CIMFP Exhibit P-01023

2

NEWFOUNDLAND AND LABRADOR HYDRO

AN INVENTORY OF SMALL HYDRO SITES FOR ENERGY SUPPLY TO THE ISLAND GRID

VOLUME 2

SITE ANALYSES

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ALPHABETICAL INDEX OF SITE ANALYSES

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Morgan Brook	Site - 1	11P/10	2	117
Nameless River (near Paradise River)	Site - 1	01M/09	2	180
New Bay River (Point Leamington)	Site - 1	02E/06	3	389
Noel Paul's Brook	Site - 1	12A/09	3	413
North Brook (Deer Lake)	Site - 1	12H/04	4	631
North East Brook (East Bay)	Site - 1	01M/14	2	162
North West River (Great Gull River)	Site - 3	02D/11	3	294
Northern Arm River (Fourche Hr.)	Site - 1	12I/09	4	535
Northern Arm River (Fourche Hr.)	Site - 2	12I/09	4	538
Northwest Arm Brook (Connoire Bay)	Site - 1	11P/13	2	79
Northwest Arm Brook (Connoire Bay)	Site - 2	11P/13	2	83
Northwest Brook (Bay le Moine)	Site - 1	11O/09	2	68
Northwest Brook (Garia Bay)	Site - 1	11O/10	2	71
Northwest Gander	Site - 2	02D/11	3	297
Northwest Gander	Site - 1	02D/12	3	300
Northwest River (Clode Sound)	Site - 1	02D/08	2	148
Old Mans Brook	Site - 1A	12H/04	4	464
Otter Point Brook	Site - 1	12H/10	4	620
Pacquet Brook	Site - 1	02E/03	4	611
Paradise River	Site - 1	01M/09	2	176
Paradise River	Site - 2	01M/09	2	171
Parsons Pond	Site - 1A	12H/14	4	451
Parsons Pond (Gambo Pond)	Site - 1	02D/09	2	197
Phillips Brook	Site - 1	11O/16	2	74
Pipers Hole River	Site - 2	01M/16	2	183
Pipers Hole River	Site - 1	01M/16	2	191
Popes Harbour River	Site - 1	02C/05	2	200
Portland Creek	Site - 7	12I/03	4	448
Portland Creek	Site - 9	12I/03	4	547
Portland Creek	Site - 2	12I/03	4	435
Portland Creek	Site - 10	12I/03	4	550
Portland Creek	Site - 6	12I/03	4	443
Portland Creek	Site - 1	12I/03	4	433
Portland Creek	Site - 8	12I/03	4	540
Portland Creek	Site - 4	12I/03	4	544
Portland Creek	Site - 3	12I/03	4	440
Red Harbour River #1	Site - 1	01N/07	1	33
Red Harbour River #2	Site - 2	01M/06	1	41
Red Indian Brook (Grand Lake)	Site - 5	12A/12	3	342
River of Ponds	Site - 3	12I/05	4	494
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River of Ponds	Site - 1	12I/06	4	488
Robinsons River	Site - 1	12B/01	3	243
Rocky Brook (Gambo Pond)	Site - 1	02D/10	2	202
Rocky River	Site - 1	01N/04	1	28
Rose Blanche Brook	Site - 1	11O/10	2	65
Salmon River (Clode Sound)	Site - 1	02D/08	2	151
Salmon River (Main Brook)	Site - 1	12P/01	4	528
Salmon River (Pool's Cove)	Site - 1	01M/11	2	142
Salmonier Cove River	Site - 1	01M/12	2	139
Salmonier River (Pinsents Fall)	Site - 1.	01N/03	1	31

ALPHABETICAL INDEX OF SITE ANALYSES

River	Site Number	Map	Hydrological Region	Page Number
Sandy Brook via Diversion Lake	Site - 1	02D/13	3	397
Sandy Harbour River	Site - 1	01M/09	2	188
Sandy Harbour River	Site - 2	01M/16	2	194
Second Burnt Pond	Site - 1	02D/16	3	340
Shanadithit Brook	Site - 1	12A/11	3	374
Sheffield Lake	Site - 1	12H/07	4	614
Shoal Brook (Chimney Bay)	Site - 1A	12I/16	4	530
Shoal Harbour River	Site - 1	02D/01	2	153
South Brook	Site - 1	12H/08	3	324
South Brook (Baie Verte)	Site - 1	12H/16	4	608
Southeast River (Placentia)	Site - 1A	01N/04	1	16
Southwest Brook (Bloomfield)	Site - 1	02C/05	2	160
Southwest Brook (St.Georges Bay)	Site - 1	12A/05	3	223
Southwest Brook (St.Georges Bay)	Site - 5A	12B/08	3	239
Southwest Brook (St.Georges Bay)	Site - 4	12A/05	3	236
Southwest Brook (St.Georges Bay)	Site - 3	12A/05	3	231
Southwest Brook (St.Georges Bay)	Site - 2	12A/05	3	226
Southwest Brook (St.Georges Bay)	Site - 6	12B/09	3	284
Southwest Gander	Site - 1	02D/10	3	305
Southwest Gander (Dead Wolf Brook)	Site - 2	02D/10	3	302
Southwest River (Port Blandford)	Site - 1	02D/08	2	145
Spout River	Site - 1	01K/12	1	43
Squid Cove Brook	Site - 1	12I/15	4	513
Steady Brook	Site - 1	12A/13	4	472
Stony Brook	Site - 1	02D/13	3	401
Thomey Cove Brook	Site - 1	11P/16	2	127
Three Brooks	Site - 1	12B/08	3	429
Tommys River	Site - 1A	02E/05	3	330
Torrent River	Site - 4	12I/11	4	507
Torrent River	Site - 3	12I/11	4	505
Torrent River	Site - 2	12I/10	4	502
Torrent River	Site - 1A	12I/10	4	497
Victoria River	Site - 1	12A/10	3	416
West Arm Brook	Site - 1A	02E/05	3	335
White Bear River	Site - 2	11P/14	2	92
White Bear River	Site - 4	11P/14	2	98
White Bear River	Site - 1	11P/14	2	89
White Bear River	Site - 3	11P/14	2	95
White Bear River	Site - 5	11P/14	2	100
White Hills	Site - 1	01M/16	2	205
Whites River (Upper Humber)	Site - 2X	12H/06	4	591
Whites River (Upper Humber)	Site - 1	12H/06	4	588

2.2 LIST OF SITE ANALYSES BY HYDROLOGIC REGION

River	Site Number	Map	Hydrological Region	Page Number
Little Harbour River	Site - 1	01N/03	1	9
Colinet River	Site - 1	01N/04	1	14
Southeast River (Placentia)	Site - 1A	01N/04	1	16
Gisborne Lake	Site - 1	01M/15	1	20
Back River (Salmonier)	Site - 1	01N/03	1	24
Rocky River	Site - 1	01N/04	1	28
Salmonier River (Pinsents Fall)	Site - 1	01N/03	1	31
Red Harbour River #1	Site - 1	01N/07	1	33
Devil Brook	Site - 1A	01M/06	1	36
Red Harbour River #2	Site - 2	01M/06	1	41
Spout River	Site - 1	01K/12	1	43
Chance Cove Brook	Site - 1	01K/14	1	47
Isle aux Morts River	Site - 1	110/10	2	53
Isle aux Morts River	Site - 2	110/10	2	56
Isle aux Morts River	Site - 3	110/11	2	59
Grandys Brook (Burnt Island)	Site - 1	110/15	2	62
Rose Blanche Brook	Site - 1	110/10	2	65
Northwest Brook (Bay le Moine)	Site - 1	110/09	2	68
Northwest Brook (Garia Bay)	Site - 1	110/10	2	71
Phillips Brook	Site - 1	110/16	2	74
Cinq Cert Brook	Site - 1	110/16	2	76
Northwest Arm Brook (Connoire Bay)	Site - 1	11P/13	2	79
Northwest Arm Brook (Connoire Bay)	Site - 2	11P/13	2	83
Kings Harbour River	Site - 2	11P/12	2	86
White Bear River	Site - 1	11P/14	2	89
White Bear River	Site - 2	11P/14	2	92
White Bear River	Site - 3	11P/14	2	95
White Bear River	Site - 4	11P/14	2	98
White Bear River	Site - 5	11P/14	2	100
Bay de Vieux Brook	Site - 1	11P/11	2	102
Grey River	Site - 1	11P/11	2	105
Grey River	Site - 2	11P/15	2	108
Dollard Brook	Site - 1	11P/15	2	111
Dollard Brook	Site - 2	11P/10	2	114
Morgan Brook	Site - 1	11P/10	2	117
Bottom Brook	Site - 1	11P/16	2	119
D'Espoir Brook	Site - 1	11P/16	2	123
Thomey Cove Brook	Site - 1	11P/16	2	127
Conne River	Site - 1	01M/13	2	130
Conne River	Site - 2	02D/04	2	133
Little River	Site - 1	01M/13	2	136
Salmonier Cove River	Site - 1	01M/12	2	139
Salmon River (Fool's Cove)	Site - 1	01M/11	2	142
Southwest River (Fort Blanford)	Site - 1	02D/08	2	145
Northwest River (Clode Sound)	Site - 1	02D/08	2	148
Salmon River (Clode Sound)	Site - 1	02D/08	2	151
Shoal Harbour River	Site - 1	02D/01	2	153
Macoles Lake	Site - 1	02D/09	2	155
Southwest Brook (Bloomfield)	Site - 1	02C/05	2	160
North East Brook (East Bay)	Site - 1	01M/14	2	162
Kane Brook	Site - 1	01M/15	2	165
Long Harbour River (Fortune Bay)	Site - 1	01M/15	2	168
Paradise River	Site - 2	01M/09	2	171

2.2 LIST OF SITE ANALYSES BY HYDROLOGIC REGION (Cont'd)

River	Site Number	Map	Hydrological Region	Page Number
Paradise River	Site - 1	01M/09	2	176
Nameless River (near Paradise River)	Site - 1	01M/09	2	180
Pipers Hole River	Site - 2	01M/16	2	183
Black River	Site - 1	01M/16	2	185
Sandy Harbour River	Site - 1	01M/09	2	188
Pipers Hole River	Site - 1	01M/16	2	191
Sandy Harbour River	Site - 2	01M/16	2	194
Parsons Pond (Gambo Pond)	Site - 1	02D/09	2	197
Popes Harbour River	Site - 1	02C/05	2	200
Rocky Brook (Gambo Pond)	Site - 1	02D/10	2	202
White Hills	Site - 1	01M/16	2	205
Middle Brook	Site - 1	02D/16	2	208
Great Gull River	Site - 1	02D/11	2	210
Harry's River	Site - 1	12B/16	3	216
Bottom Brook	Site - 1A	12A/12	3	218
Southwest Brook (St.Georges Bay)	Site - 1	12A/05	3	223
Southwest Brook (St.Georges Bay)	Site - 2	12A/05	3	226
Southwest Brook (St.Georges Bay)	Site - 3	12A/05	3	231
Southwest Brook (St.Georges Bay)	Site - 4	12A/05	3	236
Southwest Brook (St.Georges Bay)	Site - 5A	12B/08	3	239
Barachois Brook	Site - 1	12B/02	3	241
Robinsons River	Site - 1	12B/01	3	243
Fischells Brook	Site - 1	12B/07	3	245
Little Barachois Brook	Site - 2	12A/05	3	247
Little Barachois Brook	Site - 1	12B/08	3	250
Crabbes River	Site - 1	12B/02	3	253
Crabbes River	Site - 2	12B/02	3	256
Crabbes River	Site - 3A	12B/02	3	259
Crabbes River	Site - 4A	12B/02	3	264
Crabbes River	Site - 5	12B/02	3	268
Grand Codroy River	Site - 1	110/15	3	271
Grand Codroy River	Site - 2	110/15	3	274
Grand Codroy River	Site - 3	110/15	3	277
Grand Codroy River	Site - 4	12B/02	3	279
Grand Bay River	Site - 1	110/11	3	281
Southwest Brook (St.Georges Bay)	Site - 6	12B/09	3	284
Bottom Brook	Site - 2	12B/09	3	287
Mint Brook	Site - 1	02D/09	3	289
Eel Brook	Site - 1	02E/03	3	291
North West River (Great Gull River)	Site - 3	02D/11	3	294
Northwest Gander	Site - 2	02D/11	3	297
Northwest Gander	Site - 1	02D/12	3	300
Southwest Gander (Dead Wolf Brook)	Site - 2	02D/10	3	302
Southwest Gander	Site - 1	02D/10	3	305
Grand Lake	Site - 3	12B/09	3	308
Lewaseechjeech Brook	Site - 1A	12A/12	3	311
Lewaseechjeech Brook	Site - 2	12A/12	3	316
Lewaseechjeech Brook	Site - 3	12A/12	3	319
Indian Bay Brook	Site - 1	02F/04	3	322
South Brook	Site - 1	12H/08	3	324
Barneys Brook	Site - 1	12H/08	3	327
Tommys River	Site - 1A	02E/05	3	330
West Arm Brook	Site - 1A	02E/05	3	335

2.2 LIST OF SITE ANALYSES BY HYDROLOGIC REGION (Cont'd)

River	Site Number	Map	Hydrological Region	Page Number
Second Burnt Pond	Site - 1	02D/16	3	340
Red Indian Brook (Grand Lake)	Site - 5	12A/12	3	342
Grand Lake	Site - 4	12A/12	3	345
Grand Lake (Conners Brook)	Site - 6	12A/13	3	348
Grand Lake (Little Pond Brook)	Site - 7	12A/14	3	351
Lloyds River	Site - 1	12B/01	3	354
Lloyds River	Site - 2	12A/04	3	356
Lloyds River	Site - 3	12A/05	3	359
Lloyds River (Portage Lake)	Site - 4A	12A/06	3	363
Lloyds River	Site - 5A	12A/06	3	368
Lloyds River (Otter Brook)	Site - 6	12A/06	3	371
Shanadithit Brook	Site - 1	12A/11	3	374
Mary March's Brook	Site - 1	12A/16	3	377
Clench Brook	Site - 1	12A/15	3	380
Buchans Brook	Site - 1	12A/15	3	383
Crabbes River	Site - 6A	12B/02	3	386
New Bay River (Point Leamington)	Site - 1	02E/06	3	389
Harry's River (North Brook)	Site - 2	12E/09	3	393
Sandy Brook via Diversion Lake	Site - 1	02D/13	3	397
Stony Brook	Site - 1	02D/13	3	401
Great Rattling Brook	Site - 1	02D/13	3	404
Great Rattling Brook	Site - 2	02D/13	3	407
Little Rattling Brook	Site - 1	02D/13	3	410
Noel Paul's Brook	Site - 1	12A/09	3	413
Victoria River	Site - 1	12A/10	3	416
Exploits River at Exploits Dam	Site - 1	12A/15	3	419
Kings Harbour River	Site - 3	11P/13	3	423
Three Brooks	Site - 1	12B/08	3	429
Portland Creek	Site - 1	12I/03	4	433
Portland Creek	Site - 2	12I/03	4	435
Portland Creek	Site - 3	12I/03	4	440
Portland Creek	Site - 6	12I/03	4	443
Portland Creek	Site - 7	12I/03	4	448
Parsons Pond	Site - 1A	12H/14	4	451
Lomond River	Site - 1	12H/05	4	456
Goose Arm Brook	Site - 1	12H/04	4	459
Old Mans Brook	Site - 1A	12H/04	4	464
Hughes Brook	Site - 1	12H/04	4	469
Steady Brook	Site - 1	12A/13	4	472
Cooks Brook	Site - 1	12B/16	4	475
Fox Island River	Site - 1	12B/10	4	478
Harry's River	Site - 4	12B/09	4	480
Harry's River	Site - 5	12B/09	4	485
River of Ponds	Site - 1	12I/06	4	488
River of Ponds	Site - 2	12I/05	4	491
River of Ponds	Site - 3	12I/05	4	494
Torrent River	Site - 1A	12I/10	4	497
Torrent River	Site - 2	12I/10	4	502
Torrent River	Site - 3	12I/11	4	505
Torrent River	Site - 4	12I/11	4	507
East River	Site - 1	12I/11	4	510
Squid Cove Brook	Site - 1	12I/15	4	513
Castors River	Site - 1	12I/15	4	516

2.2 LIST OF SITE ANALYSES BY HYDROLOGIC REGION (Cont'd)

River	Site Number	Map	Hydrological Region	Page Number
Castors River	Site - 2	12I/15	4	519
Castors River	Site - 3	12I/15	4	522
Castors River	Site - 4X	12I/15	4	524
Salmon River (Main Brook)	Site - 1	12P/01	4	528
Shoal Brook (Chimney Bay)	Site - 1A	12I/16	4	530
Northern Arm River (Fourche Hr.)	Site - 1	12I/09	4	535
Northern Arm River (Fourche Hr.)	Site - 2	12I/09	4	538
Portland Creek	Site - 8	12I/03	4	540
Portland Creek	Site - 4	12I/03	4	544
Portland Creek	Site - 9	12I/03	4	547
Portland Creek	Site - 10	12I/03	4	550
Cascade River	Site - 1	12I/07	4	554
Little Harbour Deep River	Site - 1	12I/07	4	557
Little Harbour Deep River	Site - 2	12I/07	4	559
Little Harbour Deep River	Site - 3	12I/07	4	562
Little Harbour Deep River	Site - 4	12I/07	4	564
Little Harbour Deep River	Site - 5	12I/07	4	566
Little Cat Arm River	Site - 1	12I/02	4	569
Great Cat Arm River	Site - 1	12I/02	4	571
Great Cat Arm River	Site - 2	12I/02	4	574
Little Coney Arm River	Site - 1	12H/15	4	576
Great Coney Arm River	Site - 2	12H/15	4	579
Great Coney Arm River	Site - 1	12H/15	4	582
Great Coney Arm River	Site - 3	12H/15	4	585
Whites River (Upper Humber)	Site - 1	12H/06	4	588
Whites River (Upper Humber)	Site - 2X	12H/06	4	591
Adies Pond (Upper Humber)	Site - 1	12H/06	4	595
Grand Lake	Site - 1	12A/13	4	599
Grand Lake	Site - 2	12B/09	4	602
Middle Arm Brook (White Bay)	Site - 1	12H/16	4	605
South Brook (Baie Verte)	Site - 1	12H/16	4	608
Pacquet Brook	Site - 1	02E/03	4	611
Sheffield Lake	Site - 1	12H/07	4	614
Little Chouse Brook	Site - 1	12H/10	4	617
Otter Point Brook	Site - 1	12H/10	4	620
Middle Arm Brook (White Bay)	Site - 2	12H/16	4	622
Middle Arm Brook (White Bay)	Site - 3	12H/16	4	625
Gull Pond (White Bay)	Site - 1	12H/16	4	628
North Brook (Deer Lake)	Site - 1	12H/04	4	631
East Arm Brook (Hooping Harbour)	Site - 1	12I/09	4	634
Little Harbour Deep River	Site - 6	12I/02	4	638
River of Ponds	Site - 3X	12I/05	4	641

1. INTRODUCTION

1.1 Introductory Notes

The results of all site analyses undertaken during this study are compiled in Volume II. Each site analysis comprises, data sheets, cost analyses and, in the case of schemes having benefit/cost ratios greater than 1.0, a site map showing a schematic layout of the development. Potential environmental problems, other observations or suggestions; as well as, notes on use of non-standard unit costs or design features are recorded in the "Remarks" section of plant data sheets. In essence, the compiltation on each scheme may be regarded as a minature engineering report.

Since standard unit costs, and economic parameters apply to most sites, these data are summarized in Table 2.1, at the start of Section 2, so as to avoid repetition. Where different parameter values have been used, this fact was noted on plant data sheets.

Sites analyses are compiled by hydrologic region and file number, which roughly corresponds to the order in which the analyses were carried out. An alphabetical listing (page ii) is also provided to facilitate use of this document.

1.2 Summary of Results

Tables 3.1 and 3.2 from the Volume I are included at the end of Section 1, in order to provide a convenient summary of the findings of the study.

As previously noted in Part 3, Volume I, the benefit/cost ratios only provide a relative ranking of the viability of each site

1.2 Summary of Results (Cont'd)

and should not be assumed to represent actual values under current economic conditions. Nonetheless the following qualitative interpretations of the benefit/cost ratios can be made:

B/C $\geq$ 2.8 very attractive, probably feasible under current economic conditions

B/C 2.2 - 2.8 relatively attractive possibly feasible under present day conditions

B/C 1.00-2.2 eventually feasible

B/C < 1.0 unlikely to be feasible

TABLE 3.1

LIST OF POTENTIALLY FEASIBLE SMALL HYDRO SCHEMES

Rank	River	Site No	Location Latitude	Location Longitude	D.A. (sq. km)	Head (m)	Qav (cu.m/s)	Capacity MW	Energy GWh	Cost $(million)	Benfit \ Cost
1	Great Coney Arm River	1	49 53 18	56 50 15	83.0	153.0	3.16	5.9	25.5	$4.86	4.20
2	Lewaseechjeech Brook *	3	48 34 15	57 48 20	58.0	200.0	2.02	4.9	28.8	$6.76	3.41
3	Parsons Pond	1A	49 56 15	57 29 30	84.0	282.0	2.80	9.6	46.2	$11.48	3.22
4	Steady Brook	1	48 57 05	57 49 15	72.0	182.9	2.51	5.6	24.2	$6.03	3.22
5	Great Cat Arm River	1	50 08 15	56 45 40	55.0	198.0	2.09	5.1	21.8	$5.51	3.17
6	Kings Harbour River	3	47 39 35	57 32 00	214.0	137.0	9.16	15.3	69.8	$18.21	3.07
7	Northwest Brook (Garia Bay)	1	47 42 43	58 35 17	108.0	137.2	6.16	10.3	47.0	$12.93	2.91
8	Northwest Arm Brook (Connoire Bay)	2	47 45 30	57 54 45	222.0	61.0	11.26	8.4	38.2	$11.06	2.76
9	Castors River	2	50 52 15	56 46 30	82.0	114.0	3.25	4.5	20.6	$6.12	2.69
10	Grand Lake	3	48 39 45	58 02 45	44.0	159.0	1.81	3.5	17.6	$5.39	2.62
11	Torrent River	4	50 36 50	57 08 15	615.0	25.0	24.37	7.4	34.8	$10.74	2.59
12	Gisborne Lake	1	47 48 00	54 55 45	158.0	160.0	5.51	10.8	62.9	$19.53	2.57
13	Paradise River	1	47 36 40	54 26 15	490.0	37.0	18.63	8.4	38.3	$12.08	2.54
14	Black River	1	47 54 10	54 10 00	155.0	45.0	5.89	3.2	14.7	$4.66	2.53
15	Red Indian Brook (Grand Lake)	5	48 44 25	57 39 55	170.0	234.0	6.20	17.7	80.7	$25.56	2.53
16	Eel Brook	1	49 06 00	55 13 00	80.0	90.0	1.65	1.8	9.8	$3.22	2.45
17	Lloyds River	5A	48 26 00	57 27 15	1020.0	38.0	37.18	17.3	82.6	$27.30	2.42
18	Rose Blanche Brook	1	47 39 15	58 43 30	56.0	91.4	3.19	3.6	16.2	$5.68	2.29
19	Castors River	4X	50 54 45	56 52 30	483.0	37.0	17.60	8.0	34.4	$12.29	2.24
20	Gull Pond (White Bay)	1	49 49 30	56 24 30	76.0	122.0	1.93	2.9	12.4	$4.48	2.22
21	Lloyds River (Portage Lake)	4A	48 25 30	57 27 45	181.0	92.0	6.14	6.9	34.6	$12.57	2.20
22	D'Espoir Brook	1	47 53 45	56 11 30	278.0	77.4	11.46	10.8	49.3	$17.93	2.20
23	Portland Creek	2	50 05 45	57 21 00	65.0	400.8	2.36	11.5	52.6	$20.32	2.07
24	Little Coney Arm River	1	49 57 42	56 47 30	21.0	198.0	0.73	1.8	7.6	$2.95	2.07
25	Bottom Brook	1	47 47 55	56 19 50	175.0	107.0	6.66	8.7	39.6	$15.41	2.06
26	Grand Lake	1	48 50 42	57 41 55	40.0	173.0	1.60	3.4	14.6	$5.68	2.06
27	Crabbes River	1	48 00 10	58 37 30	80.0	106.7	5.58	7.3	33.1	$13.03	2.03
28	Torrent River	1A	50 38 55	56 53 50	218.0	79.3	9.50	9.2	41.4	$16.29	2.03
29	Cinq Cerf Brook	1	47 48 50	58 05 30	88.0	144.8	4.18	7.4	33.7	$13.35	2.02
30	Kings Harbour River	2	47 39 20	57 34 40	118.0	76.2	4.86	4.5	20.6	$8.24	2.00
31	Portland Creek	7	50 11 08	57 27 45	407.0	61.0	12.26	9.1	43.7	$17.52	2.00
32	Crabbes River	4A	48 04 30	58 39 25	258.0	45.7	18.60	10.4	47.3	$19.00	1.99
33	Northwest River (Clode Sound)	1	48 25 00	54 16 00	570.0	30.0	16.50	6.0	29.3	$11.81	1.98
34	White Bear River	2	47 51 45	57 16 50	99.0	125.0	4.39	6.7	30.5	$12.36	1.98
35	Little Barachois Brook	1	48 25 50	58 03 35	18.0	198.1	0.66	1.6	7.6	$3.10	1.97
36	South Brook	1	49 16 15	56 08 15	370.0	30.0	7.62	2.8	12.7	$5.20	1.96
37	Northern Arm River (Fourche Hr.)	1	50 32 13	56 22 30	160.0	168.0	6.34	13.0	56.2	$23.00	1.95
38	Great Rattling Brook *	1	48 55 45	55 31 30	1260.0	15.3	29.96	5.6	25.5	$10.47	1.95
39	Shanadithit Brook	1	48 40 00	57 10 15	250.0	61.0	8.56	6.4	29.0	$12.06	1.93
40	Grand Lake (Conners Brook)	6	48 49 15	57 33 15	74.0	158.0	2.58	5.0	22.7	$9.53	1.90
41	Pipers Hole River	1	47 56 00	54 17 30	768.0	30.0	26.78	9.8	44.7	$18.98	1.88
42	Lloyds River (Otter Brook)	6	48 29 15	57 20 15	48.0	113.0	1.60	2.2	11.1	$4.71	1.88
43	Maccles Lake	1	48 38 30	54 03 30	202.0	55.0	5.60	3.8	21.5	$9.16	1.88
44	Paradise River	2	47 39 20	54 28 20	460.0	30.0	17.49	6.4	29.2	$12.45	1.87
45	Three Brooks	1	48 22 00	58 21 30	71.0	107.0	3.04	4.0	18.1	$7.75	1.87
46	Whites River (Upper Humber)	2X	49 27 30	57 18 15	255.0	90.0	10.90	12.0	51.8	$22.17	1.87
47	Barneys Brook	1	49 21 45	56 11 00	274.0	45.0	6.94	3.8	17.4	$7.46	1.86
48	Shoal Brook (Chimney Bay)	1A	50 54 45	56 16 05	197.0	61.0	7.49	5.6	24.1	$10.56	1.83
49	Grand Lake (Little Pond Brook)	7	48 58 01	57 20 15	64.0	158.0	2.13	4.1	18.7	$8.22	1.82
50	Crabbes River	2	48 03 35	58 36 40	53.0	137.2	4.03	6.8	30.8	$13.68	1.80

* Possible environmental problems.

TABLE 3.1

LIST OF POTENTIALLY FEASIBLE SMALL HYDRO SCHEMES (Cont'd)

Rank	River	Site No	Location Latitude	Location Longitude	D.A. (sq. km)	Head (m)	Qav (cu.m/s)	Capacity MW	Energy GWh	Cost $(million)	Benfit \ Cost
51	Torrent River	2	50 39 40	56 57 15	46.0	137.0	2.04	3.4	14.5	$6.49	1.79
52	Hughes Brook	1	49 03 50	57 48 50	41.0	106.7	1.43	1.9	9.6	$4.30	1.79
53	Southwest Brook (St.Georges Bay)	4	48 27 40	57 59 20	69.0	84.0	2.41	2.5	11.3	$5.05	1.78
54	Great Coney Arm River	3	49 50 40	56 51 42	18.0	153.0	0.60	1.1	4.8	$2.18	1.78
55	Cascade River	1	50 23 40	56 32 10	178.0	76.2	7.34	6.8	29.5	$13.30	1.77
56	Spout River	1	47 00 45	52 58 30	85.0	76.0	3.77	3.5	15.9	$7.28	1.75
57	Crabbes River	3A	48 03 20	58 30 50	142.0	76.2	10.38	9.7	44.0	$20.21	1.74
58	Middle Arm Brook (White Bay)	3	49 48 05	56 20 50	222.0	33.0	5.63	2.3	11.4	$5.28	1.73
59	Noel Paul's Brook *	1	48 45 00	56 16 30	961.0	21.0	25.89	6.6	30.2	$14.36	1.68
60	Little Rattling Brook	1	48 55 30	55 37 45	112.0	52.0	2.49	1.6	7.2	$3.43	1.68
61	Northwest Brook (Bay le Moine)	1	47 40 40	58 06 40	46.0	106.7	2.19	2.9	13.0	$6.22	1.67
62	Adies Pond (Upper Humber)	1	49 21 00	57 14 15	466.0	42.0	19.94	10.2	50.2	$24.01	1.67
63	Long Harbour River (Fortune Bay) *	1	47 54 45	54 55 30	630.0	46.0	21.97	12.3	56.2	$27.11	1.66
64	Southwest River (Port Blandford)	1	48 17 00	54 13 00	415.0	53.3	12.50	8.1	37.1	$17.90	1.66
65	Southeast River (Placentia) *	1A	47 14 00	53 53 35	135.0	53.0	4.92	3.2	14.5	$7.12	1.63
66	Sheffield Lake	1	49 20 00	56 38 45	340.0	45.0	10.23	5.6	30.5	$15.01	1.63
67	Grand Lake	4	48 40 00	57 49 15	73.0	127.0	2.66	4.1	18.8	$9.24	1.63
68	Great Coney Arm River	2	49 53 20	56 49 15	86.0	61.0	3.27	2.4	10.5	$5.21	1.62
69	White Bear River	1	47 53 25	57 17 15	96.0	97.5	4.26	5.1	23.1	$11.44	1.62
70	Victoria River	1	48 43 30	56 41 07	782.0	37.0	23.55	10.6	48.5	$24.09	1.61
71	Back River (Salmonier)	1	47 12 30	53 21 50	65.0	38.0	2.47	1.1	5.2	$2.61	1.60
72	Rocky River *	1	47 13 25	53 33 30	296.0	16.7	11.25	2.3	10.6	$5.32	1.60
73	Little Harbour River	1	47 07 55	53 28 00	220.0	46.0	7.67	4.3	19.6	$9.96	1.58
74	White Hills	1	47 53 00	54 15 00	36.0	91.0	1.26	1.4	6.4	$3.24	1.58
75	Clench Brook	1	48 46 20	56 52 15	107.0	61.0	3.31	2.5	11.2	$5.73	1.57
76	Grey River *	1	47 41 15	57 00 15	1387.0	30.5	52.76	19.6	89.5	$45.88	1.56
77	Portland Creek	10	50 05 35	57 21 10	124.0	152.0	4.52	8.4	36.3	$18.75	1.55
78	Dolland Brook	2	47 44 15	56 36 10	688.0	46.0	26.17	14.7	67.0	$34.84	1.54
79	Lloyds River	3	48 18 45	57 39 00	690.0	30.5	27.34	10.2	46.4	$24.29	1.53
80	Conne River	2	48 18 50	55 34 55	216.0	30.5	7.53	2.8	12.8	$6.71	1.52
81	West Arm Brook	1A	49 16 15	55 31 45	285.0	60.0	4.97	3.6	16.6	$8.73	1.52
82	Crabbes River	6A	48 07 35	58 43 25	470.0	30.5	31.70	11.8	53.8	$28.36	1.52
83	Nameless River (near Paradise River)	1	47 35 30	54 27 00	203.0	45.0	7.70	4.2	19.3	$10.21	1.51
84	Old Mans Brook	1A	49 07 15	57 55 00	139.0	85.3	5.07	5.3	22.8	$12.10	1.51
85	Salmonier Cove River	1	47 41 25	55 44 15	69.0	107.0	2.30	3.0	13.7	$7.36	1.49
86	Dolland Brook	1	47 46 55	56 37 30	526.0	46.0	20.01	11.2	51.2	$27.67	1.48
87	Little River	1	47 52 10	55 40 20	175.0	61.0	6.66	4.9	22.6	$12.30	1.47
88	Grey River	2	47 49 10	56 57 55	972.0	30.5	36.97	13.8	62.7	$34.18	1.47
89	New Bay River (Point Leamington)	1	49 19 15	55 24 00	188.0	46.0	3.28	1.8	9.9	$5.42	1.46
90	Castors River	1	50 54 30	56 45 30	44.0	92.0	1.67	1.9	8.1	$4.44	1.46
91	Grand Codroy River	1	47 55 45	58 50 00	66.0	61.0	5.02	3.7	17.0	$9.36	1.46
92	Middle Arm Brook (White Bay)	1	49 50 40	56 25 20	343.0	45.0	8.69	4.8	20.6	$11.39	1.45
93	Whites River (Upper Humber)	1	49 28 30	57 18 45	245.0	61.0	10.48	7.8	33.7	$18.77	1.44
94	Squid Cove Brook	1	50 53 30	56 56 45	21.4	213.0	0.75	2.0	8.4	$4.70	1.43
95	Lewaseechjeech Brook *	2	48 34 40	57 39 55	150.0	76.0	4.99	4.6	21.1	$11.78	1.43
96	Lomond River *	1	49 21 30	57 37 45	163.0	30.5	6.72	2.5	10.8	$6.09	1.42
97	Exploits River at Exploits Dam	1	48 45 45	56 36 00	4823.0	7.0	138.00	1.0	5.8	$3.28	1.41
98	Mary March's Brook *	1	48 54 30	56 27 15	450.0	21.0	12.13	3.1	17.8	$10.10	1.41
99	Middle Arm Brook (White Bay)	2	49 49 20	56 23 00	240.0	53.0	6.09	3.9	17.0	$9.72	1.40
100	Goose Arm Brook	1	49 14 05	57 43 45	61.0	76.0	2.32	2.2	9.3	$5.33	1.40

* Possible environmental problems.

TABLE 3.1

LIST OF POTENTIALLY FEASIBLE SMALL HYDRO SCHEMES (Cont'd)

Rank	River	Site No	Location Latitude	Location Longitude	D.A. (sq. km)	Head (m)	Qav (cu.m/s)	Capacity MW	Energy GWh	Cost $(million)	Benfit \ Cost
101	Southwest Brook (St.Georges Bay)	6	48 30 30	58 12 00	482.0	50.0	16.80	10.3	46.7	$26.92	1.39
102	Isle aux Morts River	2	47 38 47	59 00 00	74.0	30.5	5.28	2.0	9.0	$5.16	1.39
103	Sandy Harbour River	2	47 48 15	54 27 20	67.0	45.0	2.54	1.4	6.4	$3.67	1.38
104	Lloyds River	2	48 13 55	57 50 55	500.0	15.2	23.78	4.4	22.2	$12.81	1.38
105	Conne River *	1	47 55 40	55 40 35	604.0	30.5	21.06	7.8	35.7	$20.69	1.38
106	Isle aux Morts River	1	47 43 00	59 00 00	33.0	45.7	2.51	1.4	7.5	$4.37	1.38
107	Portland Creek	3	50 03 40	57 20 25	71.0	152.0	2.48	4.6	21.0	$12.22	1.37
108	Stony Brook	1	48 55 25	55 40 15	186.0	32.0	4.13	1.6	7.4	$4.31	1.36
109	Southwest Gander *	1	48 42 00	54 59 00	560.0	30.5	14.20	5.3	24.1	$14.13	1.36
110	Southwest Brook (St.Georges Bay)	1	48 28 00	57 51 55	29.0	99.0	1.06	1.3	6.2	$3.66	1.36
111	Grand Codroy River	2	47 56 40	58 56 35	45.0	45.7	3.14	1.8	8.0	$4.74	1.35
112	Grand Bay River	1	47 38 10	59 08 30	46.0	61.0	2.33	1.7	7.9	$4.74	1.33
113	Little Harbour Deep River	5	50 15 28	56 40 15	409.0	46.0	16.85	9.5	40.9	$24.57	1.33
114	Thomey Cove Brook	1	47 52 28	56 10 10	34.0	107.0	1.35	1.8	8.0	$4.87	1.32
115	Grandys Brook (Burnt Island)	1	47 47 10	58 50 00	143.0	30.5	10.88	4.1	18.5	$11.19	1.32
116	East Arm Brook (Hooping Harbour)	1	50 37 55	56 12 45	174.0	110.0	6.07	8.2	35.2	$21.50	1.31
117	Harry's River	4	48 41 45	58 14 30	510.0	21.0	21.00	5.4	24.5	$15.04	1.30
118	Great Rattling Brook	2	48 58 00	55 32 45	1470.0	32.0	34.90	13.6	62.1	$38.11	1.30
119	Crabbes River	5	48 04 30	58 39 25	162.0	30.5	11.30	4.2	19.2	$11.87	1.29
120	Sandy Harbour River	1	47 43 20	54 23 00	426.0	30.0	16.20	5.9	27.0	$16.76	1.29
121	Harry's River	5	48 37 15	58 17 45	550.0	23.0	22.60	6.3	28.9	$17.93	1.29
122	Sandy Brook via Diversion Lake	1	48 51 15	55 50 50	290.0	30.0	6.90	2.5	13.1	$8.19	1.28
123	River of Ponds	2	50 28 15	57 00 20	92.0	61.0	3.79	2.8	12.2	$7.74	1.26
124	Devil Brook	1A	47 17 00	55 17 30	82.0	83.0	3.25	3.3	15.0	$9.56	1.26
125	River of Ponds	1	50 25 45	57 03 55	100.0	61.0	4.12	3.1	13.8	$8.80	1.26
126	East River	1	50 39 15	57 07 05	123.0	46.0	4.48	2.5	10.9	$6.94	1.25
127	Northwest Arm Brook (Connoire Bay)	1	47 45 00	57 54 50	74.0	61.0	3.52	2.6	11.9	$7.64	1.25
128	Lewaseechjeech Brook *	1A	48 33 15	57 42 15	166.0	46.0	5.75	3.2	15.1	$9.67	1.25
129	Northwest Gander *	2	48 35 30	55 27 00	1000.0	30.5	25.40	9.5	43.1	$27.68	1.25
130	Portland Creek	4	50 07 15	57 21 30	36.0	266.0	1.31	4.3	18.4	$12.04	1.22
131	Little Harbour Deep River	6	50 14 30	56 34 30	462.0	30.3	19.00	7.1	30.6	$20.06	1.22
132	South Brook (Baie Verte)	1	49 57 00	56 08 18	86.0	61.0	1.77	1.3	5.7	$3.76	1.21
133	Bay de Vieux Brook	1	47 42 30	57 11 10	43.0	152.0	1.63	3.0	17.5	$11.55	1.21
134	Buchans Brook	1	48 49 10	56 47 40	104.0	31.0	3.21	1.2	5.5	$3.67	1.21
135	Grand Lake	2	48 40 48	58 06 58	88.0	61.0	3.77	2.8	12.1	$8.05	1.21
136	North Brook (Deer Lake)	1	49 10 30	57 33 55	49.0	76.0	1.63	1.5	6.5	$4.39	1.19
137	Southwest Brook (St.Georges Bay)	3	48 27 00	57 58 30	64.0	69.0	2.23	1.9	9.1	$6.13	1.19
138	Little Harbour Deep River	2	50 17 15	56 42 50	205.0	76.0	8.77	8.1	35.2	$23.71	1.19
139	North East Brook (East Bay)	1	47 45 05	55 19 50	125.0	76.2	4.56	4.2	21.6	$14.62	1.18
140	Cooks Brook	1	48 58 15	58 04 00	95.0	27.4	3.61	1.2	5.2	$3.55	1.18
141	Red Harbour River #1	1	47 18 30	55 00 00	49.0	91.0	1.78	2.0	9.0	$6.13	1.18
142	Salmon River (Pool's Cove)	1	47 42 30	55 29 35	178.0	30.5	6.21	2.3	11.9	$8.17	1.16
143	White Bear River	3	47 55 15	57 17 05	440.0	46.0	19.53	11.0	50.0	$34.82	1.15
144	Rocky Brook (Gambo Pond)	1	48 35 45	54 33 15	60.0	122.0	1.67	2.5	11.3	$8.05	1.13
145	Pacquet Brook	1	49 56 10	55 54 00	102.0	67.0	1.77	1.4	6.3	$4.55	1.11
146	Little Chouse Brook	1	49 37 45	56 46 00	38.0	105.0	1.02	1.3	5.7	$4.07	1.11
147	Southwest Gander (Dead Wolf Brook)	2	48 42 00	54 57 00	192.0	30.0	5.00	1.8	8.3	$6.03	1.11
148	Tommys River	1A	49 25 45	55 55 00	370.0	30.0	7.39	2.7	12.3	$8.92	1.11
149	Kane Brook	1	47 50 15	54 56 20	148.0	46.0	5.16	2.9	13.2	$9.69	1.09
150	Little Barachois Brook	2	48 25 30	58 00 00	118.0	30.5	4.30	1.6	7.3	$5.37	1.09

* Possible environmental problems.

TABLE 3.1

LIST OF POTENTIALLY FEASIBLE SMALL HYDRO SCHEMES (Cont'd)

Rank	River	Site No	Location Latitude	Location Longitude	D.A. (sq. km)	Head (m)	Qav (cu.m/s)	Capacity MW	Energy GWh	Cost $(million)	Benfit \ Cost
151	Portland Creek	6	50 13 55	57 15 15	78.0	91.4	2.35	2.6	11.3	$8.38	1.08
152	Parsons Pond (Gambo Pond)	1	48 39 00	54 21 00	88.0	46.0	2.37	1.3	6.1	$4.50	1.08
153	North West River (Great Gull River)	3	48 34 00	55 21 00	350.0	30.0	8.90	3.3	14.9	$11.19	1.06
154	Southwest Brook (St.Georges Bay)	2	48 28 10	57 52 10	315.0	27.4	10.98	3.7	16.7	$12.67	1.06
155	Great Gull River	1	48 35 00	55 20 50	260.0	61.0	7.21	5.4	24.5	$18.69	1.05
156	Chance Cove Brook	1	46 45 00	53 02 00	72.0	97.0	2.97	3.5	16.0	$12.27	1.04
157	Portland Creek	9	50 04 00	57 20 30	42.0	198.0	1.53	3.7	16.0	$12.29	1.04
158	Isle aux Morts River	3	47 37 00	59 00 20	200.0	15.2	13.95	2.6	11.8	$9.20	1.03
159	Harry's River (North Brook)	2	48 43 00	58 17 00	92.0	69.0	3.79	3.2	14.5	$11.43	1.02
160	Bottom Brook	1A	48 32 13	57 59 58	87.0	76.2	3.31	3.1	14.0	$11.13	1.01

* Possible environmental problems.

TABLE 3.2

LIST OF INFEASIBLE SMALL HYDRO SCHEMES INVESTIGATED

Rank	River	Site No	Location Latitude	Location Longitude	D.A. (sq. km)	Head (m)	Qav (cu.m/s)	Capacity MW	Energy GWh	Cost $(million)	Benfit \ Cost
1	Robinsons River	1	48 10 32	58 26 40	280.0	15.2	13.31	2.4	11.3	$9.17	0.98
2	White Bear River	4	47 51 35	57 16 35	682.0	46.0	30.27	17.0	77.4	$65.12	0.95
3	Red Harbour River #2	2	47 17 45	55 00 50	63.0	61.0	2.49	1.9	8.4	$7.11	0.95
4	Southwest Brook (Bloomfield)	1	48 22 00	53 55 00	145.0	20.0	4.60	1.1	5.1	$4.33	0.95
5	Great Cat Arm River	2	50 07 00	56 51 15	42.0	76.0	1.66	1.5	6.7	$5.69	0.94
6	Torrent River	3	50 37 08	57 00 45	315.0	30.5	12.98	4.8	21.7	$18.87	0.92
7	Pipers Hole River	2	47 57 45	54 19 50	33.0	76.0	1.15	1.1	4.9	$4.34	0.90
8	Otter Point Brook	1	49 41 45	56 44 30	25.0	137.0	0.67	1.1	4.8	$4.37	0.89
9	Shoal Harbour River	1	48 12 00	54 00 00	116.0	30.0	4.00	1.5	6.7	$6.07	0.88
10	Castors River	3	50 56 45	56 42 30	50.0	61.0	1.90	1.4	6.1	$5.57	0.88
11	Middle Brook	1	48 46 10	54 24 20	118.0	76.0	2.99	2.8	12.6	$11.68	0.87
12	Little Harbour Deep River	4	50 15 50	56 41 05	40.0	198.0	1.52	3.7	15.9	$14.80	0.86
13	Barachois Brook	1	48 09 20	58 31 25	73.0	30.5	3.24	1.2	5.5	$5.15	0.85
14	Morgan Brook	1	47 43 18	56 30 50	178.0	46.0	6.77	3.8	17.3	$16.59	0.83
15	Lloyds River	1	48 10 00	58 00 15	125.0	31.0	6.34	2.4	10.9	$10.62	0.82
16	Second Burnt Pond	1	48 45 10	54 24 30	118.0	76.0	2.99	2.8	12.6	$12.30	0.82
17	Harry's River	1	48 48 13	58 02 10	124.0	15.2	5.11	1.0	4.7	$4.65	0.82
18	White Bear River	5	47 56 00	57 18 15	64.0	46.0	2.84	1.6	7.3	$7.18	0.81
19	Grand Codroy River	4	48 00 48	58 46 50	95.0	15.2	6.63	1.2	5.6	$5.54	0.81
20	Salmon River (Main Brook)	1	51 06 45	56 09 15	413.0	15.0	12.44	2.3	10.2	$10.13	0.81
21	Indian Bay Brook *	1	49 02 30	53 56 30	530.0	15.0	12.60	2.3	11.3	$11.34	0.80
22	Salmonier River (Pinsents Fall) *	1	47 14 00	53 31 50	141.0	18.2	5.36	1.2	5.4	$5.43	0.79
23	Northern Arm River (Fourche Hr.)	2	50 32 13	56 22 30	36.0	153.0	1.31	2.4	10.6	$11.01	0.77
24	Salmon River (Clode Sound)	1	48 23 00	54 14 00	100.0	30.0	2.90	1.1	4.8	$5.12	0.76
25	Southwest Brook (St.Georges Bay)	5A	48 28 40	58 00 30	465.0	15.2	16.21	3.0	13.7	$14.71	0.75
26	Little Cat Arm River	1	50 09 32	56 37 45	38.0	168.0	1.20	2.5	10.6	$11.50	0.74
27	Phillips Brook	1	47 47 13	58 08 15	22.0	137.2	1.05	1.8	8.0	$8.75	0.73
28	Mint Brook	1	48 44 00	54 18 00	336.0	15.0	9.00	1.6	7.5	$8.23	0.73
29	Bottom Brook	2	48 32 30	58 04 00	134.0	46.0	5.10	2.9	13.0	$14.47	0.72
30	Colinet River *	1	47 15 00	53 32 40	193.0	15.0	7.34	1.3	6.1	$6.79	0.72
31	Popes Harbour River	1	48 16 00	53 36 45	56.0	45.0	1.77	1.0	4.4	$5.06	0.70
32	Grand Codroy River	3	47 59 15	58 46 10	73.0	15.2	5.55	1.0	4.7	$5.41	0.69
33	Fischells Brook	1	48 18 10	58 36 45	307.0	15.2	13.14	2.4	11.1	$13.57	0.66
34	Little Harbour Deep River	1	50 17 10	56 43 40	112.0	61.0	4.79	3.6	15.4	$19.19	0.64
35	Northwest Gander *	1	48 31 00	55 31 00	808.0	30.5	20.50	7.6	34.8	$44.42	0.63
36	Portland Creek	1	50 07 00	57 15 45	32.0	77.0	1.17	1.1	5.4	$7.27	0.59
37	Fox Island River	1	48 42 00	58 36 30	167.0	61.0	6.62	4.9	22.5	$31.98	0.56
38	Little Harbour Deep River	3	50 16 40	56 41 40	25.0	122.0	0.95	1.4	6.1	$12.41	0.39

* Possible environmental problems.

2. SITE ANALYSES

2.1 Standard Input Data and Map Legend:

Standard input data and a listing of map symbols are given in the following tables.

TABLE 2.1 - STANDARD UNIT COSTS AND ECONOMIC PARAMETERS

ITEM	UNIT	SELECTED UNIT COST
Timber Crib Work	m^3	$300/$m^3$
Dam Concrete	m^3	$400/$m^3$
Spillway Concrete	m^3	$500/$m^3$
Excavation/Backfill	m^3	$15/$m^3$
Access Road [power plants]	km	$100,000/km
Access Road [upstream storage & diversion schemes]		$40,000/km
Reservoir Clearing	% per ha	$4,000/ha.
Fishway	vertical m	omitted
Interest Rate	% per annum	6%
O + M	% per annum	1.5%
Benefits	$ per MWh	$60/MWh

TABLE 2.2 - MAP LEGEND

Drainage Area	
Transmission Line	
Access Road	
Dam and Intake	
Powerhouse	
Canal	
Penstock	
Tunnel	

Also note that map references give powerhouse, upstream storage dam and diversion dam location.

RIVER: Little Harbour River

SITE: S.1

LAT: 47° 07' 55"

LONG: 53° 28' 00"

DRAINAGE AREA: 220.0 km²

HEAD: 46.0 m

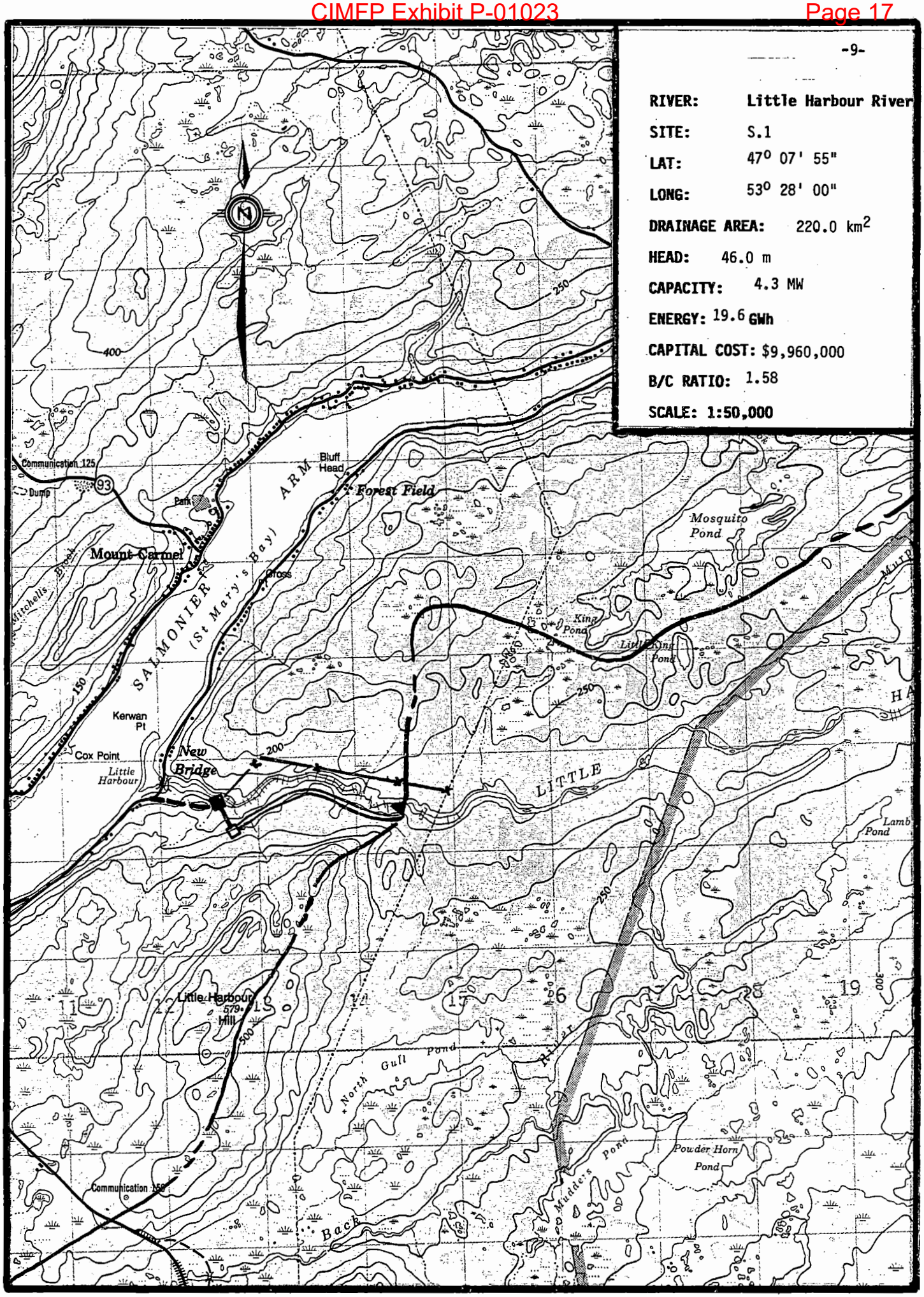
CAPACITY: 4.3 MW

ENERGY: 19.6 GWh

CAPITAL COST: $9,960,000

B/C RATIO: 1.58

SCALE: 1:50,000



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WATER SHED : Little Hr. River

SITE NAME : SITE - 1 FILE : 1001

SITE DATA

INSTALLED CAPACITY	: 4.307932 MW
PENSTOCK LENGTH	: 310 M.
DESIGN FLOW	: 11.505 M^3/S
PENSTOCK DIAMETER	: 2.107491 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 8 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 210 M^3/S
DISTANCE TO TOWN	: 5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.071865E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
712267.9	529927.9	208166.1	311828.4	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
684149.1	1455636	436690.9	70457.66	371535.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	303509.9	599804.8	255553.5

PROJECT COST: $ 9957028 COST PER KW: $ 2311.325

Total Project Cost = $ 9,957,028

WATER SHED : Little Hr. River SITE - 1

COST DATA

(ADDITIONAL COST of $ 3,860,000 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 746777.1

ANNUAL BENEFIT : $ 1177409

BENEFIT/COST RATIO: 1.576654

Total Project Cost = $ 9,957,028.00

Benefit / Cost Ratio = 1.58

MAP NUMBER 1 N/03 DATA SHEET FILE NUMBER 1001

1. Site Identification:

River Basin: Little Harbour River Site: S.1

2. Location:

Lat. 47° 07' 55" Long. 53° 28' 00" Hydrologic Region 1

3. Hydrologic Data:

A = 220 km^2, MAR = 1100 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 7.67 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 310 m
Access Road Length = 0.5 km
Dam Height = 8.0 m
Distance to Town = 5 km
Installed Capacity = 4.3 MW

Plant Design Flow = 11.5 m^3/s
T.L. Line Length = 3.0 km
Dam Length = 200 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion of 63 km^2 from Upper Salmonier River, appears marginal and therefore not included.

