49 ⁰⁰ 550,027.000	
344000	MD							38 ⁵⁰ 1,324,400.0	38 ⁵⁰ 1,324,400.0			49 ⁰⁰ 1,685,600.000	
299000	MD							38 ⁵⁰ 1,151,150.0	38 ⁵⁰ 1,151,150.0			49 ⁰⁰ 1,465,100.0	
104000	MD							38 ⁵⁰ 400,400.0	38 ⁵⁰ 400,400.0			49 ⁰⁰ 509,600.000	
1	LS							L.S. 1,430,000.0	L.S. 1,430,000.0			L.S. 1,935,486.-	
90	MO							49 ⁰⁰ 132,300.0	49 ⁰⁰ 132,300.0			187,321.6	BS8980.-

(Costs)

DIVERSIFIED CONSTRUCTORS, INC.

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BIDS OPENED _____ AT _____
Date Location
COMPLETION TIME _____ BID BOND _____

COST & ESTIMATE SUMMARY

TRICK & MURRAY, SEATTLE 47263

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
.8	CONSTRUCTION HEATING & VENTILATING										
.81	Plant	1	LS								L.S. 10500.00 L.S. 16500
.82	Operation (indirect)										L.S. 742500.00 L.S. 742500
.83	Offsite Transportation of Personnel	1	LS								L.S. 250000.00 L.S. 250000
	SUBTOTAL - ACCOUNT (63) CONSTRUCTION FACILITIES										1051719.2 1721379
(68)	MITIGATION Mitigation	1	LS								L.S. 64399.00 L.S. 64399.00
	SUBTOTAL - ACCOUNT (68) MITIGATION										64399.00 64399.00
	GRAND TOTALS										

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DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA - STAGE 1 _____ NO. _____

FOR _____ DATE _____

EST. BY ART LEE SHEET 13 OF

COST & ESTIMATE SUMMARY

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DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA

FOR _____

EST. BY _____ ART LEE

BIDS OPENED _____ AT _____
COMPLETION TIME _____ Date _____ Location _____
BID BOND _____

COST & ESTIMATE SUMMARY

TRICK & MURPHY, SEATTLE 47283											
ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
330	Land & Land Rights									1.5 1418400.0	1.5 1418400.0
331	Powerhouse & Transf.			164292.2	137725.5	146882.7	142722.6	500319.4	1047960.8	575481.6	5117460.0
332.1	Reservoir Clearing			1490790.0	838210.0	1771162.0	127707.0	204834.0			765102.0
332.2	Diversion Tunnel			323691.4	654774.9	592721.8	660676.9	678841.6	825736.2	591031.7	726170.0
332.22	U/S Cofferdam			127100.4	2971.4	59963.6	10823.0	15876.2		7576.0	13765.1
332.23	D/S Cofferdam			31602.2	847.0	12510.8	10718.8	14413.2		64900.0	13197.0
332.3	Main Dam			939386.8	2010813.5	1582225.0	5245316.3	1522218.6	285544.2	1771692.6	73323.7
332.4	Relict Channel			155643.8	26749.7	177636.1	641217.7	767885.4			1.5 26635.0
332.51	Outlet Facilities			565090.0	179654.3	72044.4	78253.2	103647.1	236937.0	847027.2	20766.0
332.52	Main Spillway			1701607.7	1620161.1	2457716.1	1860955.7	2362283.1	1163174.0	435839.8	14867.0
332.6	Power Intake			3671433.5	1352886.5	1725025.0	1416308.0	1812537.4	633654.6	1210980.7	12016.0
332.7	Surge Chamber			372177.9	98672.2	84160.3	17737.4	76244.3	206516.5	17446.9	944.5
332.8	Penstocks			176866.9	97746.5	13734.7	63017.3	80338.2	207652.5	111421.9	1402.0
332.9	Tailrace			155516.7	16491.9	67875.2	51725.7	75177.1	178205.4	41754.4	952.0
333	Waterwheels, Turbines & Generators									478365.0	1488.0
334	Accessory Electrical									1.5 715113.3	1.5 715.0
335	Miscellaneous Power Plant									1.5 776083.5	1.5 77.2
336	Roads, Rail & Air Facilities			5045890.6	203232.7	2785627.1	1085117.7	1524335.6	3144656.7	090009.0	1897.0
350											
359	Transmission Lines			1607786.7	286532.2	632757.1	1234630.0	174172.4	861703.7	1338806.10	112867.0

COST & ESTIMATE SUMMARY

108 WATANA - STAGE 1

JO8 WATANA - STAGE 1 NO

FOR _____ DATE _____

EST. BY _____ ART LEE

SHEET 14 OF 15

Location
BID BOND _____

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID		UNIT	
										Unit Cost	Amount	Unit Cost	Amount	Unit Cost	Amount
								LS 14184000	LS 14184000			LS 14184000			
		16479792	1377755	11688271	4437226	5002194	10499608	5754816	51179662			LS213243			
		14907960	3282110	1711690	1274070	2018340			20540210			2174517			
		32569149	6347749	5733018	6606767	6788496	3257362	5910319	72617042			92535961			
		1279044	29714	597436	108290	6589762		789800	3765436			4798295			
		316022	8470	175103	107188	124132		649000	1349920			1770202			
		93738668	20105135	15822250	52493163	15222186	2855442	12716936	73363180			382571794			
		7556438	269457	11716361	6412197	7618854			LS 26633347			33938874			
		5650900	1296543	720444	787532	1036471	2809370	8470292	20966552			2677677			
		49016072	16201611	24597161	18609557	23622931	11631740	1398398	148077370			189497619			
		36744325	13328865	17250250	14163080	18125374	6236546	12109807	120268267			153258145			
		3721419	986722	854603	177354	762443	2065765	174469	9115244			11795296			
		1706489	744665	737247	630113	943392	2076535	1114219	14037840			17888420			
		1555167	764719	678752	537257	751771	1782054	417544	9527834			12141417			
								4786520	17886520			6102102			
								17721333	LS 70541333			36370221			
								157760835	LS 77601335			9689632			
		50438906	2032737	72856271	10851197	15743256	31446567	6900000	129769184			165964871			
		50797867	2865322	6327571	4734630	4741724	48617027	133880610	16286968781			327455318			

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO. _____
FOR _____ DATE _____
EST. BY ART LEE SHEET 15 OF _____

Location _____
 BID BOND _____

COST & ESTIMATE SUMMARY														TOTAL DIRECT COST		TOTAL COST		BID	
QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST	BID	Unit Cost	Amount	Unit Cost	Amount				
								5000000	5000000		6371500								
								113127932	113127932		220489667								
								14399000	14399000		4399000								
		377427288	70340864	130182853	117586653	15011726	118325016	537515829	157390239		1923168455								

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DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA
FOR _____
EST. BY _____ ART LEE

BIDS OPENED _____ AT _____ Location _____
COMPLETION TIME _____ Date _____ BID BOND _____

COST & ESTIMATE SUMMARY

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
330	Land & Land Rights									LS 28520000	LS 28520000
331	Powerhouse & Transf.			164129292	1377255	4688271	4437226	5003194	104498608	5754816	5117966
332.1	Reservoir Clearing			14907910	338310	1971670	1271070	2048340			2054021
332.2	Diversion Tunnel			120948829	6285469	5764207	6436689	6591195	76485612	5782319	244592
332.22	U/S Cofferdam			1279044	29714	599636	408280	658962		709860	376544
332.23	D/S Cofferdam			315318	8462	120668	106772	143628		649000	134782
332.3	Main Dam			53740488	3715731	21272814	25050031	29979746	2855442	12716936	4953113
332.4	Relict Channel			1556438	2654917	4776361	6412197	7618854			LS 266333
332.51	Outlet Facilities			51650900	1296543	720444	782532	1036471	28073170	1470292	2090665
332.52	Main Spillway			17120872	16202411	246631161	18685557	23701231	11631740	4598398	1494033
332.6	Power Intake			32849725	13537665	17314250	14239080	15203794	6336546	12107807	105930
332.7	Surge Chamber			2721749	786722	894603	777354	762445	1206571	174469	71151
332.8	Penstocks			1705469	777665	137247	630113	803382	2026525	4174217	14027
332.9	Tailrace			155978	121112	644152	550443	715291	1674561	412220	90778
333	Waterwheels, Turbines & Generators									LS 21541333	LS 21541
334	Accessory Electrical									LS 7760835	LS 7760
335	Miscellaneous Power Plant									LS 2000000	LS 2000000
336	Roads, Rail & Air Facilities			60432900	2082887	12856271	10851197	15213356	31446567		19769
350-											
359	Transmission Lines			26097867	2865322	6327571	1734650	4741724	28619037	133880610	11286968

1ST ESTIMATE

DIVERSIFIED CONSTRUCTORS, INC.

WATANA - STAGE 1

JOB _____ NO. _____
 FOR _____ DATE _____
 EST. BY ART LEE SHEET _____ OF _____

COST & ESTIMATE SUMMARY

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID	
										Unit Cost	Amount	Unit Cost	Amount
								LS 28560000	LS 28560000			28560000	
		36429292	4577255	4688271	4427226	5002194	10491608	5754816	57179622			65218243	
		44907900	5382110	18711690	1271070	2048340			20540010			21774517	
		60918829	6285469	5766217	6424689	65911595	7648562	5282319	21459280			88511961	
		1279044	297114	599436	408280	658762		709860	3765436			4786295	
		315318	8462	124668	106712	143628		649000	1347849			1717563	
		53740488	211572	2172814	25050031	29717946	2455442	12716936	495313818			70547848	
		7556428	269497	4716361	6412197	7618854		LS 26633347				33938874	756440523
		5650900	1296543	720444	782532	1026471	2869370	9470292	20966552			26710677	
		17120872	18207411	24663161	18685557	23701231	11631740	4498398	18403370			189170444	
		36849925	13539665	19314250	14239080	15203794	6336546	12107807	22593067			153671945	
		2721819	796722	894603	177394	762445	206516	1744469	7113344			11995296	
		1708669	777665	737247	630143	843382	2076525	1144219	14037840			17888420	
		1659978	721112	644152	550443	715291	1274561	412320	9022857			11567913	
								47886520	47886520			61021092	
								LS 29541333	LS 28541333			36370221	
								LS 7760825	LS 7760825			9889632	
		6048906	2032887	12856271	10851197	8243356	31446567	2900000	129769184			165964871	
		2099867	2865322	6327571	4734650	4941724	48617027	133880610	1256968781			327455318	

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DIVERSIFIED CONSTRUCTORS, INC.

