

February 13, 2006

Project No.: P01576A01 02
Log No.: 220-001-L

BC Environment
5th Floor, 609 Broughton Street
Victoria, B.C.
V8W 9W6

Via email: Jim.Mattison@gov.bc.ca
Original to follow

Attention: Mr. J. S. Mattison, P.Eng.
ADM Water Stewardship Division

**Re: Water Release Facility At Kenney Dam
Updated Cost Estimate**

Dear Mr. Mattison:

In accordance with our Proposal dated January 20, 2006, we are pleased to present the attached updated cost estimate for the Cold Water Release Facility (CWRP) at Kenney Dam described in our report KC-155 prepared for the Nechako Environmental Enhancement Fund Management Committee in May 2001, which we previously updated for you in February 2005. This letter also includes the "ballpark" budget estimate that you requested for the addition of a small hydroelectric generating station at the facility and the associated transmission line.

1. BASIS OF ESTIMATE

The updated estimate is based on the same conceptual design, preliminary quantity take-off, construction sequence and preliminary construction schedule as presented in our report KC-155, and on construction methods and equipment generally associated with the type of work involved. As mentioned in our report, potential contractors would base their tenders on the equipment and personnel available to them at the time of tender, and on their own construction methods, provided that they met all the requirements of the contract.

The 2001 estimate and the 2005 update were prepared using G2 Estimator, a data base estimating system containing cost data on labour, equipment and materials. This year's update of the

estimate consisted primarily of updating the cost data to reflect cost increases since January 2005, and compiling a new estimate.

Labour

The labour costs are based on unionized labour rates and conditions (Columbia Hydro Constructors and Allied Hydro Council collective agreement). A new collective agreement came into effect in 2005, and the updated estimate includes rate increases applied up to January 2006. The average hourly rates used include, where applicable, all fringe benefits, trade costs, overtime pay and shift differentials.

The costs for camp, travel and small tools are included in the indirect costs.

Equipment

The equipment rates include depreciation, insurance, spare parts and fuel/oil/grease. The equipment operators are included as labour and the mechanics are included in the indirect costs.

The equipment depreciation rates are those calculated from average current capital costs and normal average industry running costs.

Materials

All permanent materials and job supplies are based on current average budget prices, and include the continued increase in steel and cement prices during 2005.

2. WORK BREAKDOWN STRUCTURE

The cost estimate utilizes a work breakdown structure (WBS) as follows:-

Direct Costs

These are costs of the hands-on labour, equipment and materials required to perform the work.

Fixed Indirect Cost - Mobilize

This cost includes the mobilization of the equipment to the job site and the set up of the site infrastructure. The site infrastructure costs include temporary roads, offices, camp, lay down areas, and the setting up of process and batch plants.

Variable Indirect Costs

These are the costs of all on-going non-direct work items and are normally spread back into the direct unit cost items in a contractor's bid. The costs include, but are not limited to, monthly

maintenance and operating expenses, contractor's on-site management staff, first aid, travel expenses, warehouse operation, small tools and supplies, mechanics, camp running cost, transportation and miscellaneous equipment, other miscellaneous items, performance bonds and insurances, head office administration and contractor's profit.

Fixed Indirect Cost Demobilize

This cost includes the demobilization of the equipment from the job site, and the clearing and restoration of the site.

Taxes

The provincial sales tax (PST) of 7% is included in the estimated costs, where applicable, and applies to equipment and materials costs. The goods and services tax (GST) is not included but , if applicable to the project proponent, should be applied at 7% to all costs.

Contingency

In view of the conceptual nature of the layout and structures, and the fact that the structures would occupy some areas outside those previously investigated for the facility designed for the Kemano Completion Project, substantial contingencies have been added to the estimated costs, particularly for the marine works, for changes due to final design and for the conditions encountered.

Engineering/Project Management

A percentage allowance has been included for investigations, final design, engineering assistance to the owner during the tendering process, construction monitoring, and the production of a construction report and record drawings.

Owner's Costs

The estimate does not include Owner's costs and financing costs, including interest during construction. The estimate also does not include any costs associated with federal and provincial environmental review and permitting, including associated environmental studies.

Escalation

The estimate has been prepared using costs at the January 2006 level. An amount would need to be added for escalation, depending upon the anticipated date of construction.

3. UPDATED ESTIMATED CONSTRUCTION COST

The total estimated construction cost, including engineering, is \$117 million. The cost estimate is summarized in Table 1, and the details of the updated cost estimate are presented in Attachment 1.

4. SMALL HYDRO FACILITY

We understand that a decision has yet to be made concerning the schedule of releases from the CWRP. Consequently, we had to make some assumptions with respect to the flows that might be available for power generation. The releases are likely to consist of the portion of the Annual Water Allocation (AWA) that is not released through Skins Lake Spillway, releases for cooling purposes, and some portion of the so-called "freed-up" flows. We assumed that the releases for cooling purposes would occur in the Summer and that the freed-up flows would primarily be used to increase flows in the late Spring, Summer and early Fall. We believe that the cooling water releases could vary from year to year. We understand that the amount of the "freed-up" flows that could be available may also vary. Consequently, only the portion of the AWA that is not released through Skins Lake Spillway could be relied upon from year to year. This is an important consideration for a small hydro facility, because BC Hydro is once again placing strong emphasis on firm energy, and on firm energy delivered during the Winter months.