(ii) A portion of Upper Little Harbour River basin diverted into Horse Chops GS at Frank's Pond.

(iii) Additional cost, canal + control structure = $3,860,000.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Little Harbour River Region: 1

Total Developed Head, H = 46 m Map: 1 N/03

Diverted Area = 63.0 km^2, MAR = 1300 mm, from Salmonier River

Location: Lat. = 47° 11.9' Long. = 53° 11.9'

Mean Diverted Flow = 2.60 m^3/s,

Additional Usable FLow, $Q^* = F'(QAV + QDV) - F.QAV$ (0.69, 10.3, 0.78, 7.70)

= 7.10 - 6.00 = 1.10 m^3/s

Additional Energy = H x Q* x 0.0716

= 46 x 1.10 x 0.0716 = 3.62 GWh p.a.

Dam: Height = 5.0 m, Length = 250 m, Q150 = 55 m^3/s

Canal: Height of Land = 2 m, Length = 2100 m

Design Flow Ratio = 1.12 Design Flow = 2.90 m^3/s

Access Road: Length = 12.0 km

Costs:		
	Dam + Spillway	= 783,000
	Diversion Canal	= 552,600
	Access Road	= 480,000
	Sub-total Direct Costs	= 1,815,600
	Total Cost Diversion	= 2,814,200
	Additional Plant Costs	= -
	Total Project Cost	= 2,814,200

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.15} = 1.12$$

Marginal, omit given that Salmonier River is a prime salmon river.

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WATER SHED : Colinet River

SITE NAME : SITE - 1 FILE : 1002

SITE DATA

INSTALLED CAPACITY	:	1.344321 MW
PENSTOCK LENGTH	:	75 M.
DESIGN FLOW	:	11.01 M^3/S
PENSTOCK DIAMETER	:	2.419281 M.
RATED HEAD	:	15 M.
HEIGHT OF DAM	:	15 M.
TRANSMISSION LINE LENGTH	:	2 KM.
LENGTH OF DAM	:	300 M.
ACCESS ROAD LENGTH	:	2 KM.
FLOOD FLOW	:	210 M^3/S
DISTANCE TO TOWN	:	2 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 5434155

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
2194403	758373.5	200087.8	86638.49	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
448175.4	953564.6	286069.4	228917.6	184046.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	440744.2	644576.6	206914.8

PROJECT COST: $ 6790012 COST PER KW: $ 5050.886

Total Project Cost = $ 6,790,012

MAP NUMBER 1 N/04 DATA SHEET FILE NUMBER 1002

1. Site Identification:

River Basin: Colinet River Site: S.1

2. Location:

Lat. 47° 15' 00" Long. 53° 32' 40" Hydrologic Region 1

3. Hydrologic Data:

A = 193 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$ Q_2 = 75 m^3/s

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 7.34 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

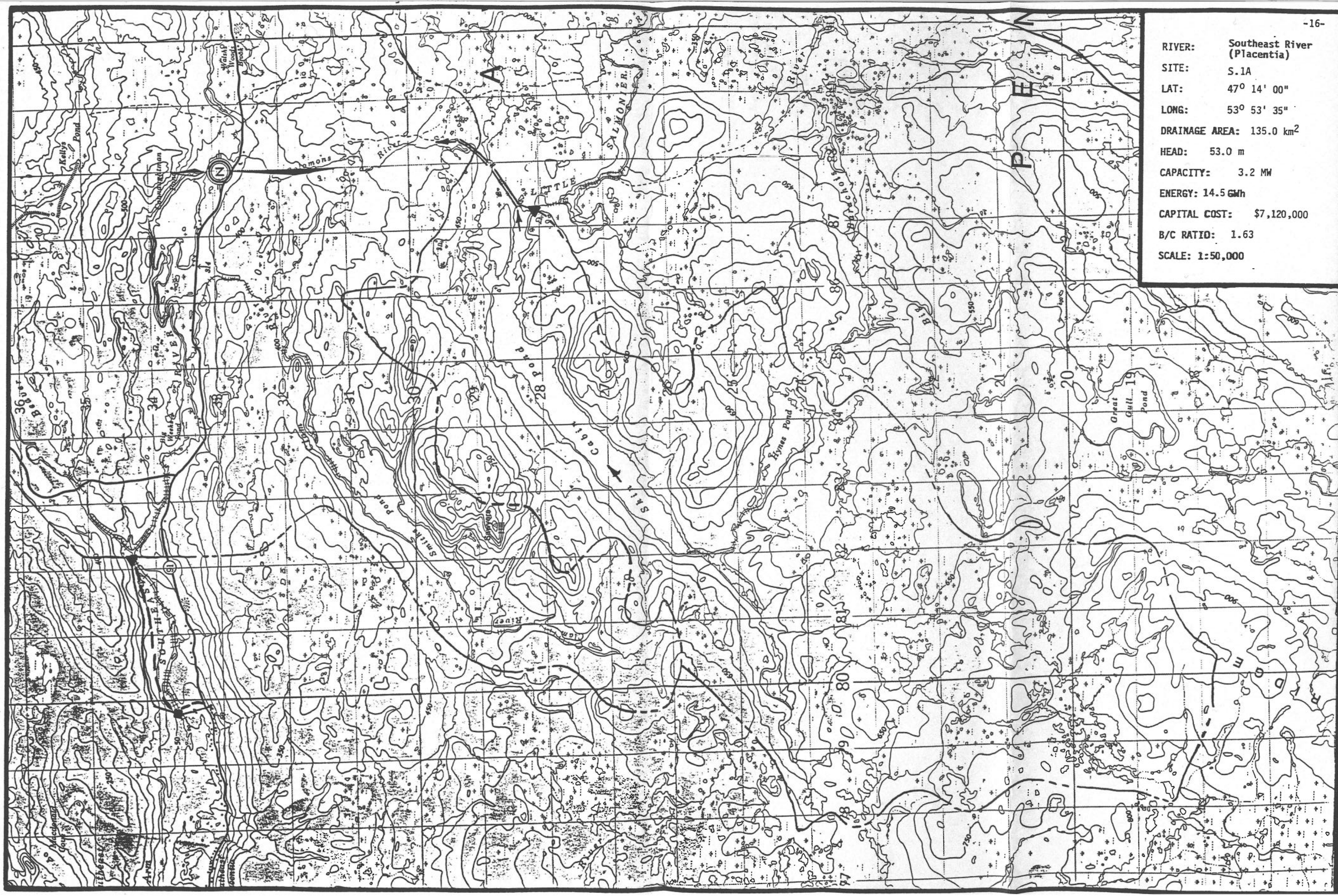
4. Site Data:

Rated Head = 15 m
Penstock Length = 75 m
Access Road Length = 2 km
Dam Height = 15 m
Distance to Town = 2 km
Installed Capacity = 1.4 MW

Plant Design Flow = 11 m^3/s
T.L. Line Length = 2 km
Dam Length = 300 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Salmon fishery being developed on river.



RIVER:	Southeast River (Placentia)
SITE:	S.1A
LAT:	47° 14' 00"
LONG:	53° 53' 35"
DRAINAGE AREA:	135.0 km^2
HEAD:	53.0 m
CAPACITY:	3.2 MW
ENERGY:	14.5 GWh
CAPITAL COST:	$7,120,000
B/C RATIO:	1.63
SCALE:	1:50,000

CIMFP Exhibit P-01023

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ShawMont Newfoundland Limited
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WATER SHED : Southeast River (Placentia)

SITE NAME : SITE - 1A FILE : 1003

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.18388 MW
PENSTOCK LENGTH	: 2900 M.
DESIGN FLOW	: 7.38 M^3/S
PENSTOCK DIAMETER	: 1.70701 M.
RATED HEAD	: 53 M.
HEIGHT OF DAM	: 5.67 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 95 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 100 M^3/S
DISTANCE TO TOWN	: 2 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8078498

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
374208.6	SEE DAM	139592.7	2362281	75000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
526866.9	1255513	376653.8	228917.6	276810.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	198706.1	922915.8	382578.5

PROJECT COST: $ 7120045 COST PER KW: $ 2236.28

Total Project Cost = $ 7,120,045

WATER SHED : Southeast River (Placentia) SITE - 1A

COST DATA

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 534003.3

ANNUAL BENEFIT : $ 870192.4

BENEFIT/COST RATIO: 1.629564

Total Project Cost = $ 7,120,045.00

Benefit / Cost Ratio = 1.63

MAP NUMBER 01N/04 DATA SHEET FILE NUMBER 1003

1. Site Identification:

River Basin: Southeast River Site: S.1

2. Location:

Lat. 47° 14' 00" Long. 53° 53' 35" Hydrologic Region 1

3. Hydrologic Data:

A = 135 km^2, MAR = 1150 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 4.92 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 100 m^3/s

Q1000 = 150 m^3/s

4. Site Data:

Rated Head = 53 m
Penstock Length = 2900 m
Access Road Length = 2 km
Dam Height = 5.67 m
Distance to Town = 2 km
Installed Capacity = 3.2 MW

Plant Design Flow = 7.38 m^3/s
T.L. Line Length = 2 km
Dam Length = 95 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion from Little Salmonier River at outlet of Skin Cabin Pond would add about 52 km^2, lat. 47° 10.9', Long 53° 48'

(ii) Salmon river.

RIVER: Gisborne Lake

SITE: S.1

LAT: 47° 48' 00"

LONG: 54° 55' 45"

DRAINAGE AREA = 158.0 km^2

HEAD = 160.0 m

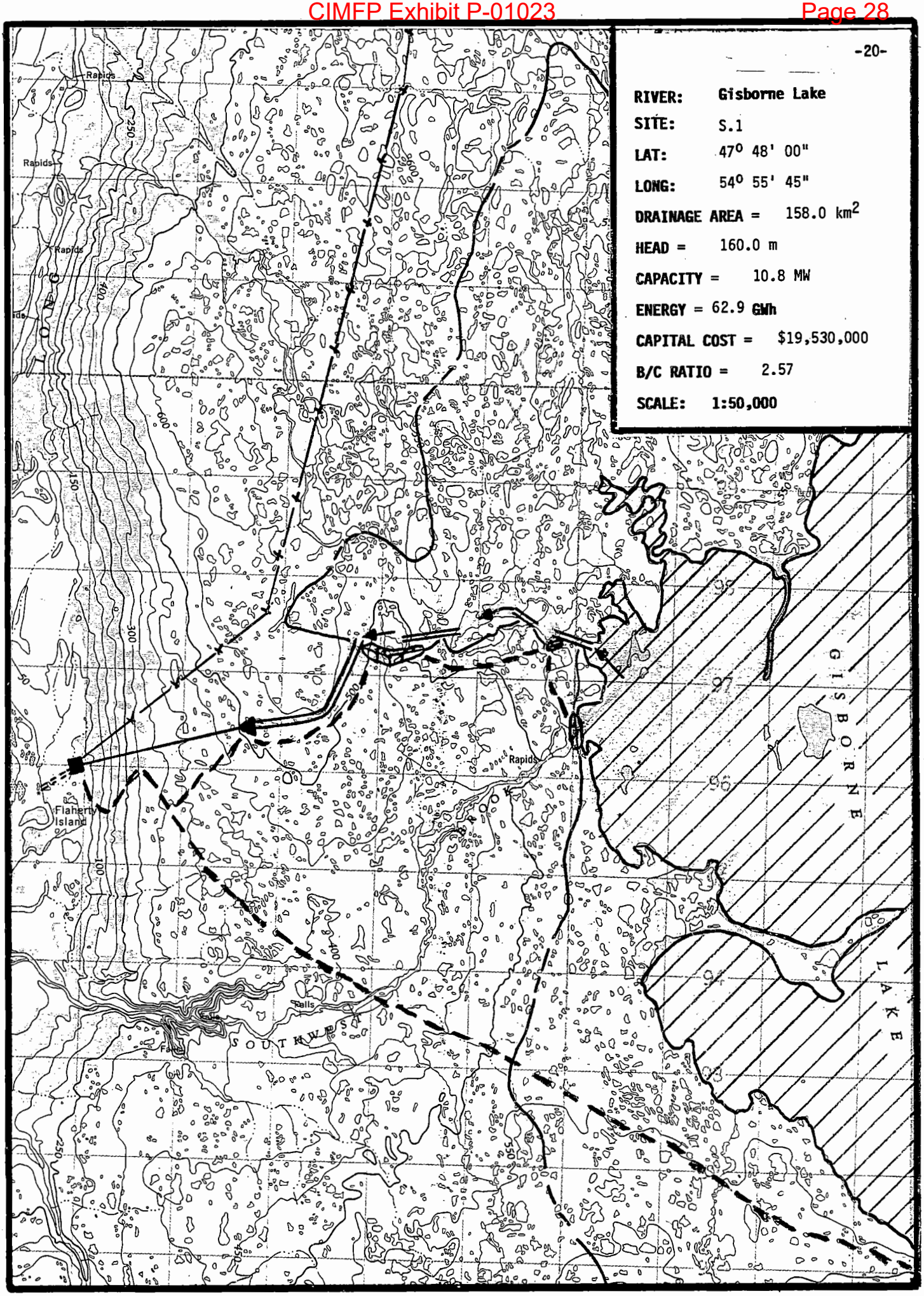
CAPACITY = 10.8 MW

ENERGY = 62.9 **GWh**

CAPITAL COST = $19,530,000

B/C RATIO = 2.57

SCALE: 1:50,000



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WATER SHED : Gisborne Lake

SITE NAME : SITE - 1 FILE : 1004

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 10.76433 MW
PENSTOCK LENGTH	: 1800 M.
DESIGN FLOW	: 8.265 M^3/S
PENSTOCK DIAMETER	: 1.535353 M.
RATED HEAD	: 160 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 21 KM.
LENGTH OF DAM	: 1000 M.
ACCESS ROAD LENGTH	: 18 KM.
FLOOD FLOW	: 112 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: 1
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.671452E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1240077	SEE DAM	154571.9	3091861	84000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
924610.8	2071128	618247.3	1481785	1279946

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1447339	1233652	904327.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.953154E+07 COST PER KW: $ 1814.468

Total Project Cost = $ 19,531,540

WATER SHED : Gisborne Lake SITE - 1

COST DATA

(ADDITIONAL COST of $ 5,000,000 for Canals INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .6666667

ANNUAL COST : $ 1464866

ANNUAL BENEFIT : $ 3771823

BENEFIT/COST RATIO: 2.574859

Total Project Cost = $ 19,531,540.00

Benefit / Cost Ratio = 2.57

MAP NUMBER 1M/15 DATA SHEET FILE NUMBER 1004

1. Site Identification:

River Basin: Gisborne Lake Site: S.1

2. Location:

Lat. 47° 48' 00" Long. 54° 55' 45" Hydrologic Region 2

3. Hydrologic Data:

A = 158 km^2, MAR = 1100 mm, ACLS = 100 %

Storage Reservoir Area = 26.0 km^2

Storage Reservoir Vol, V = 52 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.30$$

Mean Flow, QAV = 5.51 m^3/s

Usable Flow Ratio = 1.00

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 112 m^3/s

Q1000 = 150 m^3/s

4. Site Data:

Rated Head = 160 m
Penstock Length = 1800 m
Access Road Length = 18 km
Dam Height = 3 m
Distance to Town = 50 km
Installed Capacity = 10.8 MW

Plant Design Flow = 8.27 m^3/s
T.L. Line Length = 21 km
Dam Length = 1000 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Add Canals:

Sidehill, 1700m @ $1885 = $ 3,200,000

Dug Canals, 1250 m = $ 1,800,000

$ 5,000,000

RIVER: Back River (Salmonier)

SITE: S.1

LAT: 47° 12' 30"

LONG: 53° 21' 50"

DRAINAGE AREA: 65.0 km²

HEAD: 38.0 m

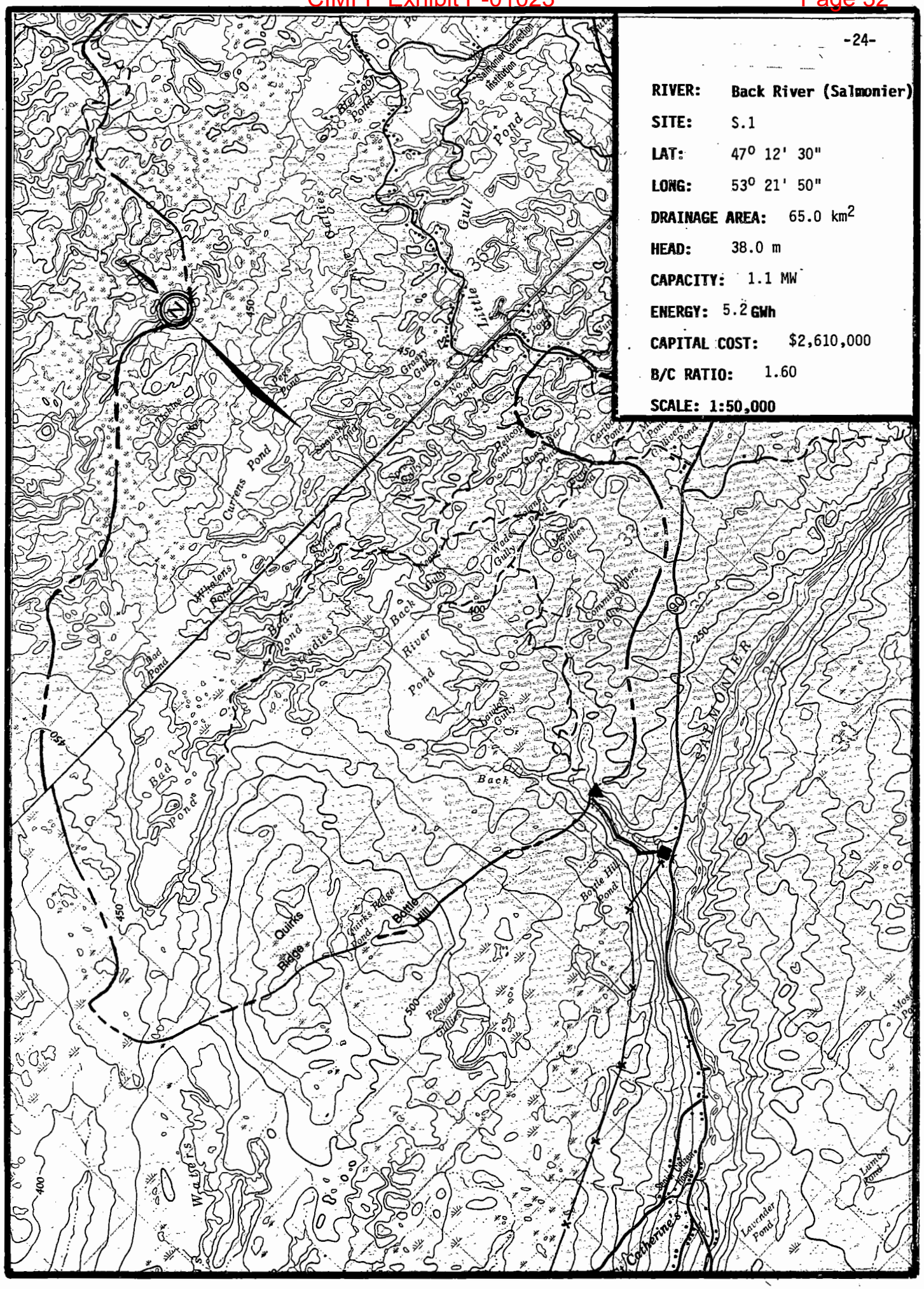
CAPACITY: 1.1 MW

ENERGY: 5.2 GWh

CAPITAL COST: $2,610,000

B/C RATIO: 1.60

SCALE: 1:50,000



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WATER SHED : BACK RIVER (Salmonier)

SITE NAME : SITE - 1 FILE : 1005

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	:	1.14603 MW
PENSTOCK LENGTH	:	300 M.
DESIGN FLOW	:	3.705 M^3/S
PENSTOCK DIAMETER	:	1.32978 M.
RATED HEAD	:	38 M.
HEIGHT OF DAM	:	5 M.
TRANSMISSION LINE LENGTH	:	6 KM.
LENGTH OF DAM	:	44 M.
ACCESS ROAD LENGTH	:	1.5 KM.
FLOOD FLOW	:	70 M^3/S
DISTANCE TO TOWN	:	6 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 3793081

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
155013.9	SEE DAM	75079.5	190442.6	52500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
289494.9	689860.1	206958	179259.1	301042.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	102218.8	285348.5	80404.65

PROJECT COST: $ 2607623 COST PER KW: $ 2275.352

Total Project Cost = $ 2,607,623

MAP NUMBER 01 N/03 DATA SHEET FILE NUMBER 1005

1. Site Identification:

River Basin: Back River (Salmonier) Site: S.1

2. Location:

Lat. 47° 12' 30" Long. 53° 21' 50" Hydrologic Region 1

3. Hydrologic Data:

A = 65 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.47 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 70 m^3/s

Q1000 = 92 m^3/s

Q_2 = 33.0

4. Site Data:

Rated Head = 38 m

Penstock Length = 300 m

Access Road Length = 1.5 km

Dam Height = 5 m

Distance to Town = 6 km

Installed Capacity = 1.19 MW

Plant Design Flow = 3.70 m^3/s

T.L. Line Length = 6 km

Dam Length = 44 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible Diversion not included. See attached sketch.

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RIVER: Rocky River

SITE: S.1

LAT: 47° 13' 25"

LONG: 53° 33' 30"

DRAINAGE AREA: 296.0 km²

HEAD: 16.7 m

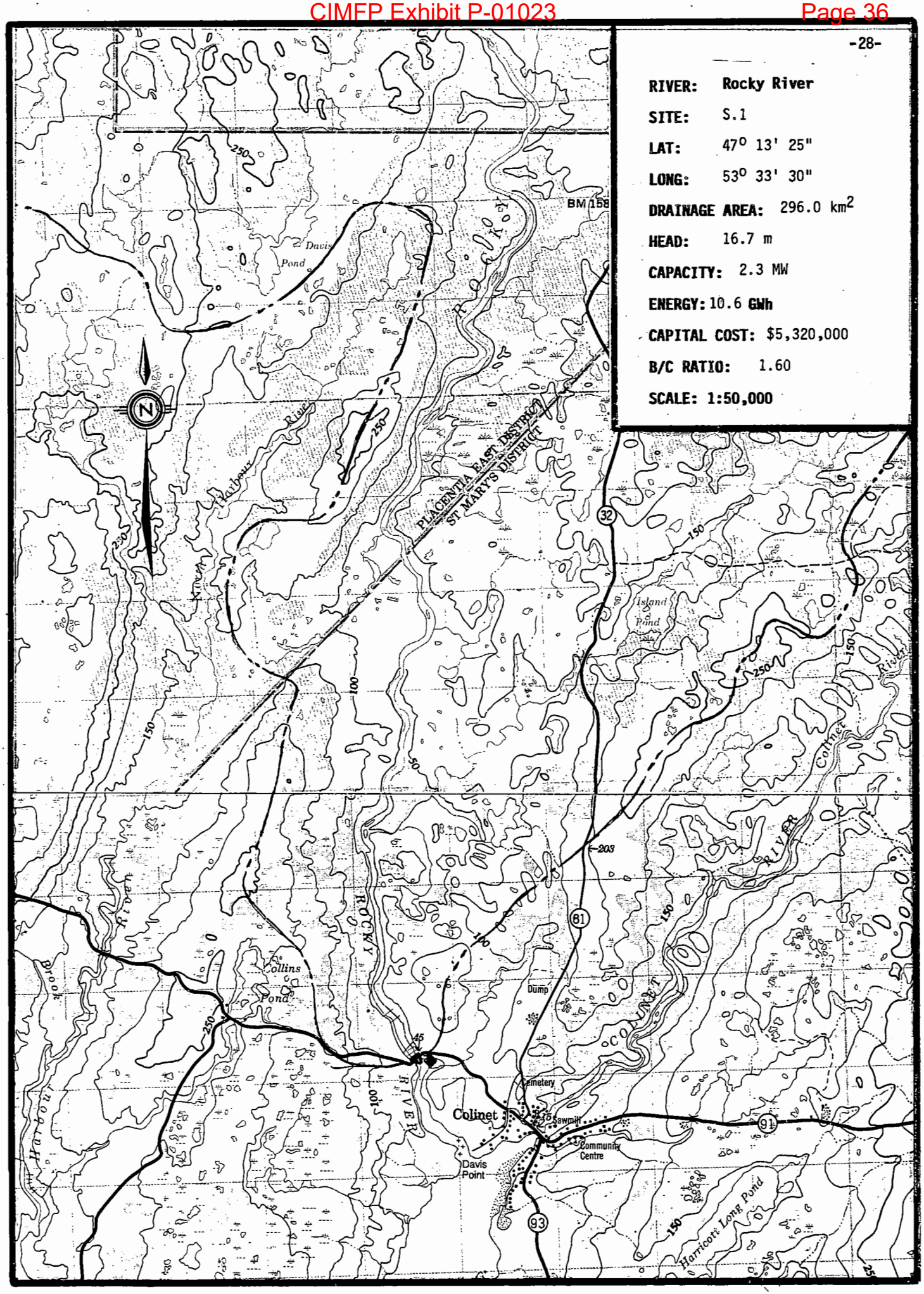
CAPACITY: 2.3 MW

ENERGY: 10.6 GWh

CAPITAL COST: $5,320,000

B/C RATIO: 1.60

SCALE: 1:50,000



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WATER SHED : Rocky River

SITE NAME : SITE - 1 FILE : 1006

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.335163 MW
PENSTOCK LENGTH	: 200 M.
DESIGN FLOW	: 16.875 M^3/S
PENSTOCK DIAMETER	: 2.856423 M.
RATED HEAD	: 17 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 1.5 KM.
LENGTH OF DAM	: 180 M.
ACCESS ROAD LENGTH	: .3 KM.
FLOOD FLOW	: 400 M^3/S
DISTANCE TO TOWN	: 1.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8287197

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
264968.1	SEE DAM	293853.9	755161	300000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
631382.8	1504572	451371.5	45641.17	216680.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	172176.8	500115.4	179169.5

PROJECT COST: $ 5315093 COST PER KW: $ 2276.113

Total Project Cost = $ 5,315,093

MAP NUMBER 01 N/04 DATA SHEET FILE NUMBER 1006

1. Site Identification:

River Basin: Rocky River Site: S.1

2. Location:

Lat. 47° 13' 25" Long. 53° 33' 30" Hydrologic Region 1

3. Hydrologic Data:

A = 296 km^2, MAR = 1200 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 11.25 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 400 m^3/s

Q1000 = 530 m^3/s

4. Site Data:

Rated Head = 16.7 m
Penstock Length = 200 m
Access Road Length = .3 km
Dam Height = 3 m
Distance to Town = 1.5 km
Installed Capacity = 2.4 MW

Plant Design Flow = 16.87 m^3/s
T.L. Line Length = 1.5 km
Dam Length = 180 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible Diversion from Colinett River at Lat. 47° 16.3' and Long. 53° 29.4', would add about 82 km^2

(ii) Fisheries and Ocean's, Canada are presently rehabilitating an old fishway bypassing the falls near the mouth of the river.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Salmonier River (Pinsents Falls)

SITE NAME : SITE - 1 FILE : 1007

SITE DATA

INSTALLED CAPACITY	:	1.178021 MW
PENSTOCK LENGTH	:	100 M.
DESIGN FLOW	:	8.039999 M^3/S
PENSTOCK DIAMETER	:	2.06012 M.
RATED HEAD	:	18 M.
HEIGHT OF DAM	:	12 M.
TRANSMISSION LINE LENGTH	:	9 KM.
LENGTH OF DAM	:	200 M.
ACCESS ROAD LENGTH	:	2.5 KM.
FLOOD FLOW	:	210 M^3/S
DISTANCE TO TOWN	:	9 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 4662582

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1143051	663237.5	150779.5	98324.26	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
383344.8	815627.1	244688.1	276727.7	397850.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	405296.4	529346.5	160837.6

PROJECT COST: $ 5426611 COST PER KW: $ 4606.55

Total Project Cost = $ 5,426,611

MAP NUMBER 1 N/03 DATA SHEET FILE NUMBER 1007

1. Site Identification:

River Basin: Salmonier River (Pinsents Falls) Site: S.1

2. Location:

Lat. 47° 14' 00" Long. 53° 31' 50" Hydrologic Region 1

3. Hydrologic Data:

A = 141 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.36 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

Rated Head = 18.2 m
Penstock Length = 100 m
Access Road Length = 2.5 km
Dam Height = 12 m
Distance to Town = 9 km
Installed Capacity = 1.24 MW

Plant Design Flow = 8.04 m^3/s
T.L. Line Length = 9 km
Dam Length = 200 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Well know salmon river.

RIVER: Red Harbour River #1

SITE: S.1

LAT: 47° 18' 30"

LONG: 55° 00' 00"

DRAINAGE AREA: 49.0 km²

HEAD: 91.0 m

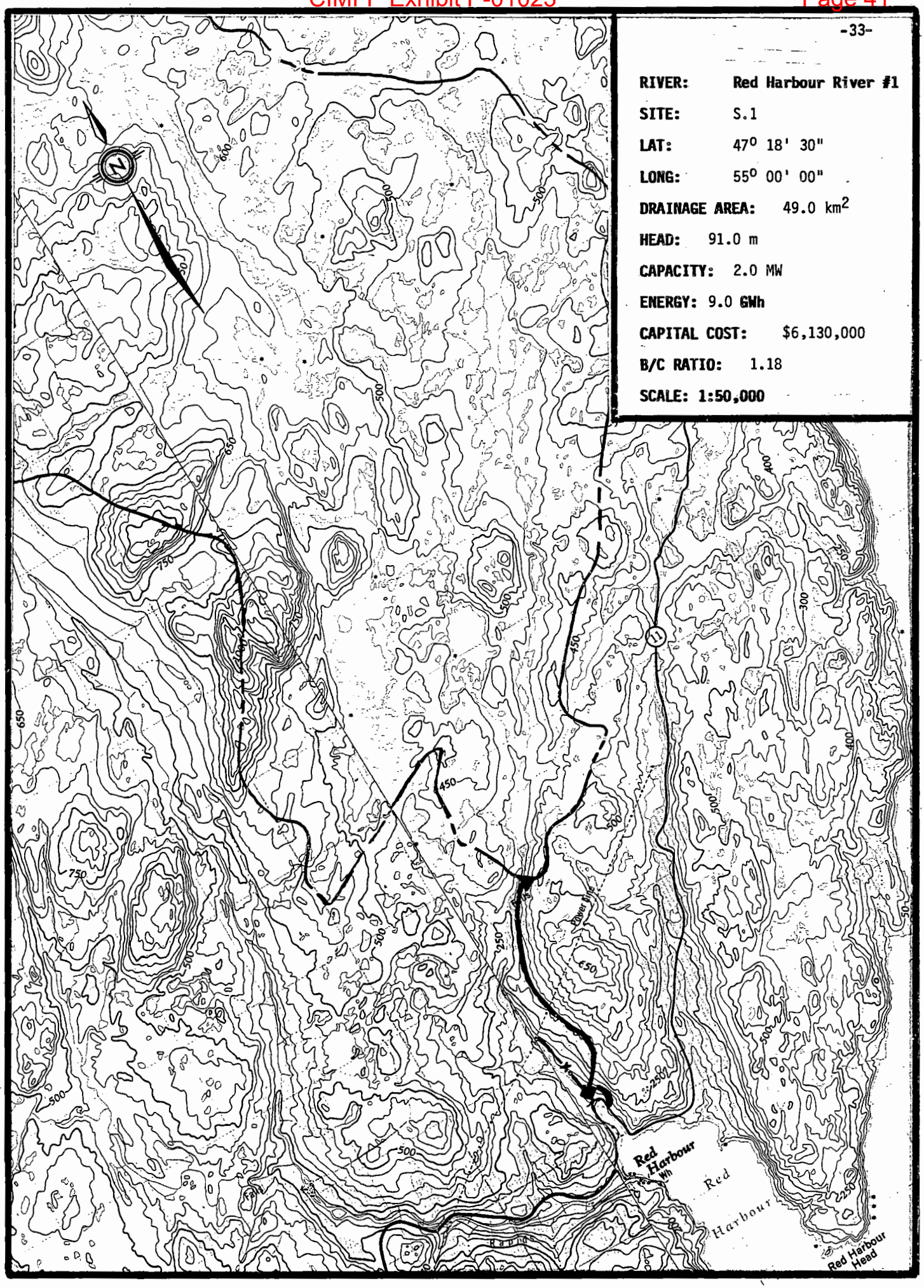
CAPACITY: 2.0 MW

ENERGY: 9.0 GWh

CAPITAL COST: $6,130,000

B/C RATIO: 1.18

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Red Harbour River #1

SITE NAME : SITE - 1 FILE : 1008

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.977776 MW
PENSTOCK LENGTH	: 3000 M.
DESIGN FLOW	: 2.67 M^3/S
PENSTOCK DIAMETER	: 1.022126 M.
RATED HEAD	: 91 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: .8 KM.
LENGTH OF DAM	: 80 M.
ACCESS ROAD LENGTH	: 1.4 KM.
FLOOD FLOW	: 72 M^3/S
DISTANCE TO TOWN	: 11 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4786511

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
265487.8	SEE DAM	55907.76	3192935	54000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
312454.9	744573.3	223372	169049	168851.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	172984.9	572739.4	199834.9

PROJECT COST: $ 6132191 COST PER KW: $ 3100.549

Total Project Cost = $ 6,132,191

MAP NUMBER 1 M/07 DATA SHEET FILE NUMBER 1008

1. Site Identification:

River Basin: Red Harbour #1 Site: S.1

2. Location:

Lat. 47° 18' 30" Long. 55° 00' 00" Hydrologic Region 1

3. Hydrologic Data:

A = 49 km^2, MAR = 1150 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 1.78 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 72 m^3/s

Q1000 = 98 m^3/s

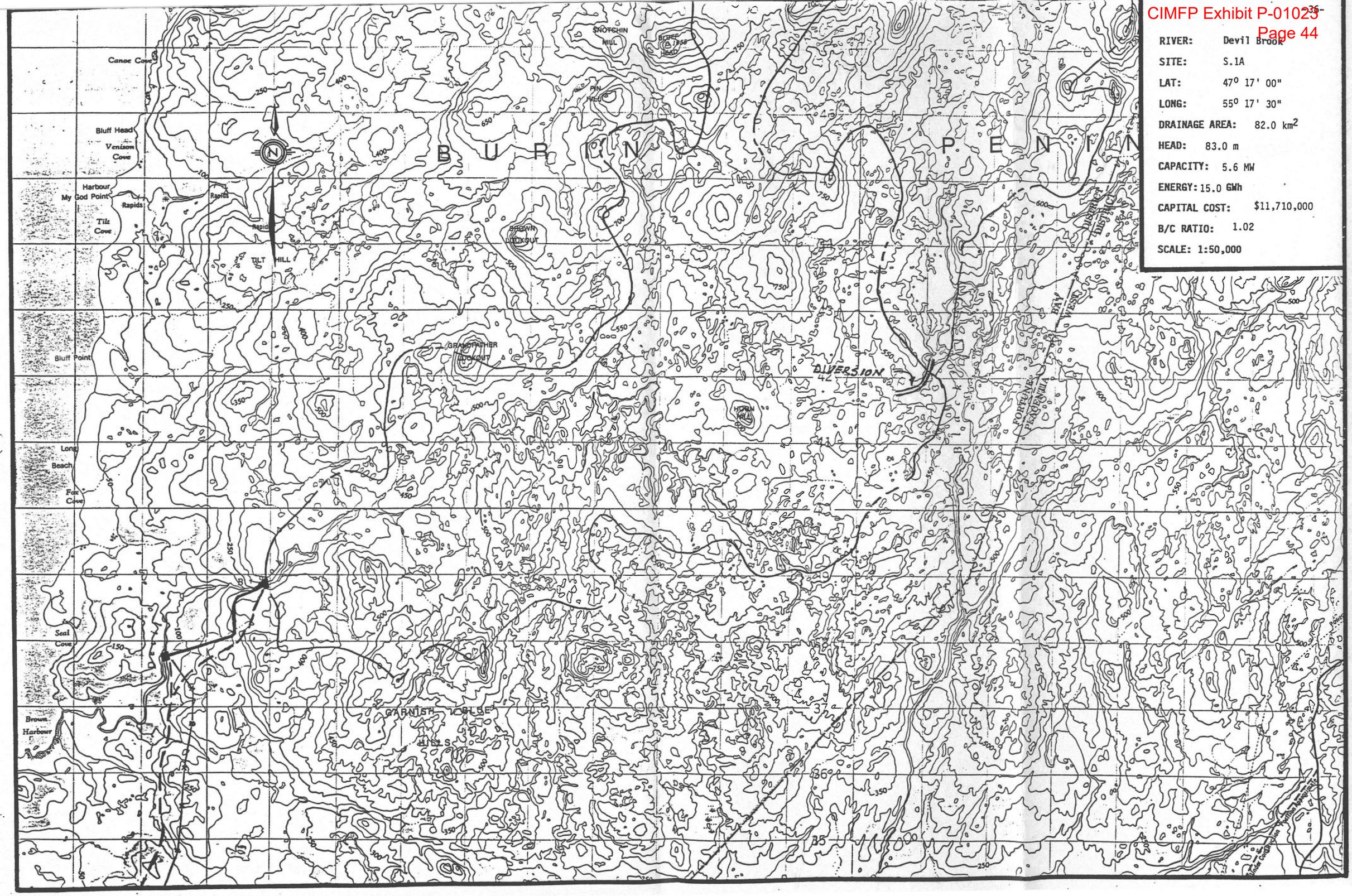
4. Site Data:

Rated Head = 91 m
Penstock Length = 3000 m
Access Road Length = 1.4 km
Dam Height = 5 m
Distance to Town = 11 km
Installed Capacity = 2.0 MW

Plant Design Flow = 2.68 m^3/s
T.L. Line Length = .8 km
Dam Length = 80 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Penstock length/head ratio > 20, would require a surge tank.



RIVER:	Devil Brook
SITE:	S.1A
LAT:	47° 17' 00"
LONG:	55° 17' 30"
DRAINAGE AREA:	82.0 km²
HEAD:	83.0 m
CAPACITY:	5.6 MW
ENERGY:	15.0 GWh
CAPITAL COST:	$11,710,000
B/C RATIO:	1.02
SCALE:	1:50,000

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WATER SHED : Devil Brook

SITE NAME : SITE - 1A FILE : 1009

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.293647 MW
PENSTOCK LENGTH	: 2200 M.
DESIGN FLOW	: 4.875 M^3/S
PENSTOCK DIAMETER	: 1.341308 M.
RATED HEAD	: 83 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 11.5 KM.
LENGTH OF DAM	: 72 M.
ACCESS ROAD LENGTH	: 9 KM.
FLOOD FLOW	: 48 M^3/S
DISTANCE TO TOWN	: 11.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: -100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7438410

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
227287.4	SEE DAM	96114.55	3210596	36000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
461131.2	1098866	329659.8	822071.6	691635.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	299498.1	751411.1	306990.3

PROJECT COST: $ 9557261 COST PER KW: $ 2901.726

Total Project Cost = $ 9,557,261

WATER SHED : Devil Brook SITE - 1A

COST DATA

(ADDITIONAL COST of $ 1,226,000 for Diversion INCLUDED)

INTEREST RATE	: 6	REVENUE, $ PER MWH	: 60
O & M PERCENTAGE	: 1.5	CAPACITY FACTOR	: .52

ANNUAL COST : $ 716794.6

ANNUAL BENEFIT : $ 900193.3

BENEFIT/COST RATIO: 1.25586

Total Project Cost = $ 9,557,261.00

Benefit / Cost Ratio = 1.26

MAP NUMBER 1 M/06 DATA SHEET FILE NUMBER 1009

1. Site Identification:

River Basin: Devil Brook Site: S.1 A

2. Location:

Lat. 47° 17' 00" Long. 55° 17' 30" Hydrologic Region 1

3. Hydrologic Data:

A = 82 km^2, MAR = 1250 mm, ACLS = 90 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 3.25 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 2.54

Flood Flow: Q150 = 48 m^3/s

Q1000 = 64 m^3/s

4. Site Data:

Rated Head = 83 m
Penstock Length = 2200 m
Access Road Length = 9 km
Dam Height = 4.8 m
Distance to Town = 11.5 km
Installed Capacity = 3.3 MW

Plant Design Flow = 4.88 m^3/s
T.L. Line Length = 11.5 km
Dam Length = 72 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion at Lat. 47° 19' 15"; Long. 55° 08' 00" would add 36 km^2 to the above drainage area at a cost of $1,226,000.

(ii) Access to diversion site from Red Harbour road approx. 9 km.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Devil Brook Region: 1

Total Developed Head, H = ...m Map: 1 M/06

Diverted Area = 36 km^2, MAR = 1250 mm, from Garursh River

Location: Lat. = 49° 19' 15" Long. = 55° 08' 00"

Mean Diverted Flow = 1.43 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 1.43 = 1.11 m^3/s

Additional Energy = H x Q* x 0.0716

= 83 x 1.11 x 0.0716 = 6.61 GWh p.a.

Dam: Height = 3 m, Length = 100 m, Q150 = 31 m^3/s

Canal: Height of Land = 3 m, Length = 600 m

Design Flow Ratio = 1.5 Design Flow = 2.15 m^3/s

Access Road: Length = 9.0 km

Costs:

Dam + Spillway	= 178,700
Diversion Canal	= 252,300
Access Road	= 360,000
Sub-total Direct Costs	= 791,000
Total Cost Diversion	= 1,226,000
Additional Plant Costs	= .....
Total Project Cost	= .....

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =

MAP NUMBER 1 M/06 DATA SHEET FILE NUMBER 1010

1. Site Identification:

River Basin: Red Harbour River #2 Site: S.2

2. Location:

Lat. 47° 17' 45" Long. 55° 00' 50" Hydrologic Region 1

3. Hydrologic Data:

A = 63 km^2, MAR = 1250 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.49 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 85 m^3/s

Q1000 = 105 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 3000 m
Access Road Length = .3 km
Dam Height = 5 m
Distance to Town = 12 km
Installed Capacity = 1.9 MW

Plant Design Flow = 3.74 m^3/s
T.L. Line Length = .6 km
Dam Length = 82 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Penstock length/head ratio > 20, would require a surge tank.

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WATER SHED : Red Harbour River #2

SITE NAME : SITE - 2 FILE : 1010

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.854577 MW
PENSTOCK LENGTH	: 3000 M.
DESIGN FLOW	: 3.735 M^3/S
PENSTOCK DIAMETER	: 1.248847 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: .6 KM.
LENGTH OF DAM	: 82 M.
ACCESS ROAD LENGTH	: .3 KM.
FLOOD FLOW	: 85 M^3/S
DISTANCE TO TOWN	: 12 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5010115

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
271453.9	SEE DAM	75626.41	4024786	63750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
343584.6	818754.9	245626.5	45641.17	154152.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	179928	656670.3	228928.5

PROJECT COST: $ 7108903 COST PER KW: $ 3833.167

Total Project Cost = $ 7,108,903

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RIVER: Spout River

SITE: S.1

LAT: 47° 00' 45"

LONG: 52° 58' 30"

DRAINAGE AREA = 85.0 km²

HEAD = 76.0 m

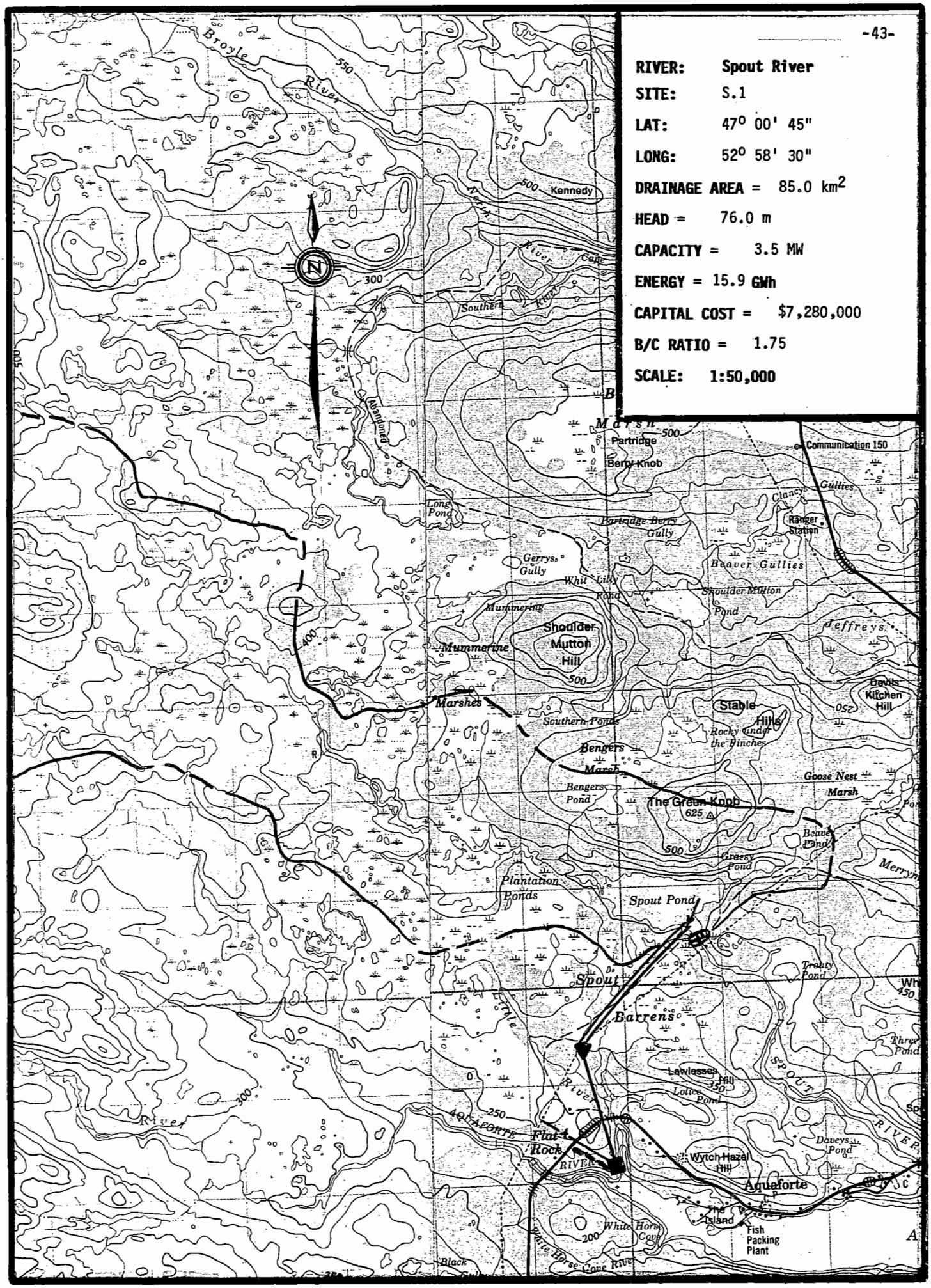
CAPACITY = 3.5 MW

ENERGY = 15.9 GWh

CAPITAL COST = $7,280,000

B/C RATIO = 1.75

SCALE: 1:50,000



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WATER SHED : Spout River

SITE NAME : SITE - 1 FILE : 1012

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.498409 MW
PENSTOCK LENGTH	: 1200 M.
DESIGN FLOW	: 5.655 M^3/S
PENSTOCK DIAMETER	: 1.447447 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: .7 KM.
LENGTH OF DAM	: 87 M.
ACCESS ROAD LENGTH	: 2.5 KM.
FLOOD FLOW	: 90 M^3/S
DISTANCE TO TOWN	: 2.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7986782

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
330201.2	SEE DAM	109850.3	1917475	67500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
496080.8	1182150	354645	276727.7	222978

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	75355.36	535557.3	213893.1

PROJECT COST: $ 7282414 COST PER KW: $ 2081.636

Total Project Cost = $ 7,282,414

WATER SHED : Spout River SITE - 1

COST DATA

(ADDITIONAL COST of $ 1,500,000 for Canal INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 546181.1

ANNUAL BENEFIT : $ 956157.1

BENEFIT/COST RATIO: 1.750623

Total Project Cost = $ 7,282,414.00

Benefit / Cost Ratio = 1.75

MAP NUMBER 1N/02 DATA SHEET FILE NUMBER 1012

1. Site Identification:

River Basin: Spout River Site: S.1

2. Location:

Lat. 47° 00' 45" Long. 52° 58' 30" Hydrologic Region 1

3. Hydrologic Data:

A = 85 km^2, MAR = 1400 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.77 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 90 m^3/s

Q1000 = 120 m^3/s Q_2 = 42

4. Site Data:

Rated Head = 76 m
Penstock Length = 1200 m
Access Road Length = 2.5 km
Dam Height = 5.5 m
Distance to Town = 2.5 km
Installed Capacity = 3.5 MW

Plant Design Flow = 5.66 m^3/s
T.L. Line Length = 0.7 km
Dam Length = 87 m
Distance to Concrete Plant = 40 km

5. Remarks:

(i) Add dug Power Canal = $1,500,000

RIVER: Chance Cove Brook

SITE: S.1

LAT: 46° 45' 00"

LONG: 53° 02' 00"

DRAINAGE AREA = 72 km^2

HEAD = 97.0 m

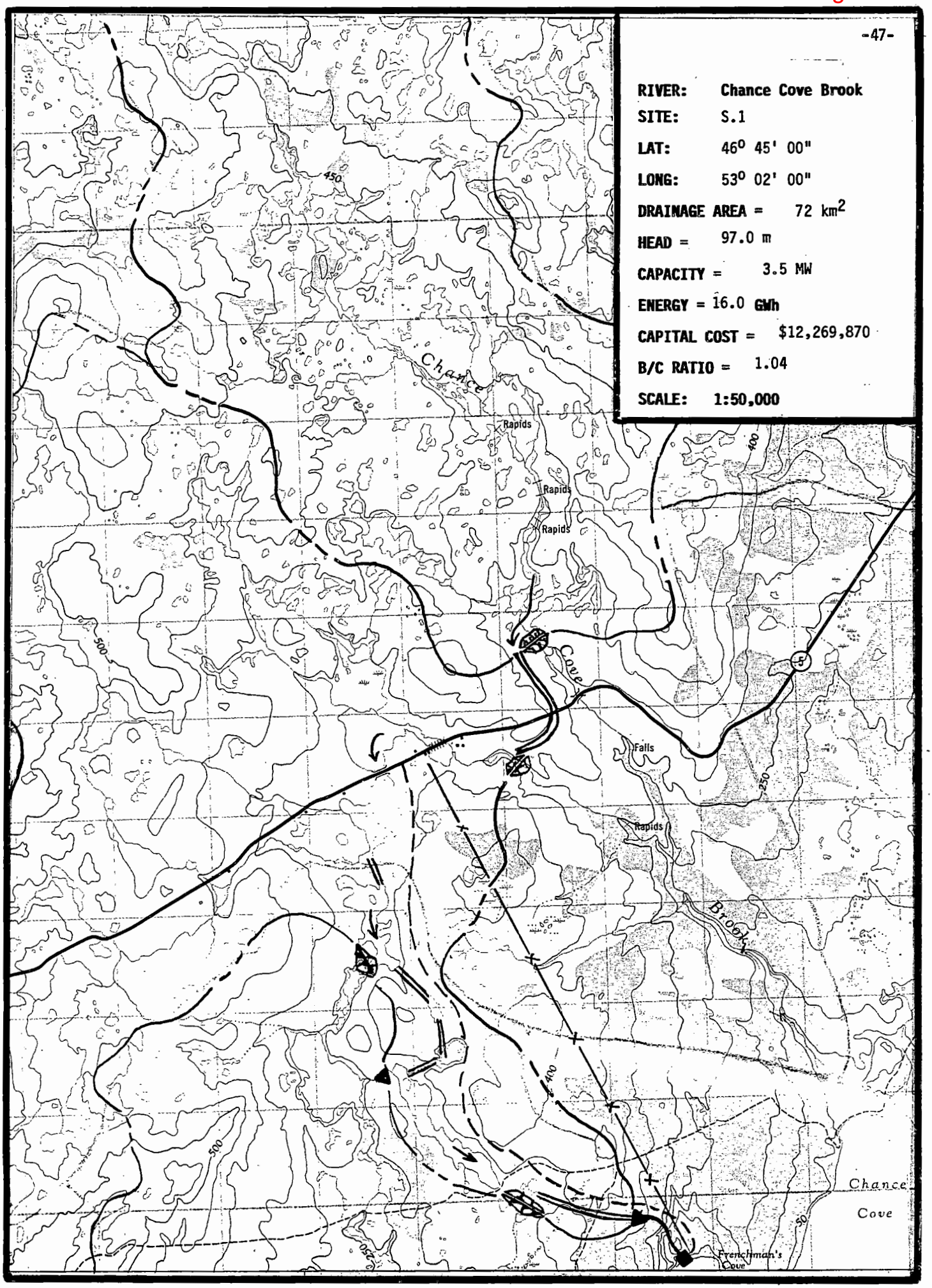
CAPACITY = 3.5 MW

ENERGY = 16.0 GWh

CAPITAL COST = $12,269,870

B/C RATIO = 1.04

SCALE: 1:50,000



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WATER SHED : Chance Cove Brook

SITE NAME : SITE - 1 FILE : 1013

SITE DATA

INSTALLED CAPACITY	: 3.517579 MW
PENSTOCK LENGTH	: 608 M.
DESIGN FLOW	: 4.455 M^3/S
PENSTOCK DIAMETER	: 1.262487 M.
RATED HEAD	: 97 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 400 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 18 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7555309

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
837945.3	62308.34	88628.81	826149	13500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
457223.5	972815.9	291844.8	323114.7	1048982

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	508564.9	574312	231478.6

PROJECT COST: $ 1.226987E+07 COST PER KW: $ 3488.157

Total Project Cost = $ 12,269,870

WATER SHED : Chance Cove Brook SITE - 1

COST DATA

(ADDITIONAL COST of $ 6,033,000 for Diversion & Canals INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 920240.1

ANNUAL BENEFIT : $ 961396.4

BENEFIT/COST RATIO: 1.044724

Total Project Cost = $ 12,269,870.00

Benefit / Cost Ratio = 1.04

MAP NUMBER 1K/14 DATA SHEET FILE NUMBER 1013

1. Site Identification:

River Basin: Chance Cove Brook Site: S.1

2. Location:

Lat. 46° 45' 00" Long. 53° 02' 00" Hydrologic Region 1

3. Hydrologic Data:

A = 72 km^2, MAR = 1300 mm, ACLS = - %

Storage Reservoir Area = - km^2

Storage Reservoir Vol, V = - $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = -$$

Mean Flow, QAV = 2.97 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 18 m^3/s

Q1000 = ____ m^3/s

4. Site Data:

Rated Head = 97.0 m
Penstock Length = 608 m
Access Road Length = 3.0 km
Dam Height = 5 m
Distance to Town = 35 km
Installed Capacity = 3.5 MW

Plant Design Flow = 4.46 m^3/s
T.L. Line Length = 20 km
Dam Length = 400 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Additional Costs:

Diversion = $2,572,000

Forebay Canal = $2,161,000

Power Canal = $1,300,000 (Rock cut)

= $6,033,000

(ii) Would involve work within Chance Cove Provincial Park.