JOB _____ WATANA _____

FOR _____

EST. BY _____ ART LEE

COST & ESTIMATE SUMMARY

TRICK & MURRAY, SEATTLE 47263

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
399	Other Tangible Property									5,000,000.0	5,000,000.0
(63)	Construction Facilities									113,127,932	113,127,932
(68)	Mitigation									16,252,000.0	16,252,000.0
	GRAND TOTALS			335,629,295	69,426,765	45,547,376	9,489,621.1	11,691,811	27,608,723	503,711,625	1,889,257,86

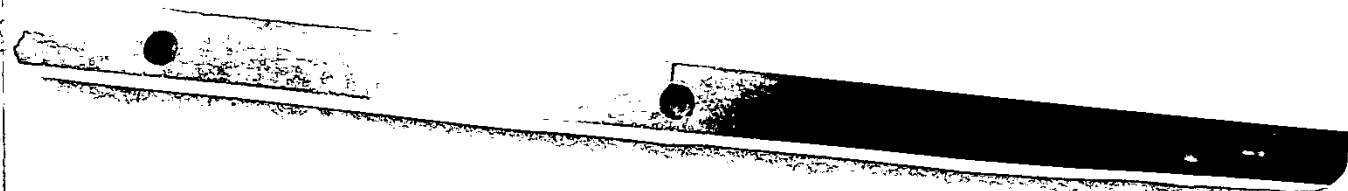
DIVERSIFIED CONSTRUCTORS, INC.

COST & ESTIMATE SUMMARY

JOB WATANA - STAGE 1 NO. _____
 FOR _____ DATE _____
 EST. BY ART LEE SHEET _____ OF _____

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	TOTAL COST		BID	
										Unit Cost	Amount	Unit Cost	Amount
								5,000,000.00	5,000,000.00			6,371,500.00	
								11,137,932.00	11,137,932.00			220,425,667.00	
								16,352,000.00	16,352,000.00			16,352,000.00	
		35,623,295.00	68,467,615.00	145,473,376.00	9,489,621.11	117,691,811.11	227,628,723.00	503,711,140.50	1,388,925,786.00			1,083,873,967.00	

INDIRECT
COST



HH-4233-HZ1-AA
3005

December 24, 1985

Mr. Arthur O. Lee, President
Diversified Engineers, Inc.
P. O. Box 487
Cottonwood, Arizona 86326

Dear Art:

Subject: Cost Estimates for Susitna
Three-Stage Development Plan

In accordance with your authorization dated November 19, 1985, we have prepared preliminary estimates of the cost of the following items for the Susitna Three-Stage Development Plan:

- o Environmental Mitigation
- o Land and Land Rights

We understand these estimates will be combined with your estimates of costs for other elements of the proposed project to arrive at an independent, feasibility-level cost estimate for the entire project.

As agreed, we have not attempted to do independent research as to the ownership of project lands or extensive analyses of mitigation requirements, but instead have relied on the data available in the amended Application for Amendment of License (Application) for the staged project, plus numerous personal discussions with various authorities, as the basis for our numbers.

In preparing these cost estimates, we conducted telephone interviews with various staff members from Harza-Ebasco in Chicago and Alaska, Landfield Services, the Alaska Power Authority, the Bureau of Land Management and a number of other key resource agencies in Anchorage. We also held individual meetings in Anchorage with the following entities:

- o Alaska DNR - Division of Parks and Recreation
- o Alaska Department of Fish and Game
- o Alaska Power Authority
- o State Office of History and Archaeology
- o National Marine Fisheries Service
- o Harza-Ebasco
- o Entrix, Inc.

Our efforts to develop estimates of land costs were hampered by the fact that the acreage data tabulated in Exhibit A of the Application does not agree with the acreages we calculated by planimentering areas from the Exhibit C drawings. Our rough calculations showed a significantly greater number of acres than indicated in Exhibit A, and our cost estimates therefore are based on these higher preliminary estimates of the total acreage required for the

three stages of development. Also, we had intended to review the previous land cost estimates developed by Harza-Ebasco to determine the basis for their unit costs applied to the various categories of land ownership. To date we have been unable to obtain this information, and have therefore had to rely solely on information on land costs we obtained by telephone from a number of sources, including the Bureau of Land Management, Landfield Services and Harza-Ebasco. It should be noted that the total land and land rights costs are extremely sensitive to unit land values and none of the entities we contacted were willing to make estimates that could be quoted.

The following discussion describes the work we conducted to arrive at estimates for the two items. Two tables are also included to summarize the results.

ENVIRONMENTAL MITIGATION

Introduction

These estimates are based on environmental mitigation requirements as outlined in the Application filed with the FERC by APA as prepared by Harza-Ebasco. Estimates of mitigation costs for the staged-project were provided to us for review by James H. Thrall on 10/10/85. Additional updated cost estimates were also made available by Harza-Ebasco on 12/17/85 at a meeting in Anchorage.

In addition to meeting with Harza-Ebasco and their subconsultant, Lawrence L. Moulton of Entrix, Inc., we held meetings with involved staff members from ADF&G, DNR, NMFS and USFWS. More than 12 persons were contacted during our review and we believe the comments and caveats accompanying our estimates clearly illustrate the strengths and weaknesses of these estimates. We have tried to identify why estimates are weak or subject to various constraints whenever possible so that the APA can better judge their validity.

There are a number of general assumptions that prevail throughout our consideration of cost estimates for particular resource mitigation plans. These assumptions are:

- o All cost estimates are based on 1985 dollars.
- o Cost estimates do not include any owner's administrative costs.
- o Cost estimates do not include any contingency costs.
- o Mitigation for impacts to aesthetic resources are assumed to be approximately \$500,000, the greatest part of which will involve measures taken during construction to reduce adverse aesthetic impacts. This amount has been arbitrarily divided into \$250,000 for Stage I, \$125,000 for Stage II and \$125,000 for Stage III, based upon the level of development perceived to be associated with each stage.

- o All annual operation and maintenance (O&M) costs for the first nine years (through the initial stage of construction corresponding to a power on-line date of 1999) are included in the construction cost estimates. This is the same assumption made by Harza-Ebasco for the Exhibit D cost estimates.
- o Long-term monitoring and O&M are not included in the estimates.

The primary objectives of our review were as follows:

- o Determine if any major mitigation issues exist that were unaddressed in the Application. Such issues could involve significant additional costs associated with the inclusion of license conditions requiring mitigation measures.
- o Determine if the scheduling of mitigation measures included in the application for the three stage proposal meet general agency approval, i.e. are any major shifts in expenditures from one stage of development to another anticipated?
- o Determine, insofar as possible, the reasonableness of the projected cost estimates based upon consultation with responsible agencies and readily available current cost information.

Where information is scarce or lacking, or where estimates cannot be verified for some other reason, we have included a brief statement explaining why that particular estimate is "soft". If more information is judged necessary before a firm estimate can be reached, this need is highlighted. To some degree the above caveats apply throughout our analysis but we have tried to indicate specifically where estimates must be viewed with particular caution. Mitigation costs associated with each significant resource area are discussed below.

Recreational Resources Mitigation

Jack Wiles, South Central Regional Manager for the Division of Parks and Outdoor Recreation, discussed costs associated with recreational resources and noted that the key issue bearing on any recreation plan is that of access, an unknown at this time. At a time when the Division's funds are being cut back, Jack noted that some rationale for prioritizing new sites is important. He does not want to see dollars for Susitna mitigation added to the DNR budget base, only to have the legislature reduce funding and FERC require DNR dollars be spent on Susitna as part of a license article. If costs are to be borne by the Applicant, as is suggested in the Application, DNR will be ready to contract the Division's services to APA.

Specific features and their costs are difficult to check exactly but a review of shop work order cost estimates and an average of 1985 construction contract costs provided by the Division plus RIM cost figures

from the Chugach National Forest indicate that costs presented in Table E.7.7.1 of the application represent those currently being experienced for these items and services.

We conclude from this review that the costs identified by Harza-Ebasco are representative of costs involved with the mitigation plan as it is proposed in the Application. Should the plan change as a result of changes in access route selection or agency input to the FERC, costs will, of necessity, shift to reflect those changes.

We assume the five-phase Recreation Plan proposed by Harza-Ebasco meshes with the three-stage project development plan in roughly the following manner:

<u>Project Stage</u>	<u>Recreation Plan Phase</u>
I	Phase 1 and 2
II	Phase 3
III	Phase 4 and 5

On the basis of the above breakdown, the costs associated with each phase have been translated into project stages. Operation and maintenance costs have also been translated from plan phases to project stages.

<u>Project Stage</u>	<u>Rec. Plan Costs</u>	<u>Recreation O&M Costs</u>	<u>Total Costs</u>
I	\$ 764,700	\$ 355,150	\$1,119,850
II	\$1,499,900	\$ -0-	\$1,499,900
III	\$ 721,550	\$ -0-	\$ 721,550
Subtotal	\$2,986,150	\$ 355,150	\$3,341,300

Notes:

- 1) All assumptions incorporated by Harza-Ebasco in the footnote to Table E.7.7.1 also apply to the above estimates.
- 2) Stage III O&M includes all O&M for remaining time of 50 year license period. O&M costs, therefore, underestimate slightly the future equipment requirements, e.g. pickups will not last 50 years.
- 3) Assumes O&M costs for Stages II and III are incorporated into overall Project O&M costs for the economic analysis and therefore not a direct construction cost.