The F2006 Open Call for Power limits the amount of firm energy that can be supplied between April and July to no more than one third of the total annual amount of firm energy. Monthly energy delivered in excess of the monthly firm energy is secondary energy, and is valued at a lower rate, at approximately 85% of the firm energy value for Tier 1 secondary energy, being an amount up to the firm amount, and at approximately 49% of the firm energy value for Tier 2 secondary energy, being the balance of the monthly amount. Increasing the capacity of a small hydro facility to utilize flows that might be available from time to time during the low value months would result in the production of secondary energy of an increasingly lower value and is unlikely to be economic. In addition, provincial water rental rates increase sharply once a facility generates more than 160,000 MWh per year. Although there are potential markets other than BC Hydro, the facility would incur wheeling charges to deliver energy to those markets.

In view of these factors, and also the results of a preliminary financial evaluation that we undertook for the Nechako Watershed Council (NWC) in October 2000, which, favoured a high plant factor, we chose to size the hydroelectric station to utilize the maximum flow that would apparently be available in the Winter. This flow would be 27.15 m³/s, representing the March amount of the AWA, which we understand is currently 32.35 m³/s, minus an amount being considered for release from Skins Lake Spillway in March to mimic a natural hydrograph, which we understand is about 5.20 m³/s. Assuming that the hydro station would be situated at the downstream portal of the diversion tunnel, and that it would be supplied with water from the low-level outlet as shown in Figures 1 and 3 of our report KC-155, the rated net head would be about 81.8 m. Assuming a single vertical-shaft Francis-type turbine-generator unit, the rated

capacity of the unit would be slightly less than 20 MW. Unless a substantial amount of the "freed-up" flows would be released from the facility in June, it would appear that there would be very little water available for a small hydro facility in that month after the deduction from the AWA of the amount being considered for release from Skins Lake Spillway. June energy also has the lowest value. Consequently, June would be the best time to conduct annual maintenance. Assuming an average 10-day outage each year, the facility would produce an annual average of 156,000 MWh of energy, and all the generation would qualify as firm energy. Moreover, it would not attract the higher water rental rate, assuming that the facility is subject to the same water rental charges as all other generators in the province.

Based on recently constructed projects, and budget prices for equipment, we believe that a single unit facility with an installed capacity of about 20 MW could be constructed for a cost of approximately \$1,000-\$1,200 per installed kilowatt, i.e. for approximately \$20-\$24 million. This cost is exclusive of the same items as the cost estimate for the CWRP itself.

A further benefit of a capacity in the order of 20 MW is that it might still be possible to use a 69 kV transmission line. Based on recent estimates for 69 kV lines, a line to the Glennan sub-station estimated by BC Hydro to be 70 km long could probably be constructed for about \$15 million, exclusive of the items indicated for the CWRP itself.

It should be noted that the economic indications for a small hydro project are significantly better than those indicated to the NWC in 2000, largely due to a greater degree of provincial involvement in small hydro and easier access to information concerning revenues and costs. For example, the bid rates for the supply of energy under the F2006 Open Call for Power are expected to be close to twice the value of energy that was assumed in 2000 in the absence of commercial information, and water rental charges for small producers are actually about one third of the rate indicated by large-scale producers in 2000.

5. DISCLAIMER

This updated cost estimate was prepared by Klohn Crippen Berger (KCB) solely for the use of the contracting party. All other parties are third parties.

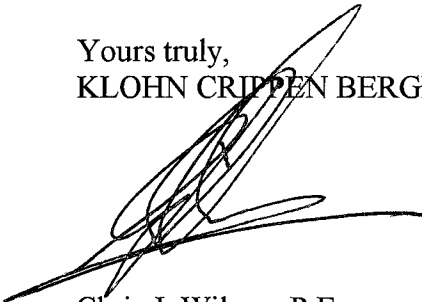
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Yours truly,
KLOHN CRIPPEN BERGER LTD.



Chris J. Wilson, P.Eng.
Project Manager

CJW/md

cc: Wenda Mason, Manager, Provincial Drought Initiative

Attachments:

Table 1
 Summary of Estimated Project Cost

ITEM	DESCRIPTION	ESTIMATED COST (\$1,000)
01	Deep-Water Intakes and Pipelines	13,546
02	Deep-Water Conduits	1,469
03	Surface-Water Intake Channel	3,896
04	Regulating Structure	7,879
05	Spillway and Flip Bucket	9,196
06	Low-Level Outlet	10,701
07	General Site Works	2,896
08	Skeleton Bay Future Hydro	928
09	Fixed Indirect Costs (Mobilize)	1,604
10	Variable Indirect Costs	33,014
11	Fixed Indirect Costs (Demobilize)	664
12	Marine Mobilize and Demobilize	1,802
13	Contingency for Design/Conditions Variations	19,500
14	Sub-Total Estimated Construction Costs	107,095
15	Investigations and Preliminary Engineering	1,500
16	Detailed Engineering (4%)	4,300
17	Construction Services (3.75%)	4,000
18	Total Estimated Project Cost	116,895

Note:

The above estimated costs are in January 2006 dollars and include PST, but do not include Owner's costs, including financing and any costs associated with federal and provincial environmental review and permitting, including associated environmental studies, and also do not include escalation and GST (if GST applicable to Proponent).