(iii) An alternative routing of the Forebay/Power Canal would be a 5 km long hillside canal. The optional routing depends on relative pond elevation and conditions.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Chance Cove Forebay Region: 1

Total Developed Head, H = 97 m Map: 1K/14

Diverted Area = 72 km^2, MAR = 1300 mm, from .....

Location: Lat. = 46° 47' 00" Long. = 53° 04' 30"

Mean Diverted Flow = 2.97 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 2.97 = 2.32 m^3/s

Additional Energy = H x Q* x 0.0716

= 97 x 2.32 x 0.0716 = 16.1 GWh p.a.

Dam: Height = 3 m, Length = 700 m, Q150 = 18 m^3/s

Canal: Height of Land = 2 m, Length = 1200 m

Design Flow Ratio = 1.5 Design Flow = 4.46 m^3/s

Access Road: Length = 3.0 km

Costs:

Dam + Spillway	= 914,800
Diversion Canal	= 359,500
Access Road	= 120,000
Sub-total Direct Costs	= 1,394,300
Total Cost Diversion	= 2,161,100
Additional Plant Costs	= -
Total Project Cost	= -

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.15}$ =

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Chance Cove ..... Region: 1 .....

Total Developed Head, H = 97.0 ....m Map: 1K/14 .....

Diverted Area = 31 .....km^2, MAR = 1300 .....mm, from Chance Cove Brook

Location: Lat. = 46° 48' 30" Long. = 53° 03' 00"

Mean Diverted Flow = 1.28 .....m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 1.28 = 1.00 .....m^3/s

Additional Energy = H x Q* x 0.0716

= 97 x 1.0 x 0.0716 = 6.9 GWh p.a.

Dam: Height = 4 .....m, Length = 500 .....m, Q150 = 70.0 m^3/s
(includes dam on South Branch of South Cove Brook)

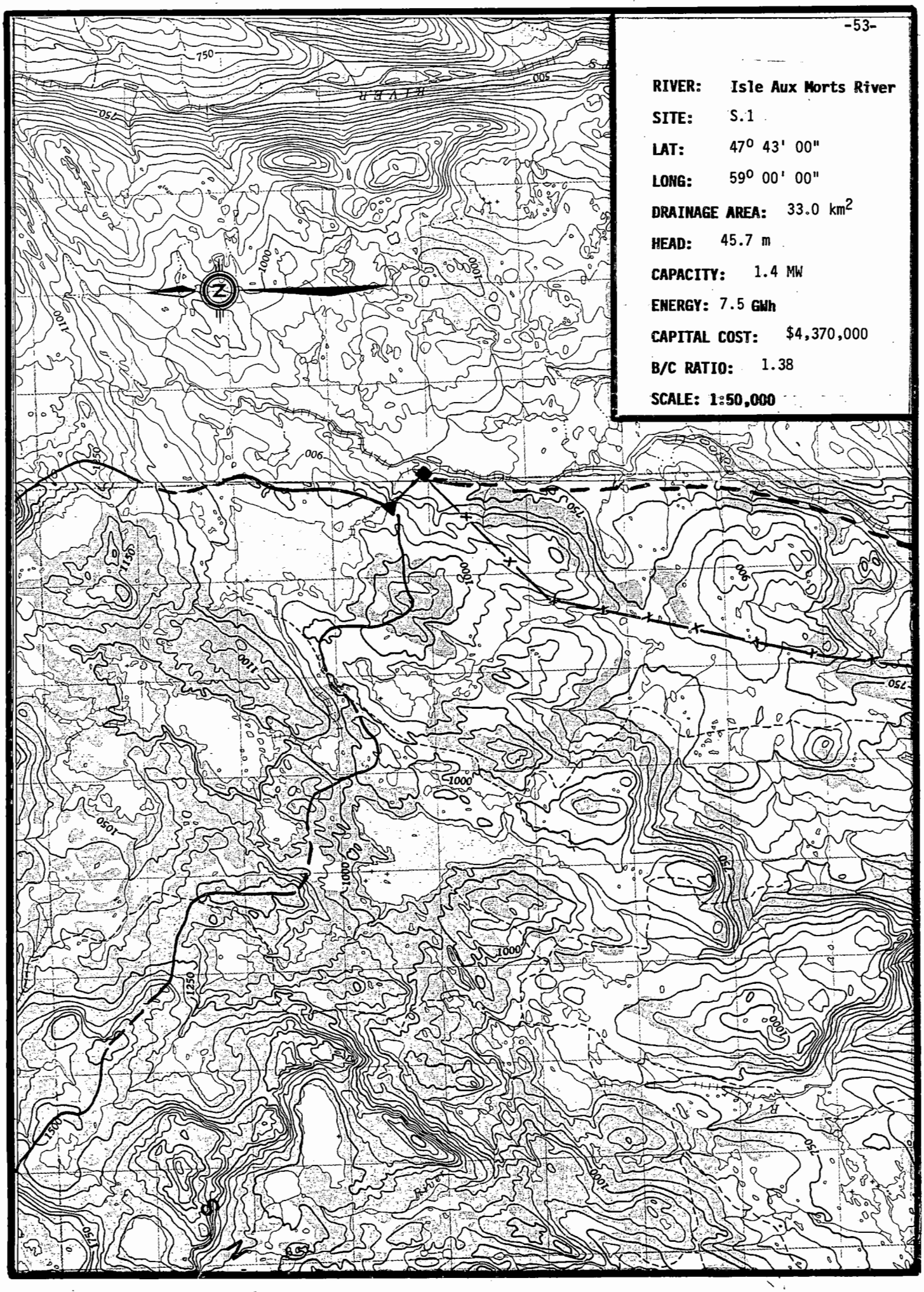
Canal: Height of Land = 3 .....m, Length = 1400 .....m

Design Flow Ratio = 1.5 ..... Design Flow = 1.92 .....m^3/s

Access Road: Length = 0.75 ...km

Costs:		
	Dam + Spillway	= 1,050,900
	Diversion Canal	= 578,700
	Access Road	= 30,000
	Sub-total Direct Costs	= 1,659,600
	Total Cost Diversion	= 2,572,400
	Additional Plant Costs	= -
	Total Project Cost	= -

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.15} =$$


RIVER:
Isle Aux Morts River
SITE:
S.1
LAT:
47° 43' 00"
LONG:
59° 00' 00"
DRAINAGE AREA:
33.0 km2
HEAD:
45.7 m
CAPACITY:
1.4 MW
ENERGY:
7.5 GWh
CAPITAL COST:
$4,370,000
B/C RATIO:
1.38
SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Isle Aux Morts River

SITE NAME : SITE - 1 FILE : 2001

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.400572 MW
PENSTOCK LENGTH	: 607 M.
DESIGN FLOW	: 3.765 M^3/S
PENSTOCK DIAMETER	: 1.304852 M.
RATED HEAD	: 45.7 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 11.7 KM.
LENGTH OF DAM	: 70 M.
ACCESS ROAD LENGTH	: 12.3 KM.
FLOOD FLOW	: 120 M^3/S
DISTANCE TO TOWN	: 23 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 23 KM.
USEFUL TURBINE FLOW RATIO	: .9199999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4272768

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
111212.9	SEE DAM	76172.89	378127.1	90000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
312299.5	744202.9	223260.9	1072070	513350.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	238863.4	464364.9	145201.2

PROJECT COST: $ 4369125 COST PER KW: $ 3119.528

Total Project Cost = $ 4,369,125

MAP NUMBER 110/10 DATA SHEET FILE NUMBER 2001

1. Site Identification:

River Basin: Isle Aux Morts River Site: S.1

2. Location:

Lat. 47° 43' 00" Long. 59° 00' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 33 km^2, MAR = 2400 mm, ACLS = 80 %

Storage Reservoir Area = 1.2 km^2

Storage Reservoir Vol, V = 2.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = .03$$

Mean Flow, QAV = 2.51 m^3/s

Usable Flow Ratio = 0.92

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 120 m^3/s

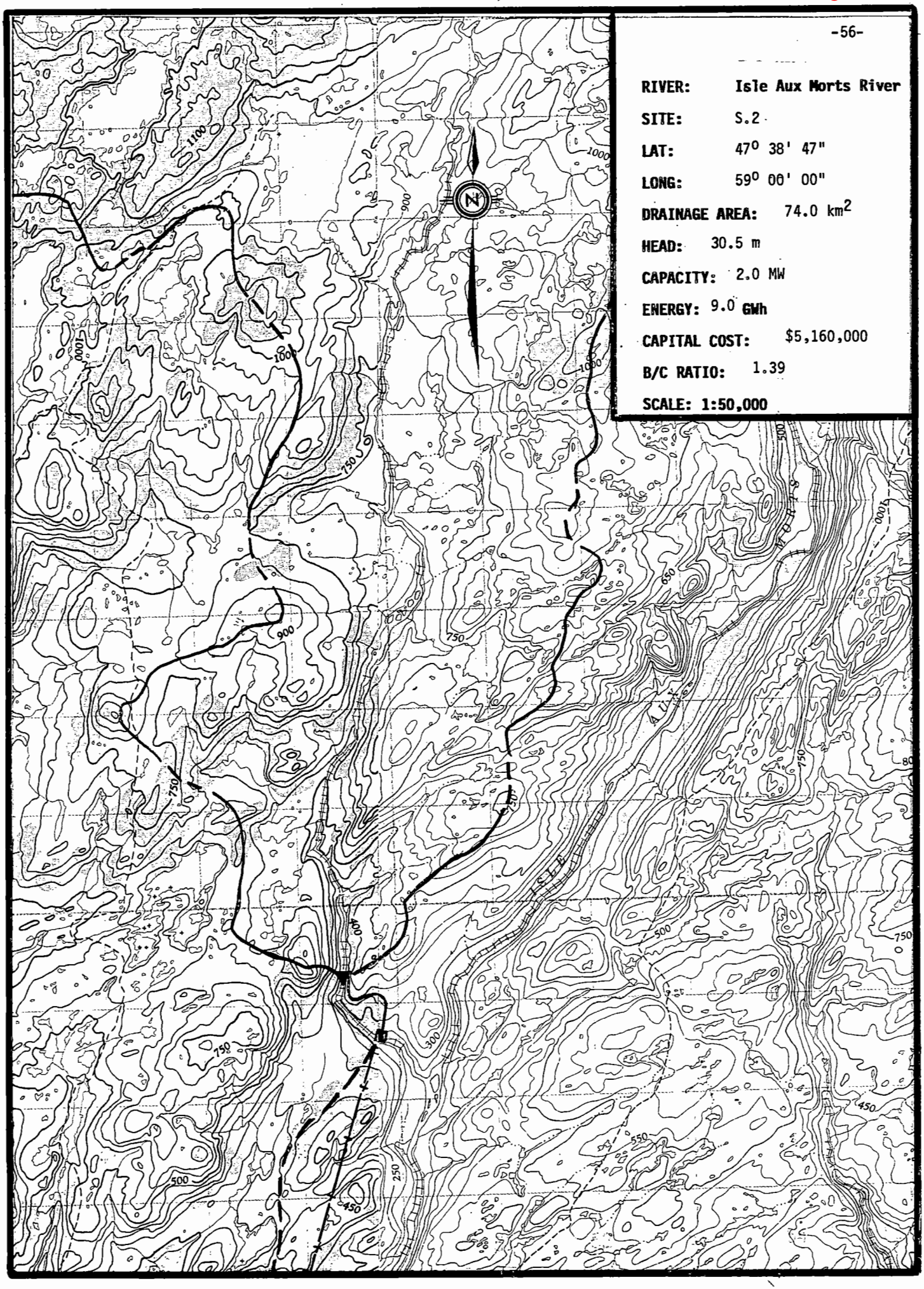
Q1000 = 170 m^3/s

4. Site Data:

Rated Head = 45.7 m
Penstock Length = 607 m
Access Road Length = 12.3 km
Dam Height = 3 m
Distance to Town = 23 km
Installed Capacity = 1.46 MW

Plant Design Flow = 3.77 m^3/s
T.L. Line Length = 11.7 km
Dam Length = 70 m
Distance to Concrete Plant = 23 km

5. Remarks:



RIVER:	Isle Aux Morts River
SITE:	S.2
LAT:	47° 38' 47"
LONG:	59° 00' 00"
DRAINAGE AREA:	74.0 km^2
HEAD:	30.5 m
CAPACITY:	2.0 MW
ENERGY:	9.0 GWh
CAPITAL COST:	$5,160,000
B/C RATIO:	1.39
SCALE:	1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Isle Aux Morts River

SITE NAME : SITE - 2 FILE : 2002

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.966298 MW
PENSTOCK LENGTH	: 936 M.
DESIGN FLOW	: 7.92 M^3/S
PENSTOCK DIAMETER	: 1.901168 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 5.9 M.
TRANSMISSION LINE LENGTH	: 3.5 KM.
LENGTH OF DAM	: 107 M.
ACCESS ROAD LENGTH	: 4.5 KM.
FLOOD FLOW	: 195 M^3/S
DISTANCE TO TOWN	: 15 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 15 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6233512

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
442371.9	SEE DAM	148752.6	849207.3	146250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
456223.3	1087171	326151.1	456072.9	280815.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	163949.7	595582	208408.9

PROJECT COST: $ 5160956 COST PER KW: $ 2624.707

Total Project Cost = $ 5,160,956

MAP NUMBER 110/10 DATA SHEET FILE NUMBER 2002

1. Site Identification:

River Basin: Isle Aux Morts River Site: S.2

2. Location:

Lat. 47° 38' 47" Long. 59° 00' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 74 km^2, MAR = 2250 mm, ACLS = 75 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.28 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 195 m^3/s

Q1000 = 260 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 936 m
Access Road Length = 4.5 km
Dam Height = 5.9 m
Distance to Town = 15 km
Installed Capacity = 2.05 MW

Plant Design Flow = 7.91 m^3/s
T.L. Line Length = 3.5 km
Dam Length = 107 m
Distance to Concrete Plant = 15 km

5. Remarks:

RIVER: Isle Aux Morts River

SITE: S.3

LAT: 47° 37' 00"

LONG: 59° 00' 20"

DRAINAGE AREA: 200.0 km²

HEAD: 15.2 m

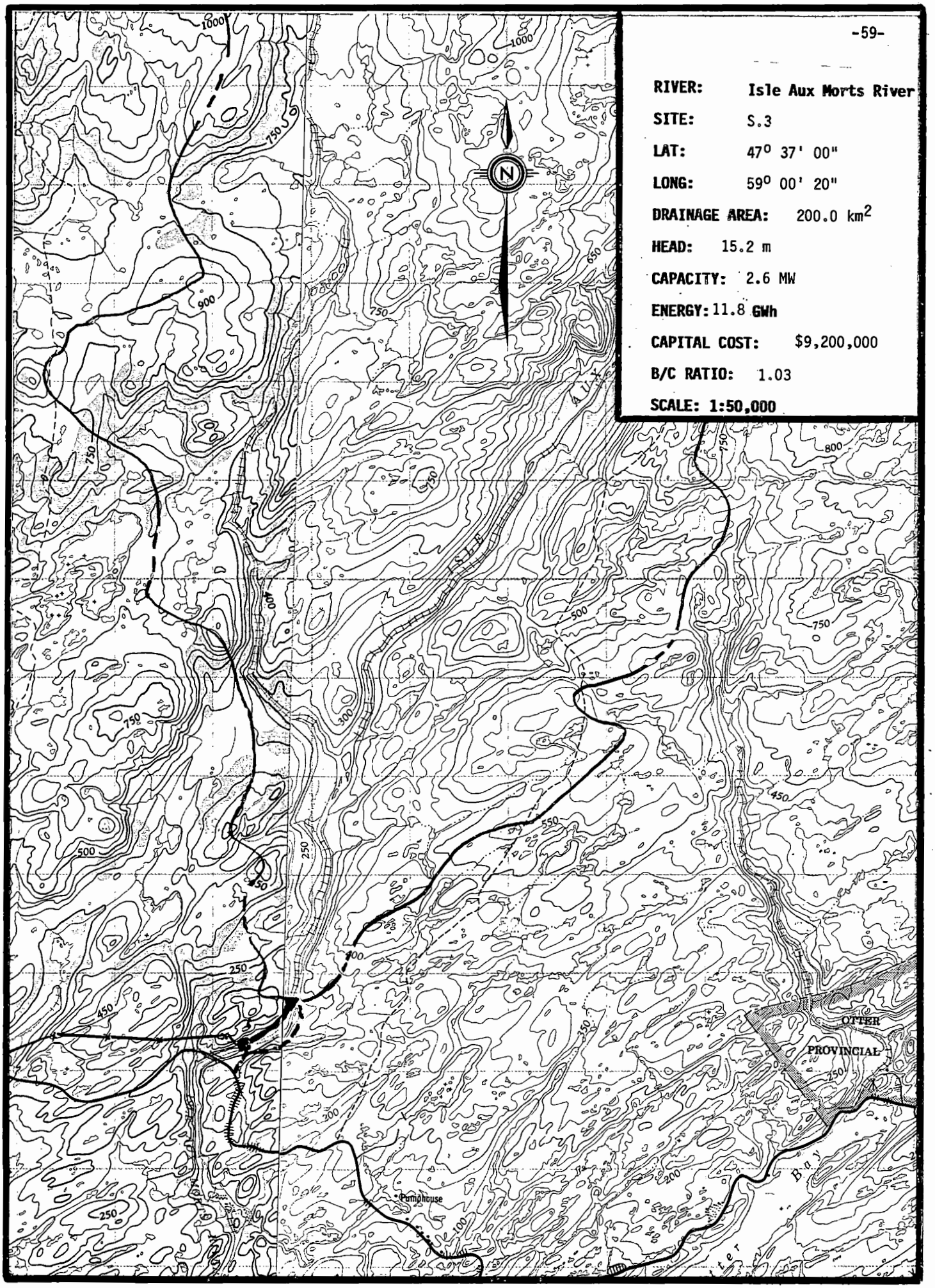
CAPACITY: 2.6 MW

ENERGY: 11.8 GWh

CAPITAL COST: $9,200,000

B/C RATIO: 1.03

SCALE: 1:50,000



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WATER SHED : Isle Aux Morts River

SITE NAME : SITE - 3 FILE : 2003

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.589008 MW
PENSTOCK LENGTH	: 715 M.
DESIGN FLOW	: 20.925 M^3/S
PENSTOCK DIAMETER	: 3.182721 M.
RATED HEAD	: 15.2 M.
HEIGHT OF DAM	: 7.5 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 120 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 740 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 10 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9270731

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
710106.8	SEE DAM	356624.3	3124595	555000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
705790.8	1681884	504565.3	70457.66	179470.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	160524.7	826244.8	321241.1

PROJECT COST: $ 9196505 COST PER KW: $ 3552.135

Total Project Cost = $ 9,196,505

MAP NUMBER 110/11 DATA SHEET FILE NUMBER 2003

1. Site Identification:

River Basin: Isle Aux Morts River Site: S.3

2. Location:

Lat. 47° 37' 00" Long. 59° 00' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 200 km^2, MAR = 2200 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 13.95 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 740 m^3/s

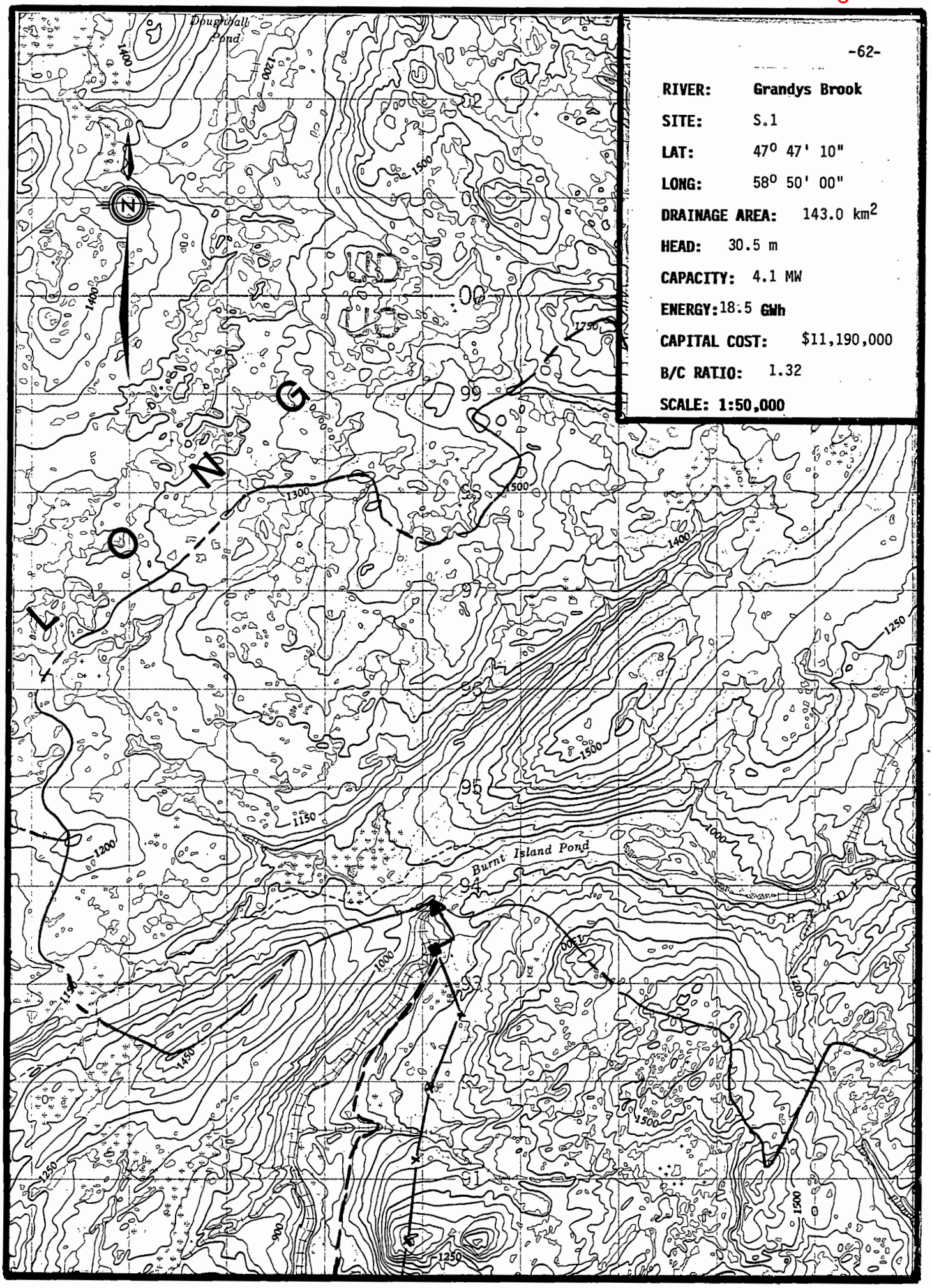
Q1000 = 1000 m^3/s

4. Site Data:

Rated Head = 15.2 m
Penstock Length = 715 m
Access Road Length = 0.5 km
Dam Height = 7.5 m
Distance to Town = 10 km
Installed Capacity = 2.70 MW

Plant Design Flow = 20.92 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 120 m
Distance to Concrete Plant = 10 km

5. Remarks:


-62-
RIVER: Grandys Brook
SITE: S.1
LAT: 47° 47' 10"
LONG: 58° 50' 00"
DRAINAGE AREA: 143.0 km²
HEAD: 30.5 m
CAPACITY: 4.1 MW
ENERGY: 18.5 GWh
CAPITAL COST: $11,190,000
B/C RATIO: 1.32
SCALE: 1:50,000
Burnt Island Pond
N

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Grandys Brook

SITE NAME : SITE - 1 FILE : 2004

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.051767 MW
PENSTOCK LENGTH	: 661 M.
DESIGN FLOW	: 16.32 M^3/S
PENSTOCK DIAMETER	: 2.594407 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 120 M.
ACCESS ROAD LENGTH	: 21.5 KM.
FLOOD FLOW	: 720 M^3/S
DISTANCE TO TOWN	: 25 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.127739E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
183955	SEE DAM	285141.3	2196562	540000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
756787.6	1803409	541022.6	1723361	1101418

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	643593.4	980790.2	434778

PROJECT COST: $ 1.119082E+07 COST PER KW: $ 2761.961

Total Project Cost = $ 11,190,820

MAP NUMBER 110/15 DATA SHEET FILE NUMBER 2004

1. Site Identification:

River Basin: Grandys Brook Site: S.1

2. Location:

Lat. 47° 47' 10" Long. 58° 50' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 143 km^2, MAR = 2400 mm, ACLS = 40 %

Storage Reservoir Area = 0.7 km^2

Storage Reservoir Vol, V = 1.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.004$$

Mean Flow, QAV = 10.88 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 720 m^3/s

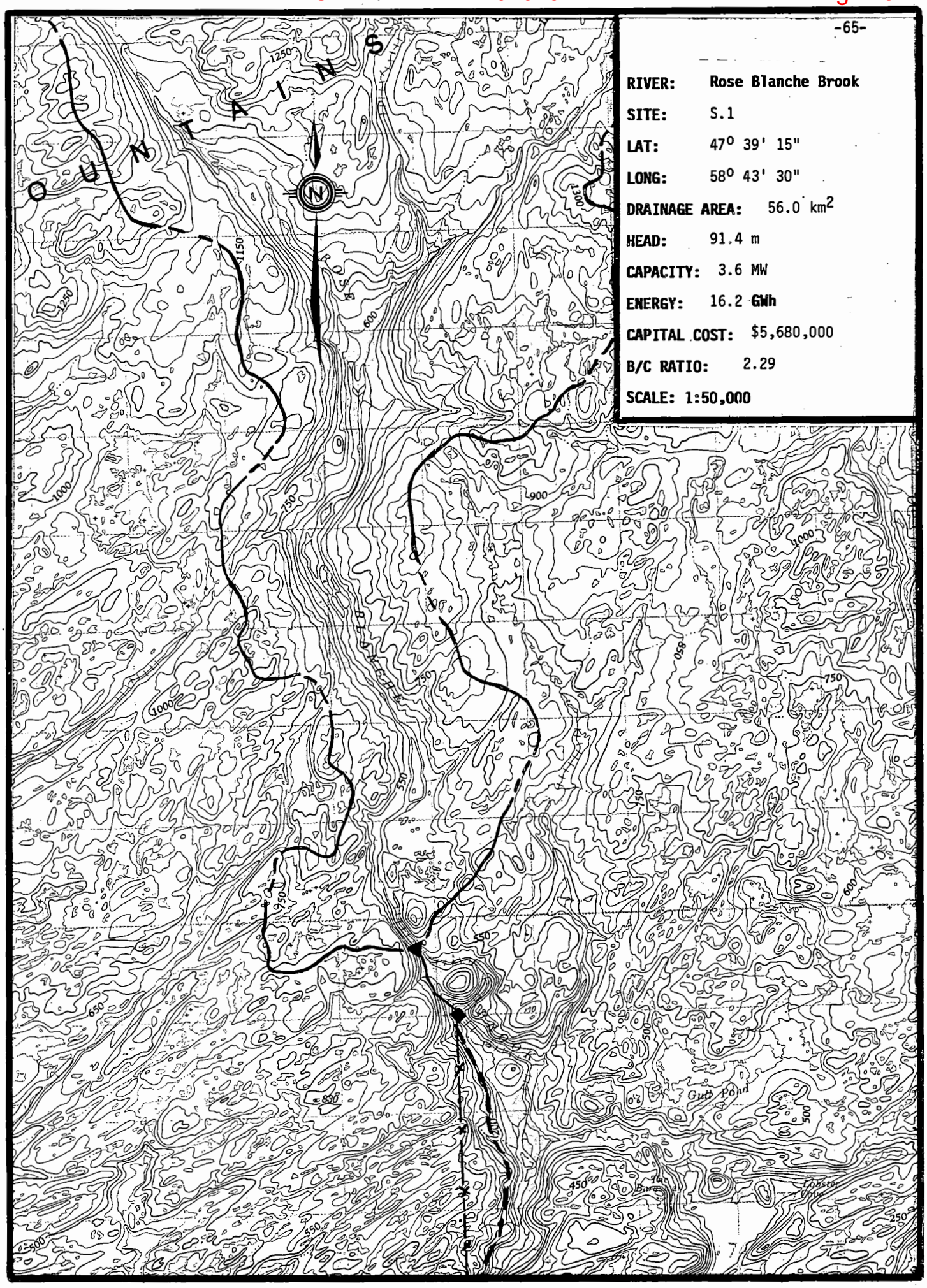
Q1000 = 980 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 661 m
Access Road Length = 21.5 km
Dam Height = 3 m
Distance to Town = 25 km
Installed Capacity = 4.23 MW

Plant Design Flow = 16.32 m^3/s
T.L. Line Length = 20 km
Dam Length = 120 m
Distance to Concrete Plant = 50 km

5. Remarks:



RIVER: Rose Blanche Brook

SITE: S.1

LAT: 47° 39' 15"

LONG: 58° 43' 30"

DRAINAGE AREA: 56.0 km^2

HEAD: 91.4 m

CAPACITY: 3.6 MW

ENERGY: 16.2 GWh

CAPITAL COST: $5,680,000

B/C RATIO: 2.29

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Rose Blanche Brook

SITE NAME : SITE - 1 FILE : 2005

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.560021 MW
PENSTOCK LENGTH	: 913 M.
DESIGN FLOW	: 4.785 M^3/S
PENSTOCK DIAMETER	: 1.312766 M.
RATED HEAD	: 91.4 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 101 M.
ACCESS ROAD LENGTH	: 5.5 KM.
FLOOD FLOW	: 205 M^3/S
DISTANCE TO TOWN	: 6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7742413

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
367377.6	SEE DAM	94516.09	1298942	153750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
470775.1	1121847	336554.1	540893.7	432555.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	121244	526018.8	210581

PROJECT COST: $ 5675054 COST PER KW: $ 1594.107

Total Project Cost = $ 5,675,054

MAP NUMBER 110/10 DATA SHEET FILE NUMBER 2005

1. Site Identification:

River Basin: Rose Blanche Brook Site: S.1

2. Location:

Lat. 47° 39' 15" Long. 58° 43' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 56 km^2, MAR = 1800 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.19 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 205 m^3/s

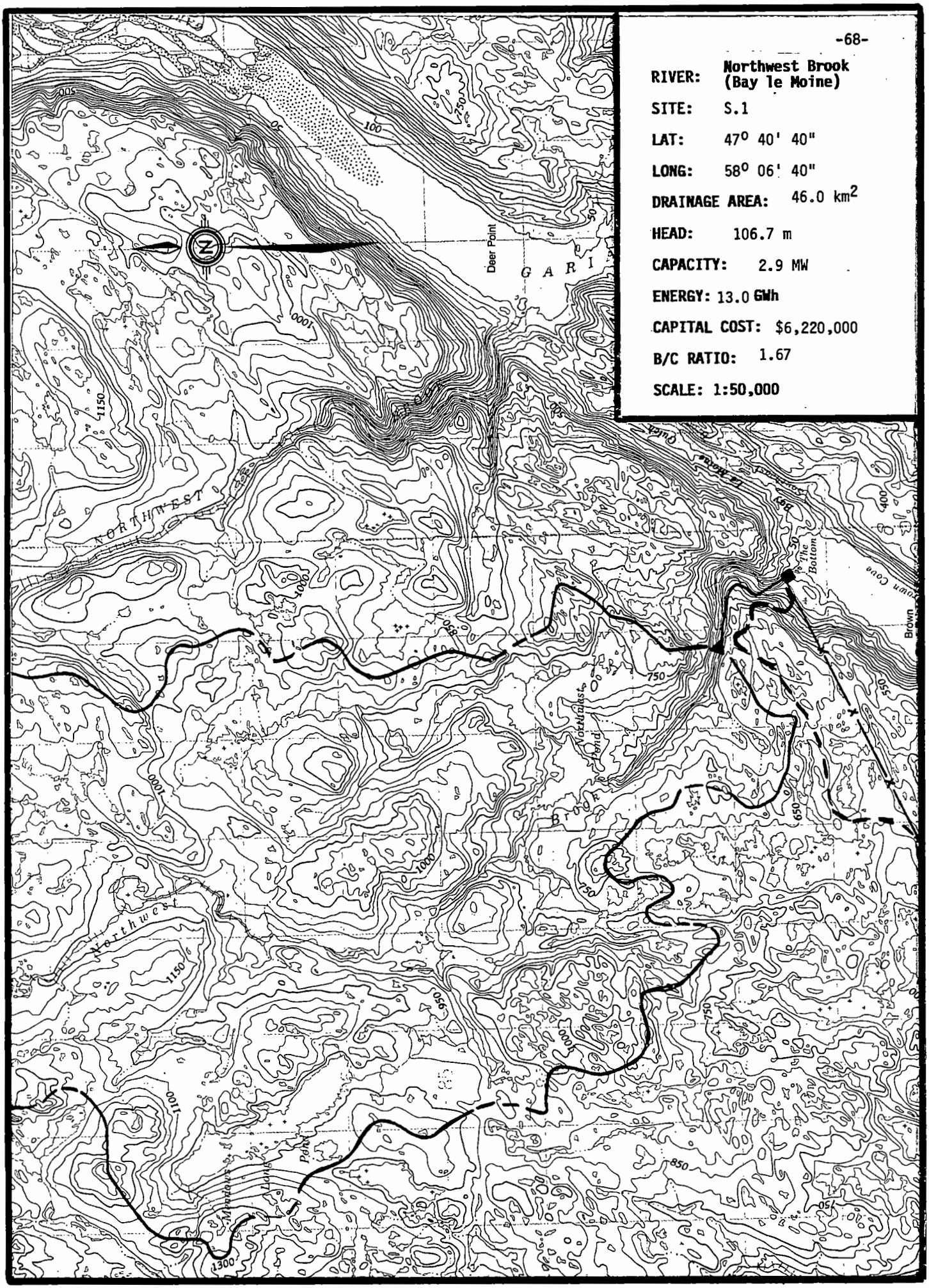
Q1000 = 270 m^3/s

4. Site Data:

Rated Head = 91.4 m
Penstock Length = 913 m
Access Road Length = 5.5 km
Dam Height = 5.4 m
Distance to Town = 6 km
Installed Capacity = 3.72 MW

Plant Design Flow = 4.79 m^3/s
T.L. Line Length = 5 km
Dam Length = 101 m
Distance to Concrete Plant = 40 km

5. Remarks:



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RIVER:	Northwest Brook (Bay le Moine)
SITE:	S.1
LAT:	47° 40' 40"
LONG:	58° 06' 40"
DRAINAGE AREA:	46.0 km^2
HEAD:	106.7 m
CAPACITY:	2.9 MW
ENERGY:	13.0 GWh
CAPITAL COST:	$6,220,000
B/C RATIO:	1.67
SCALE:	1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northwest Brook (Bay le Moine)

SITE NAME : SITE - 1 FILE : 2006

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.853147 MW
PENSTOCK LENGTH	: 1270 M.
DESIGN FLOW	: 3.285 M^3/S
PENSTOCK DIAMETER	: 1.092793 M.
RATED HEAD	: 106.7 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 12 KM.
LENGTH OF DAM	: 76 M.
ACCESS ROAD LENGTH	: 13 KM.
FLOOD FLOW	: 58 M^3/S
DISTANCE TO TOWN	: 13 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 52 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6216063

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
253510.4	SEE DAM	67374.24	1459214	43500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
381941.8	910159.2	273047.8	1123713	675791.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	232601.6	575460.4	220163.6

PROJECT COST: $ 6216477 COST PER KW: $ 2178.814

Total Project Cost = $ 6,216,477

MAP NUMBER 110/10 DATA SHEET FILE NUMBER 2006

1. Site Identification:

River Basin: Northwest Brook (Bay Le Moine) Site: S.1

2. Location:

Lat. 47° 40' 40" Long. 58° 06' 40" Hydrologic Region 2

3. Hydrologic Data:

A = 46 km^2, MAR = 1500 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.19 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 58 m^3/s

Q1000 = 79 m^3/s

4. Site Data:

Rated Head = 106.7m
Penstock Length = 1270 m
Access Road Length = 13 km
Dam Height = 5.0m
Distance to Town = 13 km
Installed Capacity = 2.98MW

Plant Design Flow = 3.28 m^3/s
T.L. Line Length = 12 km
Dam Length = 76 m
Distance to Concrete Plant = 52 km

5. Remarks:

RIVER: Northwest Brook (Garia Ba

SITE: S.1

LAT: 47° 42' 43"

LONG: 58° 35' 17"

DRAINAGE AREA: 108.0 km²

HEAD: 137.2 m

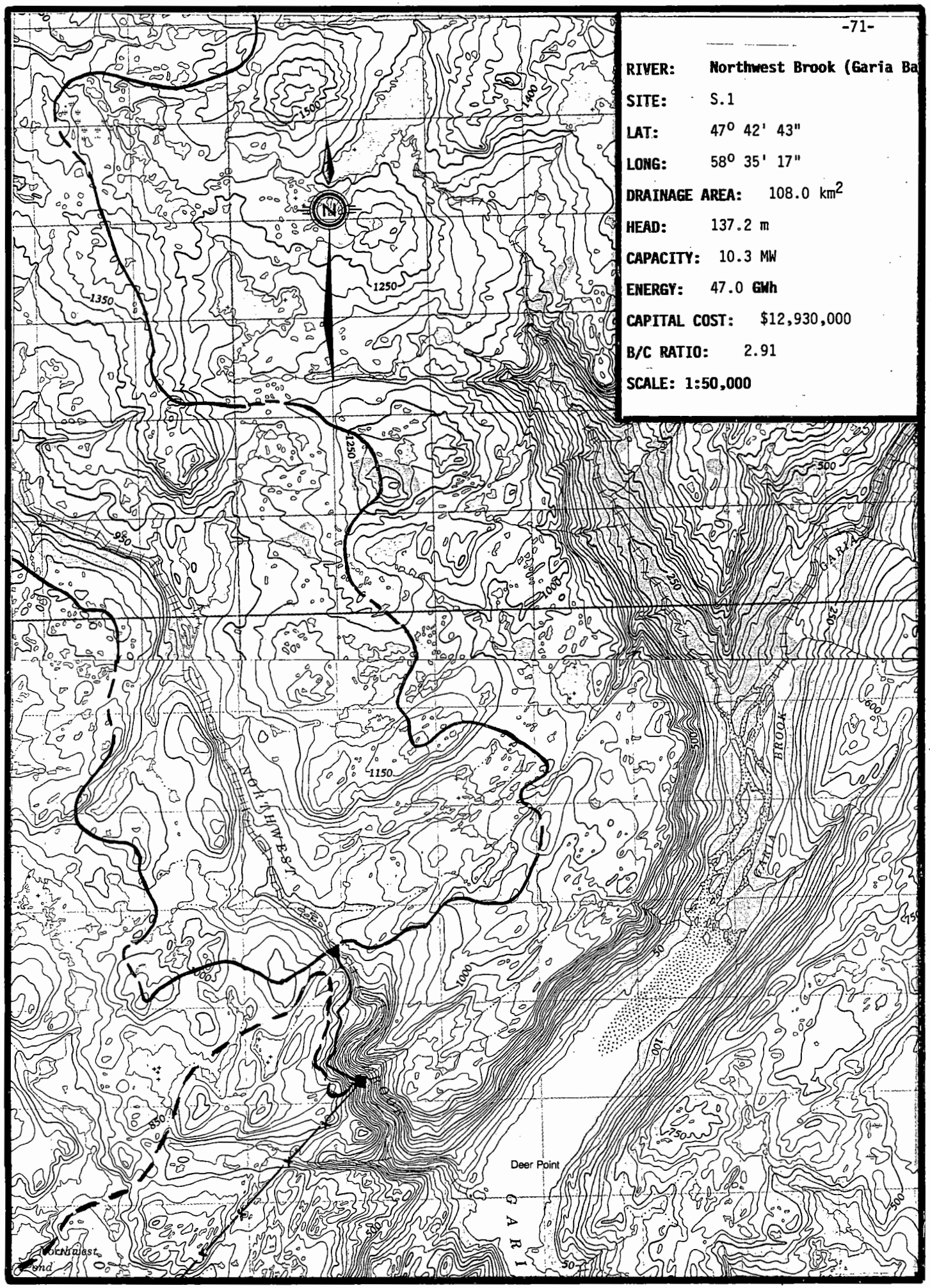
CAPACITY: 10.3 MW

ENERGY: 47.0 GWh

CAPITAL COST: $12,930,000

B/C RATIO: 2.91

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northwest Brook (Garia Bay)

SITE NAME : SITE - 1 FILE : 2007

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 10.31931 MW
PENSTOCK LENGTH	: 1821 M.
DESIGN FLOW	: 9.24 M^3/S
PENSTOCK DIAMETER	: 1.645811 M.
RATED HEAD	: 137.2 M.
HEIGHT OF DAM	: 6.2 M.
TRANSMISSION LINE LENGTH	: 16.5 KM.
LENGTH OF DAM	: 120 M.
ACCESS ROAD LENGTH	: 18.2 KM.
FLOOD FLOW	: 280 M^3/S
DISTANCE TO TOWN	: 17 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 56 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.676804E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
528986.3	SEE DAM	170890	3398700	210000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
945216.5	2117285	632025.4	1495768	1015898

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	511468.8	1111812	787055.6

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.292511E+07 COST PER KW: $ 1252.517

Total Project Cost = $ 12,925,110

MAP NUMBER 110/10 DATA SHEET FILE NUMBER 2007

1. Site Identification:

River Basin: Northwest Brook (Garia Bay) Site: S.1

2. Location:

Lat. 47° 42' 43" Long. 58° 35' 17" Hydrologic Region 2

3. Hydrologic Data:

A = 108 km^2, MAR = 1800 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V.m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.16 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 280 m^3/s

Q1000 = 470 m^3/s

4. Site Data:

Rated Head	= 137.2m	Plant Design Flow	= 9.24 m^3/s
Penstock Length	= 1821 m		
Access Road Length	= 18.2km	T.L. Line Length	= 16.5 km
Dam Height	= 6.2m	Dam Length	= 120 m
Distance to Town	= 17 km	Distance to Concrete Plant	= 56 km
Installed Capacity	= 10.78MW		

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Phillips Brook

SITE NAME : SITE - 1 FILE : 2008

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.758972 MW
PENSTOCK LENGTH	: 1602 M.
DESIGN FLOW	: 1.575 M^3/S
PENSTOCK DIAMETER	: .7690803 M.
RATED HEAD	: 137.2 M.
HEIGHT OF DAM	: 4.4 M.
TRANSMISSION LINE LENGTH	: 4 KM.
LENGTH OF DAM	: 70 M.
ACCESS ROAD LENGTH	: 46 KM.
FLOOD FLOW	: 59 M^3/S
DISTANCE TO TOWN	: 80 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3930080

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
194999.4	SEE DAM	34766.78	1240116	44250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
249307.5	594094.3	178228.3	3289636	286554

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1566702	794427.3	279190.4

PROJECT COST: $ 8752271 COST PER KW: $ 4975.787

Total Project Cost = $ 8,752,271

MAP NUMBER 110/16 DATA SHEET FILE NUMBER 2008

1. Site Identification:

River Basin: Phillips Brook Site: S.1

2. Location:

Lat. 47° 47' 13" Long. 58° 08' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 22 km^2, MAR = 1500 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.05 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 59 m^3/s

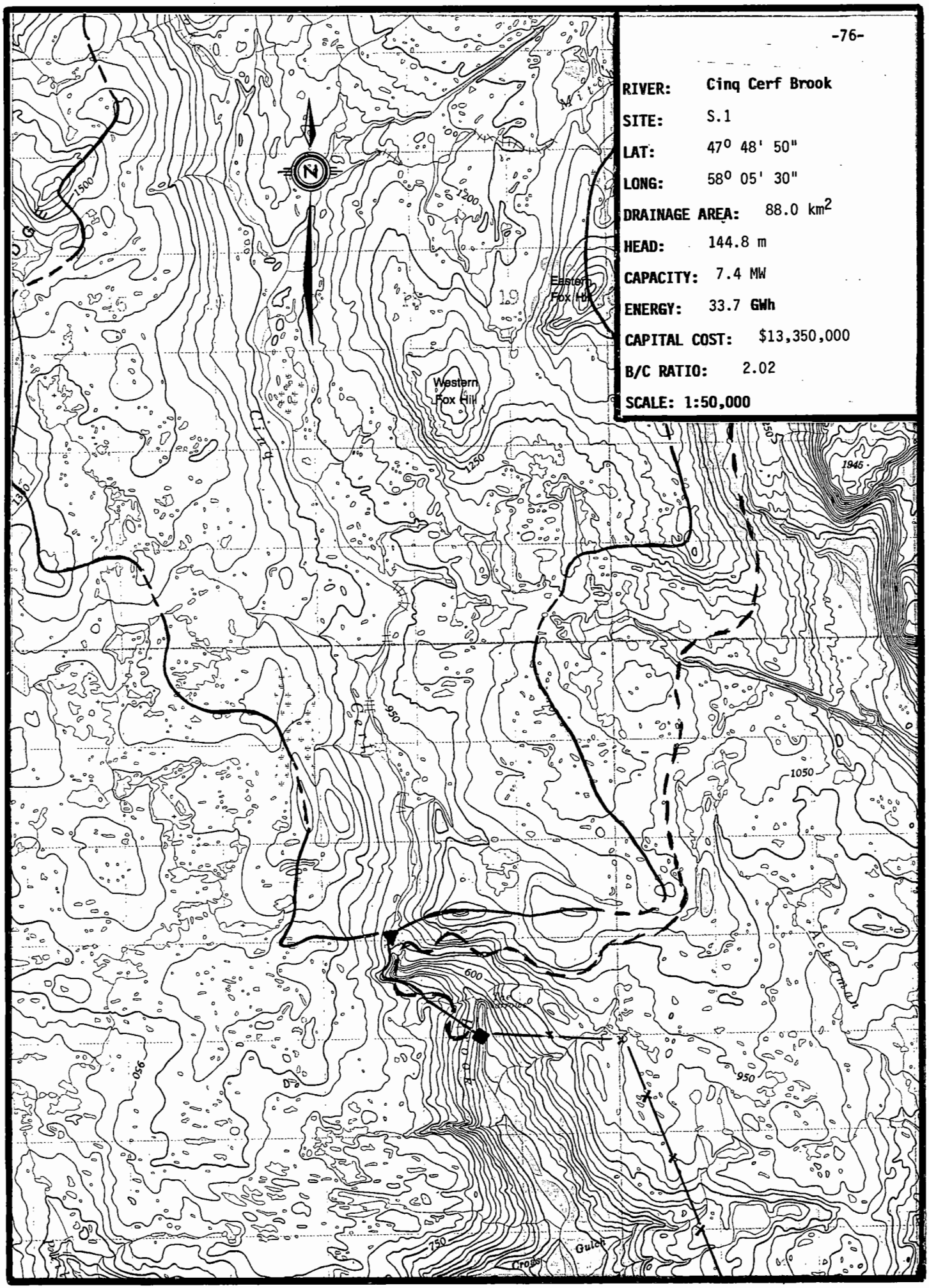
Q1000 = 79 m^3/s

4. Site Data:

Rated Head = 137.2 m
Penstock Length = 1602 m
Access Road Length = 46 km
Dam Height = 4.4 m
Distance to Town = 80 km
Installed Capacity = 1.83 MW

Plant Design Flow = 1.57 m^3/s
T.L. Line Length = 4 km
Dam Length = 70 m
Distance to Concrete Plant = 100 km

5. Remarks:


-76-
RIVER: Cinq Cerf Brook
SITE: S.1
LAT: 47° 48' 50"
LONG: 58° 05' 30"
DRAINAGE AREA: 88.0 km2
HEAD: 144.8 m
CAPACITY: 7.4 MW
ENERGY: 33.7 GWh
CAPITAL COST: $13,350,000
B/C RATIO: 2.02
SCALE: 1:50,000
N
Western Fox Hill
Eastern Fox Hill
1500
1200
1250
1945
1050
950
600
750
Ackerman
Cross Gulch

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Cinq Cerf Brook

SITE NAME : SITE - 1 FILE : 2009

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 7.390273 MW
PENSTOCK LENGTH	: 1767 M.
DESIGN FLOW	: 6.27 M^3/S
PENSTOCK DIAMETER	: 1.382572 M.
RATED HEAD	: 144.8 M.
HEIGHT OF DAM	: 5.7 M.
TRANSMISSION LINE LENGTH	: 7.7 KM.
LENGTH OF DAM	: 101 M.
ACCESS ROAD LENGTH	: 43 KM.
FLOOD FLOW	: 165 M^3/S
DISTANCE TO TOWN	: 77 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.258434E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
398582.6	SEE DAM	120546	2673110	123750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
705901.1	1581219	472005.6	3106360	459413.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1868356	1154977	683376.7

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.33476E+07 COST PER KW: $ 1806.104

Total Project Cost = $ 13,347,600

MAP NUMBER 110/16 DATA SHEET FILE NUMBER 2009

1. Site Identification:

River Basin: Cinq Cerf Brook Site: S.1

2. Location:

Lat. 47° 48' 50" Long. 58° 05' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 88 km^2, MAR = 1500 mm, ACLS = 65 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.18 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

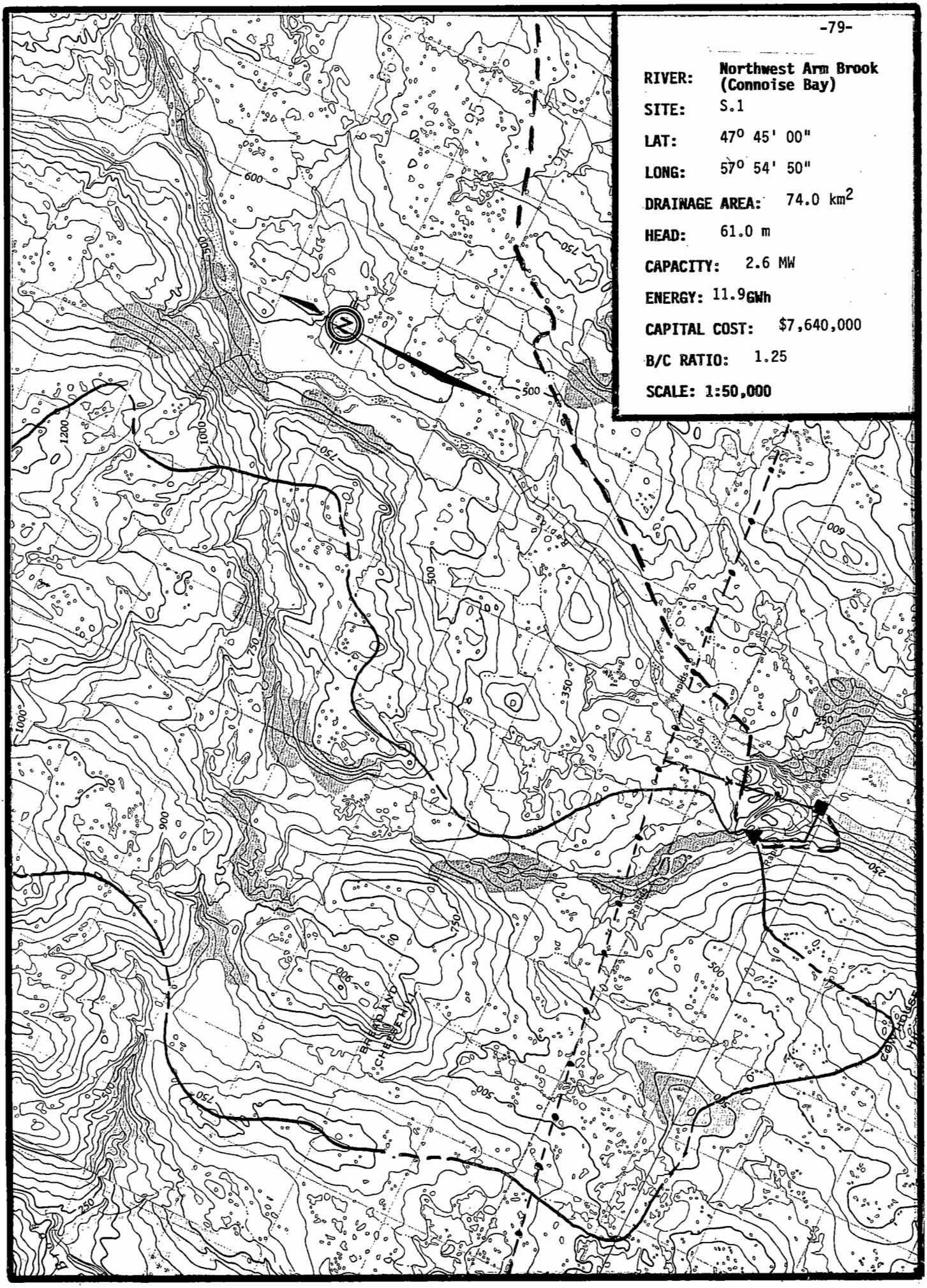
Flood Flow: Q150 = 165 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

Rated Head	= 144.8 m	Plant Design Flow	= 6.28 m^3/s
Penstock Length	= 1767 m		
Access Road Length	= 43 km	T.L. Line Length	= 7.7 km
Dam Height	= 5.7 m	Dam Length	= 101 m
Distance to Town	= 77 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 7.73 MW		

5. Remarks:


RIVER: Northwest Arm Brook (Connoise Bay)
SITE: S.1
LAT: 47° 45' 00"
LONG: 57° 54' 50"
DRAINAGE AREA: 74.0 km2
HEAD: 61.0 m
CAPACITY: 2.6 MW
ENERGY: 11.9 GWh
CAPITAL COST: $7,640,000
B/C RATIO: 1.25
SCALE: 1:50,000
600
500
750
1200
1000
350
250
900

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northwest Arm Brook

SITE NAME : SITE - 1 FILE : 2010

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.621731 MW
PENSTOCK LENGTH	: 902 M.
DESIGN FLOW	: 5.28 M^3/S
PENSTOCK DIAMETER	: 1.449296 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: 1.5 KM.
LENGTH OF DAM	: 98 M.
ACCESS ROAD LENGTH	: 21.5 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 42.6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6654711

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
367548.6	SEE DAM	103272	1443507	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
437798.3	1043264	312979.2	1723361	229390.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	896716	696705	266597.9

PROJECT COST: $ 7637389 COST PER KW: $ 2913.11

Total Project Cost = $ 7,637,389

MAP NUMBER 11 P/13 DATA SHEET FILE NUMBER 2010

1. Site Identification:

River Basin: Northwest Arm Brook (Connoise Bay) Site: S.1

2. Location:

Lat. 47° 45' 00" Long. 57° 54' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 74 km^2, MAR = 1500 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.52 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 2.5 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 902 m
Access Road Length = 21.5 km
Dam Height = 5.5 m
Distance to Town = 42.6 km
Installed Capacity = 2.74MW

Plant Design Flow = 5.28 m^3/s
T.L. Line Length = 1.5 km
Dam Length = 98 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion at Lat. 47° 54' 15"; Long. 57° 57' 50" would add 91 km^2 of area and permit increase in capcity to 3.4 MW.