Cultural Resources Mitigation

Discussions with Judith E. Bittner, SHPO, and Tim Smith, Senior Archaeologist, of the Office of History and Archaeology disclosed that no

historic/archneological mitigation plan has been agreed to despite the references to agency consultation in the Application for Amendment of License. At this point there seems to be a pretty good idea of how many sites are involved, according to Smith, but these identified sites have not yet been evaluated. He suspects a few sites will prove to be very important, requiring considerable excavation and recovery while the vast majority are small and may be quite similar in content. Loss of these latter sites can be adequately mitigated through a good sampling program. The number of sites involved also depends on the route selected for the access road. Coming south from the Denali Highway, terrain offers more freedom to shift road alignments slightly to avoid sites. The route from the Parks Highway is more constrained, especially for the railroad spur, and the ability to avoid sites is reduced.

Both Smith and Bittner believe the distribution of costs between the three stages is reasonable given the degree of impact involved at the various times. Costs for mitigation will, in their estimation, probably be about the same for either route despite the possibility of avoiding more sites along the Denali corridor. They noted that the University of Alaska Museum's estimate for mitigation under the original concept (10 percent sample over 6.2 years for \$11.1 million; 25 percent sample over 12.4 years for \$22.2 million) was a great deal higher than that proposed by Harza-Ebasco. They believe that the Museum's estimates are considerably higher than what will be required to complete an agreed-upon mitigation plan but that the Harza-Ebasco estimates may be somewhat low.

Staged development is estimated by Harza-Ebasco to cost up to a total of \$5,587,000 (70% for Stage I, 5% for Stage II and 25% for Stage III). We also assume the Harza-Ebasco figures to be somewhat low because our experience indicates that the FERC will expect a sophisticated mitigation scheme that will result in somewhat higher sampling costs than have been estimated. We estimate that cultural resource mitigation will eventually cost approximately the following amounts for the three stages:

Stage I	\$ 9,730,000
Stage II	\$ 695,000
Stage III	\$ 3,475,000
TOTAL	\$13,900,000

These values were derived by adding the Harza-Ebasco and high Museum estimates and dividing that sum in half ($5.6 + 22.2 = 27.8/2 = 13.9$). This value was then multiplied by the percent Harza-Ebasco estimated for each stage (Stage I, 80%; Stage II, 5%, Stage III, 25%).

Fish, Wildlife and Botanical Resources Mitigation

Several assumptions have been made regarding the cost estimate for fish, wildlife and botanical resource mitigation. In general, mitigation measures to offset losses expected from Stage I, II and III developments affecting fish resources will be implemented during the construction and

operation of Stage 1 because the greatest impacts within the Project area and along the middle Susitna downstream of the Project are expected to result from the initial development (E.3.2.277). The costs for downstream mitigation are based on modifications to Sloughs 8A, 9, 9A, 11, 21 and side channels 11 and 21. Finally, Case E-VI flow constraints were assumed to prevail during the construction and operation of Stage 1.

Discussions with representatives of the ADFG, FWS and NMFS were held on December 16 and 17, 1985 in Anchorage, Alaska. It soon became apparent during these discussions that several factors were commonly held as key determinants governing mitigation-related costs. One of these is the caveat that the cost of many of the long-term mitigation measures proposed will eventually be determined during the proposed monitoring programs. Other costs, such as those related to the placement or enhancement of terrestrial habitat for moose, depend upon the completion of the model being used by ADFG to estimate the amount of land required for moose mitigation. The data have not yet been run through the model so the figure of 24,500 acres (Table E.3.4.71) and associated costs must be considered preliminary. Harza-Ebasco biologist Randal L. Fairbanks estimates that figures in the Application are sufficient to cover any final amount of acreage required for mitigation treatment.

Another significant point raised by all parties consulted was that costs associated with any private lands included in wildlife mitigation, particularly those involving Prairie Creek (Table E.3.4.69), are unknown at this point in time. The use of BLM and DNR lands for wildlife mitigation is assumed without cost according to Harza-Ebasco staff.

There seems to be general agreement among the agencies that the proposed mitigation measures and their scheduling adequately address major mitigation elements identified by the agencies. The FWS seems to be the only agency strongly opposing the proposed road access route running south from the Denali Highway. Most concerns center upon points that remain to be negotiated during those several Memorandums of Understanding to be developed between APA and the respective agencies, that will address specific mitigation plans. These points involve preparing the detailed plans required to expand and quantify the overall concepts already agreed to. Such refinements should not result in significant changes in projected costs but will involve assigning costs to specific actions selected as part of mitigation. For example, periodic flushing of side channels and sloughs may be accomplished by either flow manipulation, mechanical gravel cleaning or a combination, each method having a specific cost associated with it. Another refinement involves completing documentation of proposed flows and their effects on the environment and project economics before a final flow regime can be agreed upon. Even though alternative E-VI "looks pretty good" according to Brad K. Smith, NMFS, the final flow regime remains to be agreed upon.

Given the above constraints and caveats, we have identified the following costs for mitigating impacts to fish, wildlife and botanical resources based upon a staged development plan. These cost estimates are presented in Table 1 for each stage.

LAND AND LAND RIGHTS COSTS

The land and land rights costs for the three-stage development of the Susitna Project are estimated to be \$14,184,000 for Watana-Stage I, \$9,781,000 for Devils Canyon - Stage II, and \$9,016,000 for Watana-Stage III. These costs reflect a January 1985 land value and assume the purchase of Alaska Native Corporation lands and the leasing of U. S. lands within the project boundary. The project boundary encompasses an estimated 77,168 acres. This new estimate was derived by planimetry of the project boundary for the dam and reservoir shown in Exhibit C. The project acreages presented in Exhibit A for the transmission line and access road corridors were assumed to be correct. A summary of project acreages and costs for each development stage is shown in Table 2. The appraised land value for Native corporation lands is based on telephone conversations with Harza-Ebasco and Alan Olsen of Landfield Services and Beck's in-house experience with land costs for other Alaska projects. The estimate U. S. land use fees is based on telephone conversations with BLM and FERC, and on FERC's regulations outlined in 18 CFR Ch. 1 (4-1-85 Edition) Section 11.21 paragraph b.

SUMMARY OF COSTS

The following table summarizes our estimates for the two items discussed above:

Item	<u>Estimated Costs in 1985 Dollars</u>			<u>Total</u>
	<u>Stage I</u>	<u>Stage II</u>	<u>Stage III</u>	
Lands and Land Rights Costs	\$14,184,000	\$ 9,781,000	\$9,016,000	\$ 32,981,000
Environmental Mitigation Costs	\$64,399,000	\$18,972,000	\$25,649,000	\$109,020,000

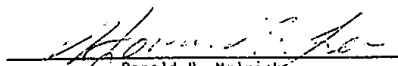
Because our estimates of costs for the two items requested are founded on a broad information base of some of which is still incomplete at this stage of project planning, we have attempted to carefully outline the basis for our numbers so you will have a good understanding of how the estimates were developed. We must emphasize that the estimates are very rough at this point due to the fact that project mitigation plans have yet to be completed. Therefore, we suggest that you supply APA with a copy of this backup information for their review so they will have a chance to modify

- 8 -

numbers if so desired based on differing assumptions. Please feel free to call us if you have any questions regarding these estimates, or need further clarification of our results.

Very truly yours,

R. W. BECK AND ASSOCIATES


Donald R. Melnick
Partner

HEL/DRM/rhm

TITLE : WANTANA FEASIBILITY ESTIMATE PHASE I

CONTRACT #5225 WORK ORDER #5 VOL. I

AUTHOR: DIVER

FICHE 1 OF 3

DATE : 860100

DOCUMENT NO. 3568



TABLE 1
ENVIRONMENTAL MITIGATION COSTS
JANUARY 1985 PRICE LEVEL⁽¹⁾

Items	Stage I Matana (\$000)	Stage II Devil Canyon (\$000)	Stage III Matana (\$000)	Remarks
1. Outlet Facilities	\$0	\$0	\$0	(2)
2. Restoration of Borrow Area D	0	0	0	Included in No. 5.
3. Restoration of Borrow Area F	0	0	0	Included in No. 5.
4. Restoration of Camp and Village	640	640	625	(3)
5. Restoration of Construction Sites	11,500	1,500	10,000	(3)
6. Fencing Around Camp	300	300	380	(3)
7. Fencing Around Garbage Disposal Area	0	0	0	Included in No. 6
8. Multilevel Intake Structure	0	0	0	(2)
9. Worker Amenities	12,300	8,100	7,400	(3)
10. Restoration of Haul Roads	0	0	0	(3)
11. Slough Modifications	1,360	0	0	(\$1,080 ^k + \$30 ^k /yr thru 1999)
12. Habitat Management on Mitigation Lands	1,860	620	540	(\$2,800 ^k + \$25 ^k /yr thru 1999)
13. Raptor Compensation	440	0	0	(\$330 ^k + \$10 ^k /yr thru 1999)(3)
14. Cultural Resource Mitigation	9,730	695	3,475	See text for basis.
15. Long Term Environmental Monitoring During Stage I Construction	8,780	2,780	2,040	Based on discussion with Harza-Ebasco 12/17/85.
16. Development of Permanent Recreation Facilities and Visitor Center	1,120	1,500	722	See text for basis.
17. Impoundment Modifications	1,120	0	0	(\$940 ^k + \$20 ^k /yr thru 1999)
18. Other Wildlife Monitoring years	1,332	0	0	(\$218 ^k /y - (\$60 ^k + 10 ^k))x 9
19. Community Infrastructure	4,667	2,712	342	(3)
20. Worker Transportation	11,000	0	0-	(3)
21. Aesthetics	250	125	125	See text for basis.
Subtotals	864,399	818,972	825,449	
Total Mitigation Cost				\$109,020,000

(1)

(1) Format from Table D.1.2.1 of Exhibit D of Application for Amendment of License.