ATTACHMENT 1

WATER RELEASE FACILITY AT KENNEY DAM
COST SUMMARY

KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 06 - COST SUMMARY

Standard Cost Summary

WorkCode.01.00.01	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
01	DEEP WATER INTAKES & PIPELINES			5,190.0	279,565	32,912	575,904	68,468	12,588,627						13,545,476
02	DEEP WATER CONDUITS			14,726.2	602,261	43,234	733,802	89,937							1,469,234
03	SURFACE WATER INTAKE CHANNEL			21,238.3	836,586	714,786	782,608	1,562,383							3,896,363
04	REGULATING STRUCTURE			36,575.4	1,493,749	118,161	1,772,225	179,508	4,315,370						7,879,012
05	SPILLWAY & FLIP BUCKET			71,303.8	2,879,564	746,405	4,275,601	1,264,334	29,614						9,195,518
06	LOW LEVEL OUTLET			46,215.5	1,923,718	194,858	4,460,510	511,930	3,610,322						10,701,339
07	GENERAL			425.3	16,906	20,298		24,777	2,833,977						2,895,957
08	SKELETON BAY FUTURE HYDRO			7,295.0	296,026	88,681	381,545	156,668	4,824						927,744
11	FIXED INDIRECT COSTS(MOBILIZE)			11,106.0	452,018	86,217		582,993	482,976						1,604,203
12	VARIABLE INDIRECT COSTS			27,003.0	10,121,227	1,226,385		14,459,122	7,207,073						33,013,806
13	CONTINGENCY							19,500,000							19,500,000
14	FIXED INDIRECT COSTS(DEMOBILIZE)			4,200.0	171,119	23,279		45,765	423,349						663,511
15	MARINE MOBILIZE/DEMOBILIZE			3,600.0	149,167	1,246,295		317,373	89,440						1,802,275
Grand Total				248,878.5	19,221,906	4,541,509	12,982,196	38,763,258	31,585,571						107,094,440



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
WorkCode.01.00.01 01 DEEP WATER INTAKES & PIPELINES															
01.01.001	Supply Pipelines and Fittings	1,000.00	TNE						12,529,000						12,529,000
01.01.003	Prepare and launch pipes	1.00	LS	400.0	15,527	7,445		6,292							29,263
01.01.004	Lower Support Prepare Bed	1.00	LS	140.0	8,621	534		2,117							11,272
01.01.005	Fabricate Lower Base Support Frames	1.00	EA				447,200								447,200
01.01.006	Install Lower Support Frame Base	1.00	EA	650.0	33,623	7,962	90,476	22,001							154,062
01.01.007	Install Anchors in base	1.00	LS	450.0	17,404	8,917	14,523	17,141							57,986
01.01.008	Install Lower Support Trunnion Frame	1.00	EA	130.0	6,725	1,592		1,538							9,855
01.01.009	Middle Support Prepare Bed	1.00	LS	70.0	4,311	267		1,058							5,636
01.01.010	Middle Support Frame Base	1.00	EA	260.0	13,449	3,185	12,667	6,058							35,358
01.01.011	Upper Dry Support Base	1.00	LS	210.0	8,441	495	11,038	1,476							21,450
01.01.012	Install Pipes	1.00	LS	2,880.0	171,464	2,514		10,788							184,766
01.01.013	Underwater Surveys	1.00	LS						59,627						59,627
01 DEEP WATER INTAKES & PIPELINES				5,190.0	279,565	32,912	575,904	68,468	12,588,627						13,545,476
WorkCode.01.00.01 02 DEEP WATER CONDUITS															
02.02.001	Fabricate Formwork	470.00	M2	1,689.1	68,671	2,616		45,943							117,229
02.02.002	Erect & Strip Formwork	2,800.00	M2	8,750.0	358,514	24,821	287	25,194							408,816
02.02.003	Reinforcement	157,000.00	KG	2,895.8	117,299	7,423	238,640	6,573							369,935
02.02.004	Concrete Placing	2,100.00	M3	1,016.4	39,889	8,374	453,137	6,265							507,665
02.02.005	Concrete Sundries not Measured	1.00	LS	375.0	17,888		41,739	5,963							65,589
02 DEEP WATER CONDUITS				14,726.2	602,261	43,234	733,802	89,937							1,469,234
WorkCode.01.00.01 03 SURFACE WATER INTAKE CHANNEL															
03.01.001	Medium Clear & Grub	1.30	HA	91.0	3,591	1,458		1,580							6,629
03.01.002	Overburden Excavation	19,300.00	M3	1,061.5	42,183	53,742		69,267							165,192
03.01.003	Drill & Blast Rock Stage 1 to El 859.5	106,300.00	M3	2,429.7	95,549	37,006		242,997							375,552
03.01.004	Excavate Rock Stage 1 to El	106,300.00	M3	3,697.4	147,842	234,007		318,003							699,852
03.01.005	Drill & Blast Rock Stage 2 to grade	67,000.00	M3	2,436.4	95,810	37,107		213,092							346,010