(ii) Initial evaluation concluded diversion was unfeasible.

(iii) Site S.1 and S.2 could use same powerhouse.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Northwest Arm Brook (near Cinq Cerf) Region: 2

Total Developed Head, H = 61.0 m Map: 11 P/13

Diverted Area = 17 km^2, MAR = 1500 mm, from Couteau Brook

Location: Lat. = 47° 54' 15" Long. = 57° 57' 50"

Mean Diverted Flow = 0.81 m^3/s,

Additional Usable FLow, $Q^* = \frac{(3.52)}{F'(QAV + QDV) - F.QAV}$ use water use curve for Region 2, $Q_p = \frac{5.28}{3.52+0.81} = 1.22$

$= 0.70(3.52+0.81) = 2.75 = .28\ m^3/s$

Additional Energy = H x Q* x 0.0716

= 61 x 0.28 x 0.0716 = 1.22 GWh p.a.

Dam: Height = 3 m, Length = 60 m, Q150 = 26 m^3/s

Canal: Height of Land = 3 m, Length = 220 m

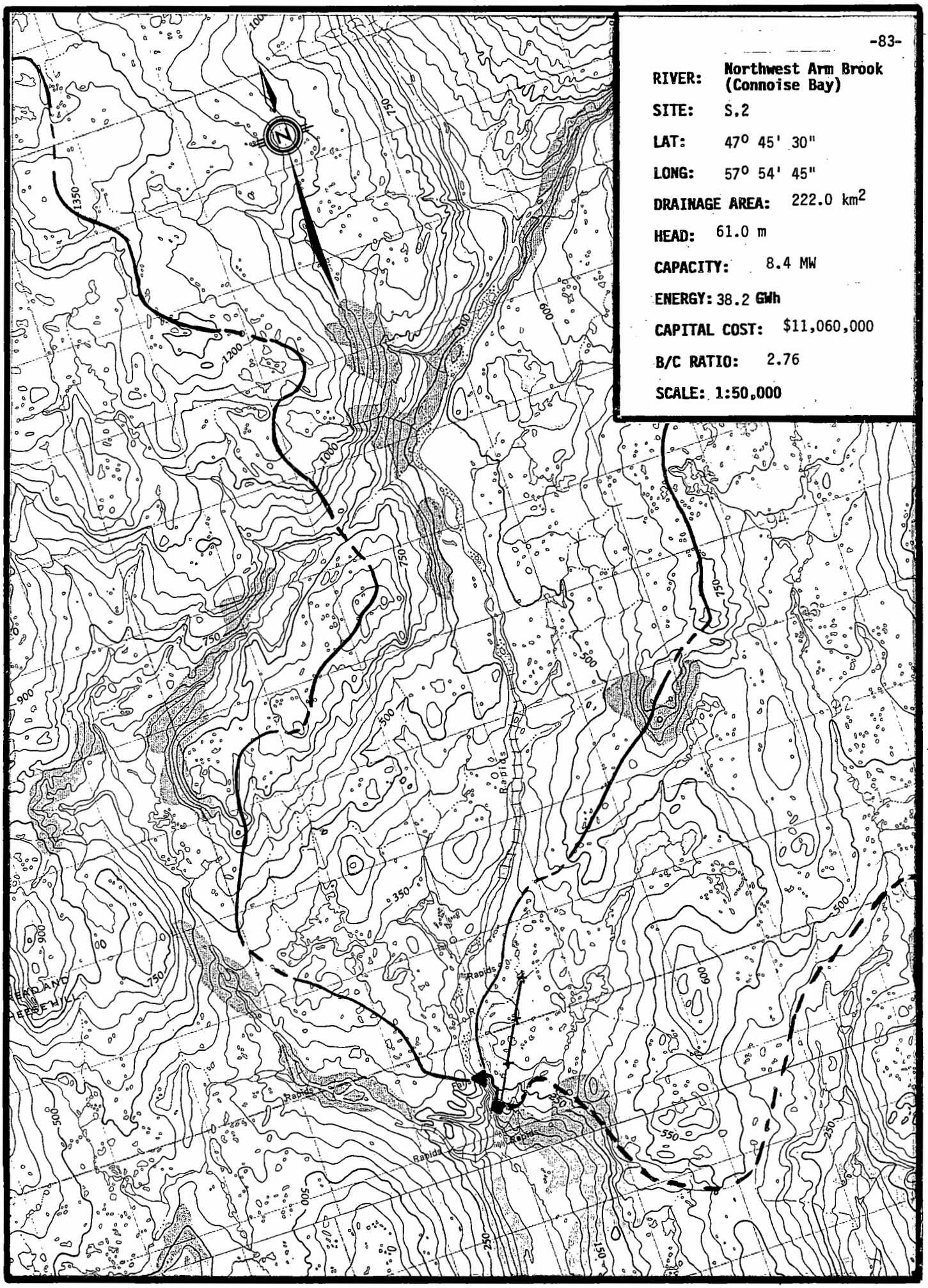
Design Flow Ratio = 1.22 Design Flow = 0.99 m^3/s

Access Road: Length = 16.5 km

Costs:	Dam + Spillway	= 115,200
	Diversion Canal	= 84,300
	Access Road	= 660,000
	Sub-total Direct Costs	= 859,500
	Total Cost Diversion	= 1,332,200
	Additional Plant Costs	= -
	Total Project Cost	= -

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ = 0.74

May be economic if access costs could be reduced, country appears open and access costs could be high in our analysis.


-83-
RIVER: Northwest Arm Brook (Connoise Bay)
SITE: S.2
LAT: 47° 45' 30"
LONG: 57° 54' 45"
DRAINAGE AREA: 222.0 km2
HEAD: 61.0 m
CAPACITY: 8.4 MW
ENERGY: 38.2 GWh
CAPITAL COST: $11,060,000
B/C RATIO: 2.76
SCALE: 1:50,000
N
Rapids
Rapids
Rapids
Rapids
Rapids

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northwest Arm Brook

SITE NAME : SITE - 2 FILE : 2011

SITE DATA

INSTALLED CAPACITY	: 8.38656 MW
PENSTOCK LENGTH	: 350 M.
DESIGN FLOW	: 16.89 M^3/S
PENSTOCK DIAMETER	: 2.389489 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 7.1 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 130 M.
ACCESS ROAD LENGTH	: 21.5 KM.
FLOOD FLOW	: 590 M^3/S
DISTANCE TO TOWN	: 42.6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.726735E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
700644.8	SEE DAM	294088.9	1044476	442500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1070209	2140418	638930.8	1723361	76173.51

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1351944	971996.9	604719.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.105946E+07 COST PER KW: $ 1318.713

Total Project Cost = $ 11,059,460

MAP NUMBER 11 P/13 DATA SHEET FILE NUMBER 2011

1. Site Identification:

River Basin: Northwest Arm Brook Site: S.2

2. Location:

Lat. 47° 45' 30" Long. 57° 54' 45" Hydrologic Region 2

3. Hydrologic Data:

A = 222 km^2, MAR = 1600 mm, ACLS = 30 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 11.26 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 590 m^3/s

Q1000 = 780 m^3/s

4. Site Data:

Rated Head	= 61 m	Plant Design Flow	= 16.89 m^3/s
Penstock Length	= 350 m		
Access Road Length	= 21.5 km	T.L. Line Length	= 1.0 km
Dam Height	= 7.1 m	Dam Length	= 130 m
Distance to Town	= 42.6 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 8.76 MW		

5. Remarks:

(i) Powerhouse could be shared with S.1

RIVER: Kings Harbour River

SITE: S.2

LAT: 47° 39' 20"

LONG: 57° 34' 40"

DRAINAGE AREA: 118.0 km²

HEAD: 76.2 m

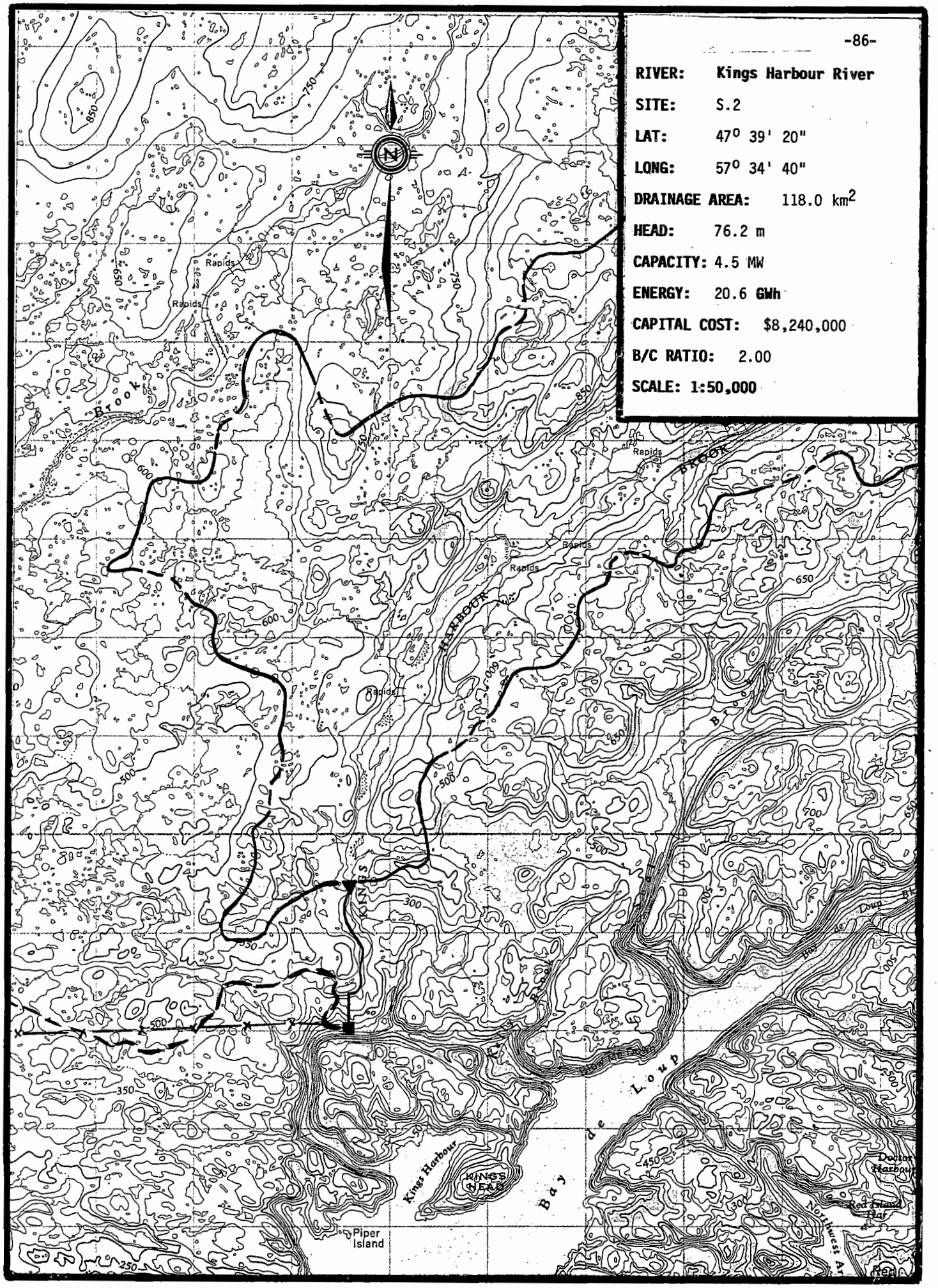
CAPACITY: 4.5 MW

ENERGY: 20.6 GWh

CAPITAL COST: $8,240,000

B/C RATIO: 2.00

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Kings Harbour River

SITE NAME : SITE - 2 FILE : 2018

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.521753 MW
PENSTOCK LENGTH	: 1600 M.
DESIGN FLOW	: 7.29 M^3/S
PENSTOCK DIAMETER	: 1.613874 M.
RATED HEAD	: 76.2 M.
HEIGHT OF DAM	: 5.8 M.
TRANSMISSION LINE LENGTH	: 4 KM.
LENGTH OF DAM	: 102 M.
ACCESS ROAD LENGTH	: 4.5 KM.
FLOOD FLOW	: 180 M^3/S
DISTANCE TO TOWN	: 6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9850738

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
412868.1	SEE DAM	138059.6	2915711	135000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS. ROAD	TRANS. LINE &SUBSTATION
593141.5	1413443	424033	456072.9	430015.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	256373.8	738693.9	326054.6

PROJECT COST: $ 8239468 COST PER KW: $ 1822.184

Total Project Cost = $ 8,239,468

MAP NUMBER 11 P/12 DATA SHEET FILE NUMBER 2018

1. Site Identification:

River Basin: Kings Harbour River Site: S.2

2. Location:

Lat. 47° 39' 20" Long. 57° 34' 40" Hydrologic Region 2

3. Hydrologic Data:

A = 118 km^2, MAR = 1300 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.86 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 180 m^3/s

Q1000 = 245 m^3/s

4. Site Data:

Rated Head = 76.2 m
Penstock Length = 1600 m
Access Road Length = 4.5 km
Dam Height = 5.8 m
Distance to Town = 6 km
Installed Capacity = 4.72 MW

Plant Design Flow = 7.29 m^3/s
T.L. Line Length = 4 km
Dam Length = 102 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: White Bear River

SITE: S.1

LAT: 47° 53' 25"

LONG: 57° 17' 15"

DRAINAGE AREA: 96.0 km²

HEAD: 97.5 m

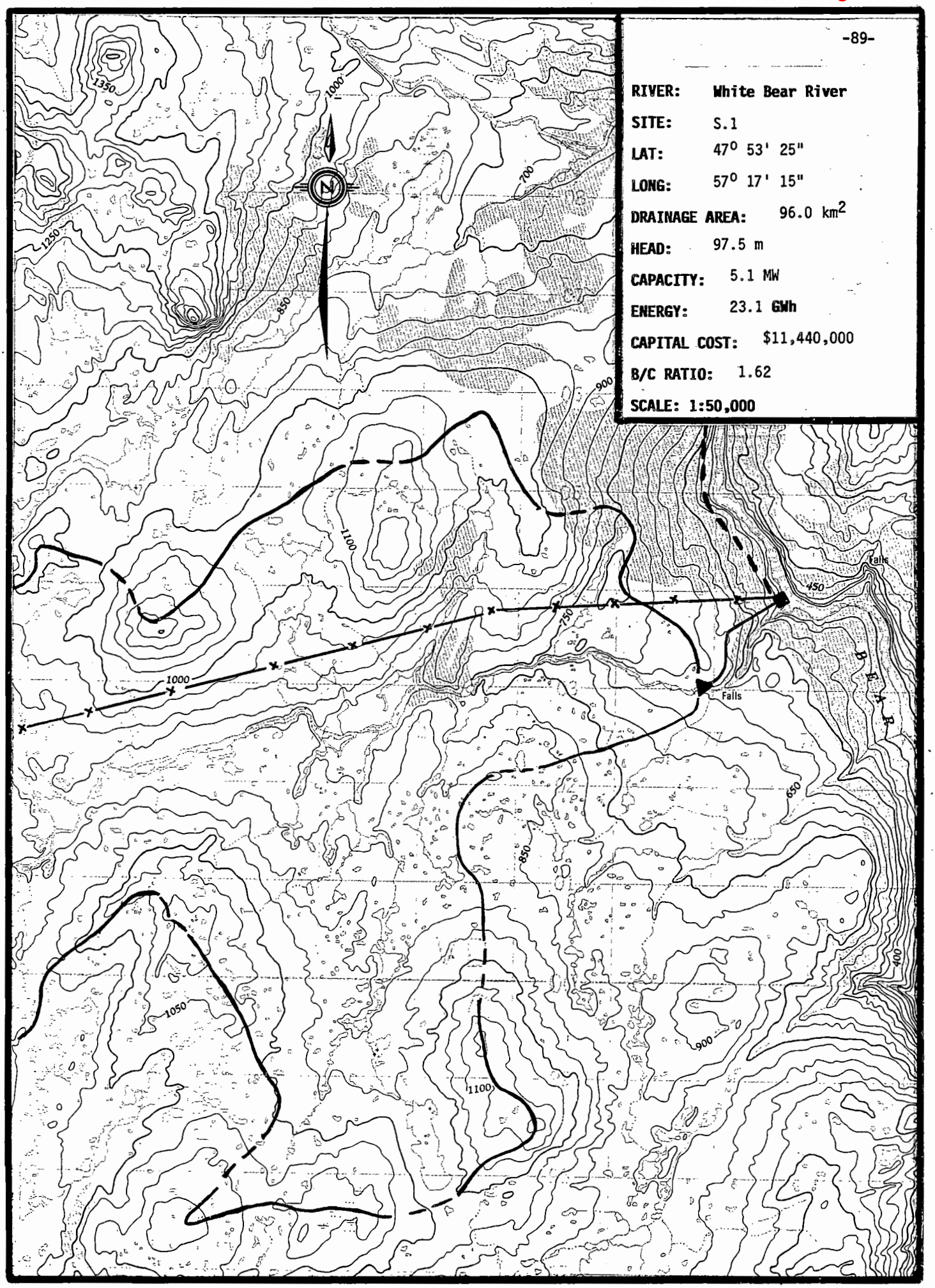
CAPACITY: 5.1 MW

ENERGY: 23.1 GWh

CAPITAL COST: $11,440,000

B/C RATIO: 1.62

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : White Bear River

SITE NAME : SITE - 1 FILE : 2019

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 5.071423 MW
PENSTOCK LENGTH	: 1250 M.
DESIGN FLOW	: 6.39 M^3/S
PENSTOCK DIAMETER	: 1.473246 M.
RATED HEAD	: 97.5 M.
HEIGHT OF DAM	: 5.7 M.
TRANSMISSION LINE LENGTH	: 28 KM.
LENGTH OF DAM	: 118 M.
ACCESS ROAD LENGTH	: 26 KM.
FLOOD FLOW	: 300 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.018566E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
458482.6	SEE DAM	122620.4	2040136	225000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
596296.6	1335705	398717.8	2025493	1308052

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1437160	1014386	480862.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.144291E+07 COST PER KW: $ 2256.352

Total Project Cost = $ 11,442,910

MAP NUMBER 11 P/14 DATA SHEET FILE NUMBER 2019

1. Site Identification:

River Basin: White Bear River Site: S.1

2. Location:

Lat. 47° 53' 25" Long. 57° 17' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 96 km^2, MAR = 1400 mm, ACLS = 10 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.26 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 300 m^3/s

Q1000 = 410 m^3/s

4. Site Data:

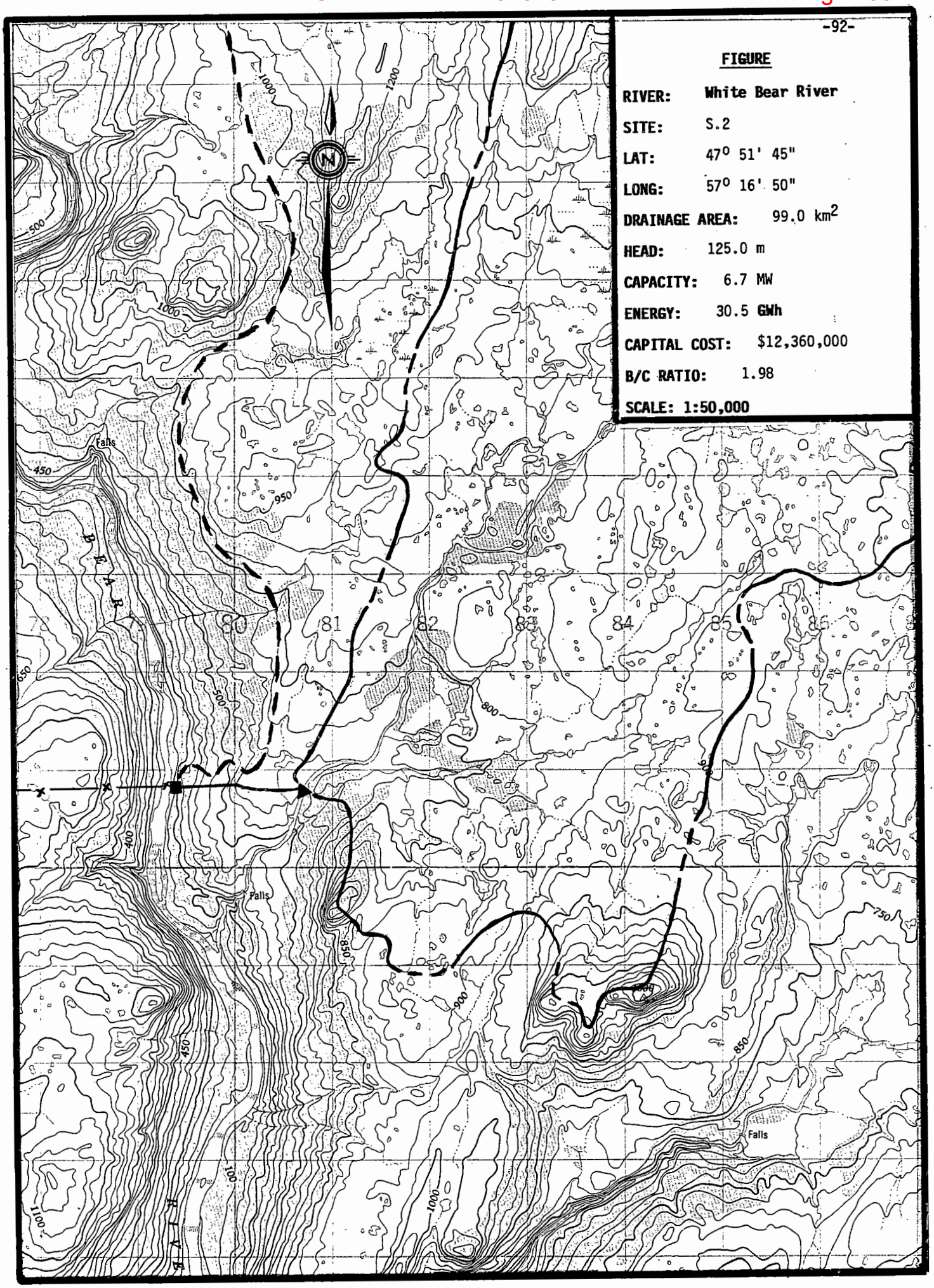
Rated Head = 97.5m
Penstock Length = 1250 m
Access Road Length = 26 km
Dam Height = 5.7 m
Distance to Town = 60 km
Installed Capacity = 5.3 MW

Plant Design Flow = 6.39 m^3/s
T.L. Line Length = 28 km
Dam Length = 118 m
Distance to Concrete Plant = 100 km

5. Remarks:

FIGURE

RIVER:	White Bear River
SITE:	S.2
LAT:	47° 51' 45"
LONG:	57° 16' 50"
DRAINAGE AREA:	99.0 km^2
HEAD:	125.0 m
CAPACITY:	6.7 MW
ENERGY:	30.5 GWh
CAPITAL COST:	$12,360,000
B/C RATIO:	1.98
SCALE: 1:50,000	



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : White Bear River

SITE NAME : SITE - 2 FILE : 2020

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 6.700237 MW
PENSTOCK LENGTH	: 1250 M.
DESIGN FLOW	: 6.585 M^3/S
PENSTOCK DIAMETER	: 1.441392 M.
RATED HEAD	: 125 M.
HEIGHT OF DAM	: 5.7 M.
TRANSMISSION LINE LENGTH	: 29 KM.
LENGTH OF DAM	: 109 M.
ACCESS ROAD LENGTH	: 30 KM.
FLOOD FLOW	: 210 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.204016E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
426887.2	SEE DAM	125983.1	1987370	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
686751.6	1538324	459201.1	2287476	1469650

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1538081	1080317	601127.1

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.235867E+07 COST PER KW: $ 1844.512

Total Project Cost = $ 12,358,670

MAP NUMBER 11 P/14 DATA SHEET FILE NUMBER 2020

1. Site Identification:

River Basin: White Bear River Site: S.2

2. Location:

Lat. 47° 51' 45" Long. 57° 16' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 99 km^2, MAR = 1400 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.39 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 210 m^3/s

Q1000 = 290 m^3/s

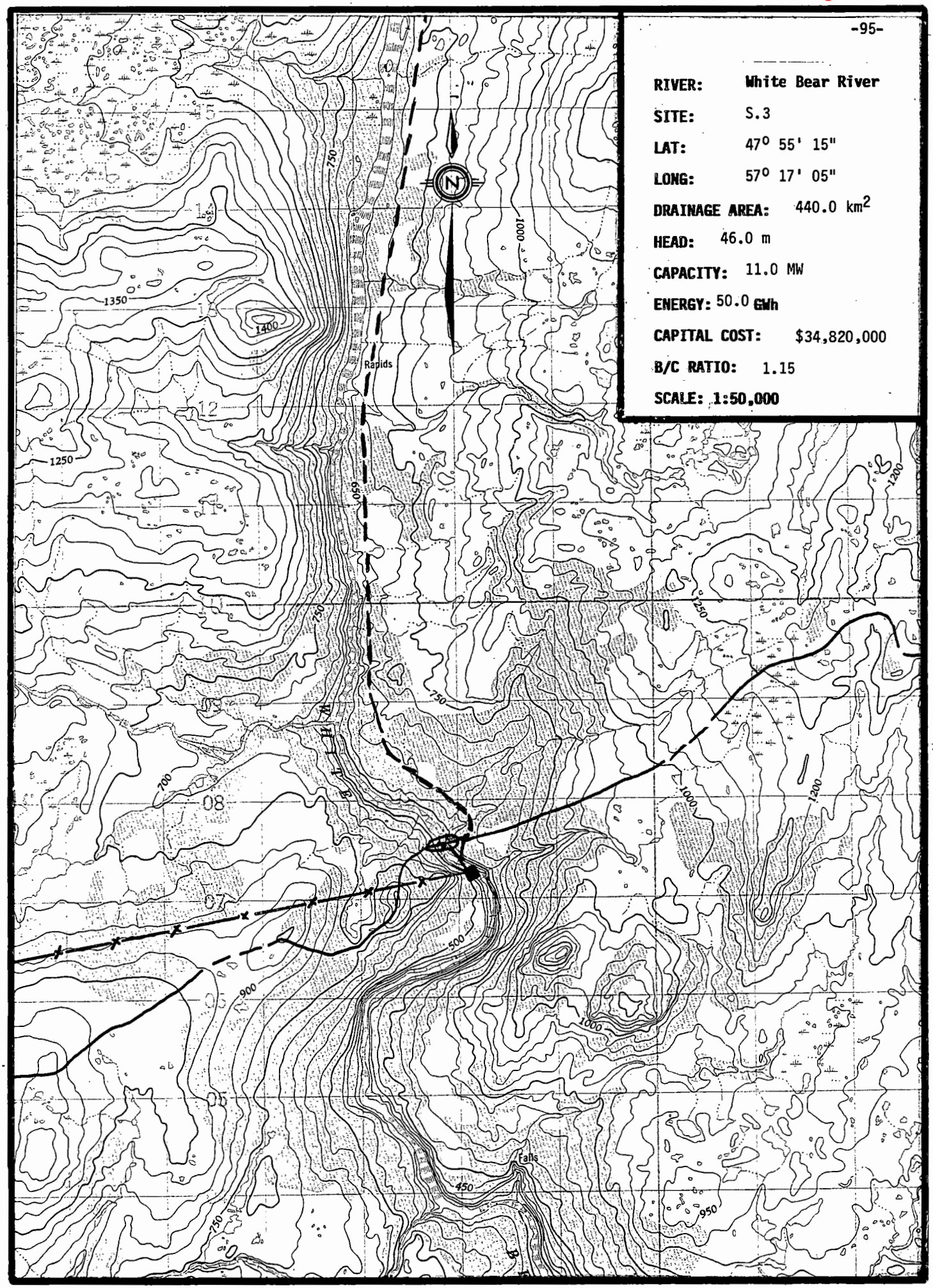
4. Site Data:

Rated Head = 125 m
Penstock Length = 1250 m
Access Road Length = 30 km
Dam Height = 5.7 m
Distance to Town = 60 km
Installed Capacity = 7.0 MW

Plant Design Flow = 6.59 m^3/s
T.L. Line Length = 29 km
Dam Length = 109 m
Distance to Concrete Plant = 100 km

5. Remarks:

Small Diversion near intake



RIVER:	White Bear River
SITE:	S.3
LAT:	47° 55' 15"
LONG:	57° 17' 05"
DRAINAGE AREA:	440.0 km^2
HEAD:	46.0 m
CAPACITY:	11.0 MW
ENERGY:	50.0 GWh
CAPITAL COST:	$34,820,000
B/C RATIO:	1.15
SCALE:	1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : White Bear River

SITE NAME : SITE - 3 FILE : 2021

SITE DATA

INSTALLED CAPACITY	: 10.96922 MW
PENSTOCK LENGTH	: 320 M.
DESIGN FLOW	: 29.295 M^3/S
PENSTOCK DIAMETER	: 3.149964 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 33.5 M.
TRANSMISSION LINE LENGTH	: 28 KM.
LENGTH OF DAM	: 260 M.
ACCESS ROAD LENGTH	: 22 KM.
FLOOD FLOW	: 1350 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.306661E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
6173337	5502109	482754.4	1378842	1012500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1484770	2969540	886430	1757369	1668645

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	6614015	2703383	2187797

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 3.482149E+07 COST PER KW: $ 3174.474

Total Project Cost = $ 34,821,490

MAP NUMBER 11 P/14 DATA SHEET FILE NUMBER 2021

1. Site Identification:

River Basin: White Bear River Site: S.3

2. Location:

Lat. 47° 55' 15" Long. 57° 17' 05" Hydrologic Region 2

3. Hydrologic Data:

A = 440 km^2; MAR = 1400 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 19.53 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 940 m^3/s

Q1000 = 1350 m^3/s

Q_2 = 480

4. Site Data:

Rated Head = 46 m

Penstock Length = 320 m

Access Road Length = 22 km

Dam Height = 33.5 m

Distance to Town = 60 km

Installed Capacity = 11.5 MW

Plant Design Flow = 20.29 m^3/s

T.L. Line Length = 28 km

Dam Length = 260 m

Distance to Concrete Plant = 100 km

5. Remarks:

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WATER SHED : White Bear River

SITE NAME : SITE - 4 FILE : 2022

SITE DATA

INSTALLED CAPACITY	: 17.00145 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 45.405 M^3/S
PENSTOCK DIAMETER	: 3.803111 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 47 M.
TRANSMISSION LINE LENGTH	: 29 KM.
LENGTH OF DAM	: 500 M.
ACCESS ROAD LENGTH	: 30 KM.
FLOOD FLOW	: 1500 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3.303986E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1.901086E+07	7592418	716152.2	1677949	1125000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2142923	4285847	1279357	2287476	2003223

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1.321155E+07	4671074	5118989

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 6.512281E+07 COST PER KW: $ 3830.428

Total Project Cost = $ 65,122,810

MAP NUMBER 11 P/14 DATA SHEET FILE NUMBER 2022

1. Site Identification:

River Basin: White Bear River Site: S.4

2. Location:

Lat. 47° 51' 35" Long. 57° 16' 35" Hydrologic Region 2

3. Hydrologic Data:

A = 682 km^2, MAR = 1400 mm, ACLS = 30 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 30.27 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 1200 m^3/s Q_2 = 590

Q1000 = 1500 m^3/s

4. Site Data:

Rated Head	= 46 m	Plant Design Flow	= 45.4 m^3/s
Penstock Length	= 300 m		
Access Road Length	= 30 km	T.L. Line Length	= 29 km
Dam Height	= 47 m	Dam Length	= 500 m
Distance to Town	= 60 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 17.8 MW		

5. Remarks:

(i) If site 4 should go ahead S.2 will loose 46m of head which would in turn reduce S.2 capacity to 4.4 MW.

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WATER SHED : White Bear River

SITE NAME : SITE - 5 FILE : 2023

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	:	1.595114 MW
PENSTOCK LENGTH	:	500 M.
DESIGN FLOW	:	4.26 M^3/S
PENSTOCK DIAMETER	:	1.374772 M.
RATED HEAD	:	46 M.
HEIGHT OF DAM	:	5.2 M.
TRANSMISSION LINE LENGTH	:	28 KM.
LENGTH OF DAM	:	103 M.
ACCESS ROAD LENGTH	:	22 KM.
FLOOD FLOW	:	220 M^3/S
DISTANCE TO TOWN	:	60 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 4746013

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
353356.1	SEE DAM	85129.59	328113.6	165000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
341284.8	813274.3	243982.3	1757369	1047307

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1105109	699319.3	236437

PROJECT COST: $ 7175681 COST PER KW: $ 4498.537

Total Project Cost = $ 7,175,681

MAP NUMBER 11 P/14 DATA SHEET FILE NUMBER 2023

1. Site Identification:

River Basin: White Bear River Site: S.5

2. Location:

Lat. 47° 56' 00" Long. 57° 18' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 64 km^2, MAR = 1400 mm, ACLS = 10 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.84 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 220 m^3/s Q_2 = 105

Q1000 = 290 m^3/s

4. Site Data:

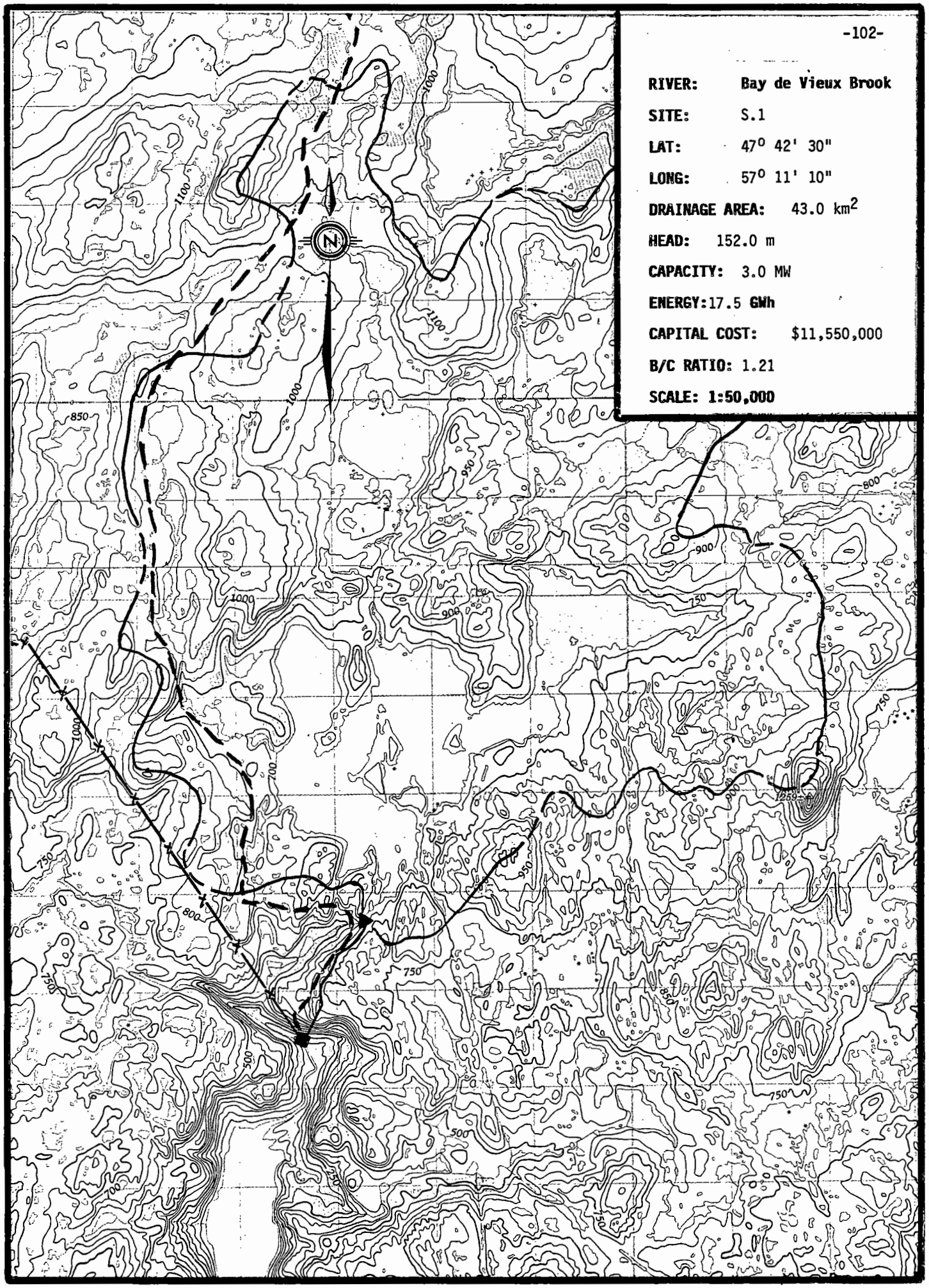
Rated Head = 46 m
Penstock Length = 500 m
Access Road Length = 22 km
Dam Height = 5.2 m
Distance to Town = 60 km
Installed Capacity = 1.7 MW

Plant Design Flow = 4.26 m^3/s
T.L. Line Length = 28 km
Dam Length = 103 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) This site is viable only if one or all of the remaining sites on White Bear River will be developed.

(ii) Total output from all 5 sites is 40.7 MW.



RIVER: Bay de Vieux Brook

SITE: S.1

LAT: 47° 42' 30"

LONG: 57° 11' 10"

DRAINAGE AREA: 43.0 km^2

HEAD: 152.0 m

CAPACITY: 3.0 MW

ENERGY: 17.5 GWh

CAPITAL COST: $11,550,000

B/C RATIO: 1.21

SCALE: 1:50,000

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WATER SHED : Bay de Vieux Brook

SITE NAME : SITE - 1 FILE : 2024

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 3.025149 MW
PENSTOCK LENGTH	: 1455 M.
DESIGN FLOW	: 2.445 M^3/S
PENSTOCK DIAMETER	: .9159512 M.
RATED HEAD	: 152 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 47 KM.
LENGTH OF DAM	: 51 M.
ACCESS ROAD LENGTH	: 50 KM.
FLOOD FLOW	: 34 M^3/S
DISTANCE TO TOWN	: 80 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .9899999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5978014

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
82319.7	SEE DAM	51649.12	1367800	25500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
351564.9	837771.6	251331.5	3531245	1958388

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1661708	1014879	419802.3

PROJECT COST: $ 1.155396E+07 COST PER KW: $ 3819.302

Total Project Cost = $ 11,553,960

MAP NUMBER 11 P/11/11 P/14 DATA SHEET FILE NUMBER 2024

1. Site Identification:

River Basin: Bay De Vieux Brook Site: S.1

2. Location:

Lat. 47° 42' 30" Long. 57° 11' 10" Hydrologic Region 2

3. Hydrologic Data:

A = 43 km^2, MAR = 1200 mm, ACLS = 100 %

Storage Reservoir Area = 4.7 km^2

Storage Reservoir Vol, V = 9.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.18$$

Mean Flow, QAV = 1.63 m^3/s

Usable Flow Ratio = 0.99

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 34 m^3/s

Q1000 = 46 m^3/s Q_2 = 18

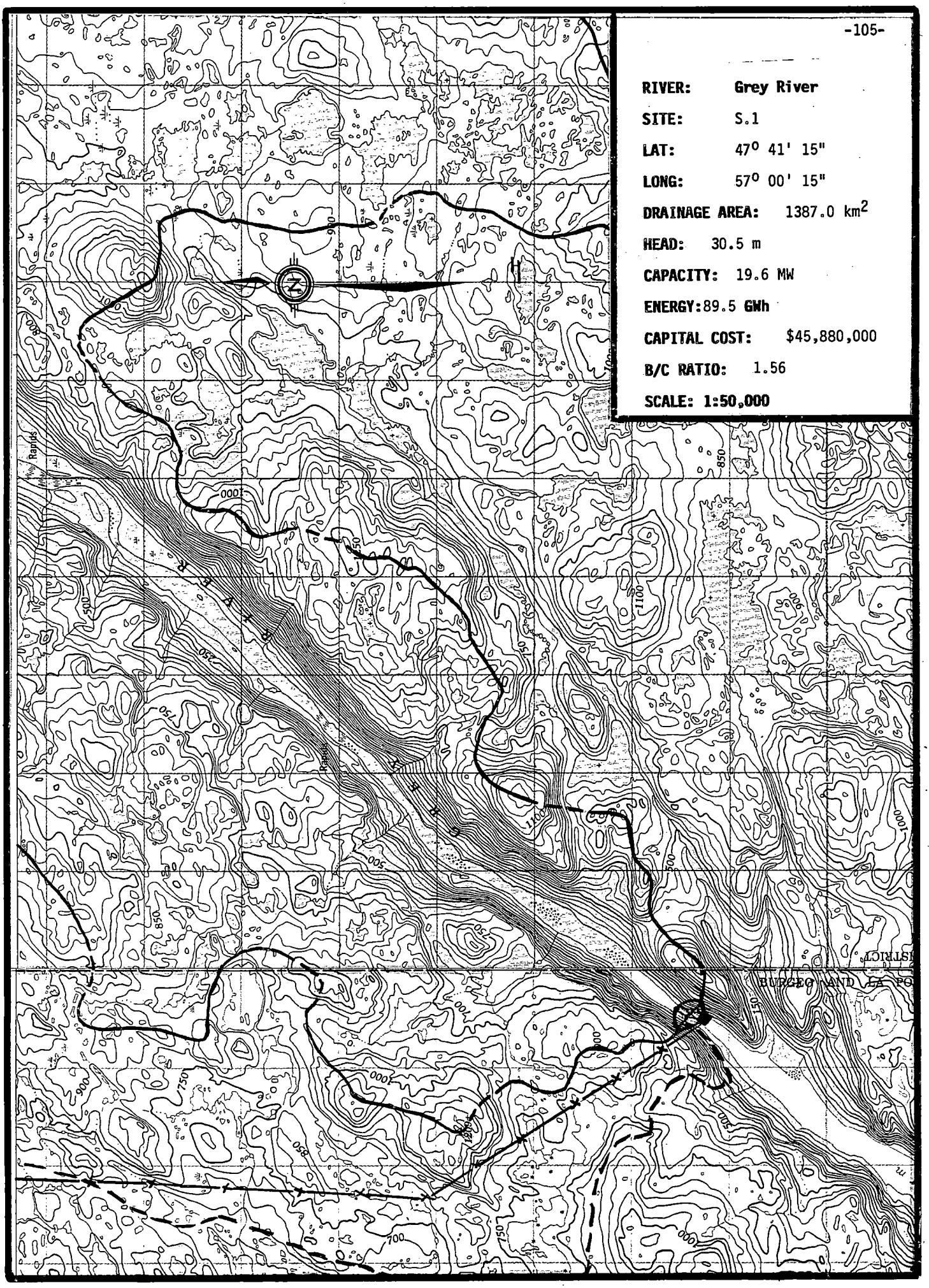
4. Site Data:

Rated Head = 152 m
Penstock Length = 1455 m
Access Road Length = 50 km
Dam Height = 3 m
Distance to Town = 80 km
Installed Capacity = 3.1 MW

Plant Design Flow = 2.45 m^3/s
T.L. Line Length = 47 km
Dam Length = 51 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) This site will look attractive if one or all of the sites on White Bear River is developed.


RIVER: Grey River
SITE: S.1
LAT: 47° 41' 15"
LONG: 57° 00' 15"
DRAINAGE AREA: 1387.0 km²
HEAD: 30.5 m
CAPACITY: 19.6 MW
ENERGY: 89.5 GWh
CAPITAL COST: $45,880,000
B/C RATIO: 1.56
SCALE: 1:50,000
GREY RIVER
Rapids

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WATER SHED : Grey River

SITE NAME : Site - 1 FILE : 2025

SITE DATA

INSTALLED CAPACITY	: 19.64809 MW
PENSTOCK LENGTH	: 128 M.
DESIGN FLOW	: 79.14 M^3/S
PENSTOCK DIAMETER	: 5.11539 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 30.5 M.
TRANSMISSION LINE LENGTH	: 60 KM.
LENGTH OF DAM	: 190 M.
ACCESS ROAD LENGTH	: 65 KM.
FLOOD FLOW	: 1350 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4.115881E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4028738	5155647	1180779	1098617	1012500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2827501	5655003	1688061	4413465	4060369

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	7490246	3391048	3880010

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 4.588198E+07 COST PER KW: $ 2335.188

Total Project Cost = $ 45,881,980

MAP NUMBER 11 P/11 DATA SHEET FILE NUMBER 2025

1. Site Identification:

River Basin: Grey River Site: S.1

2. Location:

Lat. 47° 41' 15" Long. 57° 00' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 1387 km^2, MAR = 1200 mm, ACLS = 60 %

Storage Reservoir Area = 3 km^2

Storage Reservoir Vol, V = 6 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 52.76 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 900 m^3/s

Q1000 = 1350 m^3/s

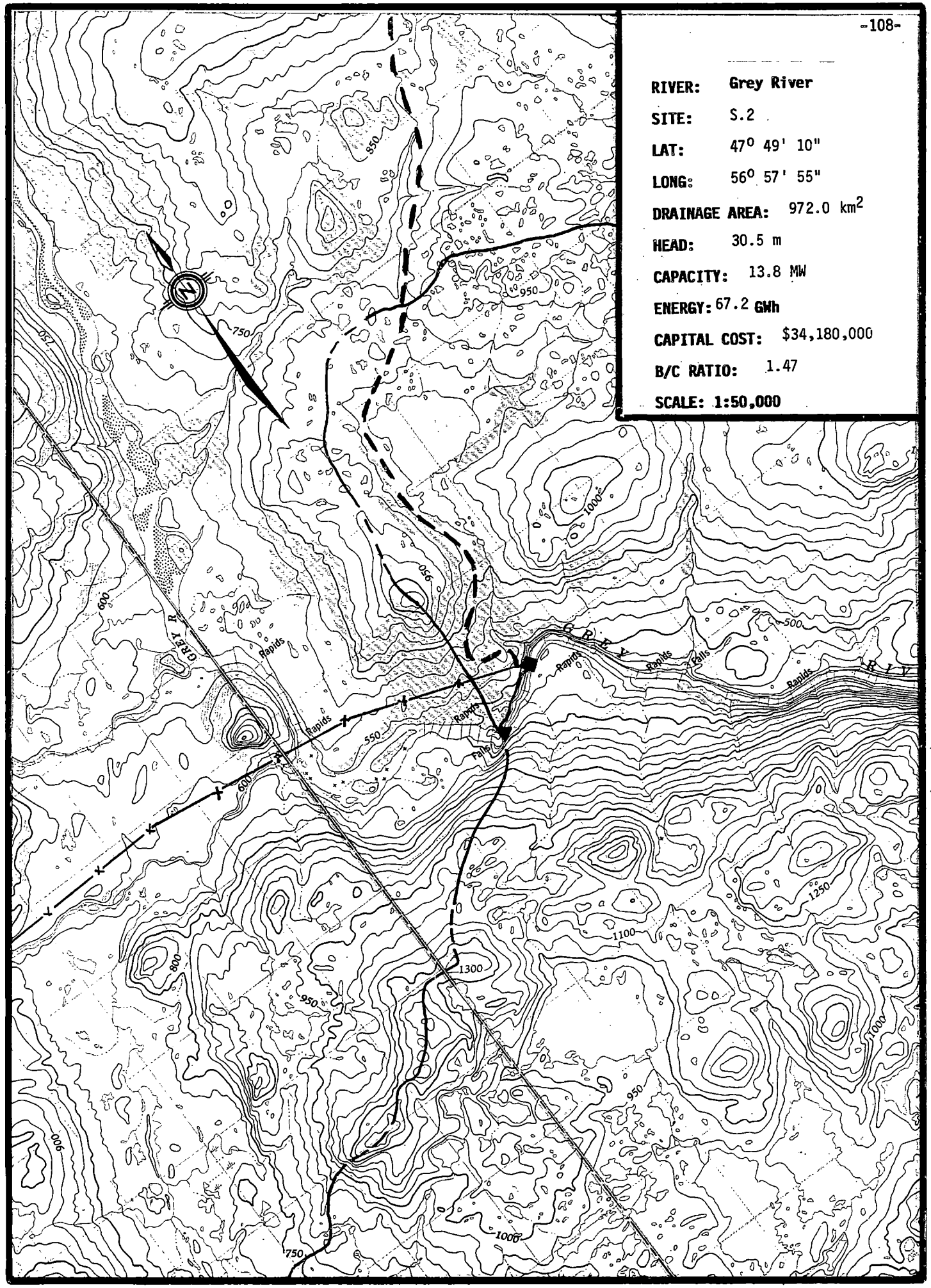
4. Site Data:

Rated Head = 30.5 m
Penstock Length = 128 m
Access Road Length = 65 km
Dam Height = 30.5 m
Distance to Town = 100 km
Installed Capacity = 20.5 MW

Plant Design Flow = 79.14 m^3/s
T.L. Line Length = 60 km
Dam Length = 190 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) This portion of river is accessible to salmon.