(2) Assumed to be incorporated in construction cost estimates for project features prepared by others.

(3) No change from Harza-Ebasco estimate per Exhibit D of Application.

TABLE 2
PROJECT LAND AND LAND RIGHTS COST
JANUARY 1985 PRICE LEVEL

Project Development	Acreage	Land Cost
Watana - Stage I		
Production Plant		
U. S. Lands	30,425 ⁽¹⁾	\$10,290,000 ⁽⁵⁾
Native Corp. Lands	4,015 ⁽¹⁾	3,212,000 ⁽⁶⁾
Transmission Plant		
U.S. Lands	1,843 ⁽³⁾	623,000 ⁽⁵⁾
Native Corp. Lands	76 ⁽²⁾	59,000 ⁽⁶⁾
TOTAL	36,357*	\$14,184,000
Devils Canyon - Stage II		
Production Plant		
U.S. Lands	3,283	1,110,000 ⁽⁵⁾
Native Corp. Lands	10,815	8,652,000 ⁽⁶⁾
Transmission Plant		
U.S. Lands	36 ⁽³⁾	19,000 ⁽⁵⁾
Native Corp. Lands	---	---
TOTAL	14,154*	\$ 9,781,000
Watana - Stage II		
Production Plant		
U.S. Lands	26,350 ⁽⁴⁾	8,912,000 ⁽⁵⁾
Native Corp. Lands	---	---
Transmission Plant		
U.S. Lands	307 ⁽³⁾	104,000 ⁽⁵⁾
Native Corp. Lands	---	---
TOTAL	26,657*	\$ 9,016,000
GRAND TOTAL	77,168*	\$32,981,000

- (1) Acreage is a percentage of total area required for Watana Dam and Reservoir plus access road right-of-way.
- (2) All Native corporation lands within the Stage III Watana development including all lands within the transmission corridor are assumed to be purchased during Stage I development.
- (3) The amount of U.S. lands to be leased for the transmission corridor is determined from incremental corridor width required for each stage of development.
- (4) Acreage represents difference between total U.S. lands required for final (Stage II) Watana development and Stage I development.
- (5) Present worth of fees to be paid for the use of U. S. lands over the 50-year license period. Annual fees are estimated based on procedures outlined in FERC regulations as follows:

Annual Use Fee = Interest rate x \$150 per acre

Interest rate is assumed to be 9% annually and annual fees are assumed to escalate at an annual rate of 5.5%. For present worth analysis, discount rate was assumed to be 9%.
- (6) Assumes an average appraised land value of \$800 per acre for native corporation lands, in 1985 dollars.

DIRECT
COST

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Land & Land Rights

ITEM NO 330

SHEET 1 OF 1 PAGE 1

JOB Watana - Stage 1

BID QUANTITY 1

UNIT LS

TAKE OFF QUANTITY

EST BY Art Lee

DATE _____

[illegible]

OPERATION Powerhouse, Excavation - Rock

ITEM NO. 331.111 SHEET OF PAGE 2
JOB Watana

JOE Watana - Stage 1 SHEET

EST. BY Art Lee

DATE _____

BID QUANTITY 123,730 UNIT CY

UNIT CY

TAKE OFF QUANTITY

408

— SHEET
Watana - Stage 1

EST. BY Art Lee

DATE _____

		DATE		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		
AS PER ORIGINAL & ESCALATED				119152	CY 325'	9873132	1156	1377087	112'	1339266	102'	1196286	119'	1419100	26.5	3175401			103'	12581064
				123730	CY 325'	4022462	1156	1430819	112'	1390725	102'	1242249	119'	1473124	26.5	3297405			103'	12856784

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
Drill & Grout U/S of Powerhouse
OPERATION

ITEM NO. 331.113 SHEET OF PAGE 2

JOB Watana - Stage 1

EST. BY Art Lee DATE 11/1/68

BID QUANTITY 34.293 UNIT LF TAKE OFF QUANTITY

[illegible]

0 0 3 5 6 8

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Concrete

ITEM NO. 331.119

SHEET 4 OF 4

JOB Walana - Stage 1

EST. BY Art Lee

DATE

BID QUANTITY 30,960 UNIT CY TAKE OFF QUANTITY

DIVERSIFIED ENGINEERS & ARCHITECTS

OPERATION

Concrete

ITEM NO.

111111

JOB

Waiana - Stage 1

DATE

EST. BY

Art Lee

BID QUANTITY

30,960

UNIT

CY

TAKE OFF QUANTITY

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
										92.00 305641.3
										10.24 356655
FURNISH CONCRETE	32847	CY	20.00	45674.0	0.39	1281.6	0.28	25044.7	0.60	271.77 310.03
PLACE CONCRETE	32601	CY	80.00	26116.0	0.42	1367.2	0.24	2086.5	0.53	172.77 133
CONCRETE WASTE	246	CY								43 355.9
CONCRETE OVERBREAK	1641	CY								140452.8
FABRICATE FORMS	28236	SF	50.05	111257.2	32.5	7116.7	0.10	2892.0	0.26	434.1 0.22
ERECT FORMS	141178	SF	77.7	127675.3	0.21	17921.9	0.36	5082.4	0.46	647.12 0.44
STRIP & CLEAN FORMS	141178	SF	3.41	141141.7	0.10	12411.8	0.18	2541.2	0.23	3247.1 0.22
FORM HARDWARE	71208	SF	10.2	92632	0.08	729.7	0.06	547.2	0.27	631.5 0.09
CONCRETE FINISH	141178	SF	0.81	11435.4	0.06	847.1	0.04	564.7	0.05	165.9 0.07
POINT & PATCH	5813	SF	1.13	6632	0.07	41.4	0.1	6510	0.08	17.3 0.1
CONSTRUCTION JOINT CLEANUP	32601	SF	22.7	14358.0	0.13	8223	0.21	13283	0.16	10120 0.34
ROCK CLEANUP	32601	CY	6.33	20701.6	0.05	2077.1	0.24	782.4	0.09	273.4 0.54
CONCRETE CURE										1760.5
REINFORCING STEEL	3096000	LB								0.28 8668.0 0.00 67536.0 0.00 17536.0
	30960	CY	10.2	326402.6	10.10	23183.9	15.23	487220	12.59	12077.7 17.00 55641.7 15.36 227111.8

OPERATION

JOB Watana - Stage 1

EST. BY Art Lee DATE _____

569 2016/5

OPERATION Metalwork

ITEM NO. 331.117 SHEET _____ OF _____ PAGE 6

JOB Watana - Stage 1

BID QUANTITY 1 UNIT LS TAKE OFF QUANTITY _____ EST BY Art Lee DATE _____

[illegible]

OPERATION Architectural

ITEM NO. 331.118

SHEET _____ OF _____ PAGE 2

JOB **Watana - Stage 1**

BID QUANTITY 1UNIT LS

TAKE OFF QUANTITY

EST. B

Art Lee

DATE _____

[illegible]

OPERATION

Mechanical

ITEM NO. 331.119

- SHEET ____ OF ____ PAGE 8

JOB Watana - Stage 1

BID QUANTITY

1

UNIT LS

TAKE OFF QUANTITY

EST BY Art Lee

DATE _____

[illegible]

OPERATION Access Tunnels & Portals

35' x 28' Excavation

ITEM NO. 331.121

- SHEET ____ OF ____ PAGE 7

JOB Watana - Stage 1

BID QUANTITY 3.850 UNIT LF TAKE OFF QUANTITY

EST. BY Art Lee

DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
OPERATION Drainage Gallery 10' x 10' Excavation

OPERATION Drainage Gallery 10' x 10' Excavation

ITEM NO. 331.123

- SHEET ____ OF ____ PAGE //

JOB Watana - Stage 1

BID QUANTITY 460

UNIT LF

TAKE OFF QUANTITY

EST. BY **Art Lee**

DATE _____

[illegible]

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Access Portal & Road, Rock Excavation ITEM NO. 331.125 SHEET OF PAGE 13

JOB Watana - Stage 1

BID QUANTITY 71,790 UNIT CY TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION _____ Ventilation Gallery 14'Hx12'W.H.S.

OPERATION

ITEM NO.

331.126

SHEET

OF

PA

14

JOE

Watana - Stage 1

BID QUANTITY

560

UNIT 1E

TAKE OFF QUANTITY

EST. BY Act-Lee

DATE

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Portals Concrete

ITEM NO. 331.127 SHEET OF PAGE 15

JOB Watana - Stage 1

BID QUANTITY 600 UNIT CY TAKE OFF QUANTITY EST. BY Art Lee DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
FURNISH CONCRETE	675	CY	20.00	13500	0.39	263	10.79	7203	0.28	5589	10.03	7310	42.76	17986.3			9305	62808
PLACE CONCRETE	659	CY	8.00	5404	0.23	217	1.89	905	1.27	1166	1.62	1069					1389	8158
WASTE CONCRETE	16	CY																
CONCRETE OVERBREAK	59	CY																
FABRICATE FORMS	3243	SF	5.05	16277	3.25	10540	0.09	324	0.26	943	0.22	113					888	28477
ERECT FORMS	6486	SF	7.77	50376	0.21	1362	0.36	2335	0.46	2784	0.44	2854					924	59731
STRIP & CLEAN FORMS	6486	SF	3.41	22117	0.10	249	0.18	1167	0.23	1472	0.22	1427					414	26852
FORM HARDWARE	6486	SF			0.03	5883											0.83	5383
CONCRETE FINISH	420	SF	1.02	102	0.08	34	0.06	25	0.07	37	0.09	38					1.32	554
POINT & PATCH	6486	SF	0.81	5254	0.06	287	0.04	259	0.05	324	0.07	454					1.03	6680
CONCRETE CURE	659	CY	6.33	1185	0.95	626	0.24	158	0.09	59	0.54	356					817	5384
CONSTRUCTION JOINT PREPARATION	208	SF	1.13	235	0.07	15	0.11	23	0.08	17	0.17	35					1.56	325
ROCK CLEANUP	1600	SF	2.27	3632	0.13	203	0.21	336	0.16	256	0.34	544					3.11	17976
REINFORCING STEEL	60000	LB											0.28	16800	0.16	9600	0.04	26400
	600	CY	20.00	13528	3.28	10746	0.35	1281	3.26	12759	24.44	14799	76.00	45663	16.00	9600	84.00	73684.8