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
03.01.006	Excavate Rock Stage 2 to grade	67,000.00	M3	3,075.9	122,966	199,314		274,766							597,046
03.01.007	Rock Bolts 25mm dia.* 4m lg. to El.859.5	635.00	EA	899.6	34,740	7,119	47,349	19,277							108,485
03.01.008	50mm dia.*6m lg. Relief Drains to El 859.5	147.00	EA	238.9	9,254	2,472	9,332	6,694							27,752
03.01.009	F.R.Shotcrete 50mm Thick to El.859.5	1,265.00	M2	205.6	7,975	1,131	62,491	1,800							73,396
03.01.010	F.R.Shotcrete 100mm Thick to El 859.5	926.00	M2	300.9	11,675	1,655	84,954	2,635							100,919
03.01.011	W.W.Fabric to El 859.5	926.00	M2	208.4	8,035	663	4,479	2,070							15,247
03.01.012	Rock Bolts 25mm dia.* 4m lg. to Grade	799.00	EA	1,131.9	43,712	8,958	59,577	24,256							136,503
03.01.013	50mm dia.*6m lg. Relief Drains to Grade	96.00	EA	156.0	6,044	1,614	6,094	4,372							18,124
03.01.014	F.R.Shotcrete 50mm Thick to Grade	2,414.00	M2	392.3	15,218	2,158	119,252	3,435							140,062
03.01.015	F.R.Shotcrete 100mm Thick to Grade	1,064.00	M2	345.8	13,415	1,902	97,614	3,028							115,959
03.01.016	W.W.Fabric to Grade	1,064.00	M2	239.4	9,233	761	5,147	2,378							17,519
03.01.017	Rock Anch. 32mm dia.* 4m lg. Grade	338.00	EA	718.3	27,737	5,684	266,311	17,640							317,372
03.01.018	Rock Bolts 25mm dia.* 4m lg. to Plug	154.00	EA	218.2	8,425	1,727	11,483	4,675							26,310
03.01.019	50mm dia.*6m lg. Relief Drains to Plug	16.00	EA	26.0	1,007	269	1,016	729							3,021
03.01.020	F.R.Shotcrete 50mm Thick to Plug	152.00	M2	24.7	958	136	7,509	216							8,819
03.01.021	Plug Rock Drill & Blast (WET)	22,900.00	M3	1,145.0	44,995	22,632		240,526							308,153
03.01.022	Plug Rock & Overburden Excavation (WET)	24,700.00	M3	2,195.6	86,223	93,271		108,949							288,442
03 SURFACE WATER INTAKE CHANNEL				21,238.3	836,586	714,786	782,608	1,562,383							3,896,363

WorkCode.01.00.01 04 REGULATING STRUCTURE

04.01.001	Rockfill	1,700.00	M3	51.0	2,127	1,462		1,646							5,235
04.01.002	Curtain Grouting Drilling	1,500.00	M	450.0	18,659	8,239		8,747							35,645
04.01.003	Curtain Grouting - Grouting	225,000.00	KG	900.0	34,499	4,012	58,221	10,231							106,963
04.02.001	Fabricate Formwork	888.00	M2	3,191.3	129,744	4,942		46,394							181,079
04.02.002	Erect & Strip Formwork	7,100.00	M2	22,187.5	909,088	62,940	1,889	68,467							1,042,385
04.02.003	Reinforcement	352,000.00	KG	6,492.4	262,989	16,642	535,040	14,736							829,408



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
04.02.004	Concrete Placing	5,650.00	M3	2,418.2	94,903	19,924	1,078,094	14,976							1,207,898
04.02.005	Concrete Sundries not Measured	1.00	LS	885.0	41,739		98,980	14,310							155,029
04.02.006	Misc.Metal Regulating Structure	33,500.00	KG						442,200						442,200
04.03.001	Deep Water Regulating Gates incl.Embeds	42.00	TNE						717,570						717,570
04.03.002	Surface Water Regulating Gates incl.Embeds	56.00	TNE						956,760						956,760
04.03.003	Deep Water Bulkheads incl.Embeds	22.00	TNE						325,754						325,754
04.03.004	Surface Water Bulkheads incl.Embeds	26.50	TNE						392,386						392,386
04.03.006	Supply & Install Rotork Hoists	4.00	EA						1,139,000						1,139,000
04.03.007	Supply & Install Gantry Crane	1.00	EA						341,700						341,700

04 REGULATING STRUCTURE				36,575.4	1,493,749	118,161	1,772,225	179,508	4,315,370	7,879,012
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WorkCode.01.00.01 05 SPILLWAY & FLIP BUCKET