RIVER: Grey River

SITE: S.2

LAT: 47° 49' 10"

LONG: 56° 57' 55"

DRAINAGE AREA: 972.0 km²

HEAD: 30.5 m

CAPACITY: 13.8 MW

ENERGY: 67.2 GWh

CAPITAL COST: $34,180,000

B/C RATIO: 1.47

SCALE: 1:50,000

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WATER SHED : Grey River

SITE NAME : SITE - 2 FILE : 2028

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	13.76781 MW
PENSTOCK LENGTH	:	720 M.
DESIGN FLOW	:	55.455 M^3/S
PENSTOCK DIAMETER	:	4.389985 M.
RATED HEAD	:	30.5 M.
HEIGHT OF DAM	:	15 M.
TRANSMISSION LINE LENGTH	:	57 KM.
LENGTH OF DAM	:	150 M.
ACCESS ROAD LENGTH	:	60 KM.
FLOOD FLOW	:	820 M^3/S
DISTANCE TO TOWN	:	90 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 3.074748E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2663470	SEE DAM	857350.9	4941116	615000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2093290	4688970	1399692	4123177	3417461

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	4327551	2639007	2413418

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 3.41795E+07 COST PER KW: $ 2482.566

Total Project Cost = $ 34,179,500

MAP NUMBER 11 P/15 DATA SHEET FILE NUMBER 2028

1. Site Identification:

River Basin: Grey River Site: S.2

2. Location:

Lat. 47° 49' 10" Long. 56° 57' 55" Hydrologic Region 2

3. Hydrologic Data:

A = 972 km^2, MAR = 1200 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 36.97 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 820 m^3/s Q_2 = 410

Q1000 = 1100 m^3/s

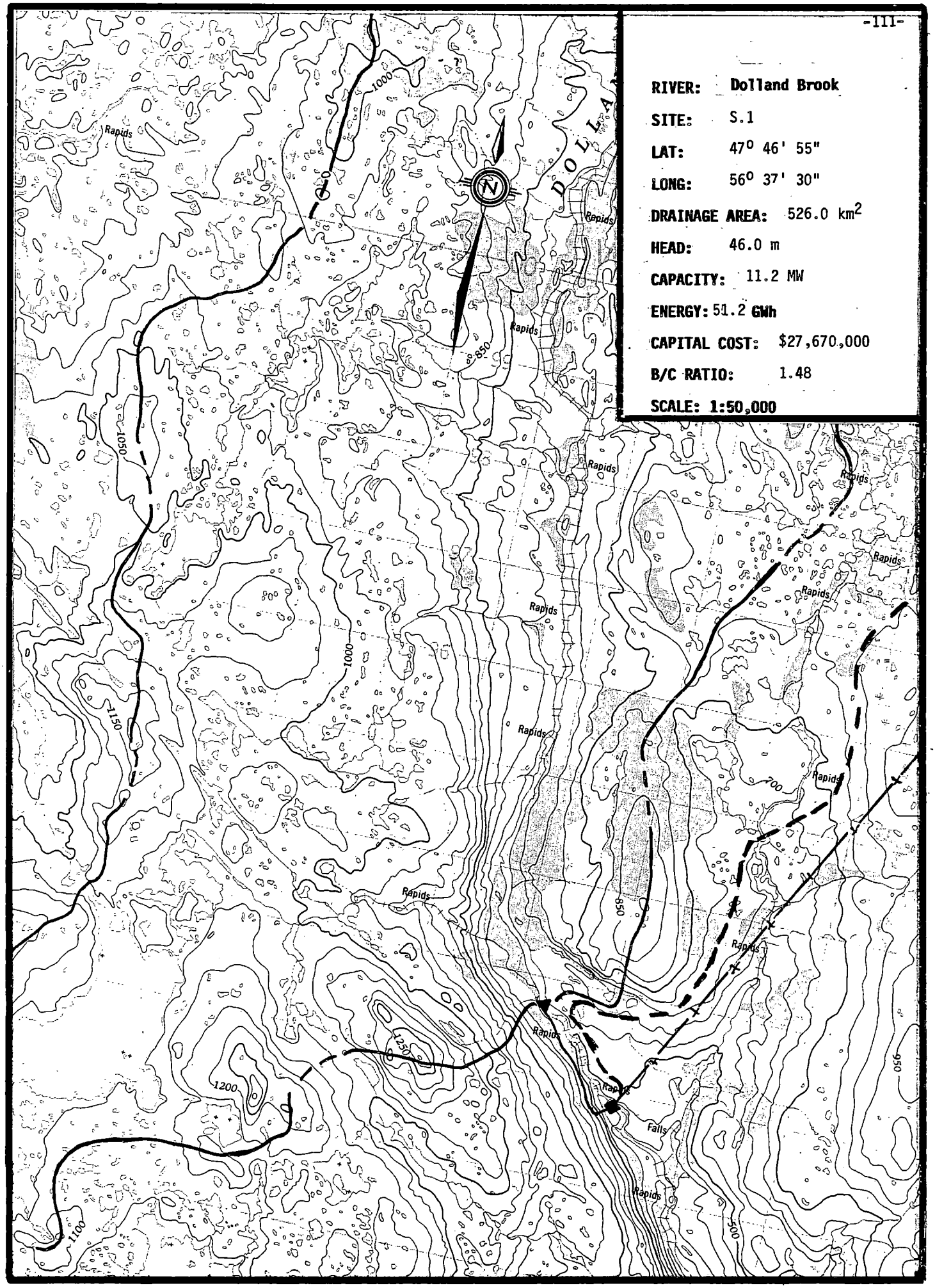
4. Site Data:

Rated Head = 30.5 m
Penstock Length = 720 m
Access Road Length = 60 km
Dam Height = 15 m
Distance to Town = 90 km
Installed Capacity = 14.3 MW

Plant Design Flow = 55.46 m^3/s
T.L. Line Length = 57 km
Dam Length = 150 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Salmon River


RIVER: Dolland Brook
SITE: S.1
LAT: 47° 46' 55"
LONG: 56° 37' 30"
DRAINAGE AREA: 526.0 km²
HEAD: 46.0 m
CAPACITY: 11.2 MW
ENERGY: 51.2 GWh
CAPITAL COST: $27,670,000
B/C RATIO: 1.48
SCALE: 1:50,000
N
Rapids
Falls
1000
1050
1150
1200
1250
1100
850
700
650
500

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Dolland Brook

SITE NAME : SITE - 1 FILE : 2029

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	11.23882 MW
PENSTOCK LENGTH	:	1460 M.
DESIGN FLOW	:	30.015 M^3/S
PENSTOCK DIAMETER	:	3.183024 M.
RATED HEAD	:	46 M.
HEIGHT OF DAM	:	8.2 M.
TRANSMISSION LINE LENGTH	:	50 KM.
LENGTH OF DAM	:	145 M.
ACCESS ROAD LENGTH	:	55 KM.
FLOOD FLOW	:	320 M^3/S
DISTANCE TO TOWN	:	100 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 2.353047E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
968712.4	SEE DAM	493419.9	6381122	240000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1515301	3394274	1013216	3829233	2834774

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	3045301	2198021	1760975

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.767435E+07 COST PER KW: $ 2462.39

Total Project Cost = $ 27,674,350

MAP NUMBER 11 P/15 DATA SHEET FILE NUMBER 2029

1. Site Identification:

River Basin: Dolland Brook Site: S.1

2. Location:

Lat. 47° 46' 55" Long. 56° 37' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 526 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 20.01 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 320 m^3/s Q_2 = 160

Q1000 = 430 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 1460 m
Access Road Length = 55 km
Dam Height = 8.2 m
Distance to Town = 100 km
Installed Capacity = 11.2 MW

Plant Design Flow = 30.01 m^3/s
T.L. Line Length = 50 km
Dam Length = 145 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Dolland Brook

SITE: S.2

LAT: 47° 44' 15"

LONG: 56° 36' 10"

DRAINAGE AREA: 688.0 km²

HEAD: 46.0 m

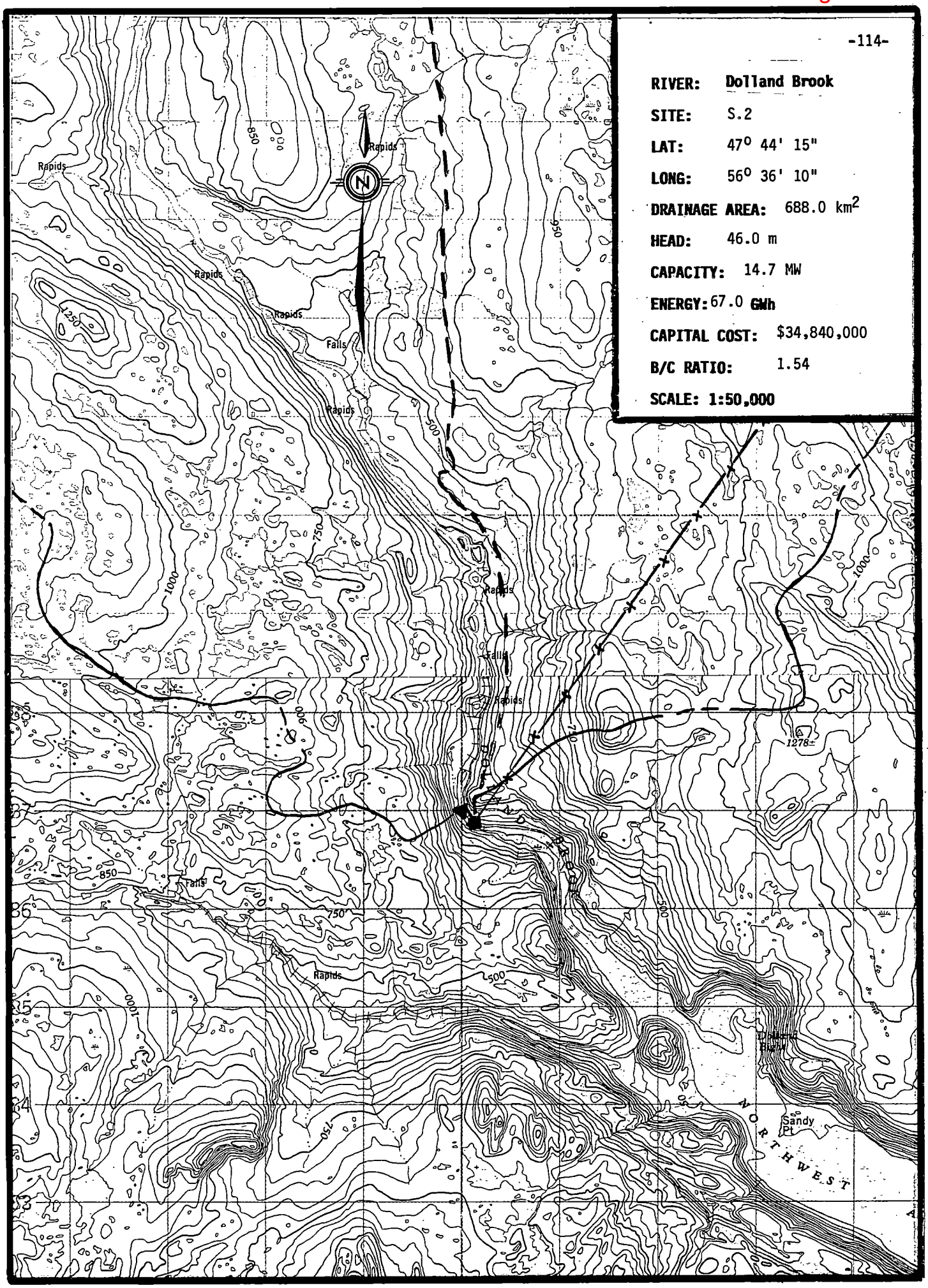
CAPACITY: 14.7 MW

ENERGY: 67.0 GWh

CAPITAL COST: $34,840,000

B/C RATIO: 1.54

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Dolland Brook

SITE NAME : SITE - 2 FILE : 2030

SITE DATA

INSTALLED CAPACITY	: 14.69864 MW
PENSTOCK LENGTH	: 250 M.
DESIGN FLOW	: 39.255 M^3/S
PENSTOCK DIAMETER	: 3.572393 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 30.5 M.
TRANSMISSION LINE LENGTH	: 52 KM.
LENGTH OF DAM	: 220 M.
ACCESS ROAD LENGTH	: 60 KM.
FLOOD FLOW	: 590 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.932291E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4596964	2703263	628228.3	1281008	442500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1897257	3794514	1132691	4123177	3218694

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	5803033	2678526	2543583

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 3.484343E+07 COST PER KW: $ 2370.521

Total Project Cost = $ 34,843,430

MAP NUMBER 11 P/10 DATA SHEET FILE NUMBER 2030

1. Site Identification:

River Basin: Dolland Brook Site: S.2

2. Location:

Lat. 47° 44' 15" Long. 56° 36' 10" Hydrologic Region 2

3. Hydrologic Data:

A = 688 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 26.17 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 430 m^3/s Q_2 = 210

Q1000 = 590 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 250 m
Access Road Length = 60 km
Dam Height = 30.5 m
Distance to Town = 100 km
Installed Capacity = 14.7 MW

Plant Design Flow = 39.26 m^3/s
T.L. Line Length = 52 km
Dam Length = 220 m
Distance to Concrete Plant = 100 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Morgan Brook

SITE NAME : SITE - 1 FILE : 2031

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 3.802438 MW
PENSTOCK LENGTH	: 250 M.
DESIGN FLOW	: 10.155 M^3/S
PENSTOCK DIAMETER	: 1.997362 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 52 KM.
LENGTH OF DAM	: 190 M.
ACCESS ROAD LENGTH	: 60 KM.
FLOOD FLOW	: 210 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9675884

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1454743	758373.5	186047.6	238309.8	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
626911.3	1333854	400156.2	4123177	2287343

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2942353	1433477	652687.1

PROJECT COST: $ 1.659493E+07 COST PER KW: $ 4364.287

Total Project Cost = $ 16,594,930

MAP NUMBER 11 P/10 DATA SHEET FILE NUMBER 2031

1. Site Identification:

River Basin: Morgan Brook Site: S.1

2. Location:

Lat. 47° 43' 18" Long. 56° 30' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 178 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 6.77 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s Q_2 = 75

Q1000 = 210 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 250 m
Access Road Length = 60 km
Dam Height = 15 m
Distance to Town = 100 km
Installed Capacity = 3.8 MW

Plant Design Flow = 10.16 m^3/s
T.L. Line Length = 52 km
Dam Length = 190 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) If Dollard Brook is developed this one will look feasible.

RIVER: Bottom Brook

SITE: S.1

LAT: 47° 47' 55"

LONG: 56° 19' 50"

DRAINAGE AREA: 175.0 km²

HEAD: 107.0 m

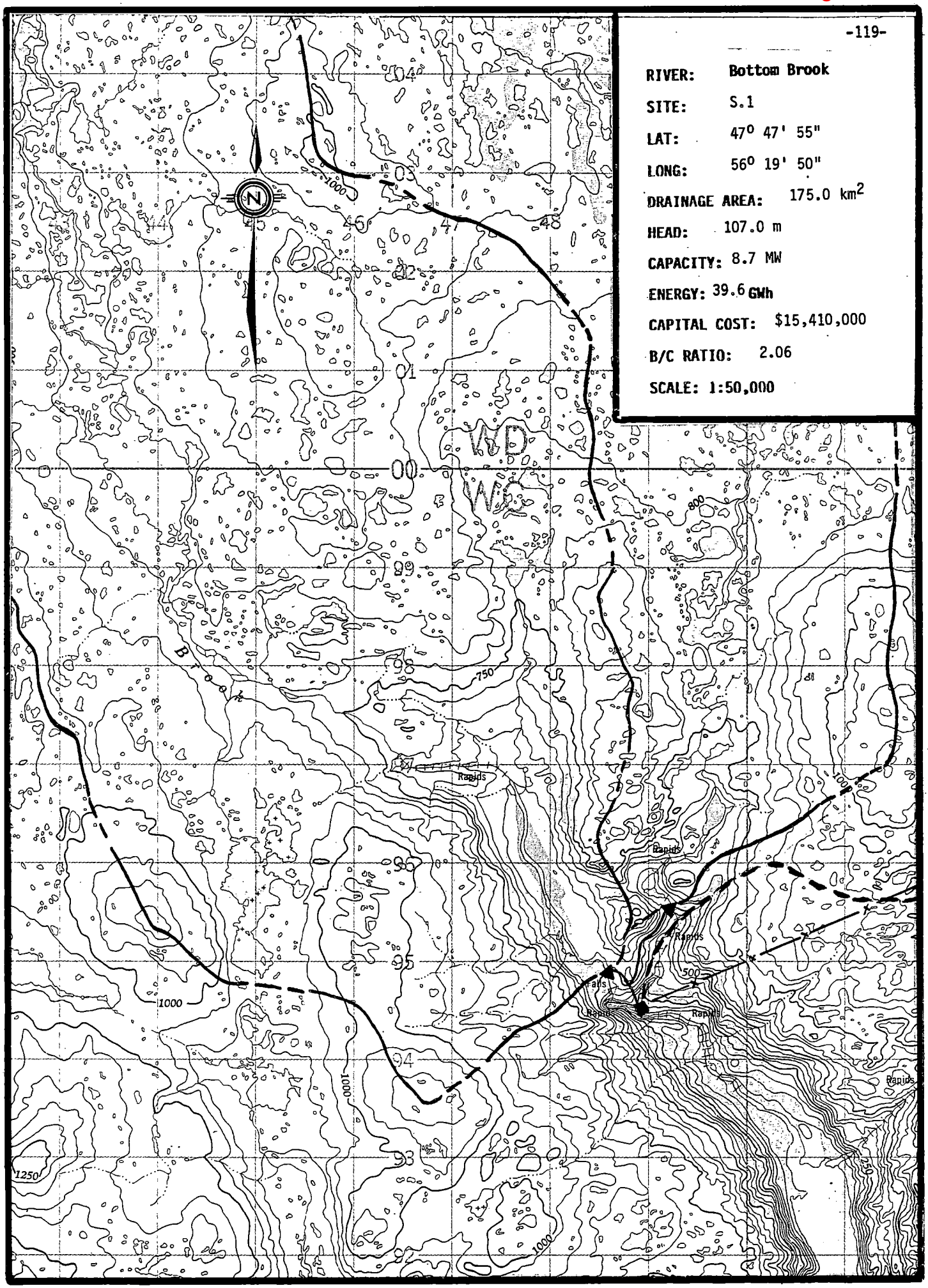
CAPACITY: 8.7 MW

ENERGY: 39.6 GWh

CAPITAL COST: $15,410,000

B/C RATIO: 2.06

SCALE: 1:50,000



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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Bottom Brook

SITE NAME : SITE - 1 FILE : 2032

SITE DATA

INSTALLED CAPACITY	: 8.70109 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 9.99 M^3/S
PENSTOCK DIAMETER	: 1.76226 M.
RATED HEAD	: 107 M.
HEIGHT OF DAM	: 6.3 M.
TRANSMISSION LINE LENGTH	: 32 KM.
LENGTH OF DAM	: 213 M.
ACCESS ROAD LENGTH	: 34 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.549887E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
908574.6	SEE DAM	183324.7	608949.5	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
900034.9	1800070	537334.4	2544255	1744123

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1880902	1129269	729102.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.540719E+07 COST PER KW: $ 1770.72

Total Project Cost = $ 15,407,190

WATER SHED : Bottom Brook SITE - 1

COST DATA

(ADDITIONAL COST of $ 2,325,000 for L.P.Penstock INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1155539

ANNUAL BENEFIT : $ 2378112

BENEFIT/COST RATIO: 2.058011

Total Project Cost = $ 15,407,190.00

Benefit / Cost Ratio = 2.06

MAP NUMBER 11 P/16 DATA SHEET FILE NUMBER 2032

1. Site Identification:

River Basin: Bottom Brook Site: S.1

2. Location:

Lat. 47° 47' 55" Long. 56° 19' 50" Hydrologic Region S.1

3. Hydrologic Data:

A = 175 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.66 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

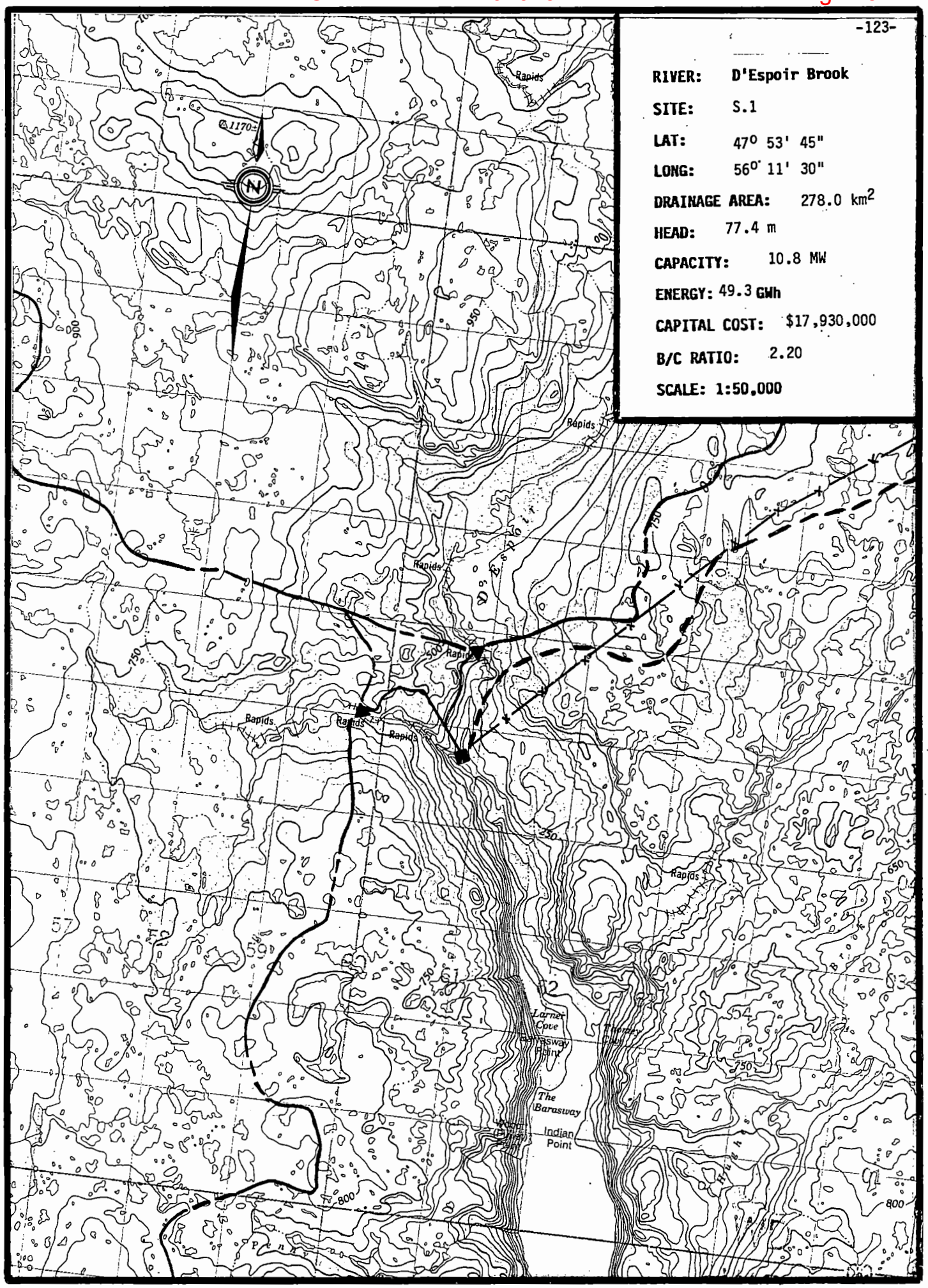
Rated Head = 107 m
Penstock Length = 300 m
Access Road Length = 34 km
Dam Height = 6.3 m
Distance to Town = 100 km
Installed Capacity = 8.7 MW

Plant Design Flow = 9.99 m^3/s
T.L. Line Length = 32 km
Dam Length = 213 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) 1 Powerhouse, 1 unit.

(ii) Additional cost of 2,325,000 for 1122m of low pressure penstock and extra intake, including indirects.



RIVER: D'Espoir Brook

SITE: S.1

LAT: 47° 53' 45"

LONG: 56° 11' 30"

DRAINAGE AREA: 278.0 km²

HEAD: 77.4 m

CAPACITY: 10.8 MW

ENERGY: 49.3 GWh

CAPITAL COST: $17,930,000

B/C RATIO: 2.20

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : D'Esppoir Brook

SITE NAME : SITE - 1 FILE : 2033

SITE DATA

INSTALLED CAPACITY	: 10.83032 MW
PENSTOCK LENGTH	: 250 M.
DESIGN FLOW	: 17.19 M^3/S
PENSTOCK DIAMETER	: 2.32871 M.
RATED HEAD	: 77.4 M.
HEIGHT OF DAM	: 6.1 M.
TRANSMISSION LINE LENGTH	: 16 KM.
LENGTH OF DAM	: 199 M.
ACCESS ROAD LENGTH	: 17 KM.
FLOOD FLOW	: 250 M^3/S
DISTANCE TO TOWN	: 45 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.008416E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
813504.7	SEE DAM	298786	721567.8	187500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1213359	2426718	724393.5	1411514	1004120

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1295315	1027782	740610.1

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.793117E+07 COST PER KW: $ 1655.645

Total Project Cost = $ 17,931,170

WATER SHED : D'Esppoir Brook SITE - 1

COST DATA

(ADDITIONAL COST of $ 6,066,000 for L.P.Penstock INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1344838

ANNUAL BENEFIT : $ 2960056

BENEFIT/COST RATIO: 2.201051

Total Project Cost = $ 17,931,170.00

Benefit / Cost Ratio = 2.20

MAP NUMBER 11 P/16 DATA SHEET FILE NUMBER 2033

1. Site Identification:

River Basin: D'Espoir Brook Site: S.1

2. Location:

Lat. 47° 53' 45" Long. 56° 11' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 278 km^2, MAR = 1300 mm, ACLS = 75 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 11.46 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 250 m^3/s

Q1000 = 340 m^3/s

4. Site Data:

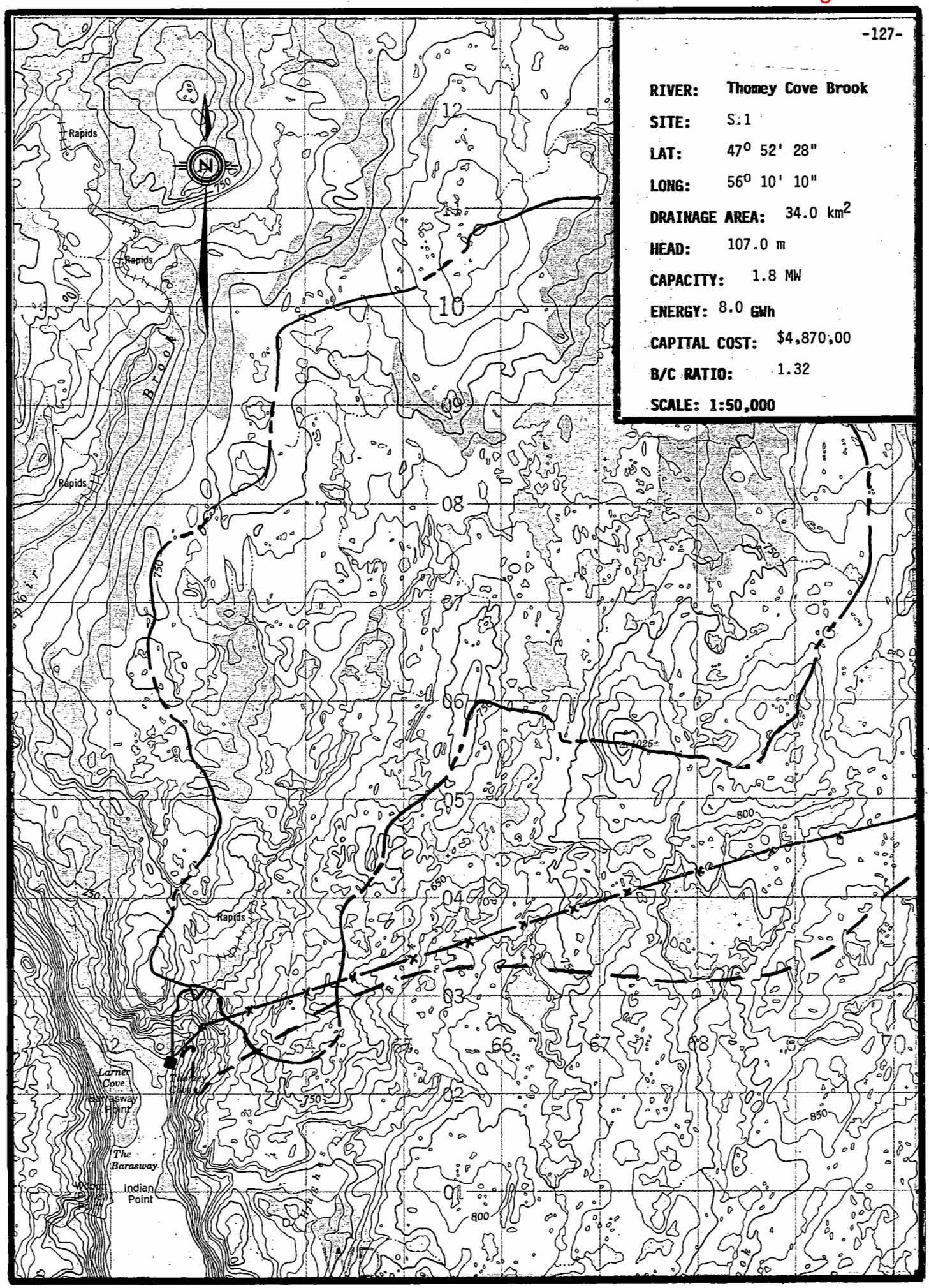
Rated Head = 77.4 m
Penstock Length = 250 m
Access Road Length = 17 km
Dam Height = 6.1 m
Distance to Town = 45 km
Installed Capacity = 10.8 MW

Plant Design Flow = 17.18 m^3/s
T.L. Line Length = 16 km
Dam Length = 199 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) 1 Powerhouse, 1 unit.

(ii) Additional cost of $6,066,000 for 2100 m of low pressure penstock and extra intake, including indirects.



RIVER: Thomey Cove Brook

SITE: S.1

LAT: 47° 52' 28"

LONG: 56° 10' 10"

DRAINAGE AREA: 34.0 km^2

HEAD: 107.0 m

CAPACITY: 1.8 MW

ENERGY: 8.0 GWh

CAPITAL COST: $4,870,00

B/C RATIO: 1.32

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Thomey Cove Brook

SITE NAME : SITE - 1 FILE : 2034

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.763734 MW
PENSTOCK LENGTH	: 782 M.
DESIGN FLOW	: 2.025 M^3/S
PENSTOCK DIAMETER	: .887196 M.
RATED HEAD	: 107 M.
HEIGHT OF DAM	: 4.6 M.
TRANSMISSION LINE LENGTH	: 12 KM.
LENGTH OF DAM	: 69 M.
ACCESS ROAD LENGTH	: 13 KM.
FLOOD FLOW	: 41 M^3/S
DISTANCE TO TOWN	: 32 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4187212

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
205443.5	SEE DAM	43590.76	709302.5	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
272487.6	649332.2	194799.7	1123713	569017.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	450905.2	463849.5	153626.5

PROJECT COST: $ 4866818 COST PER KW: $ 2759.382

Total Project Cost = $ 4,866,818

MAP NUMBER 11 P/16 DATA SHEET FILE NUMBER 2034

1. Site Identification:

River Basin: Thomey Cove Brook Site: S.1

2. Location:

Lat. 47° 52' 28" Long. 56° 10' 10" Hydrologic Region 2

3. Hydrologic Data:

A = 34 km^2, MAR = 1250 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.35 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 41 m^3/s Q_2 = 21

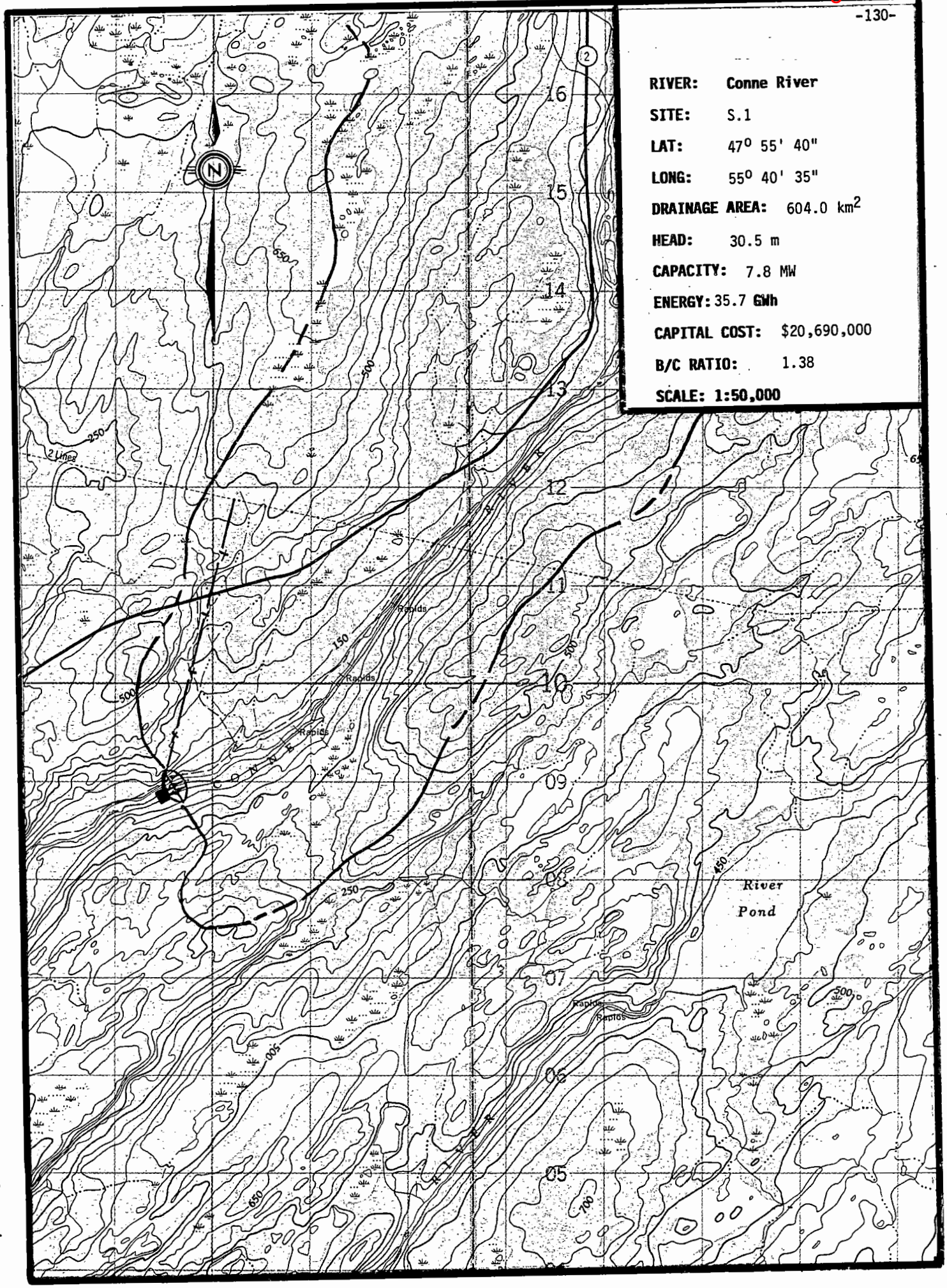
Q1000 = 54 m^3/s

4. Site Data:

Rated Head	= 107 m	Plant Design Flow	= 2.02 m^3/s
Penstock Length	= 782 m		
Access Road Length	= 13 km	T.L. Line Length	= 12 km
Dam Height	= 4.6m	Dam Length	= 69 m
Distance to Town	= 32 km	Distance to Concrete Plant	= 100 km

Installed Capacity = 1.76MW

5. Remarks:



RIVER: Conne River

SITE: S.1

LAT: 47° 55' 40"

LONG: 55° 40' 35"

DRAINAGE AREA: 604.0 km^2

HEAD: 30.5 m

CAPACITY: 7.8 MW

ENERGY: 35.7 GWh

CAPITAL COST: $20,690,000

B/C RATIO: 1.38

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Conne River

SITE NAME : SITE - 1 FILE : 2035

SITE DATA

INSTALLED CAPACITY	:	7.842849 MW
PENSTOCK LENGTH	:	129 M.
DESIGN FLOW	:	31.59 M^3/S
PENSTOCK DIAMETER	:	3.446473 M.
RATED HEAD	:	30.5 M.
HEIGHT OF DAM	:	30.5 M.
TRANSMISSION LINE LENGTH	:	3 KM.
LENGTH OF DAM	:	290 M.
ACCESS ROAD LENGTH	:	2 KM.
FLOOD FLOW	:	820 M^3/S
DISTANCE TO TOWN	:	7 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.938246E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
5894524	3494606	516662	628890.1	615000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1299414	2598828	775769.6	228917.6	200414.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1634281	1709739	1092424

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.068947E+07 COST PER KW: $ 2638.004

Total Project Cost = $ 20,689,470

MAP NUMBER 1 M/13 DATA SHEET FILE NUMBER 2035

1. Site Identification:

River Basin: Conne River Site: S.1

2. Location:

Lat. 47° 55' 40" Long. 55° 40' 35" Hydrologic Region 2

3. Hydrologic Data:

A = 604 km^2, MAR = 1100 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 21.06 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 610 m^3/s

Q1000 = 820 m^3/s

Q_2 = 300

4. Site Data:

Rated Head = 30.5 m

Penstock Length = 129 m

Access Road Length = 2.0 km

Dam Height = 30.5 m

Distance to Town = 7 km

Installed Capacity = 7.8 MW

Plant Design Flow = 31.59 m^3/s

T.L. Line Length = 3 km

Dam Length = 290 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Popular salmon river.

RIVER: Conne River

SITE: S.2

LAT: 48° 01' 50"

LONG: 55° 34' 55"

DRAINAGE AREA: 216.0 km²

HEAD: 30.5 m

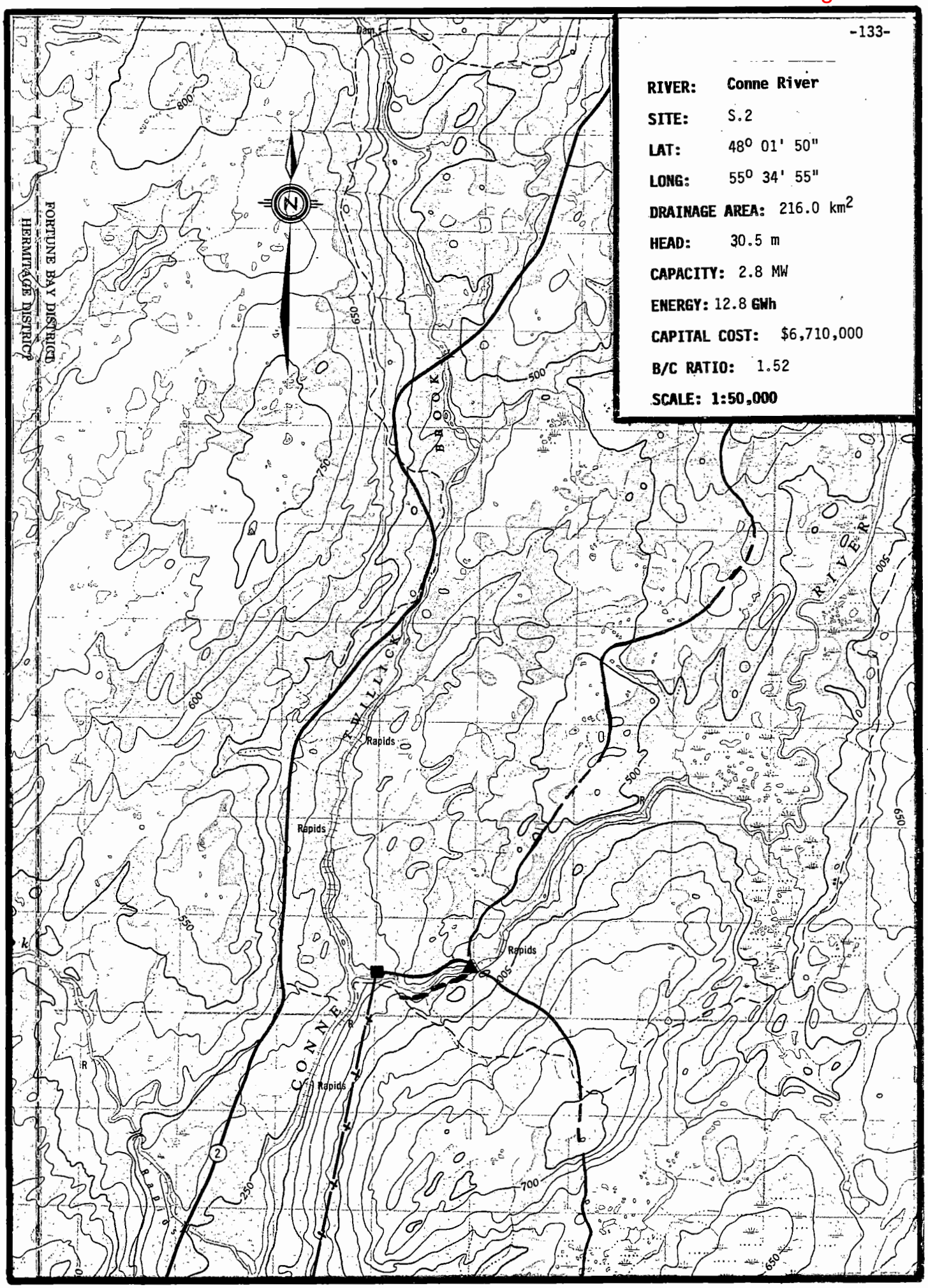
CAPACITY: 2.8 MW

ENERGY: 12.8 GWh

CAPITAL COST: $6,710,000

B/C RATIO: 1.52

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Conne River

SITE NAME : SITE - 2 FILE : 2037

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.80421 MW
PENSTOCK LENGTH	: 950 M.
DESIGN FLOW	: 11.295 M^3/S
PENSTOCK DIAMETER	: 2.214673 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 6.5 M.
TRANSMISSION LINE LENGTH	: 10 KM.
LENGTH OF DAM	: 129 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 320 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8339593

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
606998.5	SEE DAM	204743.2	1004324	240000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
584911.6	1393832	418149.6	228917.6	593892.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	395412.7	749502.2	294056.4

PROJECT COST: $ 6714740 COST PER KW: $ 2394.522

Total Project Cost = $ 6,714,740

MAP NUMBER 2 D/4 DATA SHEET FILE NUMBER 2037

1. Site Identification:

River Basin: Conne River Site: S.2

2. Location:

Lat. 48° 01' 50" Long. 55° 34' 55" Hydrologic Region 2

3. Hydrologic Data:

A = 216 km^2, MAR = 1100 mm, ACLS = 30 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 7.53 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 320 m^3/s Q_2 = 160

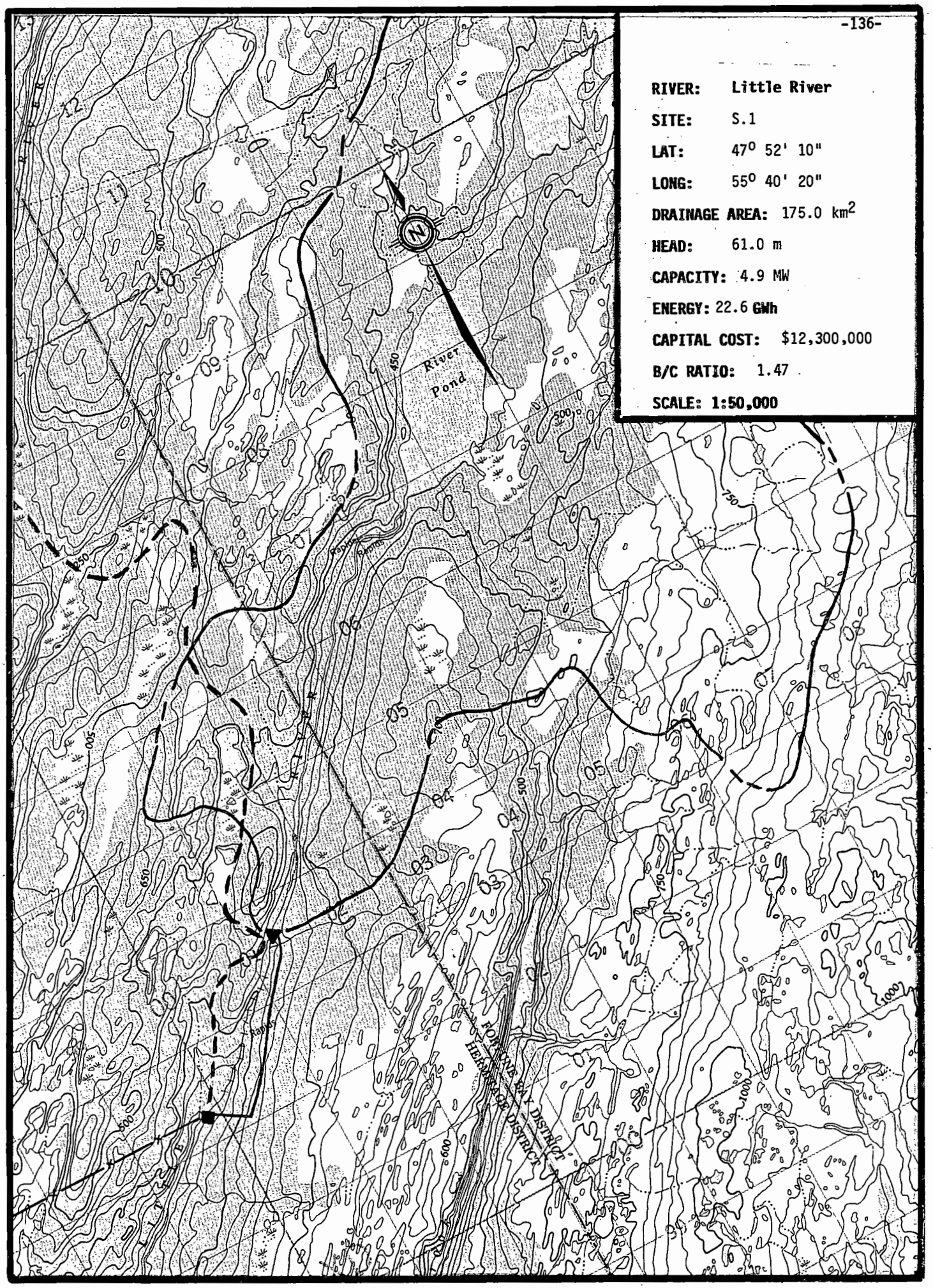
Q1000 = 430 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 950 m
Access Road Length = 2 km
Dam Height = 6.5 m
Distance to Town = 18 km
Installed Capacity = 2.8 MW

Plant Design Flow = 11.30 m^3/s
T.L. Line Length = 10 km
Dam Length = 129 m
Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Little River

SITE: S.1

LAT: 47° 52' 10"

LONG: 55° 40' 20"

DRAINAGE AREA: 175.0 km^2

HEAD: 61.0 m

CAPACITY: 4.9 MW

ENERGY: 22.6 GWh

CAPITAL COST: $12,300,000

B/C RATIO: 1.47

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Little River

SITE NAME : SITE - 1 FILE : 2038

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.960435 MW
PENSTOCK LENGTH	: 2305 M.
DESIGN FLOW	: 9.99 M^3/S
PENSTOCK DIAMETER	: 1.906503 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 6.3 M.
TRANSMISSION LINE LENGTH	: 7 KM.
LENGTH OF DAM	: 105 M.
ACCESS ROAD LENGTH	: 8.5 KM.
FLOOD FLOW	: 150 M^3/S
DISTANCE TO TOWN	: 26 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.122569E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
480716.8	SEE DAM	183324.7	5159169	112500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
684110.3	1630220	489066.1	783086.5	595822.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	613845.8	1065467	501457

PROJECT COST: $ 1.229879E+07 COST PER KW: $ 2479.377

Total Project Cost = $ 12,298,790

MAP NUMBER 1 M/13 DATA SHEET FILE NUMBER 2038

1. Site Identification:

River Basin: Little River Site: S.1

2. Location:

Lat. 47° 52' 10" Long. 55° 40' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 175 km^2, MAR = 1200 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.66 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 150 m^3/s Q_2 = 70

Q1000 = 200 m^3/s

4. Site Data:

Rated Head = 61 m

Penstock Length = 2305 m

Access Road Length = 8.5 km

Dam Height = 6.3 m

Distance to Town = 26 km

Installed Capacity = 4.9 MW

Plant Design Flow = 9.99 m^3/s

T.L. Line Length = 7.0 km

Dam Length = 105 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Salmonier Cove River

SITE: S.1

LAT: 47° 41' 25"

LONG: 55° 41' 15"

DRAINAGE AREA: 69.0 km^2

HEAD: 107.0 m

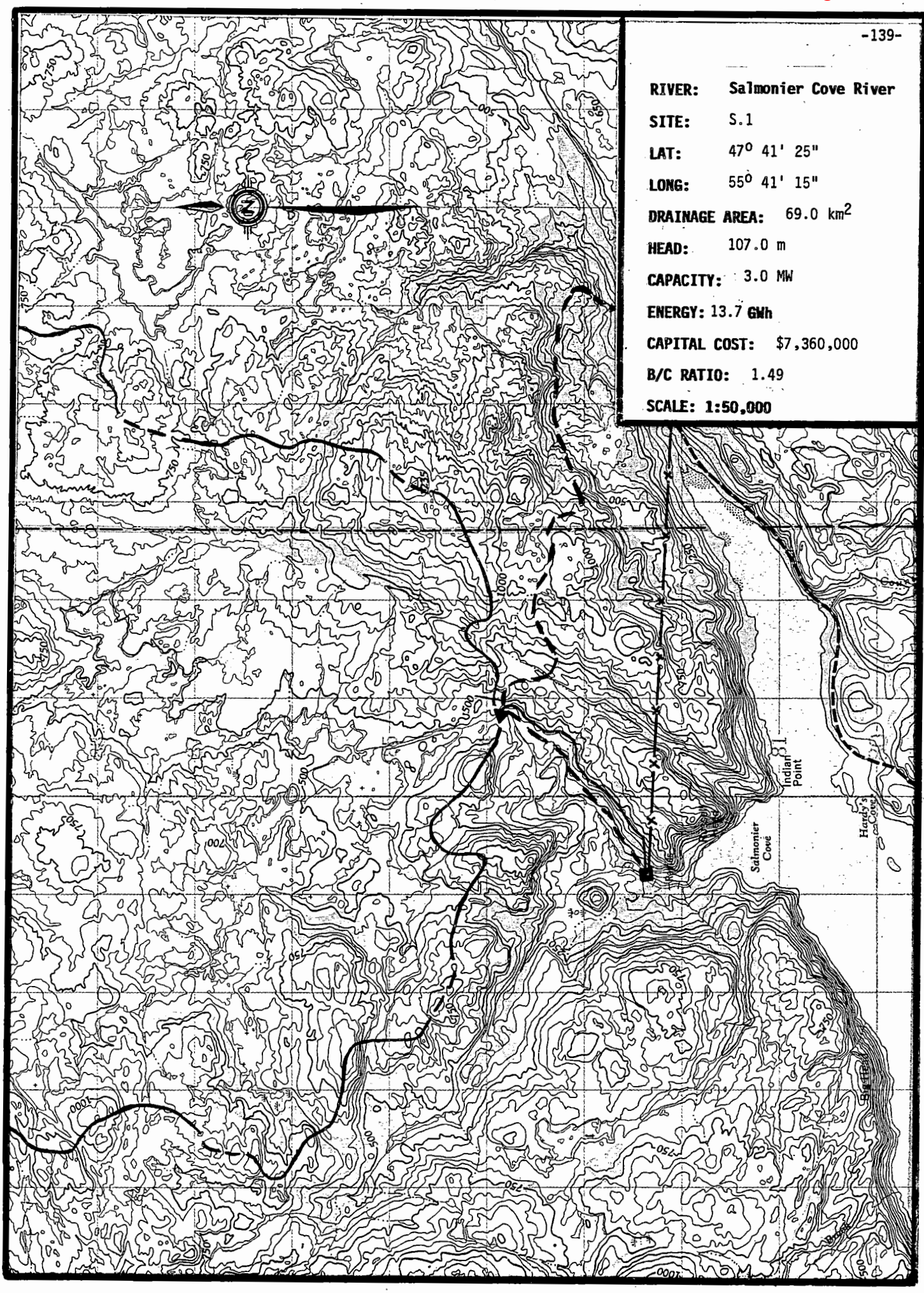
CAPACITY: 3.0 MW

ENERGY: 13.7 GWh

CAPITAL COST: $7,360,000

B/C RATIO: 1.49

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Salmonier Cove River

SITE NAME : SITE - 1 FILE : 2039

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.004881 MW
PENSTOCK LENGTH	: 2475 M.
DESIGN FLOW	: 3.45 M^3/S
PENSTOCK DIAMETER	: 1.115627 M.
RATED HEAD	: 107 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 73 M.
ACCESS ROAD LENGTH	: 7 KM.
FLOOD FLOW	: 44 M^3/S
DISTANCE TO TOWN	: 38 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6481388

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
244486	SEE DAM	70412.41	2912301	33000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
395660.5	942850.4	282855.1	663952.5	403006.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	476423.6	671879.5	264941.3

PROJECT COST: $ 7361768 COST PER KW: $ 2449.937

Total Project Cost = $ 7,361,768

MAP NUMBER 1 M/12 DATA SHEET FILE NUMBER 2039

1. Site Identification:

River Basin: Salmonier Cove River Site: S.1

2. Location:

Lat. 47° 41' 25" Long. 55° 41' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 69 km^2, MAR = 1050 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.30 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 44 m^3/s Q_2 = 22

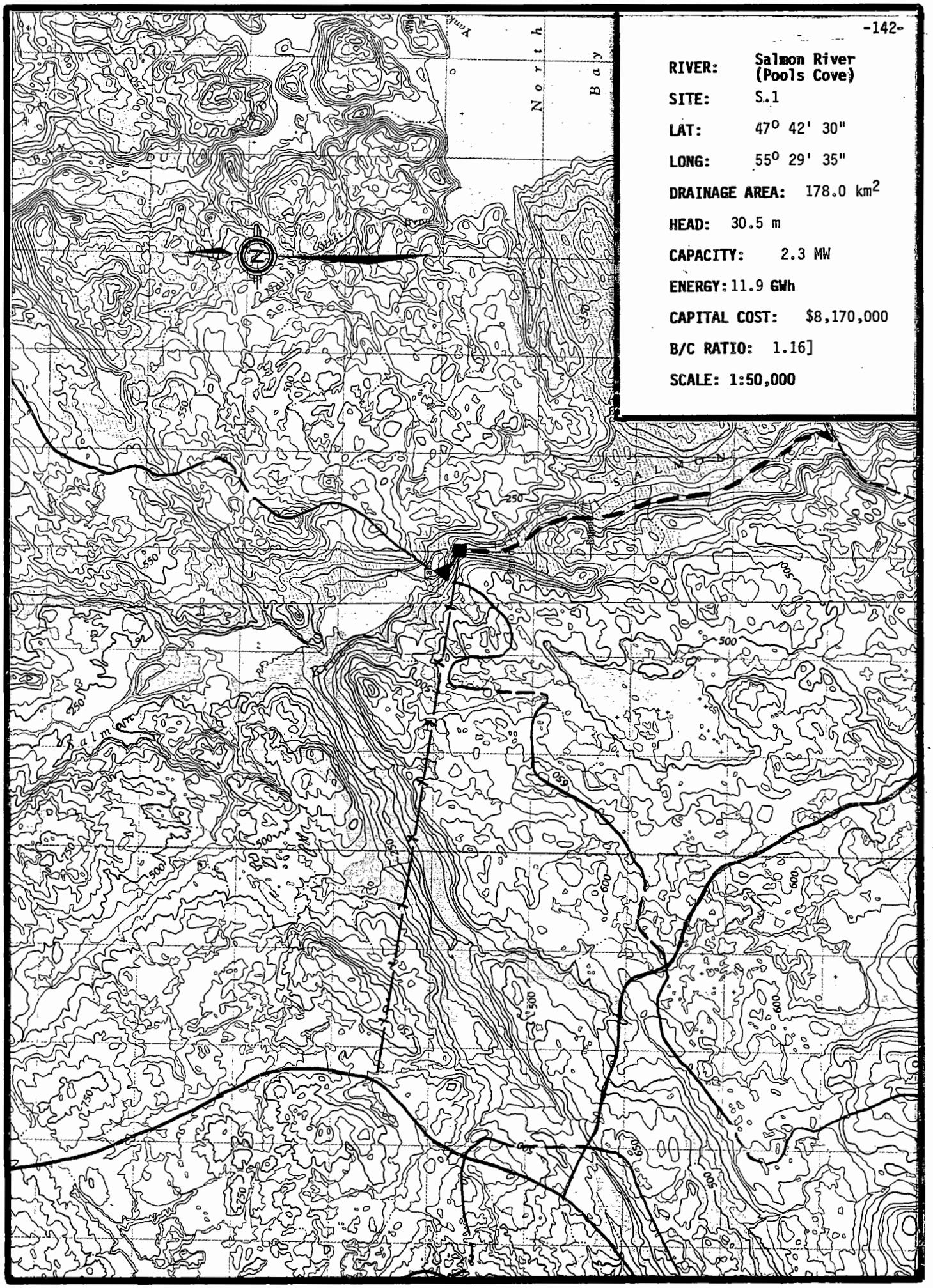
Q1000 = 59 m^3/s

4. Site Data:

Rated Head = 107 m
Penstock Length = 2475 m
Access Road Length = 7.0 km
Dam Height = 5 m
Distance to Town = 38 km
Installed Capacity = 3.0 MW

Plant Design Flow = 3.44 m^3/s
T.L. Line Length = 5.0 km
Dam Length = 73 m
Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Salmon River (Pools Cove)

SITE: S.1

LAT: 47° 42' 30"

LONG: 55° 29' 35"

DRAINAGE AREA: 178.0 km^2

HEAD: 30.5 m

CAPACITY: 2.3 MW

ENERGY: 11.9 GWh

CAPITAL COST: $8,170,000

B/C RATIO: 1.16]