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Tunnel Slab Concrete

ITEM NO. 331.128

SHEET 16 OF 16

JOB Watana - Stage 1

BID QUANTITY 3.059 UNIT CY

TAKE OFF QUANTITY 4038

EST. BY Art Lee

DATE

BID QUANTITY		UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
FURNISH CONCRETE	722.3	CY	2020	14586.0	0.39	284.4	10.79	18.67	0.28	6287.6	10.83	1878.3	42.74	31184.9			93.05	67861.3
PLACE CONCRETE	722.8	CY	802	5796.9	0.42	303.6	0.64	46.05	0.53	383.1	1.33	96.13					10.84	179.07
WASTE CONCRETE	65	CY																
CONCRETE OVERBREAK	3190	CY																
FABRICATE FORMS	330.7	SF	505	1670.0	5.55	1074.8	0.2	23.1	0.26	86.0	0.22	89.3					9.59	2952.2
ERECT FORMS	330.7	SF	7.77	2569.5	0.21	69.4	0.36	119.1	0.46	152.1	0.44	115.5					9.54	3055.6
STRIP & CLEAN FORMS	330.7	SF	3.41	1127.7	0.10	33.1	0.18	59.5	0.23	76.1	0.25	72.8					4.44	1369.2
FORM HARDWARE	330.7	SF			0.83	271.5											0.83	27.45
CONCRETE FINISH	115830	SF	102	11814.7	0.08	926.6	0.06	67.50	0.03	8110.8	0.09	1042.5					1.22	15289.6
CONCRETE CURE	722.8	CY	6.35	1587.8	0.25	696.7	0.24	173.5	0.09	65.1	0.54	370.3					3.17	5905.4
ROCK CLEANUP	115830	SF	2.27	26273.4	0.13	1505.8	0.21	2432.4	0.16	1853.3	0.23	3938.2					3.11	26073.1
REINFORCING STEEL	- 0																	
	4038	CY	14586.0	68448.0	12.77	5158.9	27.23	11844.2	23.04	9465.1	26.00	14538.2	44.22	31184.9			318.5	140639.3
	305.9	CY	14586.0	5186.01	12.77	3906.3	27.33	8972.0	23.04	7170.3	26.00	11012.4	44.22	23621.6			318.5	106532.7

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Penstock Access & Trns. Tunnel

ITEM NO. 331.129

SHEET OF PAGE 17

JOB Watana - Stage 1

Plug Concrete

EST. BY Art Lee

DATE

BID QUANTITY 5.288 UNIT CY

TAKE OFF QUANTITY 4993

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST		
	6042	CY	20 ⁰⁰	12084 ⁰	0 ³⁹	2856 ¹⁰	6517 ⁵	50238 ¹⁰	125425 ⁴²	258256	9745	522306
	6032	CY	0 ⁰⁰	48377 ⁰	0 ⁴²	2533 ⁰	2860 ⁰	5177 ¹	8023		10 ⁰⁰	65790
FURNISH CONCRETE	10	CY										
PLACE CONCRETE	1039	CY										
WASTE CONCRETE												
CONCRETE OVERBREAK												
	819	SE	10 ¹⁰	8272 ³	0 ⁵⁰	2867 ⁰	172 ⁰	434 ⁰	360		14 ¹⁰	12105
FABRICATE FORMS	819	SE	7 ⁷⁷	6364 ⁰	0 ²¹	172 ⁰	293 ⁰	377 ⁰	360		9 ²⁵	7568
ERECT FORMS	819	SE	3 ⁴¹	2793 ⁰	0 ¹⁰	82 ⁰	147 ⁰	188 ⁰	120		4 ¹⁴	3570
STRIP & CLEAN FORMS	819	SE			0 ²³	820					0 ⁰³	680
FORM HARDWARE	37588	SE	2 ²³	84871 ⁰	0 ¹³	4860 ⁰	7851 ⁰	5782 ⁰	12712		3 ¹¹	116776
FOUNDATION PREPARATION	- 0 -											
REINFORCING STEEL	4993	CY	54 ³¹	271517 ⁰	0 ²¹	13550 ¹⁵	77518 ¹²	60206 ¹¹	87070 ⁰	258256	150 ⁰³	768217
	5288	CY	41 ³¹	287507 ⁰	0 ²¹	14320 ¹⁵	82069 ¹²	63720 ¹⁷	92170 ⁵	273601	158 ⁰³	812379

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Main Portal Doors

ITEM NO. 331.1291 SHEET OF PAGE 11

JOB Watana - Stage 1

BID QUANTITY 2 UNIT EA TAKE OFF QUANTITY _____ EST. BY Art Lee

EST. BY Art Lee DATE _____[illegible]

OPERATION Access Shaft Rock Excavation 23' Dia

OPERATION Access Shaft Rock Excavation 23' Dia

ITEM NO. 331.131

- SHEET ____ OF ____ PAGE 17

JOB Watana - Stage 1

BID QUANTITY 740

UNIT LF

TAKE OFF QUANTITY

EST. BY Art Lee

DATE

[illegible]

0 0 3 5 6 8

OPERATION Miscellaneous Metalwork

ITEM NO. 331.138 SHEET _____ OF _____ PAGE 21

JOB Watana - Stage 1

BID QUANTITY 50 UNIT Tons TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION Elevators

ITEM NO. 331.139 SHEET OF PAGE 22

JOB Watana - Stage 1

BID QUANTITY 1 UNIT LS TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
OPERATION Fire Protection Headtank

OPERATION

Fire Protection Headtank

ITEM NO 331.14

- SHEET ____ OF ____ PAGE 23

JOB Watana - Stage 1

BID QUANTITY 1

UNIT LS

TAKE OFF QUANTITY

EST. BY Art Lee

DATE

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
Bus Tunnels - Excavation, Horizontal

ITEM NO. 331.151 SHEET OF PAGE 24

OPERATION 22 x 22 JOB Watana- Stage 1

BID QUANTITY 104 UNIT LF TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION Excavation Inclined 16 x 16

OPERATION Excavation Inclined 16 x 16 ITEM NO. 331.152 SHEET OF PAGE 25

ITEM NO. 331.152 SHEET OF PAGE 25

JOA Watana - Stage 1

BID QUANTITY 188 UNIT LF TAKE OFF QUANTITY 160 EST. BY Art Lee DATE _____

EST. BY Art Lee

DATE _____

[illegible]

0 0 3 5 6 8

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION **Concrete Slab**

ITEM NO. **331.164** SHEET **OF** **28**

JOB **Watana - Stage 1**

BID QUANTITY **1,550**

UNIT **CY**

TAKE OFF QUANTITY **1535**

EST. BY **Art Lee**

DATE

DATE																		
	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
FURNISH CONCRETE	2080	CY	20 ⁰⁰	41400	0 ³⁹	811	10 ²³	22443	0 ²⁸	11222	0 ⁸³	22526	4276	88764			9305	112533
PLACE CONCRETE	2042	CY	80 ⁰²	16376	0 ⁴²	858	0 ²⁴	1307	0 ⁵⁹	1082	1 ²³	2916					1091	77339
WASTE CONCRETE	38	CY																
OVERBREAK CONCRETE	507	CY																
FABRICATE FORMS	3500	SF	50 ⁰⁵	17675	3 ²⁵	11375	0 ¹⁰	3510	0 ²⁶	710	0 ²²	770					888	31080
ERECT FORMS	20876	SF	77 ¹⁷	162207	0 ²¹	4084	0 ²⁶	1515	0 ⁴²	9603	0 ⁴¹	9185					924	192874
STRIP & CLEAN FORMS	20876	SF	8 ⁴¹	71187	0 ¹⁰	2287	0 ¹⁸	3758	0 ²³	4801	0 ²²	4573					414	86426
FORM HAROVARRE	20876	SF			0 ⁸³	17327											0 ⁵⁹	119327
CONCRETE FINISH	14490	SF	10 ²²	14780	0 ⁰⁸	1159	0 ⁰²	869	0 ⁰⁷	1014	0 ²⁹	1204					132	191216
POINT & PATCH	20876	SF	0 ⁸¹	16710	0 ⁰²	1253	0 ⁰⁴	835	0 ⁰⁵	1044	0 ²⁷	1461					102	21503
CONSTRUCTION JOINT CLEANUP	461	SF	11 ¹³	521	0 ⁰⁷	32	0 ¹¹	51	0 ⁰⁸	37	0 ¹⁷	78					156	7119
FOUNDATION PREPARATION	14015	SF	2 ²⁹	21814	0 ¹³	1822	0 ²¹	2743	0 ¹²	2242	0 ³⁴	4765					311	113586
CONCRETE CURE	2042	CY	0 ¹⁵	12967	0 ²⁵	1710	0 ²⁴	470	0 ⁰⁹	184	0 ⁵⁴	1103					817	116814
REINFORCING STEEL	153500	LB											0 ²⁸	42780	0 ¹⁵	24560	0 ²⁴	645610
	1535	CY	251 ⁴⁸	316037	21 ⁰²	43048	26 ⁴¹	40561	20 ⁴⁴	28139	21 ⁵⁴	41501	18 ²⁴	131921	16 ⁰²	24560	441 ⁴¹	712761
	1550	CY	251 ⁴⁸	389794	21 ⁰⁹	43462	26 ⁴¹	40751	20 ⁴⁴	28502	21 ⁵⁴	41765	18 ²⁴	133307	16 ⁰²	24800	441 ⁴¹	719681

OPERATION Drain Holes

ITEM NO. 331.167 SHEET OF PAGE 29

Job Watana - Stage 1

BID QUANTITY 5.900 UNIT LF TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

OPERATION Bus Shafts - Excavation 10.5' Dia.