05.01.001	Medium Clear & Grub	4.40	HA	308.0	12,155	4,935		5,347							22,438
05.01.002	Overburden Excavation	59,700.00	M3	2,288.5	91,031	117,160		143,565							351,756
05.01.003	Drill & Blast Rock	76,800.00	M3	3,072.0	120,807	46,788		219,918							387,513
05.01.004	Excavate Rock to Grade	76,800.00	M3	3,072.0	122,835	194,426		264,215							581,476
05.01.005	Rock Bolts 25mm dia.* 4m lg. to Grade	1,022.00	EA	1,447.8	55,912	11,458	76,206	31,026							174,601
05.01.006	50mm dia.*6m lg. Relief Drains to Grade	158.00	EA	256.8	9,947	2,657	10,030	7,195							29,829
05.01.007	F.R.Shotcrete 50mm Thick to Grade	5,221.00	M2	848.4	32,913	4,666	257,918	7,428							302,925
05.01.008	F.R.Shotcrete 100mm Thick to Grade	1,421.00	M2	461.8	17,916	2,540	130,367	4,043							154,866
05.01.009	W.W.Fabric to Grade	1,421.00	M2	319.7	12,330	1,017	6,874	3,176							23,397
05.01.010	Rock Anch. 32mm dia.* 4m lg. Grade	820.00	EA	1,742.5	67,291	13,790	646,081	42,795							769,956
05.01.020	Hydroseeding	13,000.00	M2						29,614						29,614
05.01.021	Medium Clear & Grub Plunge Pool	0.40	HA	28.0	1,105	449		486							2,040
05.01.022	Overburden Excavation Plunge Pool	7,000.00	M3	268.3	10,674	13,737		16,833							41,244
05.01.023	Drill & Blast Rock Plunge Pool	28,000.00	M3	560.0	22,118	7,495		61,677							91,290
05.01.024	Excavate Rock to Grade Plunge Pool	28,000.00	M3	980.0	39,204	61,248		82,099							182,551
05.01.025	Place Rockfill to Left Bank Protection	12,500.00	M3	375.0	14,838	16,026		16,134							46,998



KENNEY DAM 5 (WRF06)

WATER RELEASE FACILITY AT KENNEY DAM

01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
05.02.001	Fabricate Formwork	1,031.00	M2	3,705.2	150,637	5,738		53,865							210,240
05.02.002	Erect & Strip Formwork	8,235.00	M2	25,734.4	1,054,414	73,002	2,191	79,412							1,209,019
05.02.003	Reinforcement	652,000.00	KG	12,025.8	487,128	30,826	991,040	27,295							1,536,289
05.02.004	Erect & Strip Chute & Apron Screeds	1.00	LS	1,800.0	73,156			11,925							85,082
05.02.005	Concrete Placing	8,725.00	M3	3,873.9	152,033	31,918	1,727,081	23,956							1,934,989
05.02.006	36mm*5m long Rock Anchors	530.00	EA	4,240.0	166,210	63,880	180,080	93,873							504,043
05.02.007	36mm*7m long Rock Anchors	235.00	EA	2,685.7	105,281	42,649	111,786	48,990							308,706
05.02.008	Concrete Sundries not Measured	1.00	LS	1,210.0	59,627		135,949	19,081							214,656
05 SPILLWAY & FLIP BUCKET				71,303.8	2,879,564	746,405	4,275,601	1,264,334	29,614						9,195,518
WorkCode.01.00.01 06 LOW LEVEL OUTLET															
06.01.001	Tunnel Excavation	62.00	M	1,653.3	83,705	29,782		133,975							247,462
06.01.002	Pilot Shaft Excavation	79.00	M	1,717.4	86,919	26,937		43,900							157,757
06.01.003	Shaft Slash Excavation	79.00	M	1,580.0	79,543	20,652		35,891							136,086
06.01.004	Muck from Portal Area to Dumpsite	2,170.00	M3	97.7	3,892	4,509		6,065							14,467
06.01.005	Rock Support	1.00	LS				22,052								22,052
06.01.006	Drill & Blast Rock at Intake	3,960.00	M3	352.0	13,842	5,361		28,199							47,403
06.01.007	Excavate Rock Intake	3,960.00	M3	137.7	5,508	8,717		11,847							26,072
06.01.008	F.R.Shotcrete 50mm Thick to Intake	580.00	M2	94.3	3,656	518	28,652	825							33,652
06.01.009	F.R.Shotcrete 100mm Thick to Intake	580.00	M2	188.5	7,313	1,037	53,211	1,650							63,211
06.01.010	W.W.Fabric to Intake	580.00	M2	130.5	5,033	415	2,806	1,296							9,550
06.01.011	Rock Anch. 32mm dia.* 4m lg. to Intake	290.00	EA	616.3	23,798	4,877	228,492	15,135							272,301
06.01.021	Exist.Tunnel Rock Anchors	175.00	EA	262.5	10,251	3,391	10,340	3,931							27,914
06.01.022	Exist.Tunnel Fibre Reinf.Shotcrete	70.00	M3	140.0	5,499	1,363	64,220	859							71,941
06.01.023	Exist.Tunnel Relief Drains	15.00	EA	5.0	202	220		320							742
06.02.001	Fabricate Formwork Intake	323.00	M2	1,160.8	47,193	1,797		20,403							69,393
06.02.002	Erect & Strip Formwork Intake	2,580.00	M2	8,062.5	330,345	22,871	1,109	27,785							382,110
06.02.003	Reinforcement Intake	142,000.00	KG	2,619.1	106,092	6,714	215,840	5,945							334,591
06.02.004	Concrete Placing Intake	1,990.00	M3	907.4	35,613	7,477	404,559	5,606							453,255
06.02.005	Concrete Sundries not Measured	1.00	LS	340.0	16,695		36,969	5,963							59,627