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Salmon River

SITE NAME : SITE - 1 FILE : 2040

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.312635 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 9.315001 M^3/S
PENSTOCK DIAMETER	: 2.03853 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 18.3 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 4.5 KM.
FLOOD FLOW	: 270 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .88
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7120462

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1069985	1045359	172137.9	291875.9	202500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
511090.6	1217918	365375.4	456072.9	361878.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1407111	779388.4	292673.7

PROJECT COST: $ 8173367 COST PER KW: $ 3534.223

Total Project Cost = $ 8,173,367

MAP NUMBER 1 M/11 DATA SHEET FILE NUMBER 2040

1. Site Identification:

River Basin: Salmon River Site: S.1

2. Location:

Lat. 47° 42' 30" Long. 55° 29' 35" Hydrologic Region 2

3. Hydrologic Data:

A = 178 km^2, MAR = 1100 mm, ACLS = 50 %

Storage Reservoir Area = 3.4 km^2

Storage Reservoir Vol, V = 6.8 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.03$$

Mean Flow, QAV = 6.21 m^3/s

Usable Flow Ratio = 0.88

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 220 m^3/s

Q1000 = 270 m^3/s Q_2 = 105

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 300 m
Access Road Length = 4.5 km
Dam Height = 18.3 m
Distance to Town = 60 km
Installed Capacity = 2.3 MW

Plant Design Flow = 9.31 m^3/s
T.L. Line Length = 5 km
Dam Length = 100 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Southwest River (Port Blandford)

SITE: S.1

LAT: 48° 17' 00"

LONG: 54° 13' 00"

DRAINAGE AREA: 415.0 km²

HEAD: 53.3 m

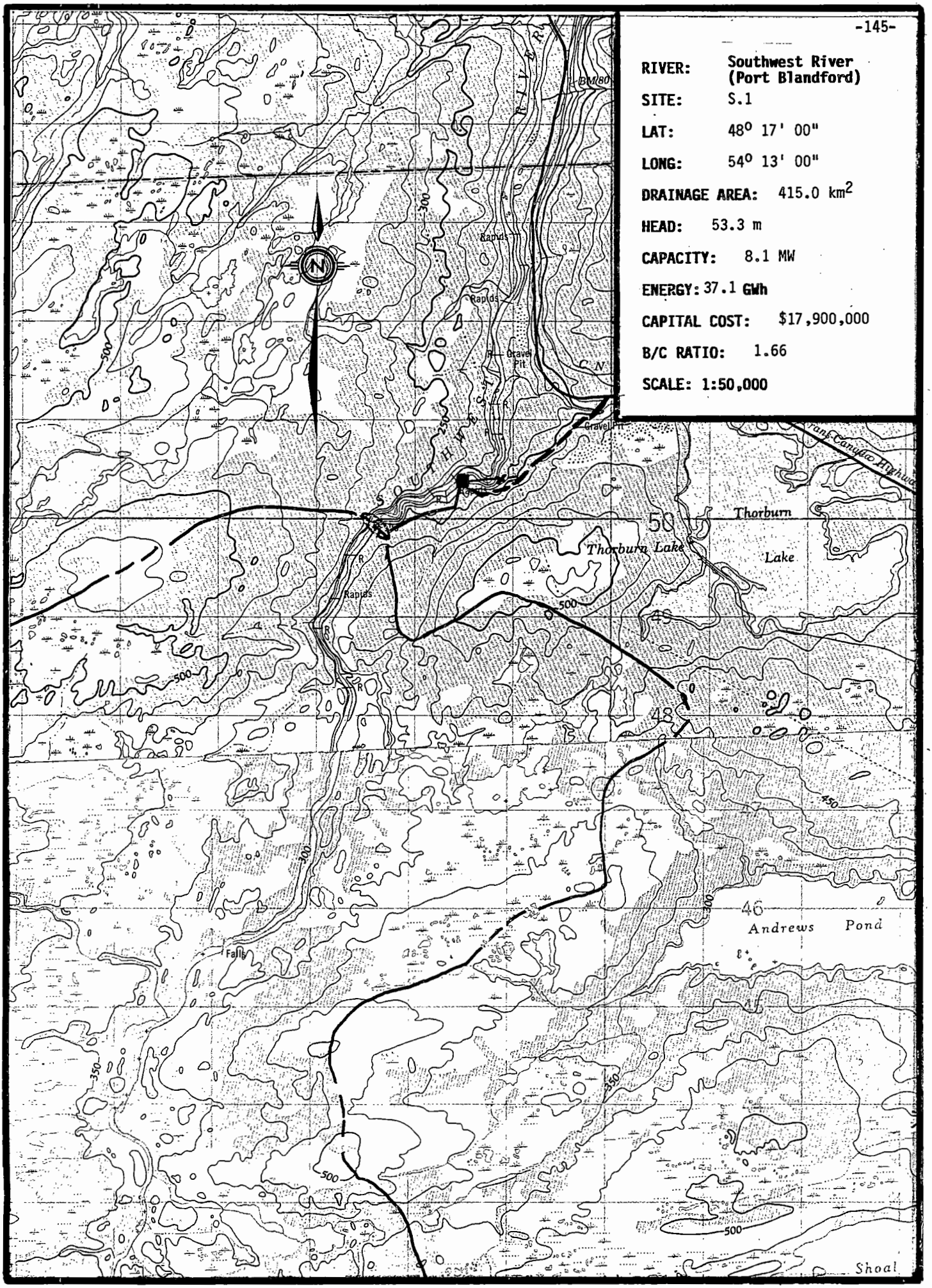
CAPACITY: 8.1 MW

ENERGY: 37.1 GWh

CAPITAL COST: $17,900,000

B/C RATIO: 1.66

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : South West River

SITE NAME : SITE - 1 FILE : 2042

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 8.134911 MW
PENSTOCK LENGTH	: 1100 M.
DESIGN FLOW	: 18.75 M^3/S
PENSTOCK DIAMETER	: 2.546943 M.
RATED HEAD	: 53.3 M.
HEIGHT OF DAM	: 24 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 300 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 390 M^3/S
DISTANCE TO TOWN	: 12 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 25 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.740975E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4241031	1663174	323082.3	3567753	292500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1095505	2453930	732516.6	323114.7	40424.63

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	700705.5	1499617	963285.9

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.789664E+07 COST PER KW: $ 2199.98

Total Project Cost = $ 17,896,640

MAP NUMBER 2 D/08 & 2 D/01 DATA SHEET FILE NUMBER 2042

1. Site Identification:

River Basin: Southwest River (Port Blandford) Site: S.1

2. Location:

Lat. 48° 17' 00" Long. 54° 13" 00" Hydrologic Region 2

3. Hydrologic Data:

A = 415 km^2, MAR = 950 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 12.5 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 290 m^3/s

Q1000 = 390 m^3/s

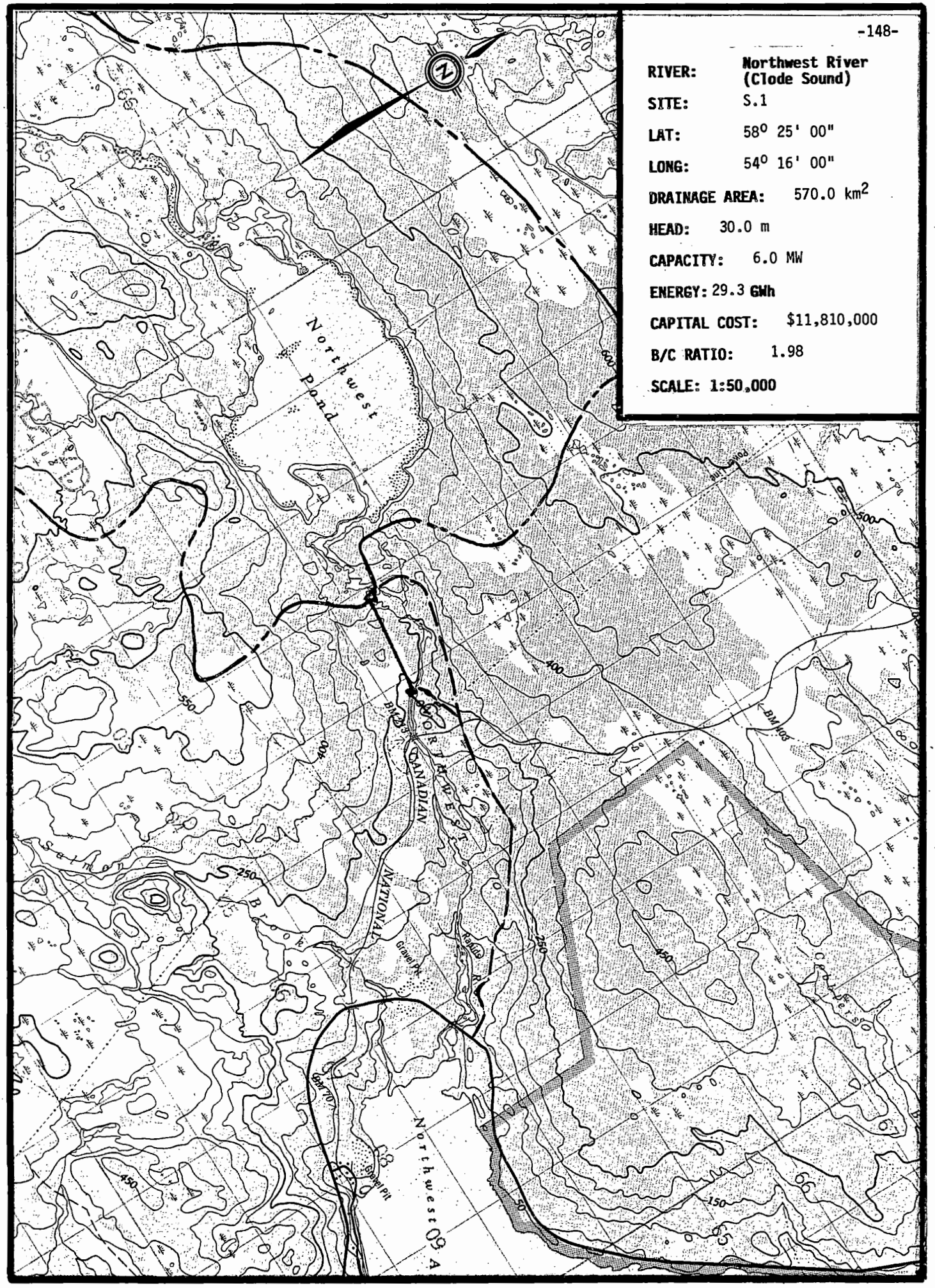
4. Site Data:

Rated Head = 53.3 m
Penstock Length = 1100 m
Access Road Length = 3 km
Dam Height = 24 m
Distance to Town = 12 km
Installed Capacity = 8.2 MW

Plant Design Flow = 18.75 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 300 m
Distance to Concrete Plant = 25 km

5. Remarks:

RIVER:	Northwest River (Clode Sound)
SITE:	S.1
LAT:	58° 25' 00"
LONG:	54° 16' 00"
DRAINAGE AREA:	570.0 km²
HEAD:	30.0 m
CAPACITY:	6.0 MW
ENERGY:	29.3 GWh
CAPITAL COST:	$11,810,000
B/C RATIO:	1.98
SCALE:	1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : North West River

SITE NAME : SITE - 1 FILE : 2043

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 6.04395 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 24.75 M^3/S
PENSTOCK DIAMETER	: 3.110361 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 150 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 350 M^3/S
DISTANCE TO TOWN	: 8 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .83
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.571771E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
615077.1	SEE DAM	414791.2	4235364	262500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1047669	2346779	700531.1	323114.7	36840.58

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	243013.4	1039771	544333

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.180978E+07 COST PER KW: $ 1953.985

Total Project Cost = $ 11,809,780

File No. 2043 Map No. 2 D/8

DATA SHEET

1. Site Identification:

River Basin: Northwest River Site: S.1

2. Location:

Lat. 48° 25' 00" Long. 54° 16' 0" Hydrologic Region 2

3. Hydrologic Data:

A = 570 km^2, MAR = 925 mm, ACLS = 60 %

Storage Reservoir Area = 4 km^2

Storage Reservoir Vol, V = 8 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = .01517$$

Mean Flow, QAV = 16.5 m^3/s

Usable Flow Ratio = 0.83

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 350 m^3/s

Q1000 = 475 m^3/s

4. Site Data:

Rated Head = 30 m
Penstock Length = 1000 m
Access Road Length = 3 km
Dam Height = 6 m
Distance to Town = 8 km
Installed Capacity = 6.6 MW

Plant Design Flow = 25 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 150 m
Distance to Concrete Plant = 40 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Salmon River
[Clode Sound]
SITE NAME : SITE - 1 FILE : 2044

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.06227 MW
PENSTOCK LENGTH	: 2000 M.
DESIGN FLOW	: 4.350001 M^3/S
PENSTOCK DIAMETER	: 1.472733 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 10 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 120 M^3/S
DISTANCE TO TOWN	: 6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3777626

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
491150.5	386247.3	86746.57	1405767	90000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
298194.7	710591.6	213177.5	323114.7	128424.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	135754.7	650658.2	197132.1

PROJECT COST: $ 5116959 COST PER KW: $ 4817.004

Total Project Cost = $ 5,116,959

MAP NUMBER 2 D/08 DATA SHEET FILE NUMBER 2044

1. Site Identification:

River Basin: Salmon River (Clode Sound) Site: S.1

2. Location:

Lat. 48° 23' 00" Long. 54° 14' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 100 km^2, MAR = 925 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.9 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 90 m^3/s

Q1000 = 120 m^3/s

4. Site Data:

Rated Head = 30 m
Penstock Length = 2000 m
Access Road Length = 3 km
Dam Height = 10 m
Distance to Town = 6 km
Installed Capacity = 1 MW

Plant Design Flow = 4.3 m^3/s
T.L. Line Length = 1 km
Dam Length = 1000 m
Distance to Concrete Plant = 40 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Shoal Harbour River

SITE NAME : SITE - 1 FILE : 2045

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.4652 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 6 M^3/S
PENSTOCK DIAMETER	: 1.691136 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 230 M^3/S
DISTANCE TO TOWN	: .5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 3 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4917470

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1523473	814141.6	115863.9	807006.1	172500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
373476.5	889986.6	266996	70457.66	131431.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	17749.81	665893.6	219203

PROJECT COST: $ 6068180 COST PER KW: $ 4141.537

Total Project Cost = $ 6,068,180

MAP NUMBER 2 D/01 DATA SHEET FILE NUMBER 2045

1. Site Identification:

River Basin: Shoal Harbour River Site: S.1

2. Location:

Lat. 48° 12' 00" Long. 54° 00' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 116 km^2, MAR = 1100 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

Q1000 = 230 m^3/s

4. Site Data:

Rated Head	= 30 m	Plant Design Flow	= 6 m^3/s
Penstock Length	= 1000 m		
Access Road Length	= 0.5 km	T.L. Line Length	= 0.5 km
Dam Height	= 15 m	Dam Length	= 200 m
Distance to Town	= 0.5 km	Distance to Concrete Plant	= 3 km
Installed Capacity	= 1.5 MW		

5. Remarks:

(i) Re-routing of railway line may be required.

RIVER: Maccles Lake

SITE: S.1

LAT: 48° 38' 30"

LONG: 54° 03' 30"

DRAINAGE AREA: 202.0 km²

HEAD: 55.0 m

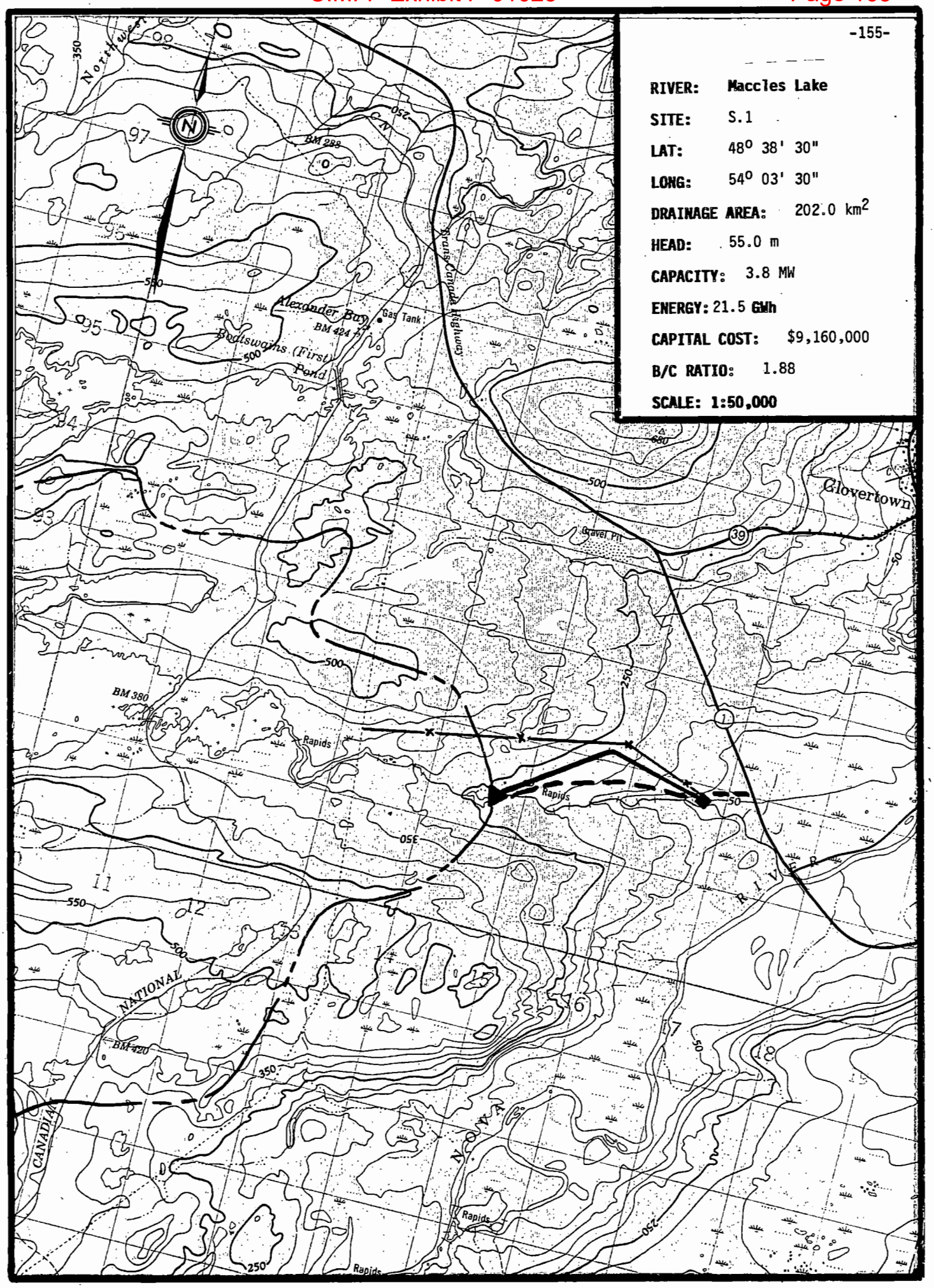
CAPACITY: 3.8 MW

ENERGY: 21.5 GWh

CAPITAL COST: $9,160,000

B/C RATIO: 1.88

SCALE: 1:50,000



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WATER SHED : Maccles Lake

SITE NAME : SITE - 1 FILE : 2046

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.76068 MW
PENSTOCK LENGTH	: 2000 M.
DESIGN FLOW	: 8.399999 M^3/S
PENSTOCK DIAMETER	: 1.795394 M.
RATED HEAD	: 55 M.
HEIGHT OF DAM	: 10 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 300 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 190 M^3/S
DISTANCE TO TOWN	: 6 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 6 KM.
USEFUL TURBINE FLOW RATIO	: .9799999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9176291

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1320154	552754	156842.3	1713523	142500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
584369.3	1392539	417761.9	228917.6	442665

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	119733.4	957782.6	415631.1

PROJECT COST: $ 9160972 COST PER KW: $ 2435.989

Total Project Cost = $ 9,160,972

WATER SHED : Maccles Lake SITE - 1

COST DATA

(ADDITIONAL COST of $ 715,800 for Storage Dam INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .6533333

ANNUAL COST : $ 687072.9

ANNUAL BENEFIT : $ 1291387

BENEFIT/COST RATIO: 1.879549

Total Project Cost = $ 9,160,972.00

Benefit / Cost Ratio = 1.88

MAP NUMBER 2 D/09 DATA SHEET FILE NUMBER 2046

1. Site Identification:

River Basin: Maccles Lake Site: S.1

2. Location:

Lat. 48° 38' 30 Long. 54° 03' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 202 km^2, MAR = 875 mm, ACLS = 60 %

Storage Reservoir Area = 20 km^2

Storage Reservoir Vol, V = 40 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = .226$$

Mean Flow, QAV = 5.6 m^3/s

Usable Flow Ratio = 0.98

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 145 m^3/s

Q1000 = 190 m^3/s

4. Site Data:

Rated Head = 55 m
Penstock Length = 2000 m
Access Road Length = 2 km
Dam Height = 10 m
Distance to Town = 6 km
Installed Capacity = 3.5 MW

Plant Design Flow = 7.4 m^3/s
T.L. Line Length = 5 km
Dam Length = 300 m
Distance to Concrete Plant = 6 km

5. Remarks:

(i) Cost of storage = $715,800

File No. 2046

SUMMARY SHEET UPSTREAM STORAGE SCHEME

Plant/s: Maccles Lake Region: 2

Total Developed Head, H = 155 m Map: 2D9

Area Controlled by Reservoir = 196 km^2

Surface Area Reservoir, As = 20.0 km^2

MAR = ... mm, QAV res. = 5.43 m^3/s

Qav proj. = 5.60 m^3/s

% of Run-off Passing through storage = 97.0 %

Storage Factor = $\frac{As}{Qav,\ proj.}$ x 0.0634 = 0.23

Net Water Use Factor, q* = 0.98 - 0.78 = 0.20

Additional Usable Flow, Q* = q* x Qav proj. = 1.12 m^3/s

Additional Energy = H x Q* x 0.0716 = 4.41 GWh p.a.

Dam: Height = 3 m, Length = 100 m

Access Road: Length = 4.0 km

Control Structure: Design Flow = 7.4 m^3/s

Reservoir: Surface Area = 20 km^2

Costs:		
	Dam and Spillway	= 159,100
	Access Road	= 160,000
	Control Structure	= 35,400
	Reservoir Clearing	= 107,300
	Sub-Total Direct Costs	= 461,800
	Cost of Storage Scheme	= 715,800

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Cost of Storage} \times 1.15}$ = 5.36
(Storage Scheme)

Benefit/Cost Ratio = $\frac{\text{Total Energy} \times 10^6}{\text{Total Project Cost} \times 1.25}$ = 1.89
(Total Project)

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WATER SHED : South West Brook

SITE NAME : SITE - 1 FILE : 2047

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.12332 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 6.9 M^3/S
PENSTOCK DIAMETER	: 1.900778 M.
RATED HEAD	: 20 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: 5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 5 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4369559

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
427019.5	SEE DAM	131394.2	907086.8	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
357371.3	851608.2	255482.5	323114.7	202158.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	46503.05	536401.2	161292.8

PROJECT COST: $ 4326933 COST PER KW: $ 3851.916

Total Project Cost = $ 4,326,933

MAP NUMBER 2 C/05 DATA SHEET FILE NUMBER 2047

1. Site Identification:

River Basin: Southwest Brook (Bloomfield) Site: S.1

2. Location:

Lat. 48° 22' 00" Long. 53° 55' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 145 km^2, MAR = 1000 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.6 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

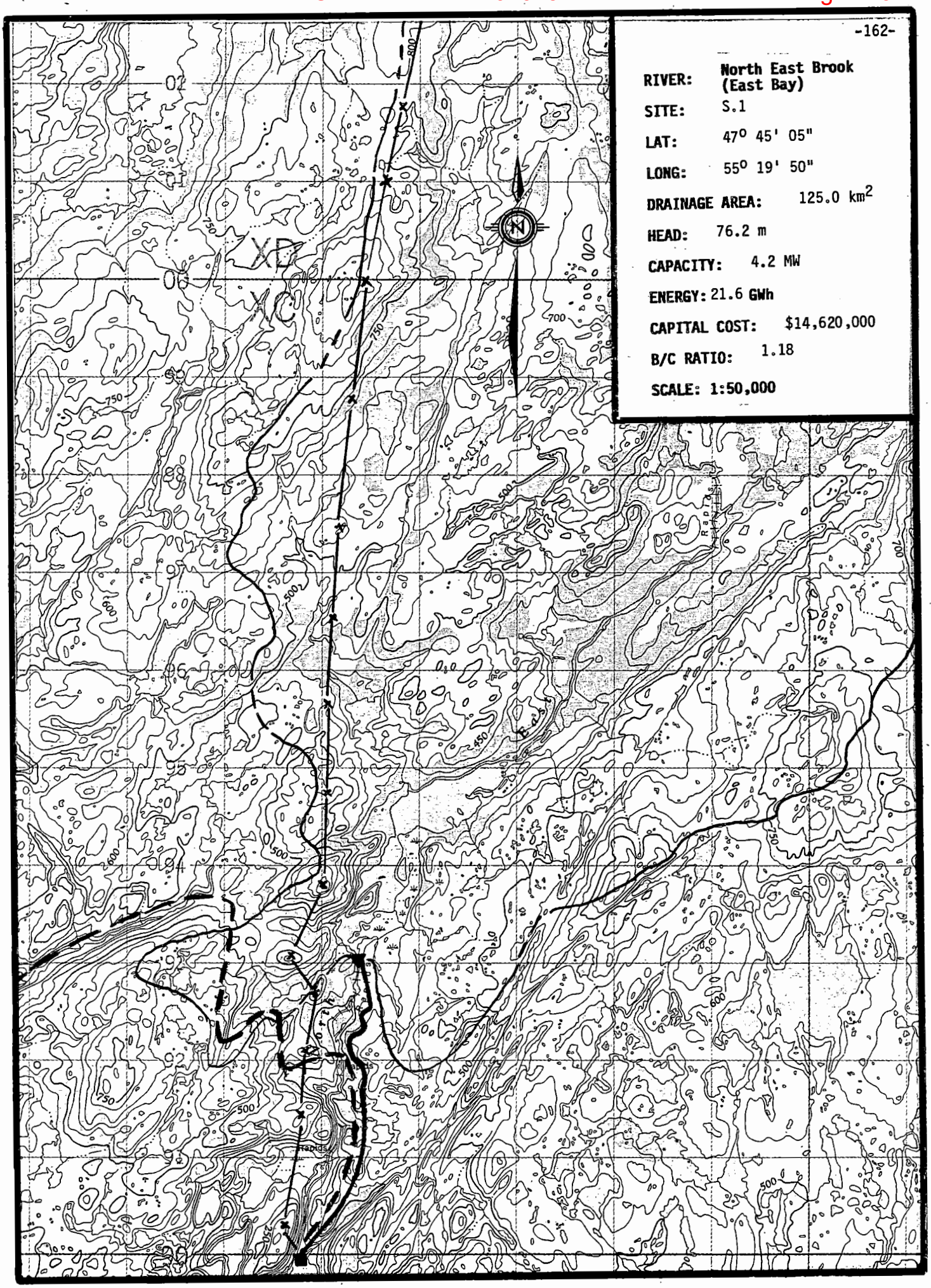
Q1000 = 225 m^3/s

4. Site Data:

Rated Head = 20 m
Penstock Length = 1000 m
Access Road Length = 3 km
Dam Height = 6 m
Distance to Town = 5 km
Installed Capacity = 1.2 MW

Plant Design Flow = 6.9 m^3/s
T.L. Line Length = 3 km
Dam Length = 100 m
Distance to Concrete Plant = 5 km

5. Remarks:


RIVER: North East Brook (East Bay)
SITE: S.1
LAT: 47° 45' 05"
LONG: 55° 19' 50"
DRAINAGE AREA: 125.0 km²
HEAD: 76.2 m
CAPACITY: 4.2 MW
ENERGY: 21.6 GWh
CAPITAL COST: $14,620,000
B/C RATIO: 1.18
SCALE: 1:50,000
XB
XC
N
Rapids

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WATER SHED : North East Brook

SITE NAME : SITE - 1 FILE : 2048

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.242633 MW
PENSTOCK LENGTH	: 3450 M.
DESIGN FLOW	: 6.84 M^3/S
PENSTOCK DIAMETER	: 1.570258 M.
RATED HEAD	: 76.2 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 21 KM.
LENGTH OF DAM	: 76 M.
ACCESS ROAD LENGTH	: 20 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .87
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9349281

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
120249.8	SEE DAM	130365.5	6081155	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
567268.1	1351788	405536.3	1620612	1160362

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1223759	1250938	576484.2

PROJECT COST: $ 1.461602E+07 COST PER KW: $ 3445.035

Total Project Cost = $ 14,616,020

MAP NUMBER 1 M/14 DATA SHEET FILE NUMBER 2048

1. Site Identification:

River Basin: North East Brook(East Bay) Site: S.1

2. Location:

Lat. 47° 45' 05" Long. 55° 19' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 125 km^2, MAR = 1150 mm, ACLS = 40 %

Storage Reservoir Area = 1.5 km^2

Storage Reservoir Vol, V = 3 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.02

Mean Flow, QAV = 4.56 m^3/s

Usable Flow Ratio = 0.87

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

Q1000 = 210 m^3/s

Q_2 = 85

4. Site Data:

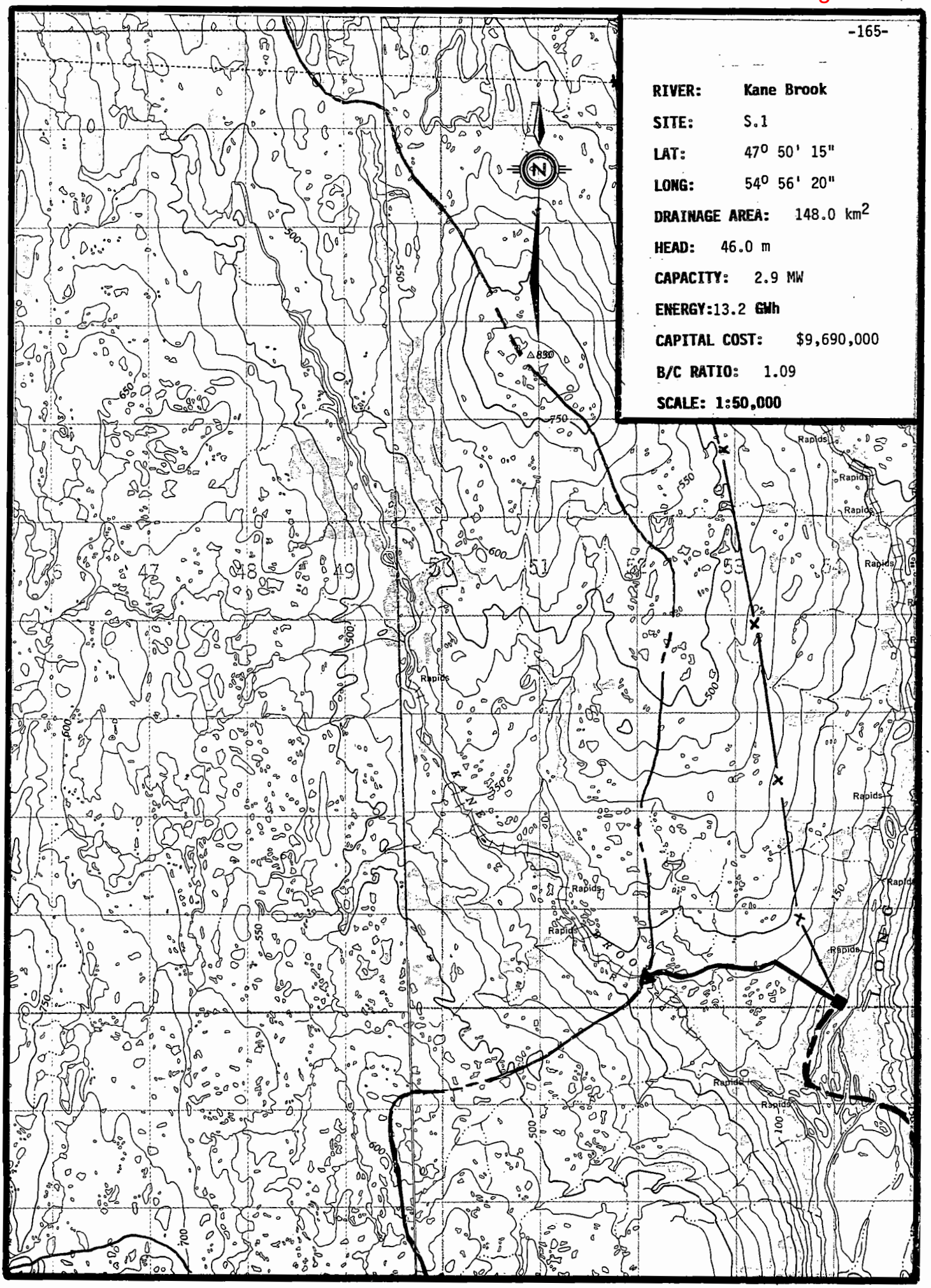
Rated Head = 76.2 m
Penstock Length = 3450 m
Access Road Length = 20 km
Dam Height = 3 m
Distance to Town = 60 km
Installed Capacity = 4.2 MW

Plant Design Flow = 6.84 m^3/s
T.L. Line Length = 21 km
Dam Length = 76 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Penstock length/head ratio > 20, surge tank required.

(ii) Terrain appears rough, hence access and T.L. are likely to be high (not tested).


RIVER: Kane Brook
SITE: S.1
LAT: 47° 50' 15"
LONG: 54° 56' 20"
DRAINAGE AREA: 148.0 km²
HEAD: 46.0 m
CAPACITY: 2.9 MW
ENERGY: 13.2 GWh
CAPITAL COST: $9,690,000
B/C RATIO: 1.09
SCALE: 1:50,000
N
Rapids
KANE
BROOK
47
48
49
50
51
53

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WATER SHED : Kane Brook

SITE NAME : SITE - 1 FILE : 2049

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.898166 MW
PENSTOCK LENGTH	: 2075 M.
DESIGN FLOW	: 7.74 M^3/S
PENSTOCK DIAMETER	: 1.777227 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 5.9 M.
TRANSMISSION LINE LENGTH	: 9.5 KM.
LENGTH OF DAM	: 104 M.
ACCESS ROAD LENGTH	: 23 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7744273

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
431193.2	SEE DAM	145706.4	1759785	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
518380.7	1235290	370587	1825039	581328.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1188687	1066229	438763

PROJECT COST: $ 9688488 COST PER KW: $ 3342.973

Total Project Cost = $ 9,688,488

MAP NUMBER 1 M/15 DATA SHEET FILE NUMBER 2049

1. Site Identification:

River Basin: Kane Brook Site: S.1

2. Location:

Lat. 47° 50' 15" Long. 54° 56' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 148 km^2, MAR = 1100 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.16 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

Q1000 = 230 m^3/s Q_2 = 82

4. Site Data:

Rated Head = 46 m
Penstock Length = 2075 m
Access Road Length = 23 km
Dam Height = 5.9 m
Distance to Town = 50 km
Installed Capacity = 2.9 MW

Plant Design Flow = 7.74 m^3/s
T.L. Line Length = 9.5 km
Dam Length = 104 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Access road from Grand Le Pierre

(ii) T.L. connects with 230 kV, Bay d'Espoir - Sunnyside T.L.

(iii) Penstock length/head ratio > 20, design with power canal supply.

RIVER: Long Harbour River (Fortune Bay)

SITE: S.1

LAT: 47° 54' 45"

LONG: 54° 55' 30"

DRAINAGE AREA: 630.0 km²

HEAD: 46.0 m

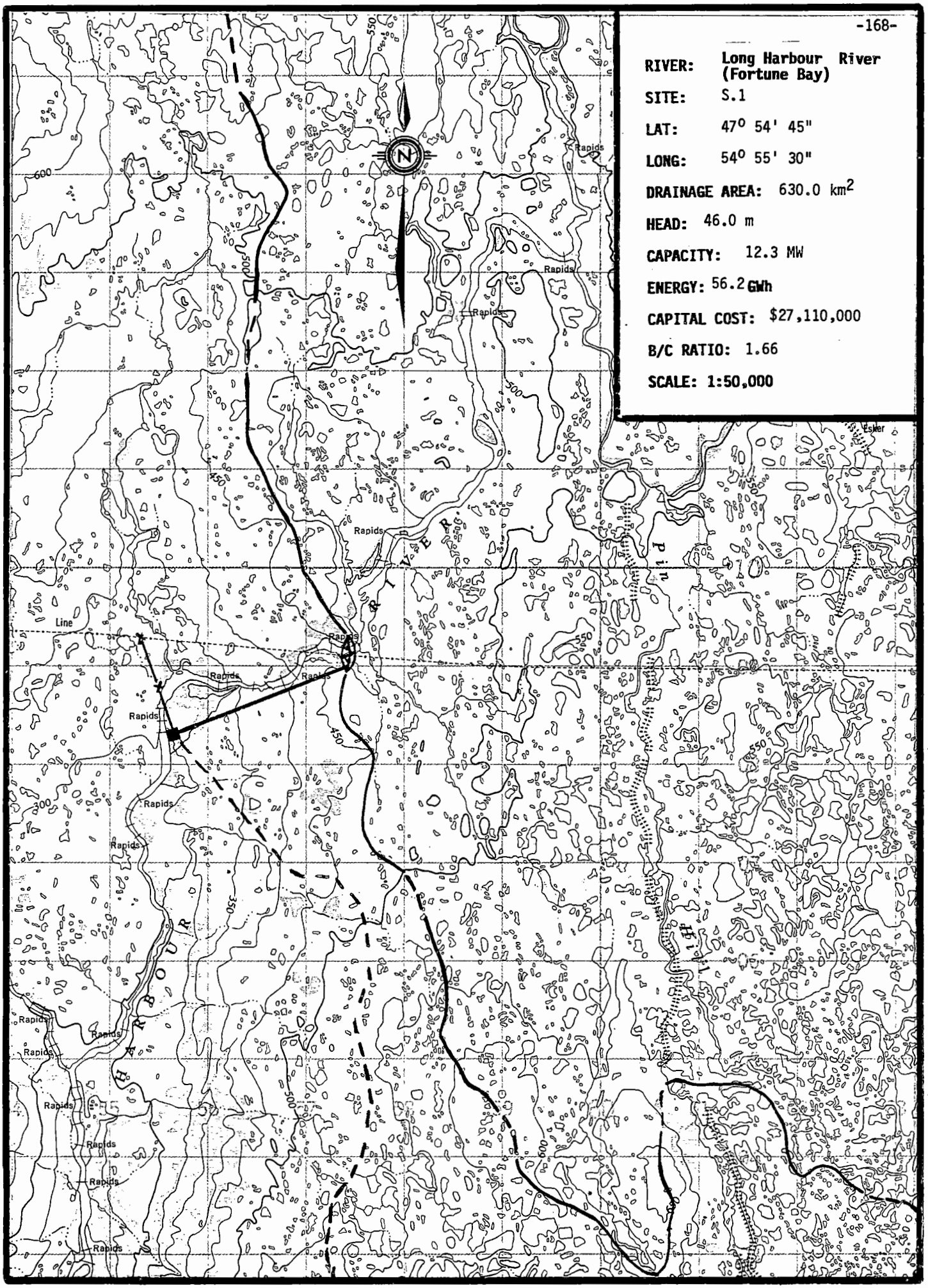
CAPACITY: 12.3 MW

ENERGY: 56.2 GWh

CAPITAL COST: $27,110,000

B/C RATIO: 1.66

SCALE: 1:50,000



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WATER SHED : Long Harbour River

SITE NAME : SITE - 1 FILE : 2050

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 12.33967 MW
PENSTOCK LENGTH	: 1900 M.
DESIGN FLOW	: 32.955 M^3/S
PENSTOCK DIAMETER	: 3.313527 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 10 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 250 M.
ACCESS ROAD LENGTH	: 28 KM.
FLOOD FLOW	: 460 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.540438E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2170634	SEE DAM	536711.6	8773785	345000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1638732	3670759	1095749	2157188	86522.51

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2671552	2151257	1809998

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.710789E+07 COST PER KW: $ 2196.808

Total Project Cost = $ 27,107,890

MAP NUMBER 1 M/15 DATA SHEET FILE NUMBER 2050

1. Site Identification:

River Basin: Long Harbour River Site: S.1

2. Location:

Lat. 47° 54' 45" Long. 54° 55' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 630 km^2, MAR = 1100 mm, ACLS = 80 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 21.97 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 370 m^3/s

Q1000 = 460 m^3/s

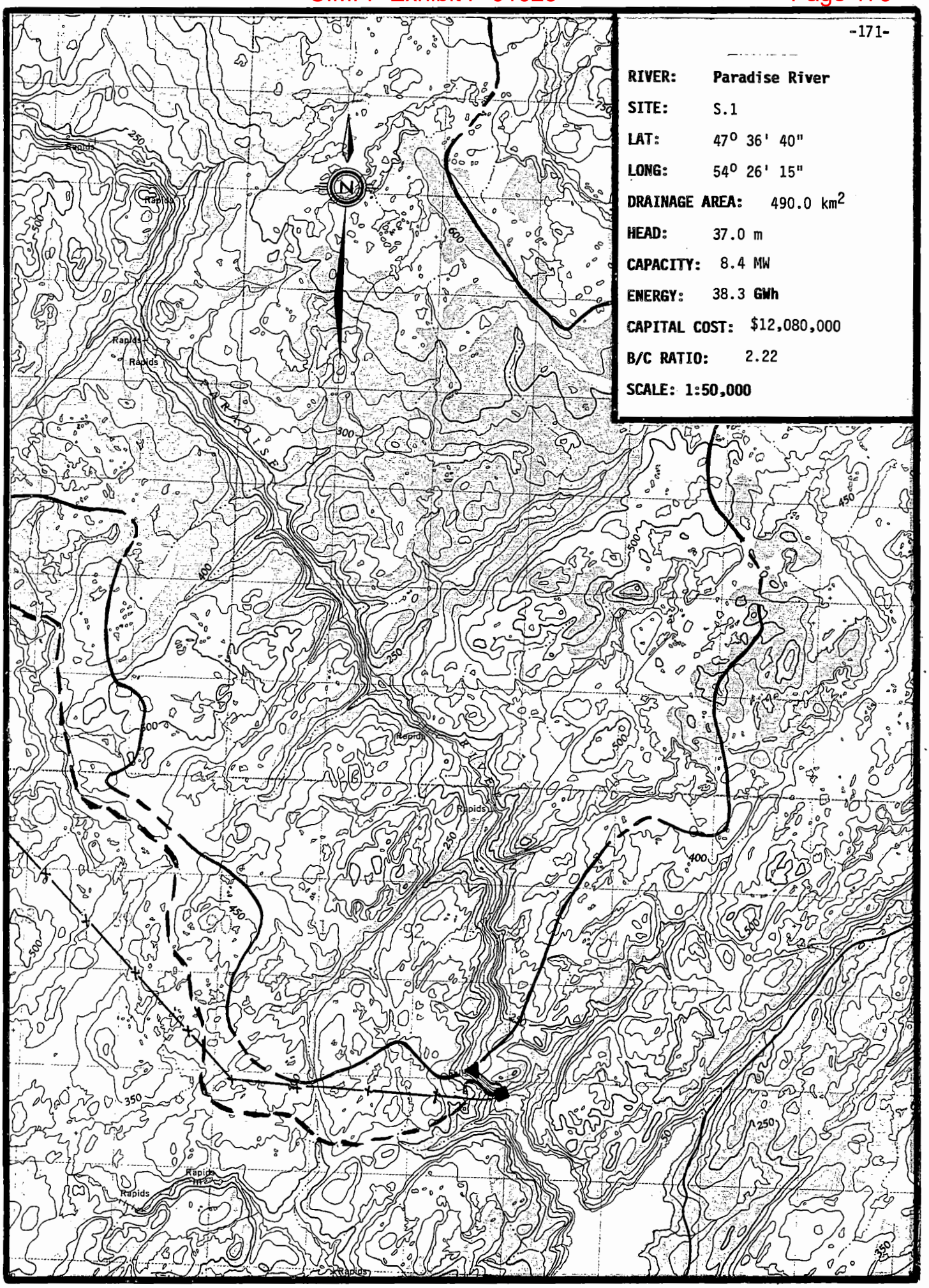
4. Site Data:

Rated Head	= 46 m	Plant Design Flow	= 32.95 m^3/s
Penstock Length	= 1900 m		
Access Road Length	= 28 km	T.L. Line Length	= 1.0 km
Dam Height	= 10 m	Dam Length	= 250 m
Distance to Town	= 50 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 12.3 MW		

5. Remarks:

(i) Penstock length/head ratio >20

(ii) Salmon river.



RIVER:	Paradise River
SITE:	S.1
LAT:	47° 36' 40"
LONG:	54° 26' 15"
DRAINAGE AREA:	490.0 km^2
HEAD:	37.0 m
CAPACITY:	8.4 MW
ENERGY:	38.3 GWh
CAPITAL COST:	$12,080,000
B/C RATIO:	2.22
SCALE:	1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Paradise River

SITE NAME : SITE 1 FILE : 2051

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 8.416474 MW
PENSTOCK LENGTH	: 400 M.
DESIGN FLOW	: 27.945 M^3/S
PENSTOCK DIAMETER	: 3.182241 M.
RATED HEAD	: 37 M.
HEIGHT OF DAM	: 8 M.
TRANSMISSION LINE LENGTH	: 12 KM.
LENGTH OF DAM	: 140 M.
ACCESS ROAD LENGTH	: 4.2 KM.
FLOOD FLOW	: 290 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.958426E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
902748.3	SEE DAM	462685.4	1747665	217500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1286400	2881536	860160	430096.1	713777.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	863650.1	1052249	661792.8

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.208026E+07 COST PER KW: $ 1435.311

Total Project Cost = $ 12,080,260

WATER SHED : Paradise River SITE 1

COST DATA

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 906019.5

ANNUAL BENEFIT : $ 2300323

BENEFIT/COST RATIO: 2.538934

Total Project Cost = $ 12,080,260.00

Benefit / Cost Ratio = 2.54

MAP NUMBER 1 M/9 DATA SHEET FILE NUMBER 2051

1. Site Identification:

River Basin: Paradise River Site: S.1

2. Location:

Lat. 47° 36' 40" Long. 54° 26' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 490 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 18.63 m^3/s

Usable Flow Ratio = .78

Max. Turbinable Flow Ratio = 150

Flood Flow: Q150 = 290 m^3/s

Q1000 = 390 m^3/s

4. Site Data:

Rated Head	= 37 m	Plant Design Flow	= 27.95 m^3/s
Penstock Length	= 400 m		
Access Road Length	= 4.2 km	T.L. Line Length	= 12 km
Dam Height	= 8 m	Dam Length	= 140 m
Distance to Town	= 30 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 8.7 MW		

5. Remarks:

(i) Same as site already studied by NLH

(ii) Possible diversion from Nameless River, Lat 47° 36.6, Long 54° 29.5, via 1.0 km tunnel. Would add about 160 km^2

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Paradise River S.1 Region: 2

Total Developed Head, H = 37.0 m Map: 1 M/9

Diverted Area = 149 km^2, MAR = 1200 mm, from Nameless River [Paradise Sound]

Location: Lat. = 47° 36' 40" Long. = 54° 29' 25"

Mean Diverted Flow = 5.7 m^3/s,

Additional Usable FLow, Q* = 0.69 x(18.5 + 5.7)- 14.5
F'(QAV + QDV) - F.QAV

= 16.7 - 14.5 = 2.20 m^3/s

Additional Energy = H x Q* x 0.0716

= 37 x 2.20 x 0.0716 = 5.82 GWh p.a.

Dam: Height = 3 m, Length = 80 m, Q150 = 120 m^3/s

Canal: Height of Land = 3.0 m, Length = 1000 m

Design Flow Ratio = 1.15 Design Flow = 6.5 m^3/s

Access Road: Length = 4.20 km @ $80,000 per km

Costs:

Dam + Spillway	= 215,700
Diversion Canal	= 541,700
Access Road	= 336,000
Sub-total Direct Costs	= 1,093,400
Total Cost Diversion	= 1,694,700
Tunnel ~~xxxxxxxxxxxxxxxx~~ Costs	= 2,200,000
Total Project Cost	= 3,894,700

Layout of Diversion is shown on map on next page.

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = 1.20$$

Water may be more valuable if used in Nameless River, S.1 where B/C = 1.51

RIVER: Paradise River

SITE: S.2

LAT: 47° 39' 20"

LONG: 54° 28' 20"

DRAINAGE AREA: 460.0 km^2

HEAD: 30.0 m

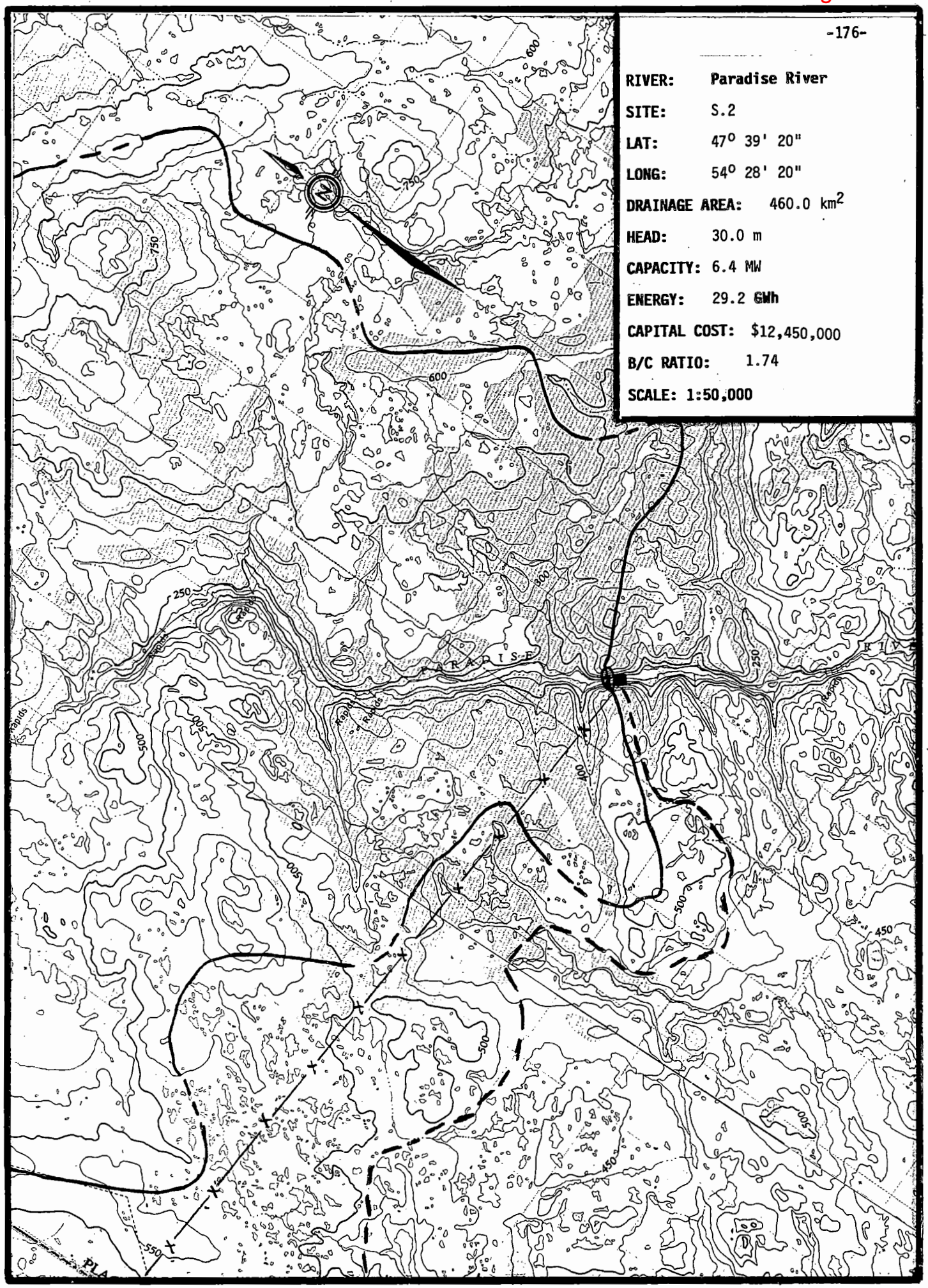
CAPACITY: 6.4 MW

ENERGY: 29.2 GWh

CAPITAL COST: $12,450,000

B/C RATIO: 1.74

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Paradise River

SITE NAME : SITE 2 FILE : 2052

SITE DATA

INSTALLED CAPACITY	: 6.406587 MW
PENSTOCK LENGTH	: 127 M.
DESIGN FLOW	: 26.235 M^3/S
PENSTOCK DIAMETER	: 3.189278 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 8 KM.
LENGTH OF DAM	: 75 M.
ACCESS ROAD LENGTH	: 3.5 KM.
FLOOD FLOW	: 350 M^3/S
DISTANCE TO TOWN	: 24 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.648694E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1701682	1778488	437124.3	556558.6	262500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1100853	2201706	657225.7	368350.7	454791.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1253655	1088802	591614.8

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.245335E+07 COST PER KW: $ 1943.836

Total Project Cost = $ 12,453,350

WATER SHED : Paradise River SITE 2

COST DATA

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 934001.2

ANNUAL BENEFIT : $ 1750997

BENEFIT/COST RATIO: 1.874727

Total Project Cost = $ 12,453,350.00

Benefit / Cost Ratio = 1.87

MAP NUMBER 1 M/9 DATA SHEET FILE NUMBER 2052

1. Site Identification:

River Basin: Paradise River Site: S.2

2. Location:

Lat. 47° 39' 20" Long. 54° 28' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 460 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 17.49 m^3/s

Usable Flow Ratio = .78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 260 m^3/s

Q1000 = 350 m^3/s

4. Site Data:

Rated Head	= 30 m	Plant Design Flow	= 26.24 m^3/s
Penstock Length	= 127 m		
Access Road Length	= 3.5 km	T.L. Line Length	= 8 km
Dam Height	= 30 m	Dam Length	= 75 m
Distance to Town	= 24 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 6.7 MW		

5. Remarks:

Low head damsite.

If Site 1 developed Transmission Line & Access Road would be very minimal for this site.