OPERATION

ITEM NO. 331.171 SHEET OF PAGE 30

JOB Watana - Stage 1

BID QUANTITY 560

UNIT LFTAKE OFF QUANTITY

EST. BY Art Lee

DATE _____

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
 OPERATION **Concrete Lining 9.0' Dia.**

ITEM NO. **331.174** SHEET **31** OF **31**

JOB **Watana - Stage 1**

BID QUANTITY **560**

UNIT **LF**

TAKE OFF QUANTITY **560**

EST. BY **Art Lee**

DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST								
FURNISH CONCRETE	1197	CY	23740	0.39	167	0.24	12976	8.28	471	0.83	12969	4276	518V	285	111382			
PLACE CONCRETE	1141	CY	18054	0.50	571	0.05	2339	266	303	0.43	2773			1925	22752			
CONCRETE WASTE	56	CY																
CONCRETE OVERBREAK	489	CY																
FABRICATE FORMS	565	SF	1346	7605	366	2068	0.89	168	0.70	376	0.59	333		1820	105616			
ERECT FORMS	15831	SF	777	123007	0.21	3325	0.36	5679	0.46	7282	0.44	6766		924	144279			
STRIP & CLEAN FORMS	15831	SF	341	53784	0.10	1583	0.18	2850	0.23	2641	0.22	3413		414	65541			
FORM HARDWARE	15831	SF			0.83	13140								283	13140			
POINT & PATCH	15831	SF	0.81	12823	0.26	750	0.24	633	0.05	792	0.21	1408		123	162016			
CONSTRUCTION JOINT CLEANUP	880	SF	113	774	0.07	62	2.11	97	0.28	78	0.17	150		136	13373			
CONCRETE CURE	1141	CY	635	1245	0.25	1084	0.24	277	0.29	103	0.51	616		317	9322			
ROCK CLEANUP	19354	SF	227	43734	0.13	7516	0.21	4064	0.16	3097	0.34	6580		311	60191			
REINFORCING STEEL	65200	LB											0.22	18756	0.16	10482	0.44	28688
	560	LF	51351	237566	4.01	25766	5.85	29036	50.88	28227	62.15	34973	120.00	69440	1463	10482	86752	485540

OPERATION

Miscellaneous Metalwork

ITEM NO. 331.177 SHEET _____ OF _____ PAGE 32

108 Watana - Stage 1

EST. BY Ar: Lee DATE

BID QUANTITY 9 UNIT Tons TAKE OFF QUANTITY

[illegible]

JOB		EST. BY		DATE		BID QUANTITY		UNIT		TAKE OFF QUANTITY		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST					
SUB CONTRACT		1		EA																				1.5		169400		1.5		169400	

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

ITEM NO. 331.18 SHEET OF PAGE 35

Care of Water

Watana - Stage 1

EST. BY Art Lee DATE _____

BID QUANTITY 1 UNIT LS TAKE OFF QUANTITY

[illegible]

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Miscellaneous Buildings & Structures

ITEM NO. 331.20

- SHEET ____ OF ____ PAGE 32

JOB Watana - Stage 1

BID QUANTITY 1

UNIT LS

TAKE OFF QUANTITY

EST. BY Art Lee

DATE _____

OPERATION Reservoir Clearing

OPERATION

ITEM NO. 332.1

SHEET _____ OF _____ PAGE 38

JOB Watana - Stage 1

BID QUANTITY 21,000

UNIT Ac

TAKE OFF QUANTITY

EST. BY Art Lee

DATE _____

8-5

22

JOB Watana - Stage 1

EST BY Art Lee

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
OPERATION Diversion Tunnel, Excavation 39' Dia.

ITEM NO. 332.202 SHEET OF PAGE 46

JOB Watana - Stage 1

DATE _____

BID QUANTITY 7.220

UNIT 1F

TAKE OFF QUANTITY

EST. BY Art Lee

DATE _____

BID QUANTITY		UNIT		TAKE OFF QUANTITY		EST. BY		DATE		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
SAID 2. ORIGINAL - ESCALATE		7.220	LF	1114	8047540	426	3.777	164	711	2.577	164	711	3.464	589	402	290	583	157	11	349	12	211	533	00	
													</												

OPERATION Diversion Tunnel, Excavation 40' Dia

OPERATION

Diversion Tunnel, Excavation 40' Dia

ITEM NO.

332.203

SHEET

OF

De

22 14

108

Watana - Stage 1

BID QUANTITY

260

UNIT LE

TAKE OFF QUANTITY

EST. BY

Art Lee

DATE _____

OPERATION Portals, Common Excavation

ITEM NO. 332.204 SHEET OF PAGE 42

108 Watana- Stage 1

BID QUANTITY 67.100 UNIT CY TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION Portals, Rock Excavation

ITEM NO. 332.205

SHEET _____ OF _____ PAGE 23

OPERATION _____

JOB Watana - Stage 1

BID QUANTITY 85,550 UNIT CY

TAKE OFF QUANTITYEST BY Art Lee

DATE _____

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Temporary Cofferdam Fill for U/S

Portals

BID QUANTITY 30.540 UNIT CY TAKE OFF QUANTITY

ITEM NO. 332.207 SHEET OF PAGE 43

ITEM NO. Watana - Stage 1

EST. BY Art Lee

EST. BY Art Lee DATE _____

003568

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Tunnel Concrete Lining 36' I.D.

ITEM NO. 332.208

SHEET 46 OF 46

JOB Watauga - Stage I

BID QUANTITY 7,220 UNIT LF TAKE OFF QUANTITY 7220 EST BY Art Lee DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
FURNISH CONCRETE	72296	CY	141542.0	0.34	28125.10	730.02	43.28	27941.1	0.8	28125.10
PLACE CONCRETE	71363	CY	51634.1	0.92	30112.20	1149.2	0.53	28001.7	1.3	28125.10
WASTE CONCRETE	433	CY								
CONCRETE OVERBREAK	24592	CY								
FABRICATE FORMS	31279	SF	12101.5	3.66	11449.1	0.20	2149.5	0.58	12101.5	12101.5
ERECT FORMS	842206	SF	65437.1	0.21	17636.3	0.36	20017.4	0.24	2149.5	12101.5
STRIP & CLEAN FORMS	842206	SF	287172.2	0.10	8422.0	0.18	10159.7	0.23	12101.5	12101.5
FORM HANDWARE	642206	SF		0.83	61923.1					12101.5
CONSTRUCTION JOINT PREPARATION	25625	SF	173	0.07	1074.0	0.1	281.9	0.28	205.0	12101.5
CONCRETE CURE	71863	CY	45603.0	0.93	2827.8	0.24	1412.4	0.29	616.8	12101.5
FOUNDATION CLEANUP	884594	SF	200802.8	0.13	1474.7	0.21	18516.5	0.16	14153.5	12101.5
REINFORCING STEEL	100.000	LB								12101.5
	7220	LF	1495245.3	11.8	121803.3	1.49	159	1.38	12101.5	12101.5

[illegible]

OPERATION Portal Concrete

OPERATION

ITEM NO. 332.210ITEM NO. 332.210 SHEET _____ OF _____ PAGE 48

___ JOB

Watana - Stage 1

BID QUANTITY 10.525

UNIT CY

TAKE OFF QUANTITY

EST. BY

Art Lee

DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Mass Concrete ITEM NO 332.211 SHEET 49 OF 49

JOB Watana - Stage 1

BID QUANTITY 200 UNIT CY TAKE OFF QUANTITY EST. BY Art Lee DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST								
FURNISH CONCRETE	304	CY	20 ⁰⁰	608.0	0 ³⁹	11.9	10 ⁷⁹	328.0	2 ²⁸	231.7	10 ⁸³	329.2	42 ⁷⁵	1277.9	93 ⁰⁵	2828.7		
PLACE CONCRETE	302	CY	80 ⁰²	242.2	0 ⁴²	12.7	0 ⁵⁴	17.3	0 ⁵³	160	1 ³³	40.2			10 ⁹⁴	230.4		
WASTE CONCRETE	2	CY																
CONCRETE OVERCREAK	104	CY																
FABRICATE FORMS	336	SF	5 ⁰⁵	166.7	3 ²⁵	107.2	0 ¹⁰	3.4	0 ²⁶	87	0 ²²	7.4			8 ⁸⁸	298.4		
ERECT FORMS	3588	SF	7 ⁷⁹	2787.9	6 ²¹	16.3	0 ³⁶	129.2	0 ⁴⁶	1650	0 ⁴⁴	1529			9 ²⁴	331.53		
STRIP & CLEAN FORMS	3588	SF	3 ⁴¹	1223.5	0 ¹⁰	85.9	0 ¹⁸	646	0 ²³	825	0 ²²	78.9			4 ¹⁴	148.54		
FORM HARDWARE	3588	SF			0 ⁸³	297.8									0 ⁸³	297.8		
CONSTRUCTION JOINT PREPARATION	106	SF	1 ¹³	120	0 ⁰⁷	7	0 ¹¹	12	0 ⁰⁸	9	0 ¹⁷	18			1 ⁵⁶	166		
FOUNDATION PREPARATION	371.4	SF	2 ²⁷	843.1	0 ¹³	48.3	0 ²¹	780	0 ¹⁴	591.4	0 ³⁴	1263			3 ¹¹	1155.1		
CONCRETE CURE	304	CY	6 ³⁵	1730	0 ⁹⁵	28.9	0 ²⁴	73	0 ⁰⁹	27	0 ⁵⁴	16.4			8 ¹⁷	248.2		
REINFORCING STEEL	486	LB											0 ²⁸	136	0 ¹⁶	78	0 ⁴⁴	2.4
	200	CY	303 ⁰⁷	6077.4	31 ⁰²	620.7	0 ⁵⁵	621.0	29 ³⁴	5869	37 ²⁰	7581	65 ⁶⁷	13135	0 ²⁷	78	109 ⁶¹	9997.4