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
	Intake														
06.02.006	Fabricate Formwork	185.00	M2	1,772.9	72,137	3,263		14,620							90,019
06.02.007	E & S Formwork	1,265.00	M2	6,957.5	282,762			12,906							295,668
06.02.008	Reinforcement	5,000.00	KG	200.0	8,120		7,600								15,720
06.02.009	Steel Liner	52.00	TNE	554.7	22,384	2,387	325,754	16,841							367,367
06.02.010	Concrete Liner	875.00	M3	875.0	34,096	2,044	154,203	9,607							199,950
06.02.011	Contact Grouting	1.00	LS	200.0	7,813	1,739	3,016	7,429							19,996
06.02.012	Consolidation Grouting	1.00	LS	400.0	15,626	3,414	6,032	2,985							28,056
06.02.013	Concrete Sundries Low Level Outlet	1.00	LS	296.0	14,310		32,198	4,770							51,279
06.02.021	Steel Pipe in Exist.Tunnel	280.00	TNE	4,977.8	200,886	21,426	2,104,872	47,231							2,374,415
06.02.022	Fabricate Formwork Exist.Tunnel	335.00	M2	1,203.9	48,946	1,864		18,990							69,801
06.02.023	Erect & Strip Formwork Exist.Tunnel	1,340.00	M2	4,187.5	171,311	5,966		10,194							187,470
06.02.024	Reinforcement Exist.Tunnel	119,000.00	KG	2,194.9	88,783	2,826	180,880	3,650							276,138
06.02.025	Concrete Placing Exist.Tunnel	2,820.00	M3	2,030.4	79,519	3,291	543,122	5,958							631,889
06.02.026	Concrete Sundries not Measured Exist Tunnel	1.00	LS	300.0	11,925		34,583	7,155							53,664
06.02.027	Misc. Metal LLO	5,000.00	KG						37,587						37,587
06.03.001	Surface Water Gate incl.Embeds	20.10	TNE						343,409						343,409
06.03.002	Surface Water Bulkhead incl.Embeds	7.30	TNE						108,091						108,091
06.03.003	Deep Water Gate incl.Embeds	20.10	TNE						343,409						343,409
06.03.004	Deep Water Bulkhead incl.Embeds	7.30	TNE						108,091						108,091
06.03.005	Skinning Bulkhead incl.Embeds	22.20	TNE						328,715						328,715
06.03.006	LLO Heating & Ventilation	1.00	LS						155,029						155,029
06.03.007	LLO Hollow Cone Valves	2.00	EA						834,773						834,773
06.03.008	LLO Butterfly Valves	2.00	EA						405,461						405,461
06.03.009	LLO Dresser Couplings	2.00	EA						23,851						23,851
06.03.010	LLO Trashrack	10.00	TNE						113,900						113,900
06.03.011	LLO Rotork Hoists	2.00	EA						569,500						569,500
06.03.012	LLO Winch Hoists	2.00	EA						238,507						238,507

06 LOW LEVEL OUTLET				46,215.5	1,923,718	194,858	4,460,510	511,930	3,610,322						10,701,339
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KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
WorkCode.01.00.01 07 GENERAL															
07.01.001	Medium Clear & Grub	0.60	HA	42.0	1,658	673		729							3,060
07.01.002	Overburden Excavation	10,000.00	M3	383.3	15,248	19,625			24,048						58,921
07.01.003	Fencing & Gates	1.00	LS						83,432						83,432
07.01.004	Operators House Incl.Furnishings	1.00	LS						484,075						484,075
07.01.005	Roads & Yards	1.00	LS						59,627						59,627
07.01.006	Septic Disposal System	1.00	LS						51,279						51,279
07.03.001	Plumbing	1.00	LS						11,390						11,390
07.03.002	Domestic Water System	1.00	LS						13,118						13,118
07.03.003	Station Drainage	1.00	LS						13,118						13,118
07.03.004	Heating & Ventilation	1.00	LS						22,658						22,658
07.04.001	Coating, Cable & Trays	1.00	LS						29,813						29,813
07.04.002	Diesel Generating System	1.00	LS						127,601						127,601
07.04.003	Power Distribution System	1.00	LS						481,783						481,783
07.04.004	Data Collection System	1.00	LS						51,279						51,279
07.04.005	Telephone System	1.00	LS						454,355						454,355
07.04.006	Instrumentation	1.00	LS						461,510						461,510
07.04.007	Lighting & 120v Power Distribution	1.00	LS						246,854						246,854
07.04.008	Grounding System	1.00	LS						171,725						171,725
07.04.009	Fire Alarm System	1.00	LS						45,316						45,316
07.04.010	Security Alarm System	1.00	LS						25,043						25,043
07 GENERAL				425.3	16,906	20,298		24,777	2,833,977						2,895,957
WorkCode.01.00.01 08 SKELETON BAY FUTURE HYDRO															
08.01.001	Medium Clear & Grub	0.20	HA	14.0	553	224		243							1,020
08.01.002	Overburden Excavation	18,000.00	M3	690.0	27,447	35,325			43,286						106,057
08.01.003	Drill & Blast Rock	3,400.00	M3	272.0	10,696	4,143			14,985						29,825
08.01.004	Excavate Rock to Grade	3,400.00	M3	272.0	10,876	14,874			19,938						45,689
08.01.005	Rock Bolts 25mm dia.* 4m lg. to Grade	60.00	EA	85.0	3,282	673	4,474	1,821							10,251
08.01.006	Rock Anch. 32mm dia.* 4m lg. Grade	55.00	EA	116.9	4,513	925	6,321	2,482							14,241