RIVER: Nameless River (near Paradise River)

SITE: S.1

LAT: 47° 35' 30"

LONG: 54° 27' 00"

DRAINAGE AREA: 203.0 km²

HEAD: 45.0 m

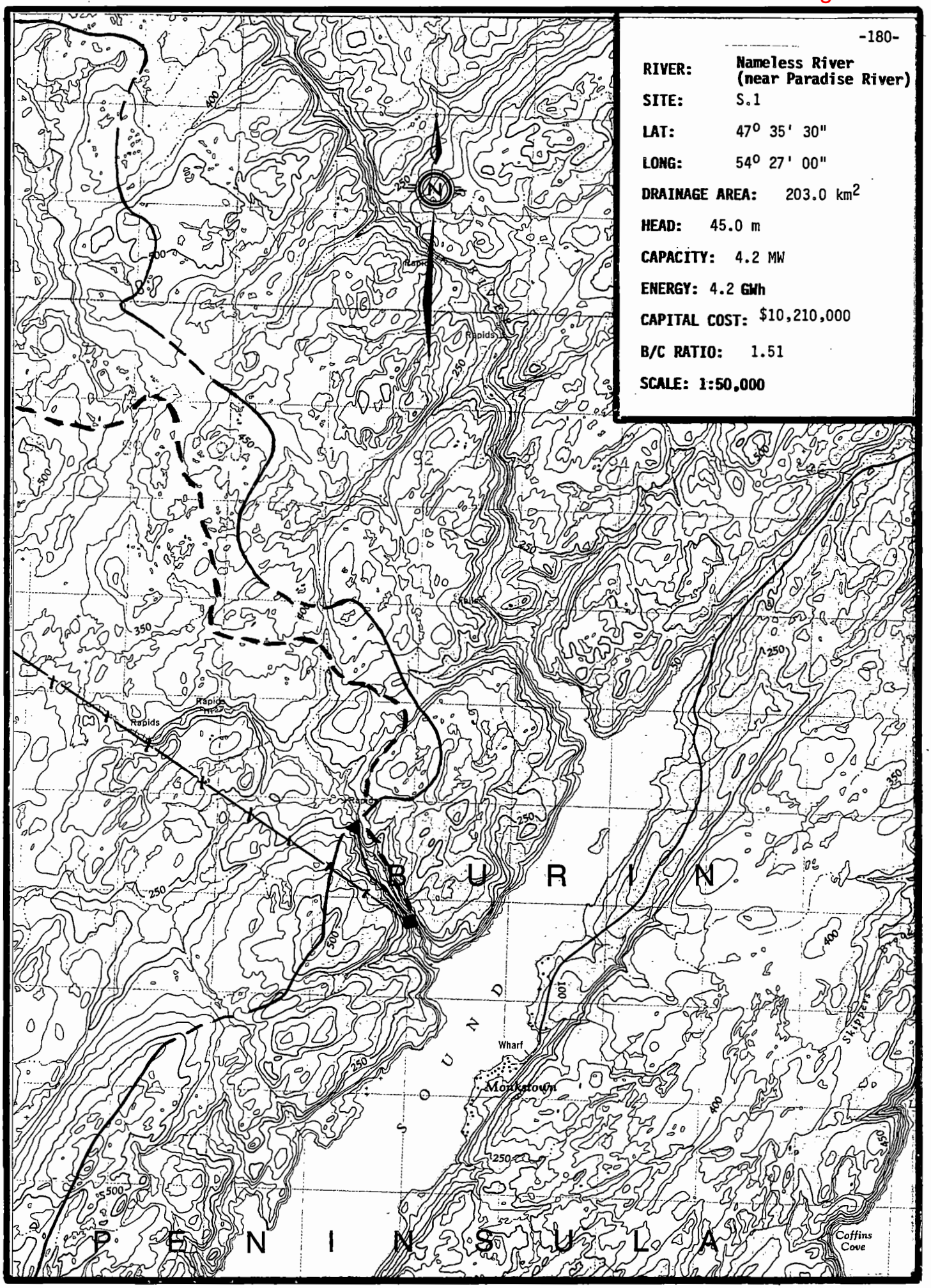
CAPACITY: 4.2 MW

ENERGY: 4.2 GWh

CAPITAL COST: $10,210,000

B/C RATIO: 1.51

SCALE: 1:50,000



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WATER SHED : Nameless River (Near Paradise River)

SITE NAME : SITE 1 FILE : 2053

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.230765 MW
PENSTOCK LENGTH	: 1300 M.
DESIGN FLOW	: 11.55 M^3/S
PENSTOCK DIAMETER	: 2.117537 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 105 M.
ACCESS ROAD LENGTH	: 24 KM.
FLOOD FLOW	: 165 M^3/S
DISTANCE TO TOWN	: 34 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.061821E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
446188	SEE DAM	208898.7	1313915	123750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
680764.2	1622247	486674	1892270	909237.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	979786.9	1061674	479994.8

PROJECT COST: $ 1.02054E+07 COST PER KW: $ 2412.188

Total Project Cost = $ 10,205,400

MAP NUMBER 1 M/09 DATA SHEET FILE NUMBER 2053

1. Site Identification:

River Basin: Nameless River (near Paradise River) Site: S.1

2. Location:

Lat. 47° 35' 30" Long. 54° 27' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 203 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 7.7 m^3/s

Usable Flow Ratio = .78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 165 m^3/s

Q1000 = 230 m^3/s

4. Site Data:

Rated Head = 45 m
Penstock Length = 1300 m
Access Road Length = 24 km
Dam Height = 6 m
Distance to Town = 34 km
Installed Capacity = 4.4 MW

Plant Design Flow = 11.58 m^3/s
T.L. Line Length = 15 km
Dam Length = 105 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) If Paradise River sites developed - Access Road and Transmission Line distances would be ≈ 4 km each.

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Pipers Hole River

SITE NAME : SITE 1 FILE : 2054

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.067154 MW
PENSTOCK LENGTH	: 1600 M.
DESIGN FLOW	: 1.725 M^3/S
PENSTOCK DIAMETER	: .8687122 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 80 M.
ACCESS ROAD LENGTH	: 7 KM.
FLOOD FLOW	: 79 M^3/S
DISTANCE TO TOWN	: 11 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2825182

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
265487.8	SEE DAM	37733.07	1417507	59250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
216073.8	514899.2	154469.8	663952.5	259706.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	210677.9	421858.3	121934.7

PROJECT COST: $ 4343550 COST PER KW: $ 4070.219

Total Project Cost = $ 4,343,550

MAP NUMBER 1 M/16 DATA SHEET FILE NUMBER 2054

1. Site Identification:

River Basin: Pipers Hole River Site: S.2

2. Location:

Lat. 47° 57' 45" Long. 54° 19' 50" Hydrologic Region 2

3. Hydrologic Data:

A = 33 km^2, MAR = 1100 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.15 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 79 m^3/s

Q1000 = 110 m^3/s

4. Site Data:

Rated Head = 76 m
Penstock Length = 1600 m
Access Road Length = 7 km
Dam Height = 5 m
Distance to Town = 11 km
Installed Capacity = 1.1 MW

Plant Design Flow = 1.72 m^3/s
T.L. Line Length = 5 km
Dam Length = 80 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Black River

SITE: S.1

LAT: 47° 54' 10"

LONG: 54° 10' 00"

DRAINAGE AREA: 155.0 km^2

HEAD: 45.0 m

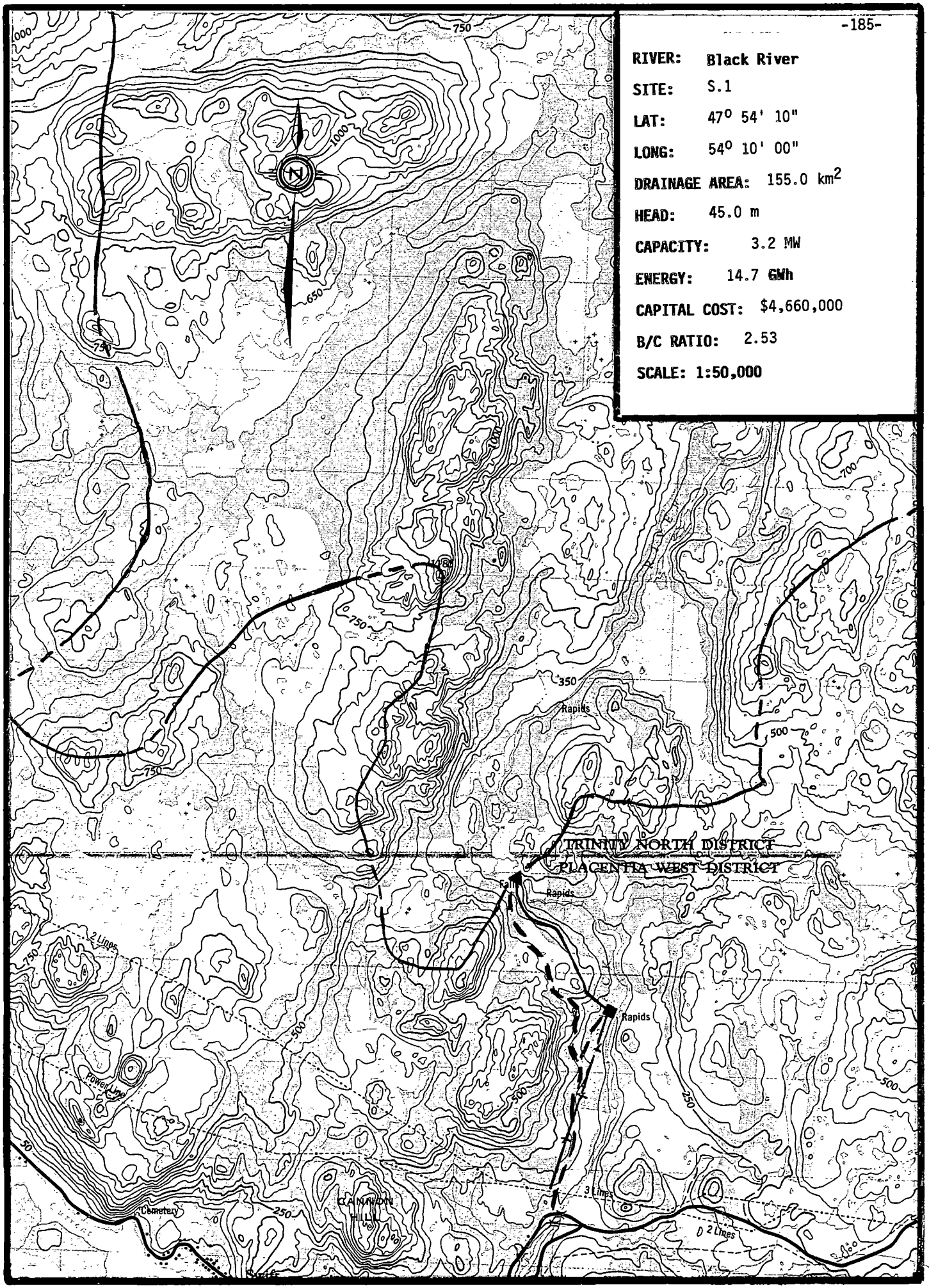
CAPACITY: 3.2 MW

ENERGY: 14.7 GWh

CAPITAL COST: $4,660,000

B/C RATIO: 2.53

SCALE: 1:50,000



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WATER SHED : Black River

SITE NAME : SITE 1 FILE : 2056

SITE DATA

INSTALLED CAPACITY	: 3.236261 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 8.835 M^3/S
PENSTOCK DIAMETER	: 1.887077 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 101 M.
ACCESS ROAD LENGTH	: 4 KM.
FLOOD FLOW	: 140 M^3/S
DISTANCE TO TOWN	: 5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8523607

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
430860.4	SEE DAM	164133.8	270162.6	105000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
564331	1200704	360211.3	412624.1	278988.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	216440.6	473257.5	182834.4

PROJECT COST: $ 4659549 COST PER KW: $ 1439.794

Total Project Cost = $ 4,659,549

MAP NUMBER 1 M/16 DATA SHEET FILE NUMBER 2056

1. Site Identification:

River Basin: Black River Site: S.1

2. Location:

Lat. 47° 54' 10" Long. 54° 10' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 155 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.89 m^3/s

Usable Flow Ratio = .78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 140 m^3/s

Q1000 = 180 m^3/s

4. Site Data:

Rated Head	= 45 m	Plant Design Flow	= 8.84 m^3/s
Penstock Length	= 300 m		
Access Road Length	= 4 km	T.L. Line Length	= 2 km
Dam Height	= 6 m	Dam Length	= 101 m
Distance to Town	= 5 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 3.3 MW		

5. Remarks:

A small run of salmon exist on lower 4.8 km of river below falls (site of this project!)

RIVER: Sandy Harbour River

SITE: S.1

LAT: 47° 43' 20"

LONG: 54° 23' 00"

DRAINAGE AREA: 426.0 km²

HEAD: 30.0 m

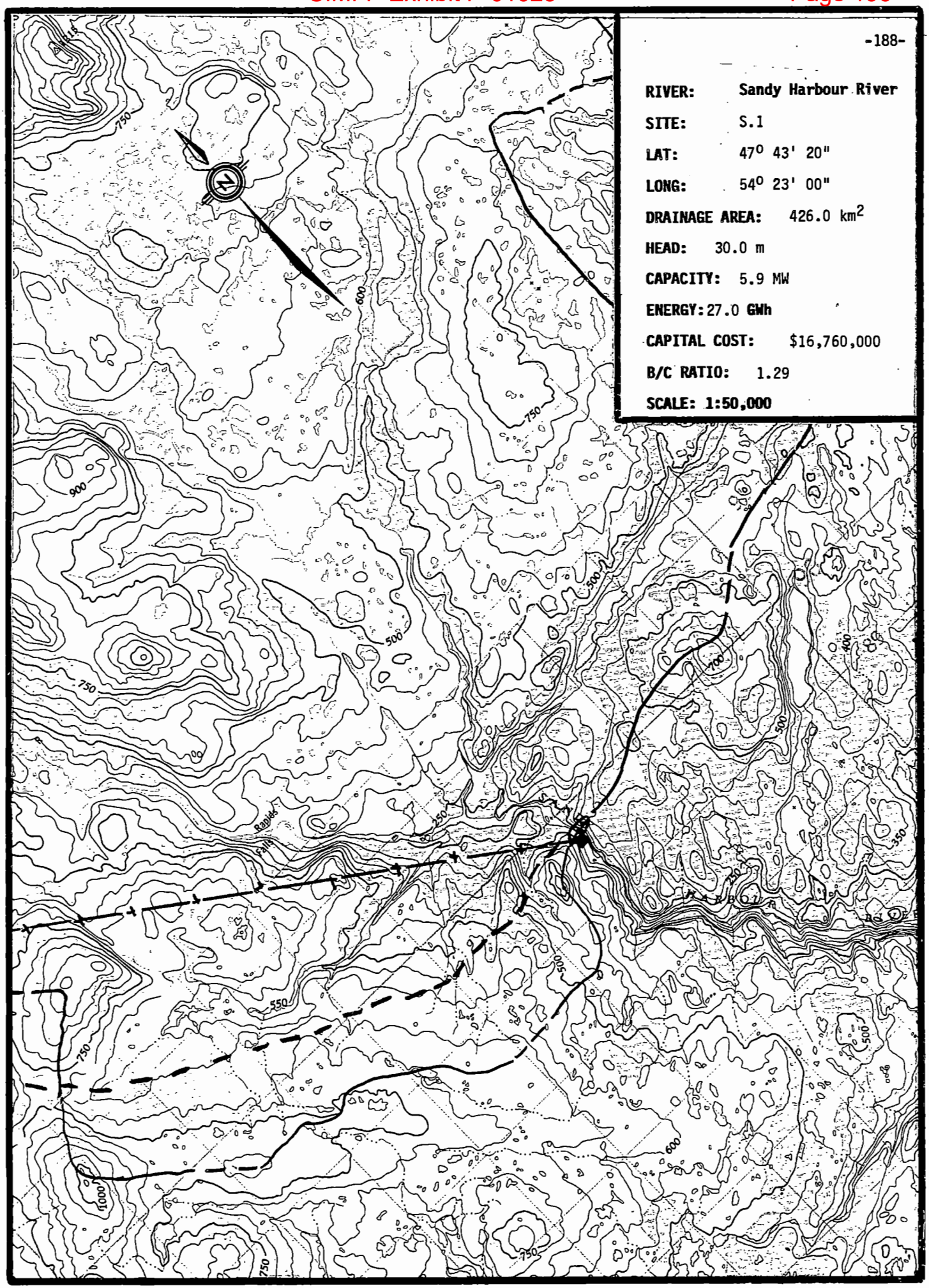
CAPACITY: 5.9 MW

ENERGY: 27.0 GWh

CAPITAL COST: $16,760,000

B/C RATIO: 1.29

SCALE: 1:50,000



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WATER SHED : Sandy Harbour River

SITE NAME : SITE 1 FILE : 2057

SITE DATA

INSTALLED CAPACITY	: 5.93406 MW
PENSTOCK LENGTH	: 127 M.
DESIGN FLOW	: 24.3 M^3/S
PENSTOCK DIAMETER	: 3.085916 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 10 KM.
LENGTH OF DAM	: 150 M.
ACCESS ROAD LENGTH	: 12 KM.
FLOOD FLOW	: 520 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.548299E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
3175446	2421924	407997.5	532159.8	390000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1031456	2062912	615794.8	1049803	543020.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2343995	1424833	765042.6

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.676439E+07 COST PER KW: $ 2825.112

Total Project Cost = $ 16,764,390

MAP NUMBER 1 M/09 DATA SHEET FILE NUMBER 2057

1. Site Identification:

River Basin: Sandy Harbour River Site: S.1

2. Location:

Lat. 47° 43' 20" Long. 54° 23' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 426 km^2, MAR = 1200 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 16.2 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 400 m^3/s

Q1000 = 520 m^3/s

4. Site Data:

Rated Head = 30 m
Penstock Length = 127 m
Access Road Length = 12 km
Dam Height = 30 m
Distance to Town = 35 km
Installed Capacity = 6.2 MW

Plant Design Flow = 24.3 m^3/s
T.L. Line Length = 10 km
Dam Length = 150 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Pipers Hole River

SITE: S.1

LAT: 47° 56' 00"

LONG: 54° 17' 30"

DRAINAGE AREA: 768.0 km²

HEAD: 30.0 m

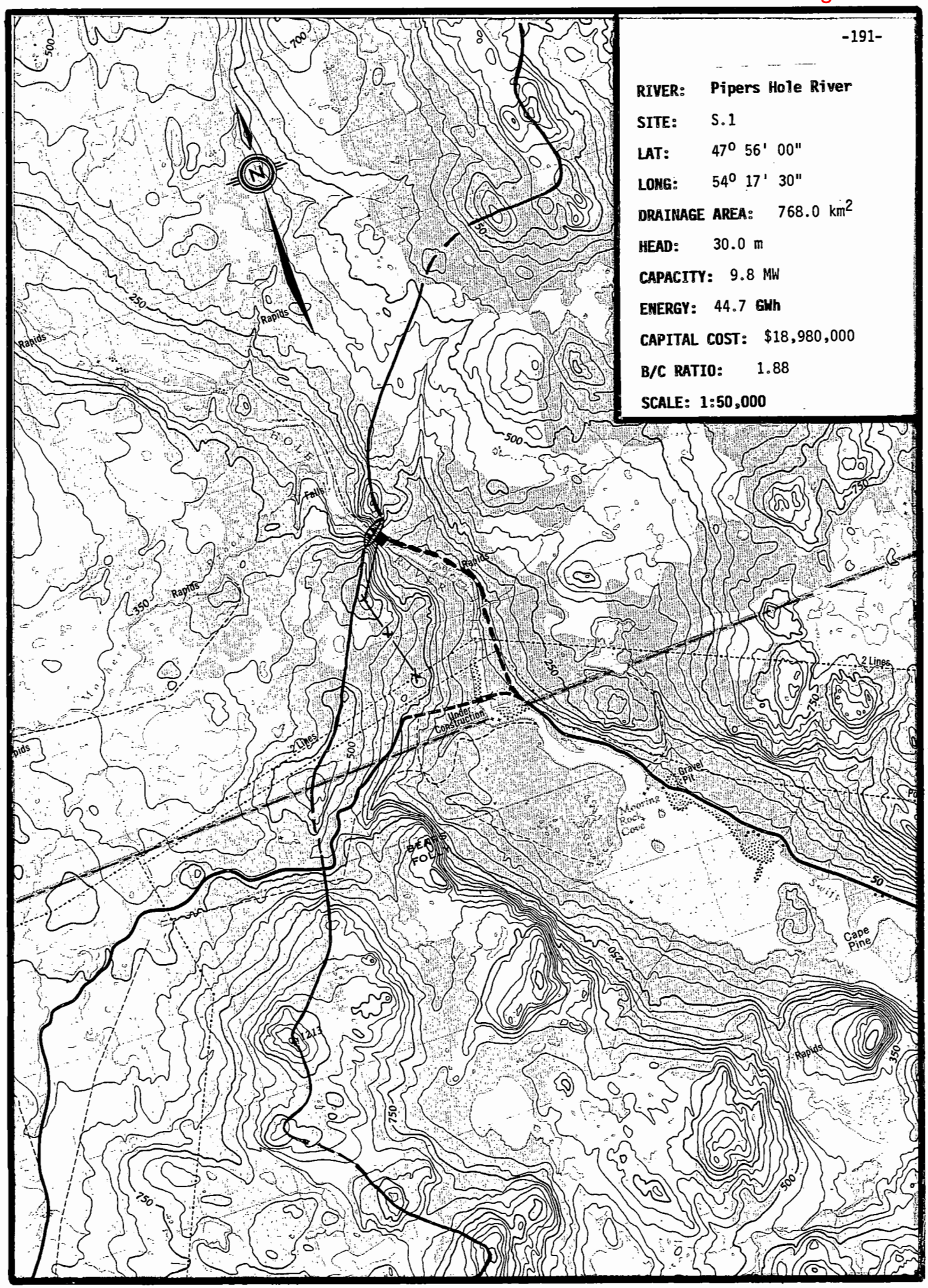
CAPACITY: 9.8 MW

ENERGY: 44.7 GWh

CAPITAL COST: $18,980,000

B/C RATIO: 1.88

SCALE: 1:50,000



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WATER SHED : Pipers Hole River

SITE NAME : SITE 1 FILE : 2058

SITE DATA

INSTALLED CAPACITY	: 9.809513 MW
PENSTOCK LENGTH	: 127 M.
DESIGN FLOW	: 40.17 M^3/S
PENSTOCK DIAMETER	: 3.830463 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 1.5 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 25 KM.
FLOOD FLOW	: 690 M^3/S
DISTANCE TO TOWN	: 8.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.338069E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2204565	3019818	641392.1	717537.3	517500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1580441	3160882	943546.8	1959082	115439

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1423398	1572627	1125743

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.898197E+07 COST PER KW: $ 1935.057

Total Project Cost = $ 18,981,970

MAP NUMBER 1 M/16 DATA SHEET FILE NUMBER 2058

1. Site Identification:

River Basin: Pipers Hole River Site: S.1

2. Location:

Lat. 47° 56' 00" Long. 54° 17' 30" Hydrologic Region 2

3. Hydrologic Data:

A = 768 km^2, MAR = 1100 mm, ACLS = 70 %

Storage Reservoir Area = - km^2

Storage Reservoir Vol, V = - $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 26.78 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 510 m^3/s

Q1000 = 690 m^3/s

4. Site Data:

Rated Head	= 30 m	Plant Design Flow	= 40.2 m^3/s
Penstock Length	= 127 m		
Access Road Length	= 25 km	T.L. Line Length	= 1.5 km
Dam Height	= 30 m	Dam Length	= 100 m
Distance to Town	= 8.5 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 10.24 MW		

5. Remarks:

RIVER: Sandy Harbour River

SITE: S.2

LAT: 47° 48' 15"

LONG: 54° 27' 20"

DRAINAGE AREA: 67.0 km^2

HEAD: 45.0 m

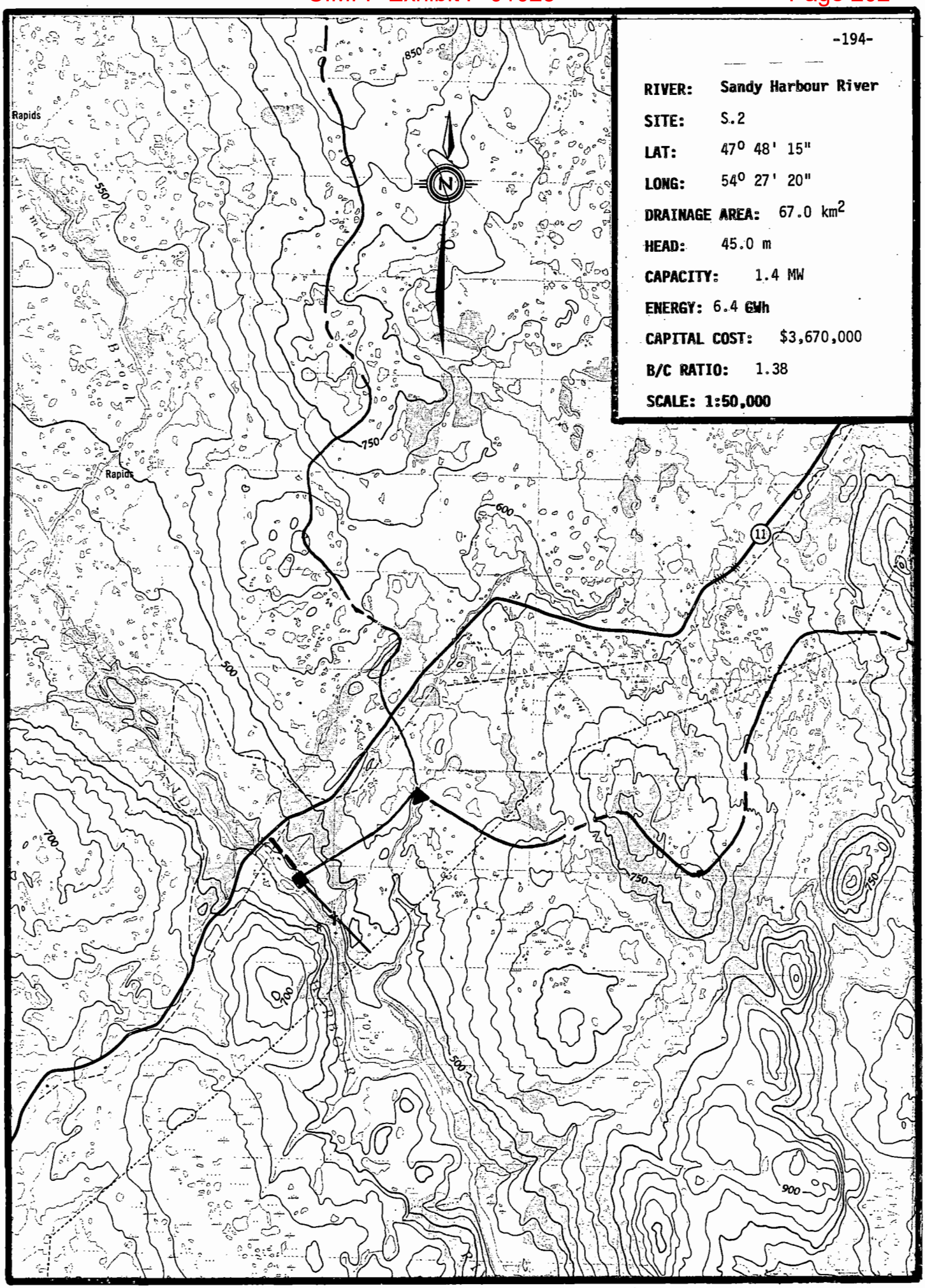
CAPACITY: 1.4 MW

ENERGY: 6.4 GWh

CAPITAL COST: $3,670,000

B/C RATIO: 1.38

SCALE: 1:50,000



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ShawMont Newfoundland Limited
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WATER SHED : Sandy Harbour River

SITE NAME : SITE 2 FILE : 2059

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.395603 MW
PENSTOCK LENGTH	: 1500 M.
DESIGN FLOW	: 3.81 M^3/S
PENSTOCK DIAMETER	: 1.314373 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 5.1 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 80 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 68 M^3/S
DISTANCE TO TOWN	: 25 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4276540

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
273432.2	SEE DAM	76991.81	941212.9	51000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
313210.9	746374.9	223912.5	70457.66	148700.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	215422	466293.6	145741.7

PROJECT COST: $ 3672751 COST PER KW: $ 2631.659

Total Project Cost = $ 3,672,751

MAP NUMBER 1 M/16 DATA SHEET FILE NUMBER 2059

1. Site Identification:

River Basin: Sandy Harbour River Site: S.2

2. Location:

Lat. 47° 48' 15" Long. 54° 27' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 67 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.54 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 68 m^3/s

Q1000 = 90 m^3/s

4. Site Data:

Rated Head = 45 m

Penstock Length = 1500 m

Access Road Length = .5 km

Dam Height = 5.1 m

Distance to Town = 25 km

Installed Capacity = 1.5 MW

Plant Design Flow = 3.82 m^3/s

T.L. Line Length = 1 km

Dam Length = 80 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Parsons Pond(Gambo Pond

SITE: S.1

LAT: 48° 39' 00"

LONG: 54° 21' 00"

DRAINAGE AREA: 88.0 km²

HEAD: 46.0 m

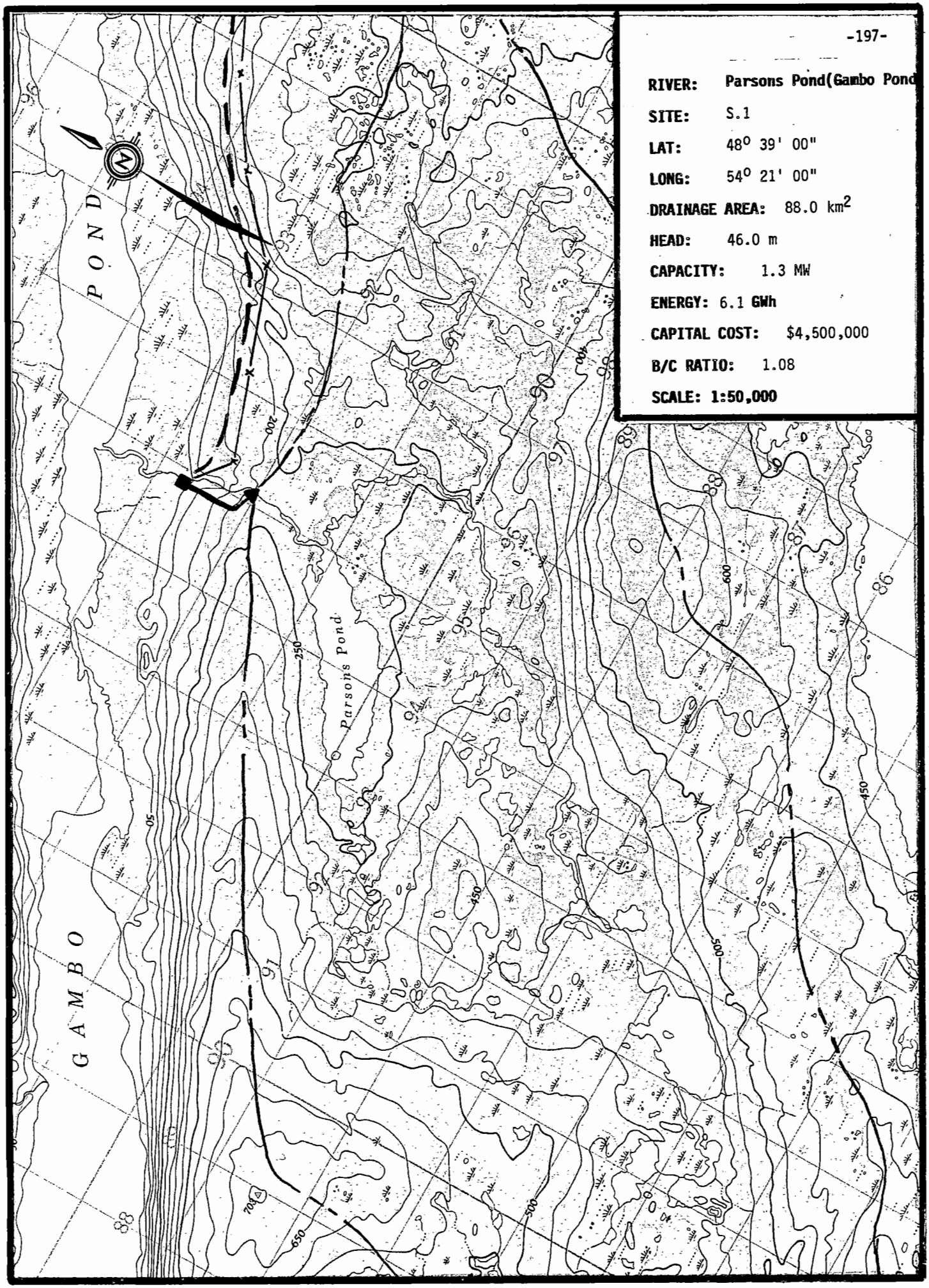
CAPACITY: 1.3 MW

ENERGY: 6.1 GWh

CAPITAL COST: $4,500,000

B/C RATIO: 1.08

SCALE: 1:50,000



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WATER SHED : Parsons pond (Gambo pond)

SITE NAME : SITE 1 FILE : 2060

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 1.331134 MW
PENSTOCK LENGTH	: 800 M.
DESIGN FLOW	: 3.555 M^3/S
PENSTOCK DIAMETER	: 1.271878 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 72 M.
ACCESS ROAD LENGTH	: 10 KM.
FLOOD FLOW	: 41 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 30 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4091679

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
241469.6	SEE DAM	72338.19	485802.4	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
300689.2	716536	214960.8	899091	604182.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	293893.9	487773.1	151419.3

PROJECT COST: $ 4498906 COST PER KW: $ 3379.755

Total Project Cost = $ 4,498,906

MAP NUMBER 2 D/09 DATA SHEET FILE NUMBER 2060

1. Site Identification:

River Basin: Parsons Pond (Gambo Pond) Site: S.1

2. Location:

Lat. 48° 39' 00" Long. 54° 21' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 88 km^2, MAR = 850 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.37 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 41 m^3/s

Q1000 = 55 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 800 m
Access Road Length = 10 km
Dam Height = 5 m
Distance to Town = 30 km
Installed Capacity = 1.39 MW

Plant Design Flow = 3.55 m^3/s
T.L. Line Length = 15 km
Dam Length = 72 m
Distance to Concrete Plant = 30 km

5. Remarks:

(i) Access Road connects to existing woods road which extends approximately 6 km inland from the T.C.H.

(ii) Gambo Pond could serve as water access and barge equipment to site.

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WATER SHED : Popes Harbour Pond

SITE NAME : SITE 1 FILE : 2061

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: .9725264 MW
PENSTOCK LENGTH	: 1800 M.
DESIGN FLOW	: 2.655 M^3/S
PENSTOCK DIAMETER	: 1.125301 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 71 M.
ACCESS ROAD LENGTH	: 9.5 KM.
FLOOD FLOW	: 46 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3061893

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
224444.1	SEE DAM	55625.01	967574.2	34500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
243239.7	579635.1	173890.5	860733.5	843767.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	318270.4	588018.6	172309.7

PROJECT COST: $ 5062008 COST PER KW: $ 5205.008

Total Project Cost = $ 5,062,008

MAP NUMBER 2 C/05 DATA SHEET FILE NUMBER 2061

1. Site Identification:

River Basin: Popes Harbour pond Site: S.1

2. Location:

Lat. 48° 16' 00" Long. 53° 36' 45" Hydrologic Region 2

3. Hydrologic Data:

A = 56 km^2, MAR = 1000 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.77 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 46 m^3/s

Q1000 = 62 m^3/s

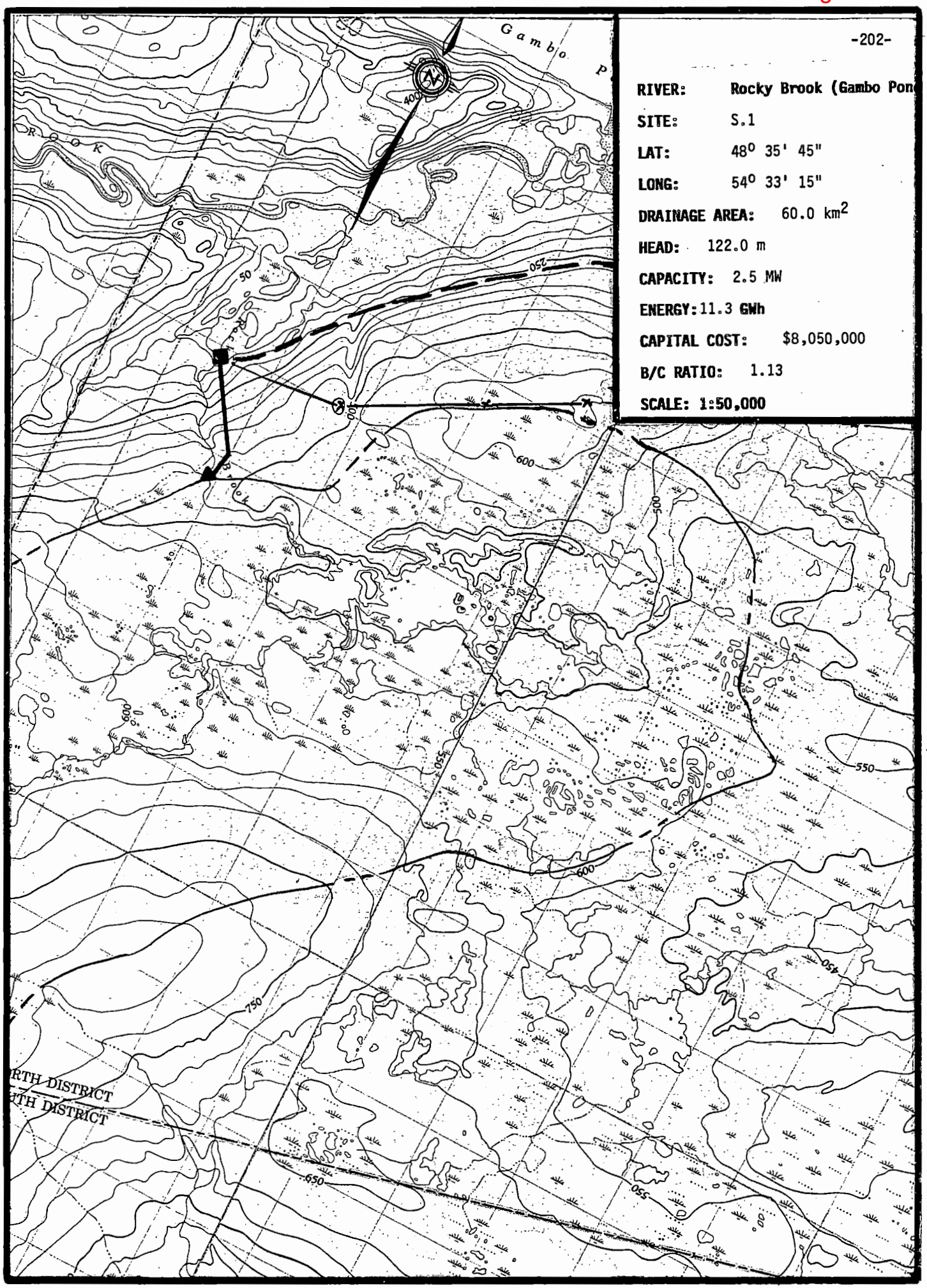
4. Site Data:

Rated Head = 45 m
Penstock Length = 1800 m
Access Road Length = 9.5 km
Dam Height = 4.8 m
Distance to Town = 20 km
Installed Capacity = 1.0 MW

Plant Design Flow = 2.66 m^3/s
T.L. Line Length = 20 km
Dam Length = 21 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion @ Lat. 48° 21' 00", Long. 53° 31' 30" would provide an additional 30 km^2 of drainage area.


-202-
RIVER: Rocky Brook (Gambo Pon
SITE: S.1
LAT: 48° 35' 45"
LONG: 54° 33' 15"
DRAINAGE AREA: 60.0 km²
HEAD: 122.0 m
CAPACITY: 2.5 MW
ENERGY: 11.3 GWh
CAPITAL COST: $8,050,000
B/C RATIO: 1.13
SCALE: 1:50,000
Gambo
400
250
100
600
500
550
650
750
450
RTH DISTRICT
TH DISTRICT

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WATER SHED : Rocky Brook (Gambo Pond)

SITE NAME : SITE 1 FILE : 2062

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 2.487665 MW
PENSTOCK LENGTH	: 1500 M.
DESIGN FLOW	: 2.505 M^3/S
PENSTOCK DIAMETER	: .9544814 M.
RATED HEAD	: 122 M.
HEIGHT OF DAM	: 4.7 M.
TRANSMISSION LINE LENGTH	: 32 KM.
LENGTH OF DAM	: 66 M.
ACCESS ROAD LENGTH	: 26 KM.
FLOOD FLOW	: 31 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5375055

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
203735.1	SEE DAM	52788.45	1477113	23250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
331097.8	788999.1	236699.7	2025493	1346765

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	551370.5	731573.8	277802.2

PROJECT COST: $ 8046688 COST PER KW: $ 3234.635

Total Project Cost = $ 8,046,688

MAP NUMBER 2 D/10 DATA SHEET FILE NUMBER 2062

1. Site Identification:

River Basin: Rocky Brook (Gambo Pond) Site: S.1

2. Location:

Lat. 48° 35' 45" Long. 54° 33' 15" Hydrologic Region 2

3. Hydrologic Data:

A = 60 km^2, MAR = 850 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 1.67 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 31 m^3/s

Q1000 = 41 m^3/s

4. Site Data:

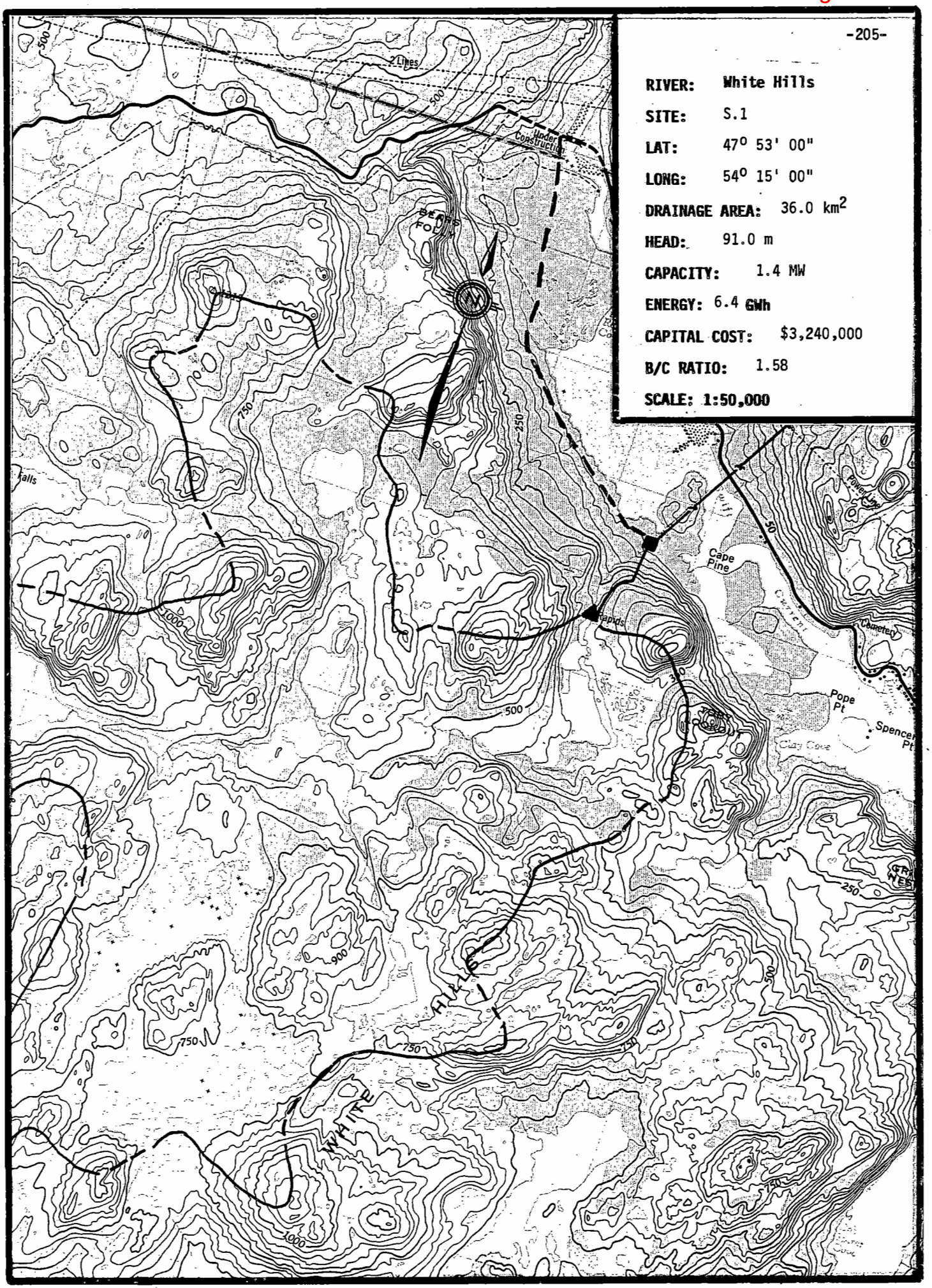
Rated Head = 122 m
Penstock Length = 1500 m
Access Road Length = 26 km
Dam Height = 4.71 m
Distance to Town = 30 km
Installed Capacity = 2.5 MW

Plant Design Flow = 2.42 m^3/s
T.L. Line Length = 32 km
Dam Length = 60 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Gambo Pond could be used for access and to barge equipment to site.

(ii) If Parsons Pond site developed first access would be constructed half way to this site.


-205-
RIVER: White Hills
SITE: S.1
LAT: 47° 53' 00"
LONG: 54° 15' 00"
DRAINAGE AREA: 36.0 km²
HEAD: 91.0 m
CAPACITY: 1.4 MW
ENERGY: 6.4 GWh
CAPITAL COST: $3,240,000
B/C RATIO: 1.58
SCALE: 1:50,000
2 Lines
Under Construction
Cape Pine
Rapids
Pope Pt
Spencer Pt
Clay Cove
Power Line
Cemetery
WHITE
500
750
1000
900
250

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WATER SHED : White Hills

SITE NAME : SITE - 1 FILE : 2063

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.399998 MW
PENSTOCK LENGTH	: 910 M.
DESIGN FLOW	: 1.89 M^3/S
PENSTOCK DIAMETER	: .881015 M.
RATED HEAD	: 91 M.
HEIGHT OF DAM	: 3.5 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 60 M.
ACCESS ROAD LENGTH	: 4.5 KM.
FLOOD FLOW	: 47 M^3/S
DISTANCE TO TOWN	: 12 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3605608

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
121923.6	SEE DAM	40966.38	818972.8	35250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
245331.1	584618.8	175385.6	456072.9	187663.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	154699.2	319564.4	95858.9

PROJECT COST: $ 3236308 COST PER KW: $ 2311.651

Total Project Cost = $ 3,236,308

MAP NUMBER 1 M/16 DATA SHEET FILE NUMBER 2063

1. Site Identification:

River Basin: White Hills Site: S.1

2. Location:

Lat. 47° 53' 00" Long. 54° 15' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 36 km^2, MAR = 1100 mm, ACLS = 81.0 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.26 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 47 m^3/s

Q1000 = 0 m^3/s

4. Site Data:

Rated Head = 91 m
Penstock Length = 910 m
Access Road Length = 4.5 km
Dam Height = 3.5 m
Distance to Town = 12 km
Installed Capacity = 1.4 MW

Plant Design Flow = 1.89 m^3/s
T.L. Line Length = 2.0 km
Dam Length = 60 m
Distance to Concrete Plant = 100 km

5. Remarks:

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WATER SHED : Middle Brook

SITE NAME : SITE - 1 FILE : 2064

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.7746 MW
PENSTOCK LENGTH	: 4500 M.
DESIGN FLOW	: 4.485 M^3/S
PENSTOCK DIAMETER	: 1.31013 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 4.3 M.
TRANSMISSION LINE LENGTH	: 9 KM.
LENGTH OF DAM	: 80 M.
ACCESS ROAD LENGTH	: 9 KM.
FLOOD FLOW	: 41 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6604231

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
212652.1	SEE DAM	89165.79	6387063	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
421777.5	1005087	301526.1	822071.6	552266.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	418289.1	1027102	416333

PROJECT COST: $ 1.168408E+07 COST PER KW: $ 4211.088

Total Project Cost = $ 11,684,080

MAP NUMBER 2 D/16 DATA SHEET FILE NUMBER 2064

1. Site Identification:

River Basin: Middle Brook Site: S.1

2. Location:

Lat. 48° 46' 10" Long. 54° 24' 20" Hydrologic Region 2

3. Hydrologic Data:

A = 118 km^2, MAR = 800 mm, ACLS = 100 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.99 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 41 m^3/s

Q1000 = 56 m^3/s

4. Site Data:

Rated Head = 76 m
Penstock Length = 4500 m
Access Road Length = 9.0 km
Dam Height = 4.3 m
Distance to Town = 20 km
Installed Capacity = 2.8 MW

Plant Design Flow = 4.49 m^3/s
T.L. Line Length = 9.0 km
Dam Length = 80 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Lower portion of river accessible to salmon at least as far as First Burnt Pond where powerhouse would be located.

RIVER: Great Gull River

SITE: S.1

LAT: 48° 35' 00"

LONG: 55° 20' 50"

DRAINAGE AREA = 260.0 km²

HEAD = 61.0 m

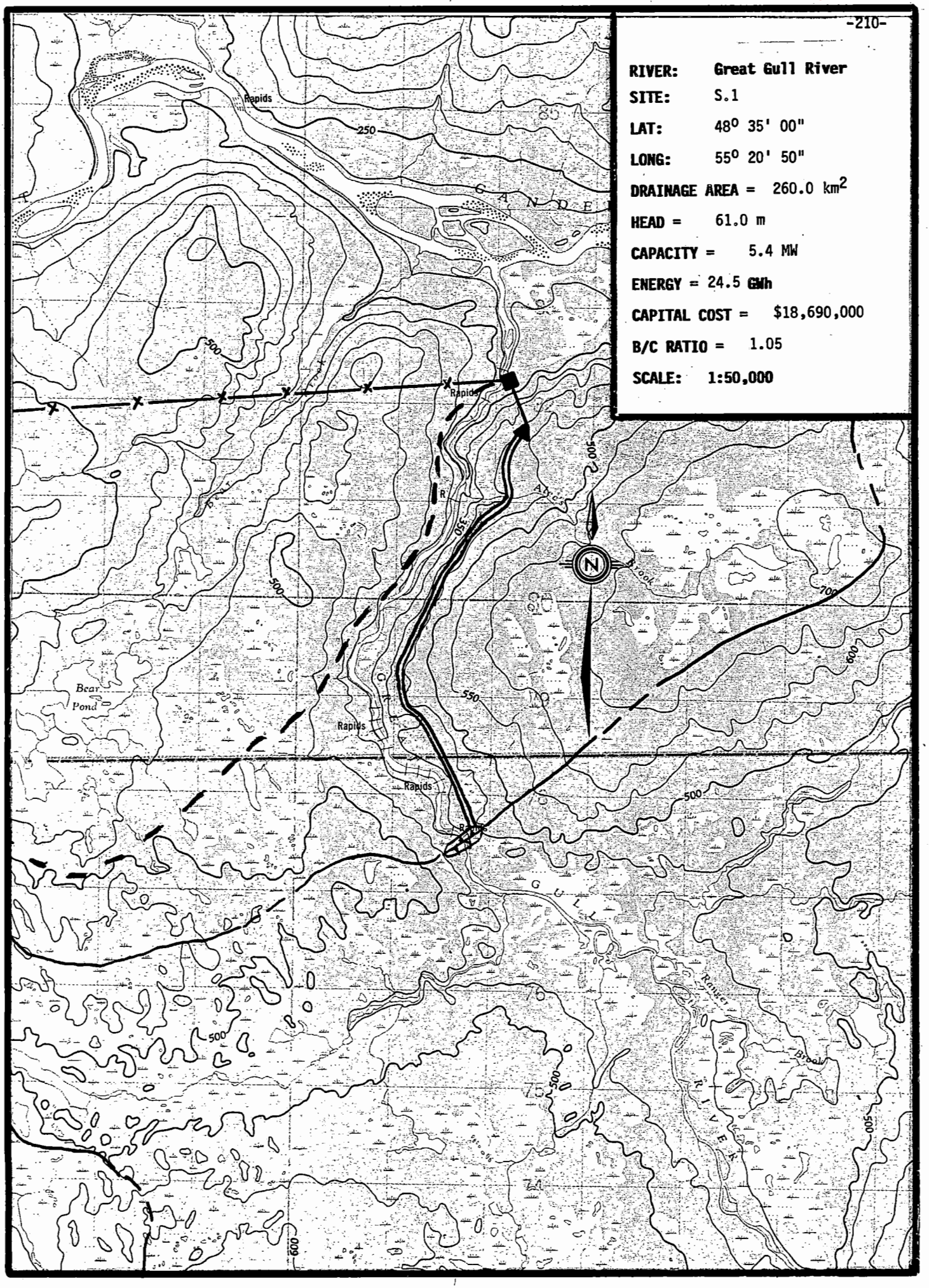
CAPACITY = 5.4 MW

ENERGY = 24.5 GWh

CAPITAL COST = $18,690,000

B/C RATIO = 1.05

SCALE: 1:50,000



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WATER SHED : Great Gull River

SITE NAME : SITE - 1 FILE : 2065

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 5.37008 MW
PENSTOCK LENGTH	: 475 M.
DESIGN FLOW	: 10.815 M^3/S
PENSTOCK DIAMETER	: 1.972676 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 6.4 M.
TRANSMISSION LINE LENGTH	: 30 KM.
LENGTH OF DAM	: 107 M.
ACCESS ROAD LENGTH	: 15 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 45 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.198039E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
500904.4	SEE DAM	196895.5	1109636	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
737649.7	1652335	493234.5	1269057	1415995

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	640756.3	847839.4.	406511.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.869106E+07 COST PER KW: $ 3480.593

Total Project Cost = $ 18,691,060

WATER SHED : Great Gull River SITE - 1

COST DATA

(ADDITIONAL COST of $ 9,304,000 for Sidehill Canal INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1401830

ANNUAL BENEFIT : $ 1467707

BENEFIT/COST RATIO: 1.046994

Total Project Cost = $ 18,691,060.00

Benefit / Cost Ratio = 1.05

MAP NUMBER 2D/11 DATA SHEET FILE NUMBER 2065

1. Site Identification:

River Basin: Great Gull River Site: S.1

2. Location:

Lat. 48° 35' 00" Long. 55° 20' 50" Hydrologic Region 3

3. Hydrologic Data:

A = 260 km^2, MAR = 875 mm, ACLS = 65 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 7.21 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s Q_2 = 75

4. Site Data:

Rated Head = 61 m
Penstock Length = 475 m
Access Road Length = 15 km
Dam Height = 6.4 m
Distance to Town = 35 km
Installed Capacity = 5.4 MW

Plant Design Flow = 10.82 m^3/s
T.L. Line Length = 30 km
Dam Length = 107 m
Distance to Concrete Plant = 45 km

5. Remarks:

(i) Possible Diversions:

Little Gander Pond - 79 km^2

Berry Hill Pond - 37 km^2

But, both appear to be infeasible.