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Flip Bucket Concrete

ITEM NO. 332.212

SHEET OF

PAGE 50

JOB Watana - Stage 1

BIO QUANTITY 2.000 UNIT CY TAKE OFF QUANTITY 2302 EST. BY Art Lee DATE

BID QUANTITY		2.000		UNIT		CY		TAKE OFF QUANTITY		2302		EST. BY		Art Lee		DATE						
		QUANTITY		UNIT		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST		
FURNISH CONCRETE		2391	CY	20 ⁰⁰		47820	1 ³⁹	8212	1079	25717	028	19797	1083	21587	5427	102239					235	222482
PLACE CONCRETE		2388	CY	8 ⁰²		19152	042	1203	044	1528	053	1266	133	3176		8184					1044	31609
WASTE CONCRETE		3	CY																			
CONCRETE OVERBREAK		86	CY																			
FABRICATE FORMS		1680	SE	5 ⁰⁵		18484	525	5460	010	168	026	437	023	370							888	149119
ERECT FORMS		3360	SE	7 ²⁷		36107	021	106	036	1210	046	1546	044	1478							934	31042
STRIP & CLEAN FORMS		3360	SE	3 ⁴¹		11458	010	336	018	605	023	773	022	739							414	13911
FORM MAINTENANCE		3360	SE				083	2789													083	2789
FOUNDATION PREPARATION		4625	SE	2 ²⁷		10499	013	601	021	971	016	740	034	1513							311	14384
CONCRETE FINISH		4625	SE	1 ⁰²		47118	008	370	006	2718	007	324	009	416							122	16106
CONCRETE CURE		2388	CY	6 ³⁵		15164	093	2269	023	573	009	215	054	1290							817	19511
REINFORCING STEEL		115100	LB														028	32228	016	18416	044	50644
		2302	CY	62 ²⁹		143402	628	14466	1352	21132	1070	25078	1521	33727	6209	142751	800	18416	128	410402		
		2000	CY	62 ²⁹		124580	628	12560	1352	21040	1070	21800	1521	20340	6209	124180	800	16000	128	356500		

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION: Suspended Metal Roof - Emergency ITEM NO. 332.214 SHEET OF PAGE 52

Release Chamber

108 Watana - Stage 1

BID QUANTITY 2.775 UNIT SE TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

BID QUANTITY		UNIT	TAKE OFF QUANTITY		EST. BY		DATE		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
SUB CONTRACT			2775	SF																	91.35	56.926	31.35	56.926
													</											

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Lower Diversion Tunnel Plug Concrete ITEM NO. 332.215 SHEET OF PAGE 53

JOB Watana - Stage 1

BID QUANTITY 5,570 UNIT CY TAKE OFF QUANTITY 4650 EST. BY Art Lee DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
FURNISH CONCRETE	4650	CY	20 ²⁰ 73700	0 ²⁹ 1817	10 ²⁰ 5028	18 ²⁸ 38385	10 ⁸³ 50468	42 ⁷⁶ 197262		73 ²⁵ 433613
PLACE CONCRETE	4650	CY	8 ⁰² 37293	0 ⁴² 1953	0 ⁶⁴ 2976	0 ⁵³ 2465	1 ³³ 6185			10 ²⁴ 50872
WASTE CONCRETE	10	CY								
CONCRETE OVERBREAK	-0-									
FABRICATE FORMS	7824	SF	13 ⁴⁶ 105042	3 ⁶⁶ 28863	0 ²⁹ 7243	0 ²⁰ 5463	0 ⁵⁹ 4604			18 ⁷⁰ 145935
ERECT FORMS	15608	SF	7 ²⁷ 121274	0 ²¹ 2872	0 ³⁶ 5619	0 ⁴⁶ 7180	0 ⁴⁴ 6868			9 ²⁴ 144319
STRIP & CLEAN FORMS	15608	SF	3 ⁴¹ 53223	0 ¹⁰ 1561	0 ¹⁸ 2809	0 ²³ 3590	0 ²² 3434			4 ¹⁴ 64617
FORM HARDWARE	15608	SF		0 ⁸³ 12953						0 ⁸² 12955
CONCRETE CURE	4650	CY	6 ³⁵ 29528	0 ²⁵ 4418	0 ²⁴ 1116	0 ²⁹ 419	0 ⁵⁴ 2511			8 ¹⁷ 57792
CONSTRUCTION JOINT PREPARATION	13572	SF	1 ¹³ 15336	0 ²⁷ 950	0 ¹¹ 1493	0 ⁰⁸ 1086	0 ¹⁷ 2307			1 ⁵⁶ 31172
REINFORCING STEEL	46500	LB					0 ²⁸ 12768	0 ¹⁵ 7296		0 ⁴⁴ 20064
	4650	CY	9 ¹⁵ 154896	11 ⁹³ 55495	14 ³¹ 66557	12 ⁶⁴ 58788	16 ⁴² 76317	45 ⁵³ 212030	1 ⁵⁶ 7296	200 ²⁷ 731439
	5570	CY	9 ¹³ 548957	11 ⁹² 66450	14 ³¹ 79707	12 ⁶⁴ 70405	16 ⁴² 91469	45 ⁵³ 253936	1 ⁵⁶ 8689	200 ²⁷ 1115503

OPERATION Diversion Tunnel Mechanical

ITEM NO 332.216

SHEET _____ OF _____ PAGE 54

JOB Watana - Stage 1

EST BY Art Lec**BID QUANTITY**

1

UNIT LS

TAKE OFF QUANTITY

EST BY

Article

DATE

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

ITEM NO. 332.217 SHEET OF PAGE 55
FOR Watana - Stage 1

BID QUANTITY 8.245 UNIT CY TAKE OFF QUANTITY

EST BY Art Lee DATE _____

OPERATION		JOB		DATE		EST BY		DATE		EQUIPMENT		EQUIPMENT		EQUIPMENT		PERMANENT		SUB-CONTRACTS		TOTAL	
BID QUANTITY		UNIT		TAKE OFF QUANTITY		CONSTRUCTION		CONSTRUCTION		REPAIR LABOR		RENT		SUPPLIES		MATERIALS				DIRECT COST	
8,245		CY				LABOR & INSURANCE		SUPPLIES													
REJECT MATERIAL FROM CONCRETE AGGREGATE PRODUCTION.				8,245	CY	586	48316	0.20	11.49	345	28445	282	23251	354	29252					1589	131013

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION U/S Cofferdam Common Excavation

ITEM NO. 332.221 SHEET OF PAGE 56

JOB Watana - Stage 1

EST BY Art Lee

BID QUANTITY 1.300 UNIT CY TAKE OFF QUANTITY

EST BY Art Lee DATE _____[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
OPERATION Impervious Fill

OPERATION

Impervious Filt

ITEM NO. 332.222 SHEET OF PAGE 57

108 Watana - Stage 1

JOB Watana - Stage 1

EST BY **Art Lee**

EST BY Art Lee DATE _____

BID QUANTITY 67.600 UNIT CY TAKE OFF QUANTITY

BID QUANTITY		67.600	UNIT	CY	TAKE OFF QUANTITY		EST. BY	Art Lee		DATE		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
ORIGINAL - ESCALATE					67.600	CY	409	275.132	0.3	8788	103	19675	0.77	52052	123	23175									723	188748	

OPERATION Rock & Gravel Fill

ITEM NO. 332.223 SHEET OF PAGE 58

OPERATION _____ JOB Watana - Stage 1

BID QUANTITY 407.000 UNIT CY TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION: Filters

ITEM NO. 332.224 SHEET _____ OF _____ PAGE 59

JOB Watana - Stage 1

BID QUANTITY 42.900 UNIT CY TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Cut-off Wall U/S

ITEM NO 332.225 SHEET OF PAGE 60

JOB Watana - Stage 1

BID QUANTITY 35.900 UNIT SF TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

OPERATION Care of Water

ITEM NO. 332.226 SHEET OF PAGE 61

JOB Watana - Stage 1

BID QUANTITY 1 UNIT LS TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.
OPERATION D/S Cofferdam Common Excavation

ITEM NO 332.231 SHEET OF PAGE 62

10B Watana - Stage 1

EST BY Art Lee

BID QUANTITY 5.000 UNIT CY TAKE OFF QUANTITY

[illegible]

0 0 3 5 6 8

OPERATION Impervious Fill

ITEM NO. 332.232 SHEET OF PAGE 63

JOA Watana - Stage 1

BID QUANTITY 47.250 UNIT CY TAKE OFF QUANTITY _____ EST BY Art Lee DATE _____

[illegible]

OPERATION Rock & Gravel Fill

OPERATION Rock & Gravel Fill

ITEM NO. 332.233 SHEET OF PAGE 64

JOB Watana - Stage 1

EST. BY Art Lee

BID QUANTITY 42,000 UNIT CY TAKE OFF QUANTITY _____ EST. BY Art Lee DATE _____

BID QUANTITY		UNIT		TAKE OFF QUANTITY		EST. BY		DATE		CONSTRUCTION LABOR & INSURANCE		CONSTRUCTION SUPPLIES		EQUIPMENT REPAIR LABOR		EQUIPMENT RENT		EQUIPMENT SUPPLIES		PERMANENT MATERIALS		SUB-CONTRACTS		TOTAL DIRECT COST	
42,000		CY				ATL		ECC		088		001		055		052		043						259	
SAME AS ITEM 332.223		42000		CY		36960		420		23100		21840		26460										108780	

OPERATION Cutoff Wall D/S

ITEM NO. 332.235SHEET 1 OF 1

- PAGE 15

OPERATION Cutoff Wall D/S

JOA

Watana - Stage 1

— JOB

Art Lee

DATE _____

BID QUANTITY 29,500

UNIT SF

TAKE OFF QUANTITY

— ESI BY

Art Lee

DATE _____

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Removal of Cofferdam

ITEM NO. 332.236 SHEET _____ OF _____ PAGE 66

JOB Watana - Stage 1

BID QUANTITY 90,000 UNIT CY TAKE OFF QUANTITY

EST. BY Art Lee DATE _____[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Main Dam Excavation - Common