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
08.01.007	F.R.Shotcrete 50mm Thick to Grade	200.00	M2	32.5	1,261	179	9,880	285							11,604
08.01.009	W.W.Fabric to Grade	200.00	M2	45.0	1,735	143	967	447							3,293
08.01.011	Stub Tunnel Excavation	7.00	M	164.7	8,339	2,967		13,890							25,196
08.01.012	Stub Tunnel Rock Support	1.00	LS				2,086								2,086
08.01.013	Muck from Portal Area to Dumpsite	76.00	M3	3.4	136	158		212							507
08.01.021	Consolidation Grouting Drilling	280.00	M	120.0	4,976	2,197		2,183							9,356
08.01.022	Consolidation Grouting - Grouting	42,000.00	KG	240.0	9,200	1,070	9,880	4,463							24,613
08.02.001	Fabricate Formwork	138.00	M2	495.9	20,163	768		7,210							28,141
08.02.002	Erect & Strip Formwork	825.00	M2	2,578.1	105,633	7,313	220	7,956							121,122
08.02.003	Reinforcement	57,000.00	KG	1,051.3	42,586	2,695	86,640	2,386							134,307
08.02.004	Concrete Placing	750.00	M3	321.0	12,598	2,645	151,135	1,988							168,365
08.02.005	Concrete Sundries not Measured	1.00	LS					21,466							21,466
08.02.006	36mm*15m long Rock Anchors	4.00	EA	128.0	5,018	7,711	4,855	2,224							19,808
08.02.010	Steel Liner/Blind Flange	9.00	TNE	313.0	12,633	1,347	78,933	4,747							97,660
08.02.011	Concrete Liner	14.00	M3	22.4	901	33	2,467	1,346							4,747
08.02.021	Supply and Install Stoplog Guides	3.60	TNE	240.0	9,890	2,837	22,770	2,512							38,009
08.02.022	Fabricate Formwork Guides	4.00	M2	5.1	211	4		186							402
08.02.023	Erect & Strip Formwork Guides	10.00	M2	31.0	1,274	71		74							1,419
08.02.025	Concrete Placing	5.00	M3	53.5	2,104	379	918	337							3,738
08.02.026	S & I Handrails	550.00	KG						4,824						4,824

08 SKELETON BAY FUTURE HYDRO				7,295.0	296,026	88,681	381,545	156,668	4,824						927,744
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WorkCode.01.00.01 11 FIXED INDIRECT COSTS(MOBILIZE)

11.11.001	Freight equipment to site.	1.00	LS						333,909						333,909
11.11.002	Assemble equipment at site	1.00	LS	1,600.0	64,795	8,465		7,969							81,229
11.11.003	Medium Clear & Grub Temp.Facilities	2.40	HA	168.0	6,630	2,692		2,917							12,239
11.11.004	Level & Compact Temp.Facility Area	2.40	HA	288.0	11,433	10,269		117,440							139,142
11.11.005	Install Temp.Utilities & Services	1.00	LS	2,800.0	110,163	10,524		188,959							309,646
11.11.006	Erect Offices & Workshops	1.00	LS	2,800.0	115,205	16,930		27,863							159,998
11.11.007	Office Furnishings	1.00	LS					83,477							83,477



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
11.11.008	Install Camp	1.00	LS						149,067						149,067
11.11.009	Erect Process Plant	1.00	LS	750.0	30,394	2,116		19,880							52,391
11.11.010	Erect Batch Plant	1.00	LS	1,500.0	60,789	4,232		21,872							86,894
11.11.011	Temporary Access Roads	1.00	LS	1,200.0	47,838	30,988		110,230							189,056
11.11.012	Fuel Storage Facility	1.00	LS	0.0	4,770			2,385							7,155

11 FIXED INDIRECT COSTS(MOBILIZE)				11,106.0	452,018	86,217		582,993	482,976						1,604,203
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WorkCode.01.00.01 12 VARIABLE INDIRECT COSTS

12.12.001	Maintain General Facilities	30.00	MON		17,888	10,733		7,155							35,776
12.12.002	Operating Expense	30.00	MON			115,197		60,260	293,363						468,820
12.12.003	On site staff Management	1.00	LS	4,944.0	8,005,783										8,005,783
12.12.004	Engineering Equip.& Supplies	1.00	LS					119,253							119,253
12.12.005	First Aid & Safety	1.00	LS			7,747		81,536							89,283
12.12.006	Site Photos	1.00	LS						7,155						7,155
12.12.007	Business Travel	30.00	MON						35,776						35,776
12.12.008	Warehouse Operation	1.00	LS	4,944.0	201,384	17,504		603,008	119,253						941,149
12.12.009	Equipment Shop	1.00	LS	10,000.0	397,685	79,968		169,568	300,000						947,221
12.12.010	Explosive Magazines	1.00	LS					5,963							5,963
12.12.011	Blasting Consultant	3.00	MON		24,720				22,351						47,071
12.12.012	Winter Work Costs	1.00	LS	1,400.0	55,953	43,880		187,058							286,891
12.12.013	Camp running cost	1.00	LS						2,566,331						2,566,331
12.12.014	Lube & Fuel	1.00	LS	2,000.0	77,394	22,288		68,863							168,545
12.12.015	Proj.Transport & Misc.Equipment	1.00	LS	3,715.0	143,759	332,802		416,458							893,019
12.12.016	Travel Expenses	1.00	LS						1,644,503						1,644,503
12.12.017	Misc.Overtime	1.00	LS		1,196,662										1,196,662
12.12.018	Equipment Balance	1.00	LS			596,267									596,267
12.12.019	H.O.Administration Fee	1.00	LS					1,740,000							1,740,000
12.12.020	Bonds	1.00	LS						950,000						950,000
12.12.021	Insurances	1.00	LS						1,200,000						1,200,000
12.12.022	Construction Water Treatment	1.00	LS						68,340						68,340



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
13.13.001	Contractors Profit	1.00	LS					11,000,000							11,000,000
12 VARIABLE INDIRECT COSTS				27,003.0	10,121,227	1,226,385		14,459,122	7,207,073						33,013,806
WorkCode.01.00.01 13 CONTINGENCY															
13.13.002	Civil Contingency	1.00	LS					12,000,000							12,000,000
13.13.003	Marine Contingency	1.00	LS					7,500,000							7,500,000
13 CONTINGENCY				2.00	LS			19,500,000							19,500,000
WorkCode.01.00.01 14 FIXED INDIRECT COSTS(DEMOBILIZE)															
14.11.001	Dismantle Offices & Workshops	1.00	LS	1,400.0	57,603	8,465		7,969							74,036
14.11.002	Dismantle & Remove Camp	1.00	LS						77,515						77,515
14.11.003	Dismantle Process Plant	1.00	LS	400.0	16,240	2,116		1,992							20,349
14.11.004	Dismantle Batch Plant	1.00	LS	800.0	32,480	4,232		3,984							40,697
14.11.005	Demob & Tidy Site	1.00	LS					23,851	11,925						35,776
14.11.006	Dismantle & Assemble equipment at site	1.00	LS	1,600.0	64,795	8,465		7,969							81,229
14.11.007	Freight equipment from site.	1.00	LS						333,909						333,909
14 FIXED INDIRECT COSTS(DEMOBILIZE)				7.00	LS	4,200.0	171,119	23,279	45,765	423,349					663,511
WorkCode.01.00.01 15 MARINE MOBILIZE/DEMOBILIZE															
15.11.100	Excavate & Grade Area Launching Site	1.00	LS	480.0	19,261	22,516		27,937							69,714
15.11.101	Place & Compact Granular Base	1.00	LS	360.0	14,382	14,225		89,242							117,849
15.11.102	Lay Launching Rails	1.00	LS	440.0	18,432	5,673		59,482							83,587
15.11.103	Install winches and anchor pads	1.00	LS	400.0	19,081	11,925		16,695							47,701
15.11.104	Supply of Marine Equipment	1.00	LS			1,180,608		113,970							1,294,577
15.11.105	Supply and Erect Covered Welding Workshop	1.00	LS						89,440						89,440
15.11.106	Erection of Flexifloats for crane platform	1.00	LS	320.0	12,986	2,837		2,512							18,334
15.11.107	Modify Flexifloats for Winch platforms	1.00	LS	1,040.0	42,348	5,673		5,024							53,045



KENNEY DAM 5 (WRF06) WATER RELEASE FACILITY AT KENNEY DAM 01 - COST SUMMARY

Standard Cost Summary

WorkSheet Number	Description	Quantity	Unit	Manhours	Labor	Equipment	Materials	Supplies	Subcontracts	(Not Used)	(Not Used)	(Not Used)	(Not Used)	(Not Used)	Total Cost
15.11.108	Modify Flexifloats for Plug Drill Platform	1.00	LS	240.0	9,693										9,693
15.11.109	Modify Flexifloats for crane platform	1.00	LS	320.0	12,986	2,837		2,512							18,334
15 MARINE MOBILIZE/DEMobilize		10.00	LS	3,600.0	149,167	1,246,295		317,373	89,440						1,802,275
Grand Total				248,878.5	19,221,906	4,541,509	12,982,196	38,763,258	31,585,571						107,094,440