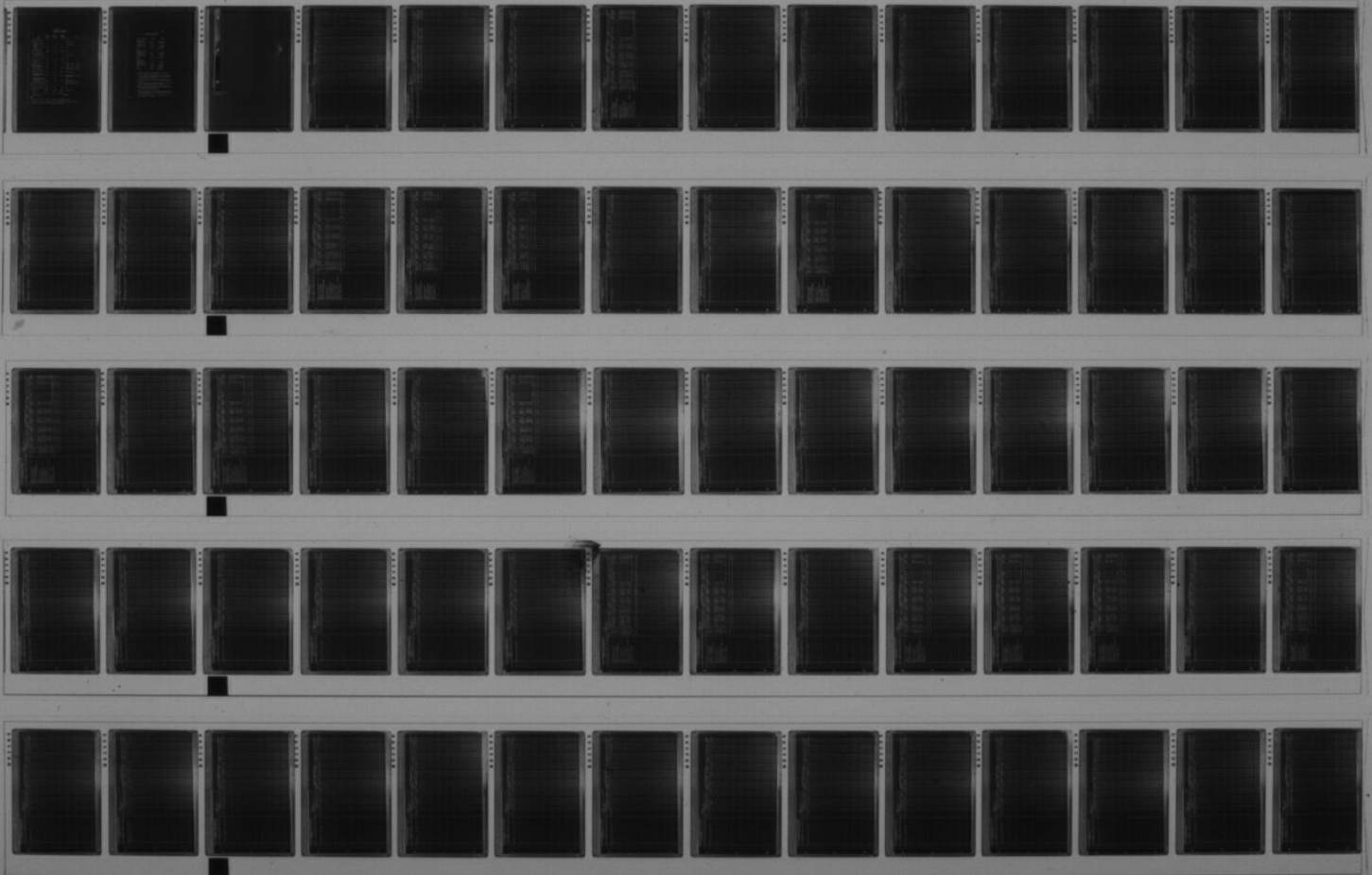
ITEM NO. 332.3 SHEET OF PAGE 67

108 Watana - Stage 1

BID QUANTITY 3.496.000 UNIT CY TAKE OFF QUANTITY _____ EST BY Art Lee DATE _____

[illegible]

3568 2 CF 3



DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION INDUSTRIAL FILL ITEM NO. 332.313 SHEET OF 62 PAGE 62

JOB Watana - Stage 1

BID QUANTITY 5,300.00 UNIT CY TAKE OFF QUANTITY EST. BY Art Lee DATE

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
STAIR BEARS O.K.	1000000	CY	0.07	1000000.00	0.00	0.00	0.00	0.00	0.00	2.00 2100000
LOAD, Haul & P.C.E.	6300000	CY	1.45	9135000.00	0.01	13000	0.00	0.00	0.00	4.27 26900000
	6300000	CY	1.55	9855000.00	0.01	75000	0.00	0.00	0.00	4.67 29000000

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION

Provide Drying Facilities for

Impervious Fill

BID QUANTITY 1

UNIT LS

TAKE OFF QUANTITY

ITEM NO. 332.318

SHEET

OF

PAGE 22

JOB Wetana - Stage 1

EST. BY

Art Lee

DATE

QUANTITY

UNIT

CONSTRUCTION LABOR & INSURANCE

CONSTRUCTION SUPPLIES

EQUIPMENT REPAIR LABOR

EQUIPMENT RENT

EQUIPMENT SUPPLIES

PERMANENT MATERIALS

SUB-CONTRACTS

TOTAL DIRECT COST

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION FILLING

ITEM NO. 332.318

SHEET OF

PAGE 23

BID QUANTITY 216.700 UNIT CY TAKE OFF QUANTITY

EST. BY Art Lee DATE

CONSTRUCTION LABOR & INSURANCE

CONSTRUCTION SUPPLIES

EQUIPMENT REPAIR LABOR

EQUIPMENT RENT

EQUIPMENT SUPPLIES

PERMANENT MATERIALS

SUB-CONTRACTS

TOTAL DIRECT COST

ORIGINAL - ESCALATE

STRIPPING BORROW - ESCALATE

4216.700

1

1/31

6/23/70

1/31

6/23/70

1/31

6/23/70

1/31

6/23/70

1/31

6/23/70

1/31

6/23/70

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1/31

6/23/70

1/31

6/23/70

DIVERSIFIED CONSTRUCTORS, INC.

332-
ITEM NO 331 SHEET 1 OF 1 PAGE 15

OPERATION ROCKFELL DIRECTLY ERDIA

JOB KATANA - PHASE I

EXCAVATION

FORM 2 QUANTITY 7845000 UNIT C.Y. EST. BY DATE

FROM ORIGINAL ESTIMATE, ALL SPILLWAY EXCAVATION INCLUDES HAUL, 7845000 15.3 = 51275 HOURS (US 2.74 AM) = 25637 HOURS			
FOLLOWING SPREAD TO HANDLE AT DARISSIE			
SPREAD	LABOR	EQUIPMENT	SUPPLIES
1- 09 EMBANKMENT	51.44	47.50	4.31
1- COMPACTOR R/L = 60.44	1.43	3.81	17.24
1- PICKUP	2.57	0.97	5.71
1- DOZER OPERATOR	38.34		
1- COMPACTOR OPERATOR	32.65		
1- DUMP TRUCK	32.84		
1- 4MAN	48.20		
COST PER HOUR	21064	5828	7424
COST 25637 HOURS	5400178	1804124	1803821
SUMMARY		TOTAL	UNIT PRICE
DIRECT LABOR	383678	2149	
SUPPLIES	120185	2101	
REPAIR LABOR	1549500	219	
EQUIPMENT	1494124	219	
EQUIP SUPPLIES	1775106	222	
	8797593	110	

ITEM NO. 332.322 SHEET OF PAGE 16
JOB Watana - Stage 1

ITEM NO. 332.322 SHEET OF PAGE 16
JOB Watana - Stage 1

JOB Watering - Stage 1 EST. BY Art Lee DATE 11-1-68

BID QUANTITY	UNIT	TAKE OFF QUANTITY
	CY	

[illegible]

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Drill & Grout - Curtain

ITEM NO. 332.324 SHEET 21 OF 21 PAGE 21

JOB Watana - Stage 1

EST. BY Art Lee DATE

BID QUANTITY	UNIT	TAKE OFF QUANTITY	UNIT	EST. BY	DATE	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
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SUB-CONTRACT

2182.270 L.F.

2182.270 L.F.

2182.270 L.F.

2182.270 L.F.

Drain Holes

ITEM NO. 332.326 — SHEET — OF — PAGE 6

008 Watana - Stage 1

EST. BY Art Lee DATE

QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
93.975	LF	2.97	40000	12000	4000	5000			559
PER ORIGINAL - ESCALATE									

DIVERSIFIED ENGINEERS & CONSTRUCTORS, INC.

OPERATION Grout Galleries and Portals ITEM NO. 332.331 SHEET 21 OF 21
Horizontal Galleries 10' x 10' JOB Watana - Stage 1

BID QUANTITY	UNIT	TAKE OFF QUANTITY
6.555	LF	

EST. BY Art Lee DATE _____

EST. BY Art Lee DATE _____

	QUANTITY	UNIT	CONSTRUCTION LABOR & INSURANCE	CONSTRUCTION SUPPLIES	EQUIPMENT REPAIR LABOR	EQUIPMENT RENT	EQUIPMENT SUPPLIES	PERMANENT MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST
ORIGINAL - ESCALATE	655.5 LF	LF	279.8 136.0 143.8	70.21 197.04 70.21	46.62 171.59 171.59	40,000.00 40,000.00 40,000.00	325.17 325.17 325.17			944.73 2,094,234