(ii) Add sidehill Canal, 4650 m long = $9,304.000

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Great Gull River Region: 2

Total Developed Head, H = 61.0 m Map: 2D/06

Diverted Area = 37 km^2, MAR = 880 mm, from Little Gull River

Location: Lat. = 48° 22' 30" Long. = 55° 26' 00"

Mean Diverted Flow = 1.03 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 1.03 = 0.81 m^3/s

Additional Energy = H x Q* x 0.0716

= 61 x 0.81 x 0.0716 = 3.52 GWh p.a.

Dam: Height = 3 m, Length = 60 m, Q150 = 18 m^3/s

Canal: Height of Land = 2 m, Length = 1000 m

Design Flow Ratio = 1.50 Design Flow = 1.55 m^3/s

Access Road: Length = 7.5 km

Costs:	Dam + Spillway	= 109,200
	Diversion Canal	= 229,800
	Access Road	= 300,000
	Sub-total Direct Costs	= 639,000
	Total Cost Diversion	= 990,300
	Additional Plant Costs	= 2,390,000 (estimated)
	Total Project Cost	= 3,380,300

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ = 0.83 < 1.0 infeasible

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Great Gull River Region: 2

Total Developed Head, H = 61 m Map: 2 D/06

Diverted Area = 79 km^2, MAR = 870 mm, from S.W. Gander

Location: Lat. = 48° 26' 15" Long. = 55° 12' 30"

Mean Diverted Flow = 2.18 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 2.18 = 1.70 m^3/s

Additional Energy = H x Q* x 0.0716

= 61 x 1.70 x 0.0716 = 7.42 GWh p.a.

Dam: Height = 3 m, Length = 60 m, Q150 = 33 m^3/s

Canal: Height of Land = 4 m, Length = 800 m

Design Flow Ratio = 1.5 Design Flow = 3.27 m^3/s

Access Road: Length = 9.0 km

Costs:		
	Dam + Spillway	= 120,500
	Diversion Canal	= 547,500
	Access Road	= 360,000
	Sub-total Direct Costs	= 1,028,000
	Total Cost Diversion	= 1,593,000
	Additional Plant Costs	= 5,000,000 (estimated)
	Total Project Cost	= 6,593,000

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ = 0.09<1.0 infeasible

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Harry's River

SITE NAME : SITE - 1 FILE : 3001

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: .9508707 MW
PENSTOCK LENGTH	: 1595 M.
DESIGN FLOW	: 7.665 M^3/S
PENSTOCK DIAMETER	: 2.065822 M.
RATED HEAD	: 15.24 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 85 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 245 M^3/S
DISTANCE TO TOWN	: 22 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 22 KM.
USEFUL TURBINE FLOW RATIO	: .855
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4074961

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
133739.6	SEE DAM	144435.1	1572621	183750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
349758.4	833466.9	250040.1	70457.66	101643.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	159784	656082	193524.8

PROJECT COST: $ 4649303 COST PER KW: $ 4889.522

MAP NUMBER 12 B/16 DATA SHEET FILE NUMBER 3001

1. Site Identification:

River Basin: Harry's River Site: S.1

2. Location:

Lat. 48° 48' 13" Long. 58° 02' 10" Hydrologic Region 3

3. Hydrologic Data:

A = 124 km^2, MAR = 1300 mm, ACLS = 40 %

Storage Reservoir Area = 3.2 km^2

Storage Reservoir Vol, V = 6.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.040$$

Mean Flow, QAV = 5.11 m^3/s

Usable Flow Ratio = 0.855

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 245 m^3/s

Q1000 = 340 m^3/s

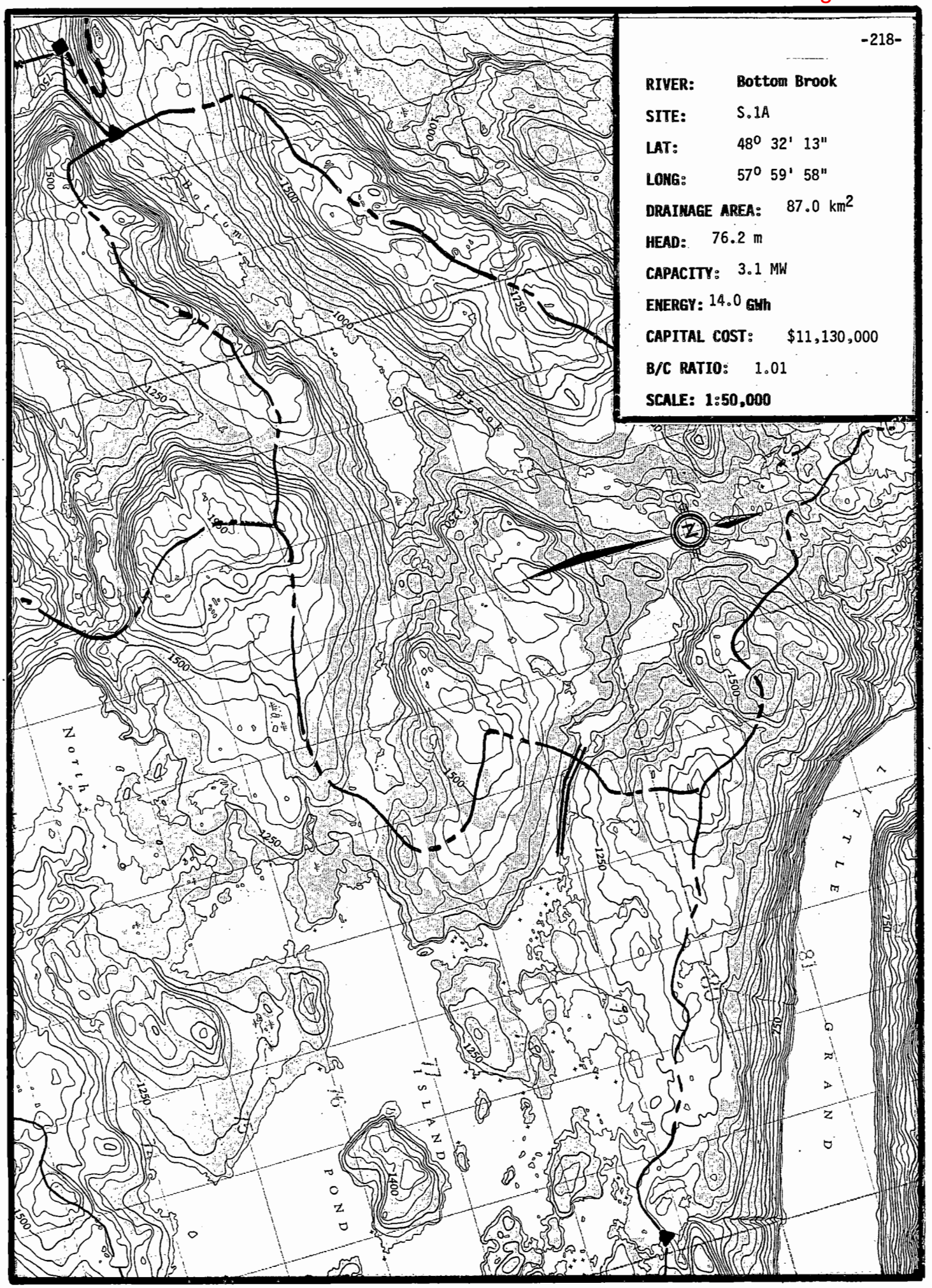
4. Site Data:

Rated Head	= 15.24 m	Plant Design Flow	= 7.67 m^3/s
Penstock Length	= 1595 m		
Access Road Length	= 0.5 km	T.L. Line Length	= 0.5 km
Dam Height	= 3 m	Dam Length	= 85 m
Distance to Town	= 22 km	Distance to Concrete Plant	= 22 km
Installed Capacity	= 0.994 MW		

5. Remarks:

(i) < 1 MW

(ii) Dam costs could be minimized by utilizating existing dam on Pinchgut Lake.


-218-
RIVER: Bottom Brook
SITE: S.1A
LAT: 48° 32' 13"
LONG: 57° 59' 58"
DRAINAGE AREA: 87.0 km²
HEAD: 76.2 m
CAPACITY: 3.1 MW
ENERGY: 14.0 GWh
CAPITAL COST: $11,130,000
B/C RATIO: 1.01
SCALE: 1:50,000
Bottom Brook
North
ISLAND
POND
LITTLE
GRAND
1500
1250
1000
750

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Bottom Brook

SITE NAME : SITE - 1A FILE : 3003

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.07963 MW
PENSTOCK LENGTH	: 1110 M.
DESIGN FLOW	: 4.965 M^3/S
PENSTOCK DIAMETER	: 1.368176 M.
RATED HEAD	: 76.2 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 86 M.
ACCESS ROAD LENGTH	: 9.5 KM.
FLOOD FLOW	: 86 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 30 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7189291

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
317886.6	SEE DAM	97710.08	1658442	64500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
453307.2	1080221	324066.4	860733.5	223624.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	347032.8	575399.5	224382.2

PROJECT COST: $ 1.113391E+07 COST PER KW: $ 3615.339

Total Project Cost = $ 11,133,910

WATER SHED : Bottom Brook SITE - 1A

COST DATA

(ADDITIONAL COST of $ 4,906,600 for Diversion INCLUDED)

INTEREST RATE	: 6	REVENUE, $ PER MWH	: 60
O & M PERCENTAGE	: 1.5	CAPACITY FACTOR	: .52

ANNUAL COST : $ 835043.1

ANNUAL BENEFIT : $ 841699.9

BENEFIT/COST RATIO: 1.007972

Total Project Cost = $ 11,133,910.00

Benefit / Cost Ratio = 1.01

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3003

1. Site Identification:

River Basin: Bottom Brook Site: S.1A

2. Location:

Lat. 48° 32' 13" Long. 57° 59' 58" Hydrologic Region 3

3. Hydrologic Data:

A = 87 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.31 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 86 m^3/s

Q1000 = 115 m^3/s

4. Site Data:

Rated Head = 76.2 m
Penstock Length = 1110 m
Access Road Length = 9.5 km
Dam Height = 5.4 m
Distance to Town = 30 km
Installed Capacity = 3.213 MW

Plant Design Flow = 4.96 m^3/s
T.L. Line Length = 1 km
Dam Length = 86 m
Distance to Concrete Plant = 30 km

5. Remarks:

(i) Diversion canal at Lat. 48° 34' 00", Long. 57° 52' 50"

(ii) Diversion dam at Lat. 48° 33' 40", Long. 57° 48' 45"

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Bottom Brook Region: 3

Total Developed Head, H = 76.2 m Map: 12 A/12

Diverted Area = 56 km^2, MAR = 1200 mm, from Island Pond (Little Grand Lake)

Location: Lat. = 48° 33' 40" Long. = 57° 48' 45"

Mean Diverted Flow = 2.13 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.41(1.18+2.13) - 0.92 = 0.437 m^3/s

Additional Energy = H x Q* x 0.0716

= .... x 0.0716 = 2.385 GWh p.a.

Dam: Height = 7 m, Length = 675 m, Q150 = 42 m^3/s

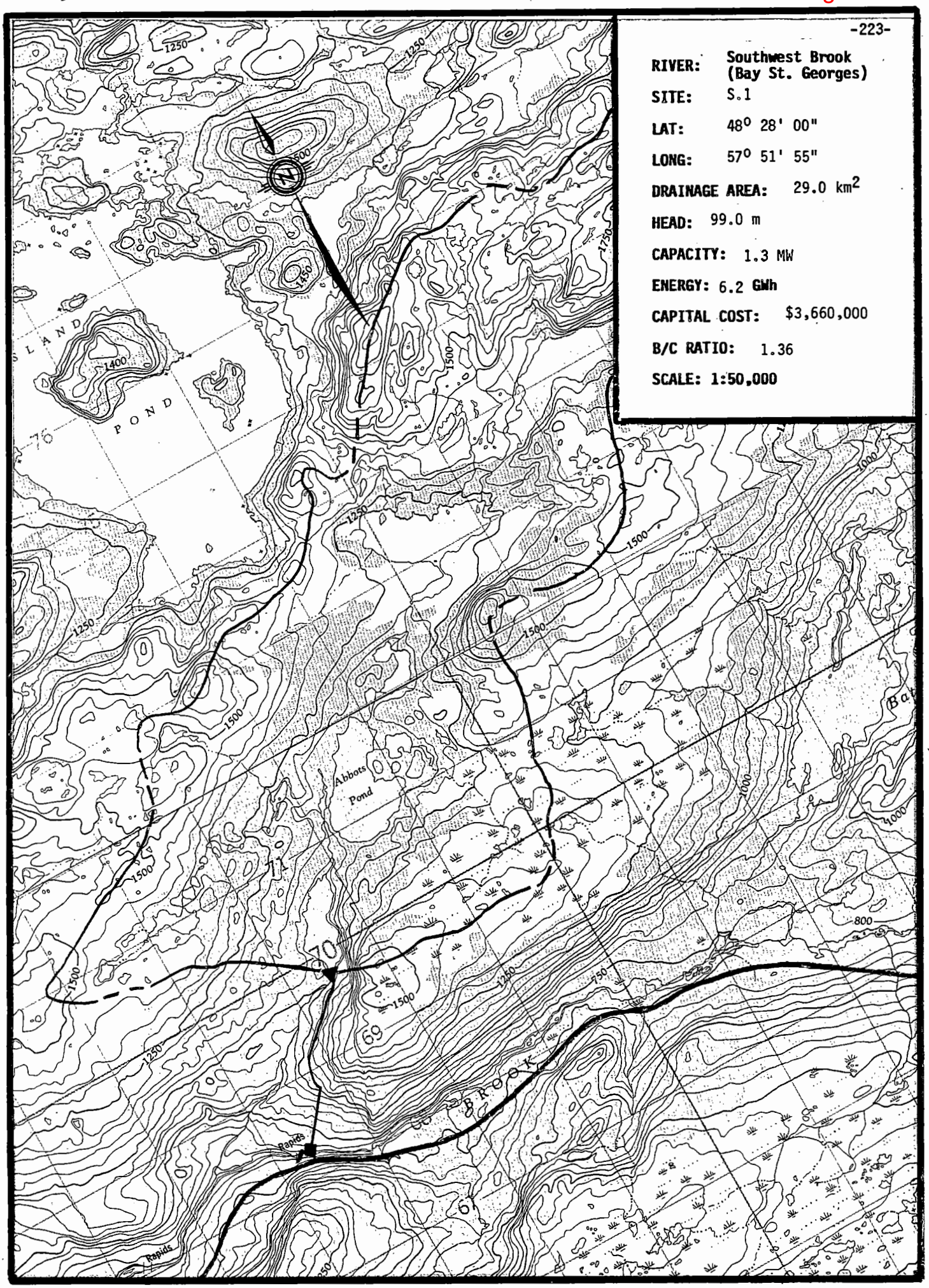
Canal: Height of Land = 3 m, Length = 1200 m

Design Flow Ratio = 0.534 Design Flow = 1.137 m^3/s

Access Road: Length = 13.5 km

Costs:		
	Dam + Spillway	= 2,159,700
	Diversion Canal	= 465,800
	Access Road	= 540,000
	Sub-total Direct Costs	= 3,165,600
	Total Cost Diversion	= 4,906,600
	Additional Plant Costs	= -
	Total Project Cost	= 4,906,600

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = 0.39$$


-223-
RIVER: Southwest Brook (Bay St. Georges)
SITE: S.1
LAT: 48° 28' 00"
LONG: 57° 51' 55"
DRAINAGE AREA: 29.0 km²
HEAD: 99.0 m
CAPACITY: 1.3 MW
ENERGY: 6.2 GWh
CAPITAL COST: $3,660,000
B/C RATIO: 1.36
SCALE: 1:50,000
Abbots Pond
POND
BROOK
Rapids
1250
1500
1750
1400
1000
800

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Southwest Brook

SITE NAME : SITE - 1 FILE : 3004

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.281317 MW
PENSTOCK LENGTH	: 2040 M.
DESIGN FLOW	: 1.59 M^3/S
PENSTOCK DIAMETER	: .8083183 M.
RATED HEAD	: 99 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 49 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 30.2 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .83
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3215699

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
79249.82	SEE DAM	35064.64	1668258	22650

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
223880	533501.3	160050.4	127000	122093.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	225526.8	359316.7	106799.5

PROJECT COST: $ 3663390 COST PER KW: $ 2859.081

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3004

1. Site Identification:

River Basin: Southwest Brook Site: S.1

2. Location:

Lat. 48° 28' 00" Long. 57° 51' 55" Hydrologic Region 3

3. Hydrologic Data:

A = 29 km^2, MAR = 1150 mm, ACLS = 90 %

Storage Reservoir Area = .5 km^2

Storage Reservoir Vol, V = 1 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.03

Mean Flow, QAV = 1.06 m^3/s

Usable Flow Ratio = 0.83

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 30.2 m^3/s

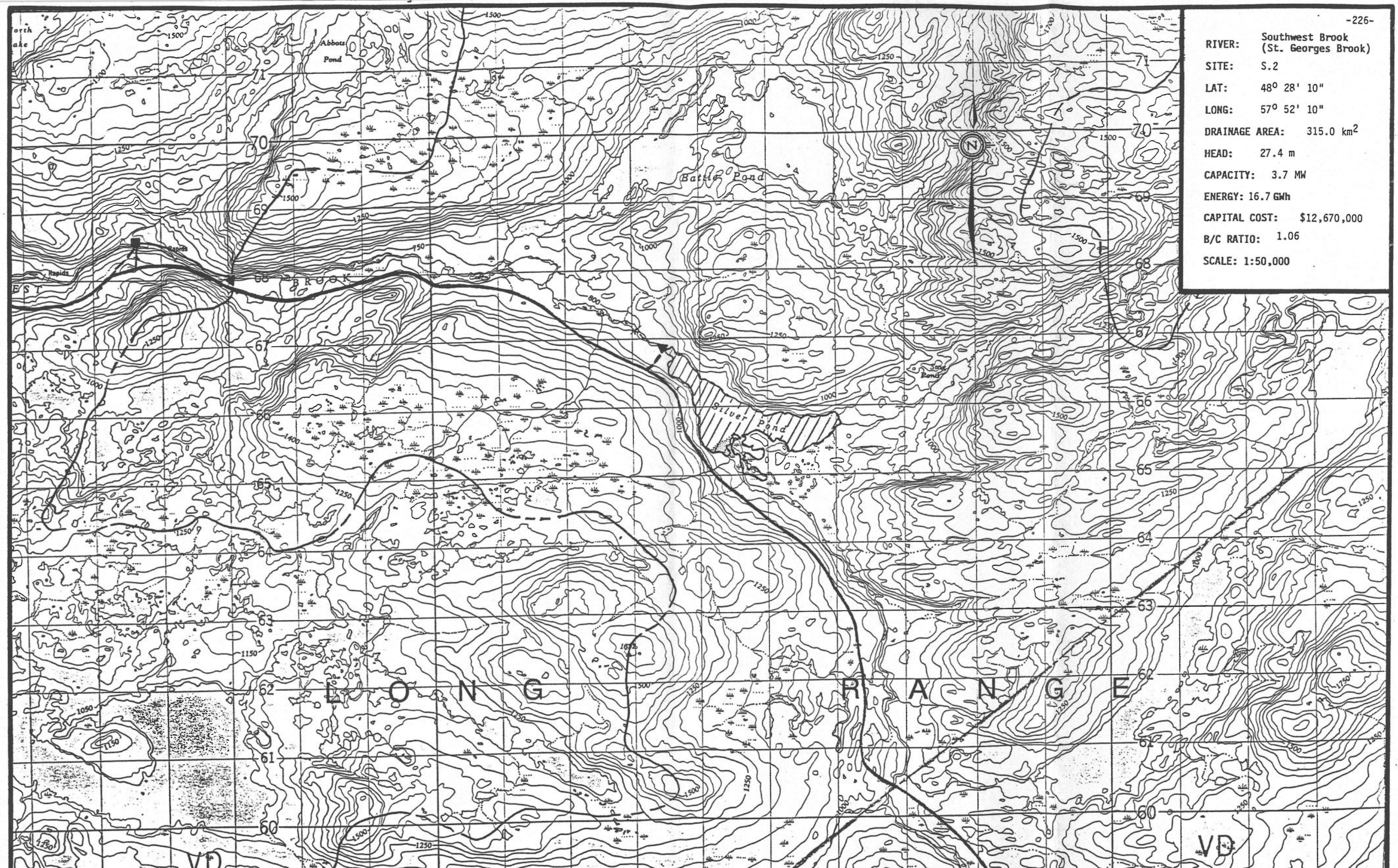
Q1000 = 40.5 m^3/s

4. Site Data:

Rated Head = 99 m
Penstock Length = 2040 m
Access Road Length = 1 km
Dam Height = 3 m
Distance to Town = 60 km
Installed Capacity = 1.28 MW

Plant Design Flow = 1.59 m^3/s
T.L. Line Length = .5 km
Dam Length = 49 m
Distance to Concrete Plant = 60 km

5. Remarks:



RIVER: Southwest Brook (St. Georges Brook)

SITE: S.2

LAT: 48° 28' 10"

LONG: 57° 52' 10"

DRAINAGE AREA: 315.0 km²

HEAD: 27.4 m

CAPACITY: 3.7 MW

ENERGY: 16.7 GWh

CAPITAL COST: $12,670,000

B/C RATIO: 1.06

SCALE: 1:50,000

CIMFP Exhibit P-01023

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Southwest Brook

SITE NAME : SITE - 2 FILE : 3005

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.673403 MW
PENSTOCK LENGTH	: 1815 M.
DESIGN FLOW	: 16.47 M^3/S
PENSTOCK DIAMETER	: 2.644014 M.
RATED HEAD	: 27.4 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 160 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.068434E+07

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
156067.2	SEE DAM	287498.9	6183936	120000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
733606.4	1748168	524450.5	127000	217711.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	704245.6	1075250	469933.6

PROJECT COST: $ 1.267407E+07 COST PER KW: $ 3450.226

Total Project Cost = $ 12,674,070

WATER SHED : Southwest Brook SITE - 2

COST DATA

(ADDITIONAL COST of $ 326,200 for Storage INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 950555.2

ANNUAL BENEFIT : $ 1003985

BENEFIT/COST RATIO: 1.056209

Total Project Cost = $ 12,674,070.00

Benefit / Cost Ratio = 1.06

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3005

1. Site Identification:

River Basin: Southwest Brook Site: S.2

2. Location:

Lat. 48° 28' 10" Long. 57° 52' 10" Hydrologic Region 3

3. Hydrologic Data:

A = 315 km^2, MAR = 1100 mm, ACLS = 90 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 10.98 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 160 m^3/s

Q1000 = 240 m^3/s

4. Site Data:

Rated Head = 27.4 m
Penstock Length = 1815 m
Access Road Length = 1 km
Dam Height = 3 m
Distance to Town = 60 km
Installed Capacity = 3.838 MW

Plant Design Flow = 16.48 m^3/s
T.L. Line Length = .5 km
Dam Length = 100 m
Distance to Concrete Plant = 60 km

5. Remarks:

(i) Salmon are reported to reach this point.

File No. 3005

SUMMARY SHEET UPSTREAM STORAGE SCHEME

Plant/s: Southwest Brook S.2 & S.5A Region: 3

Total Developed Head, H = 27.4 m Map: 12 A/05

Area Controlled by Reservoir = 215 km^2

Surface Area Reservoir, As = 1.8 km^2 Silver Pond

MAR = 1100 mm, QAV res. = 7.50 m^3/s

Qav proj. = 10.98 m^3/s

% of Run-off Passing through storage = 68.3 %

Storage Factor = $\frac{As \quad 1.8}{Qav,\ proj.}$ x 0.0634 = 0.01

Net Water Use Factor, q* = (0.80 - 0.775) = 0.025

Additional Usable Flow, Q* = q* x Qav proj. = 0.27 m^3/s

Additional Energy = H x Q* x 0.0716 = 0.539 GWh p.a.

Dam: Height = 3 m, Length = 60 m

Access Road: Length = 0.3 km

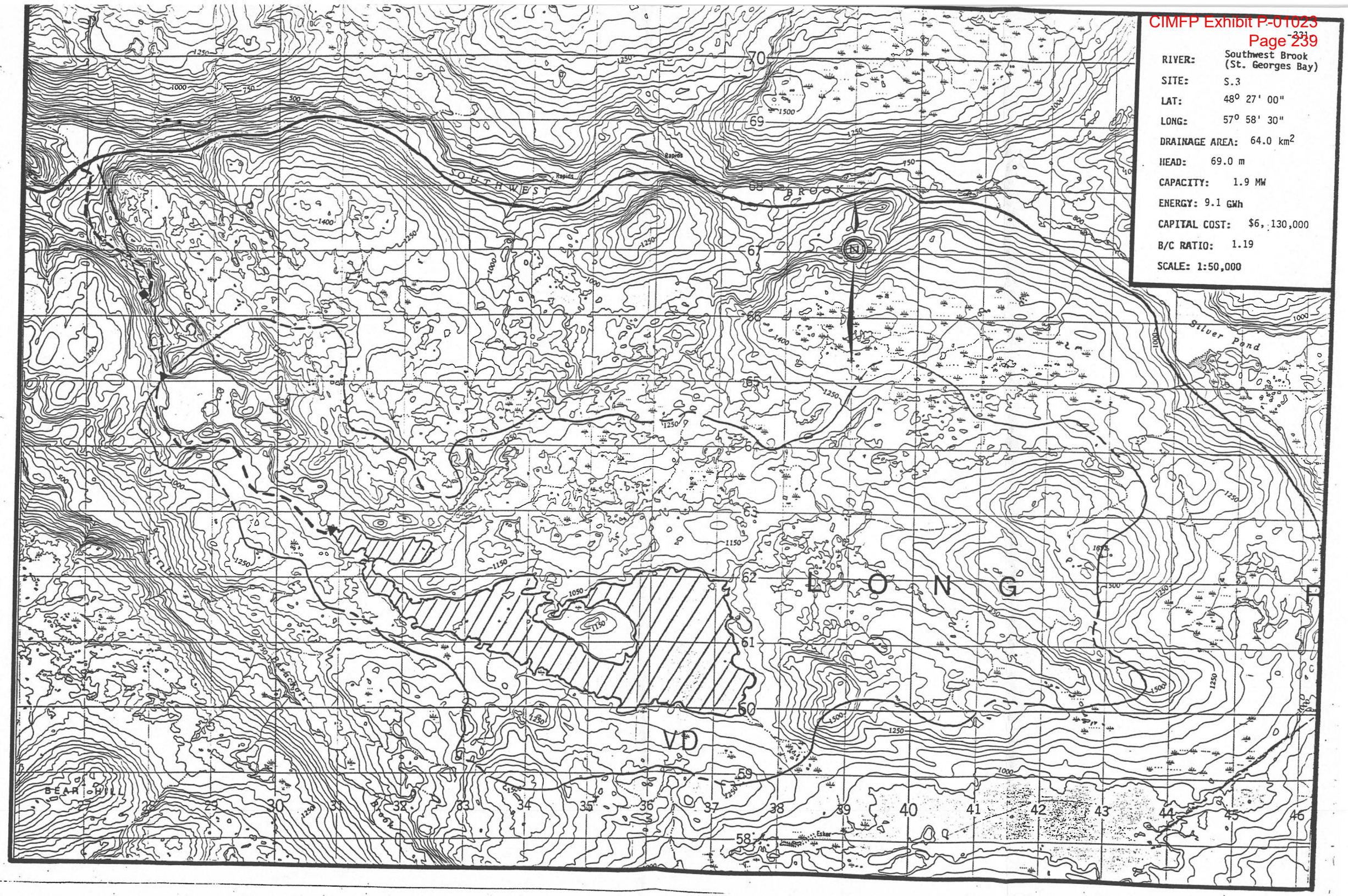
Control Structure: Design Flow = 16.48 m^3/s

Reservoir: Surface Area = 1.8 km^2

Costs:		
	Dam and Spillway	= 95,500
	Access Road	= 12,000
	Control Structure	= 70,770
	Reservoir Clearing	= 32,200
	Sub-Total Direct Costs	= 210,500
	Cost of Storage Scheme	= 326,200

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Cost of Storage} \times 1.15}$ = 1.44
(Storage Scheme)

Benefit/Cost Ratio = $\frac{\text{Total Energy} \times 10^6}{\text{Total Project Cost} \times 1.25}$ = 1.09
(Total Project)


RIVER: Southwest Brook (St. Georges Bay)
SITE: S.3
LAT: 48° 27' 00"
LONG: 57° 58' 30"
DRAINAGE AREA: 64.0 km²
HEAD: 69.0 m
CAPACITY: 1.9 MW
ENERGY: 9.1 GWh
CAPITAL COST: $6,130,000
B/C RATIO: 1.19
SCALE: 1:50,000
SOUTHWEST BROOK
Rapids
Silver Pond
LONG
VD
BEAR HILL
Esker

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WATER SHED : Southwest Brook

SITE NAME : SITE - 3 FILE : 3006

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.878753 MW
PENSTOCK LENGTH	: 1400 M.
DESIGN FLOW	: 3.345 M^3/S
PENSTOCK DIAMETER	: 1.170636 M.
RATED HEAD	: 69 M.
HEIGHT OF DAM	: 7 M.
TRANSMISSION LINE LENGTH	: 3.3 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 3.9 KM.
FLOOD FLOW	: 66 M^3/S
DISTANCE TO TOWN	: 52 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 52 KM.
USEFUL TURBINE FLOW RATIO	: .83
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4912407

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
331545.2	200749.7	68480.75	1741737	49500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
332077.5	791333.5	237400	403839.3	267567.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	476341.3	528054	180254.9

PROJECT COST: $ 6132181 COST PER KW: $ 3263.964

Total Project Cost = $ 6,132,181

WATER SHED : Southwest Brook SITE - 3

COST DATA

(ADDITIONAL COST of $ 523,300 for Storage INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5533333

ANNUAL COST : $ 459913.6

ANNUAL BENEFIT : $ 546401.5

BENEFIT/COST RATIO: 1.188052

Total Project Cost = $ 6,132,181.00

Benefit / Cost Ratio = 1.19

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3006

1. Site Identification:

River Basin: -Southwest Brook Site: S.3

2. Location:

Lat. 48° 27' 00" Long. 57° 58' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 64 km^2, MAR = 1100 mm, ACLS = 95 %

Storage Reservoir Area = 1.2 km^2

Storage Reservoir Vol, V = 2.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.03$$

Mean Flow, QAV = 2.23 m^3/s

Usable Flow Ratio = 0.83

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 49.5 m^3/s

Q1000 = 66 m^3/s

4. Site Data:

Rated Head = 69 m
Penstock Length = 1400 m
Access Road Length = 3.9 km
Dam Height = 7 m
Distance to Town = 52 km
Installed Capacity = 1.604 MW

Plant Design Flow = 3.35 m^3/s
T.L. Line Length = 3.3 km
Dam Length = 100 m
Distance to Concrete Plant = 52 km

5. Remarks:

File No. 3006

SUMMARY SHEET UPSTREAM STORAGE SCHEME

Plant/s: Southwest Brook S.3; S.4 & S.5A. Region: 3

Total Developed Head, H = 69 m Map: 12 A/05

Area Controlled by Reservoir = 56 km^2

Surface Area Reservoir, As = 6.8 km^2

MAR = ... mm, QAV res. = 1.95 m^3/s

Qav proj. = 2.23 m^3/s

% of Run-off Passing through storage = 87.5 %

Storage Factor = $\frac{\text{As } 6.8}{\text{Qav, proj.}}$ x 0.0634 = 0.19

Net Water Use Factor, q* = (0.97 - 0.775) 0.195

Additional Usable Flow, Q* = q* x Qav proj. = 0.435 m^3/s

Additional Energy = H x Q* x 0.0716 = 2.148 GWh p.a.

Dam: Height = 3 m, Length = 60 m

Access Road: Length = 4 km

Control Structure: Design Flow = 3.35 m^3/s

Reservoir: Surface Area = 6.8 km^2

Costs:		
	Dam and Spillway	= 95,500
	Access Road	= 160,000
	Control Structure	= 19,600
	Reservoir Clearing	= 62,600
	Sub-Total Direct Costs	= 337,600
	Cost of Storage Scheme	= 523,300

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Cost of Storage} \times 1.15}$ = 3.57
(Storage Scheme)

Benefit/Cost Ratio = $\frac{\text{Total Energy} \times 10^6}{\text{Total Project Cost} \times 1.25}$ = 1.47
(Total Project)

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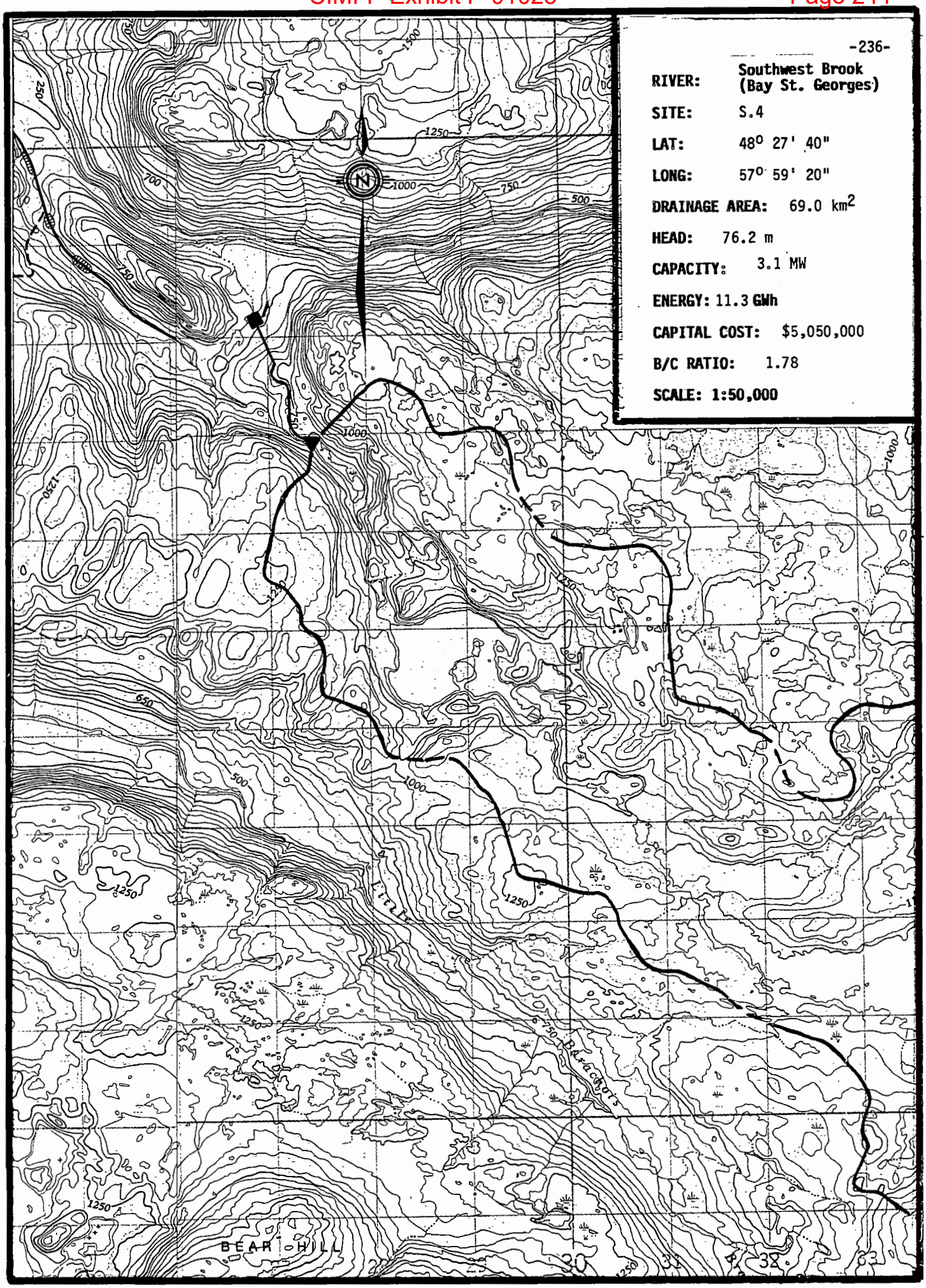
RIVER:	Southwest Brook (Bay St. Georges)
SITE:	S.4
LAT:	48° 27' 40"
LONG:	57° 59' 20"
DRAINAGE AREA:	69.0 km^2
HEAD:	76.2 m
CAPACITY:	3.1 MW
ENERGY:	11.3 GWh
CAPITAL COST:	$5,050,000
B/C RATIO:	1.78
SCALE:	1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Southwest Brook

SITE NAME : SITE - 4 FILE : 3007

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.471792 MW
PENSTOCK LENGTH	: 1569 M.
DESIGN FLOW	: 3.615 M^3/S
PENSTOCK DIAMETER	: 1.177492 M.
RATED HEAD	: 84 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 56 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 50.5 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5861047

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
89968.48	SEE DAM	73436.06	1965277	37875

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
375611.2	895073.4	268522	228917.6	174960.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	289310.6	476224.4	172113.8

PROJECT COST: $ 5047291 COST PER KW: $ 2041.956

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3007

1. Site Identification:

River Basin: Southwest Brook Site: S.4

2. Location:

Lat. 48° 27' 40" Long. 57° 59' 20" Hydrologic Region 3

3. Hydrologic Data:

A = 69 km^2, MAR = 1100 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.41 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 50.5 m^3/s

Q1000 = 70 m^3/s

4. Site Data:

Rated Head = 84 m

Penstock Length = 1569 m

Access Road Length = 2 km

Dam Height = 3 m

Distance to Town = 50 km

Installed Capacity = 2.47 MW

Plant Design Flow = 3.61 m^3/s

T.L. Line Length = 0.5 km

Dam Length = 56 m

Distance to Concrete Plant = 50 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Southwest Brook

SITE NAME : SITE - 5A FILE : 3009

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	3.016363 MW
PENSTOCK LENGTH	:	1430 M.
DESIGN FLOW	:	24.315 M^3/S
PENSTOCK DIAMETER	:	3.39374 M.
RATED HEAD	:	15.24 M.
HEIGHT OF DAM	:	7.85 M.
TRANSMISSION LINE LENGTH	:	1 KM.
LENGTH OF DAM	:	139 M.
ACCESS ROAD LENGTH	:	2 KM.
FLOOD FLOW	:	275 M^3/S
DISTANCE TO TOWN	:	50 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	50 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.050123E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
870624.7	SEE DAM	408224.3	6824495	206250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
784732.5	1870001	561000.3	228917.6	221220.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	933552.8	1264953	535960

PROJECT COST: $ 1.470993E+07 COST PER KW: $ 4876.712

MAP NUMBER 12 B/08 DATA SHEET FILE NUMBER 3009

1. Site Identification:

River Basin: Southwest Brook (Bay St. Georges) Site: S.5A

2. Location:

Lat. 48° 28' 40" Long. 58° 00' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 465 km^2, MAR = 1100 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 16.21 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 275 m^3/s

Q1000 = 380 m^3/s

4. Site Data:

Rated Head	= 15.24 m	Plant Design Flow	= 24.32 m^3/s
Penstock Length	= 1430 m		
Access Road Length	= 2 km	T.L. Line Length	= 1.0 km
Dam Height	= 7.85 m	Dam Length	= 139 m
Distance to Town	= 50 km	Distance to Concrete Plant	= 50 km
Installed Capacity	= 3.02 MW		

5. Remarks:

(i) Same layout as for S.5 except tailrace of S.4 now discharges into S.5, thus adding 69 km^2 of drainage area.

(ii) Possible diversion at North Lake.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Barachois Brook

SITE NAME : SITE - 1 FILE : 3010

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.206592 MW
PENSTOCK LENGTH	: 936 M.
DESIGN FLOW	: 4.86 M^3/S
PENSTOCK DIAMETER	: 1.541069 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 25 KM.
LENGTH OF DAM	: 98 M.
ACCESS ROAD LENGTH	: 5.5 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 110 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4176572

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
357542	SEE DAM	95848.34	688378.3	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
324127.1	772387.9	231716.4	540893.7	864577.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	406999.1	572236.1	176437.8

PROJECT COST: $ 5147394 COST PER KW: $ 4266.06

Total Project Cost = $ 5,147,394

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3010

1. Site Identification:

River Basin: Barachois Brook Site: S.1

2. Location:

Lat. 48° 09' 20" Long. 58° 31' 25" Hydrologic Region 3

3. Hydrologic Data:

A = 73 km^2, MAR = 1400 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.24 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 936 m
Access Road Length = 5.5 km
Dam Height = 5.4 m
Distance to Town = 30 km
Installed Capacity = 1.26 MW

Plant Design Flow = 4.86 m^3/s
T.L. Line Length = 25 km
Dam Length = 98 m
Distance to Concrete Plant = 110 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Robinsons River

SITE NAME : SITE - 1 FILE : 3011

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.47673 MW
PENSTOCK LENGTH	: 385 M.
DESIGN FLOW	: 19.965 M^3/S
PENSTOCK DIAMETER	: 3.117945 M.
RATED HEAD	: 15.24 M.
HEIGHT OF DAM	: 7.4 M.
TRANSMISSION LINE LENGTH	: 28.6 KM.
LENGTH OF DAM	: 110 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 490 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8933965

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
642989.1	SEE DAM	341864.9	1636020	367500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
683594	1628990	488696.9	323114.7	1229667

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	688542.6	824794.3	317080.3

PROJECT COST: $ 9172854 COST PER KW: $ 3703.615

Total Project Cost = $ 9,172,854

MAP NUMBER 12 B/01 DATA SHEET FILE NUMBER 3011

1. Site Identification:

River Basin: Robinsons River Site: S.1

2. Location:

Lat. 48° 10' 32" Long. 58° 26' 40" Hydrologic Region 3

3. Hydrologic Data:

A = 280 km^2, MAR = 1500 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 13.31 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 490 m^3/s

Q1000 = 620 m^3/s

4. Site Data:

Rated Head	= 15.24 m	Plant Design Flow	= 19.97 m^3/s
Penstock Length	= 385 m		
Access Road Length	= 3.0 km	T.L. Line Length	= 28.6 km
Dam Height	= 7.4 m	Dam Length	= 110 m
Distance to Town	= 35 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 2.58 MW		

5. Remarks:

(i) Lower 30 km of river accessible to salmon.

(ii) Regarded as a river with potential for supporting a large salmon population.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Fischells Brook

SITE NAME : SITE - 1 FILE : 3012

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.445096 MW
PENSTOCK LENGTH	: 1045 M.
DESIGN FLOW	: 19.71 M^3/S
PENSTOCK DIAMETER	: 3.100758 M.
RATED HEAD	: 15.24 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 168 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 690 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8840288

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2949473	SEE DAM	337932.5	4407405	517500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
677470.4	1614397	484319.2	70457.66	173920.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	691928.5	1179201	470350.6

PROJECT COST: $ 1.357435E+07 COST PER KW: $ 5551.665

Total Project Cost = $ 13,574,350

MAP NUMBER 12 B/07 DATA SHEET FILE NUMBER 3012

1. Site Identification:

River Basin: Fischells Brook Site: S.1

2. Location:

Lat. 48° 18' 10" Long. 58° 36' 45" Hydrologic Region 3

3. Hydrologic Data:

A = 307 km^2, MAR = 1350 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 13.14 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 509 m^3/s

Q1000 = 690 m^3/s

4. Site Data:

Rated Head	= 15.24 m	Plant Design Flow	= 19.71 m^3/s
Penstock Length	= 1045 m		
Access Road Length	= 0.5 km	T.L. Line Length	= 0.5 km
Dam Height	= 15 m	Dam Length	= 168 m
Distance to Town	= 20 km	Distance to Concrete Plant	= 40 km
Installed Capacity	= 2.55 MW		

5. Remarks:

(i) Accessible to salmon for 20 km above river mouth.

RIVER: Little Barachois Broo

SITE: S.2

LAT: 48° 25' 30"

LONG: 58° 00' 00"

DRAINAGE AREA: 118.0 km²

HEAD: 30.5 m

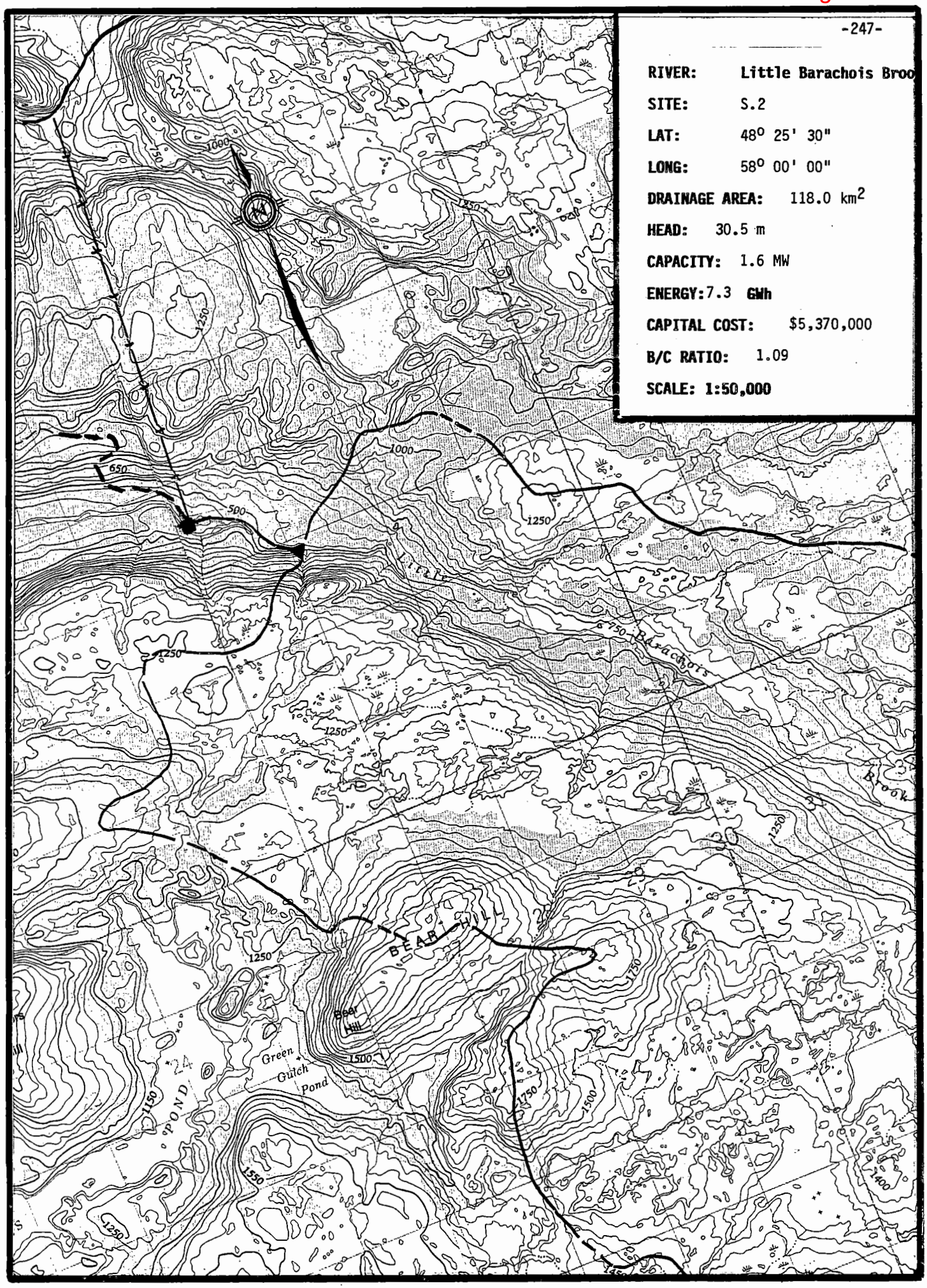
CAPACITY: 1.6 MW

ENERGY: 7.3 GWh

CAPITAL COST: $5,370,000

B/C RATIO: 1.09

SCALE: 1:50,000



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ShawMont Newfoundland Limited
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WATER SHED : Little Barachois Brook

SITE NAME : SITE - 2 FILE : 3013

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.601342 MW
PENSTOCK LENGTH	: 1320 M.
DESIGN FLOW	: 6.45 M^3/S
PENSTOCK DIAMETER	: 1.740521 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 5.7 M.
TRANSMISSION LINE LENGTH	: 4.4 KM.
LENGTH OF DAM	: 89 M.
ACCESS ROAD LENGTH	: 4.4 KM.
FLOOD FLOW	: 82 M^3/S
DISTANCE TO TOWN	: 54 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 54 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5267653

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
355696.9	SEE DAM	123656.1	1096352	61500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
395149.8	941633.4	282490	447443.7	289915

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	518102.6	641322.7	214953.2

PROJECT COST: $ 5368215 COST PER KW: $ 3352.324

Total Project Cost = $ 5,368,215

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3013

1. Site Identification:

River Basin: Little Barachois Brook Site: S.2

2. Location:

Lat. 48° 25' 30" Long. 58° 00' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 118 km^2, MAR = 1150 mm, ACLS = 85 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.30 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 82 m^3/s

Q1000 = 110 m^3/s

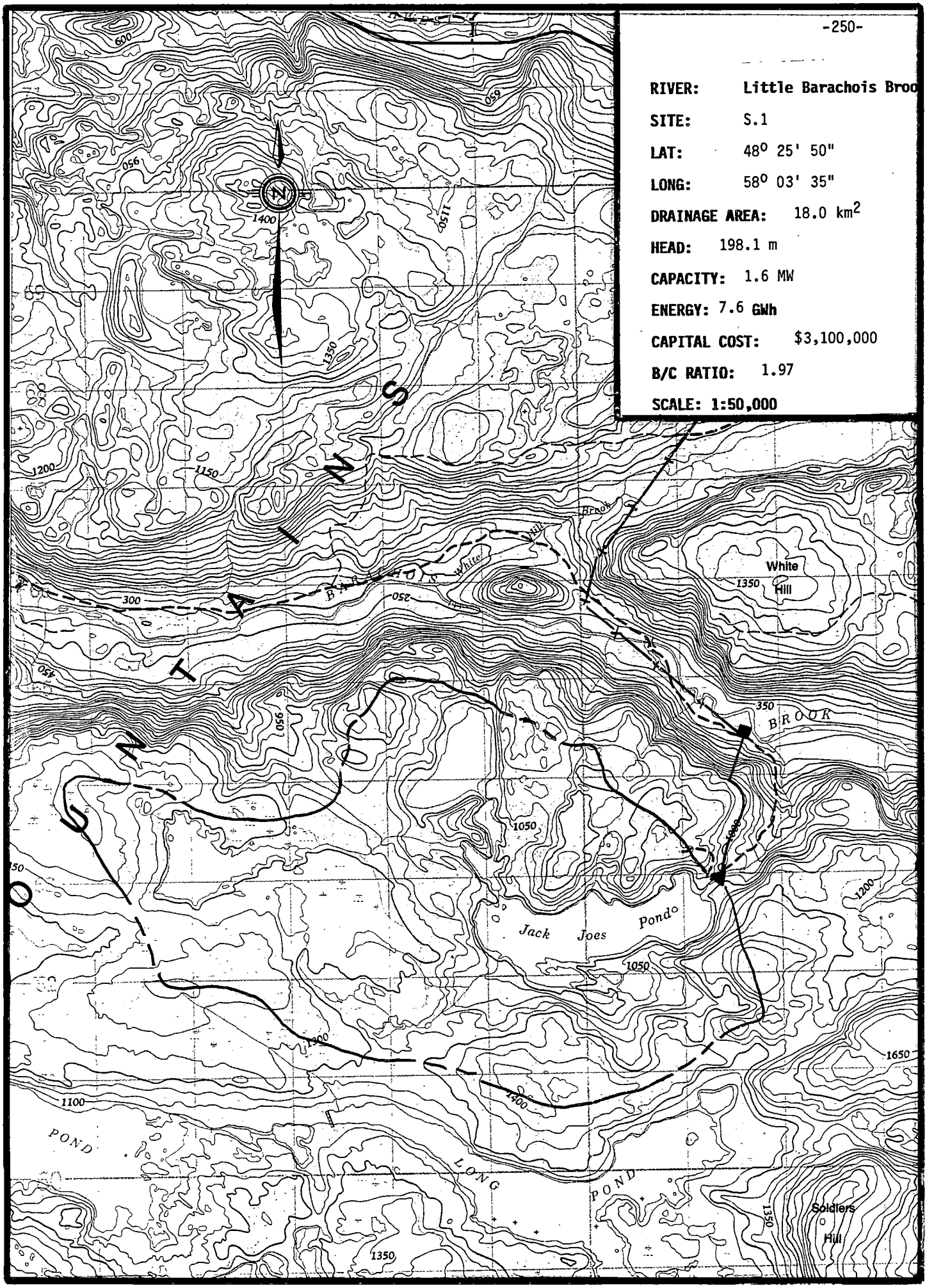
4. Site Data:

Rated Head = 30.5 m
Penstock Length = 1320 m
Access Road Length = 4.4 km
Dam Height = 5.7 m
Distance to Town = 54 km
Installed Capacity = 1.672 MW

Plant Design Flow = 6.45 m^3/s
T.L. Line Length = 4.4 km
Dam Length = 89 m
Distance to Concrete Plant = 54 km

5. Remarks:

(i) Lower sections of river accessible to salmon.


-250-
RIVER: Little Barachois Broo
SITE: S.1
LAT: 48° 25' 50"
LONG: 58° 03' 35"
DRAINAGE AREA: 18.0 km²
HEAD: 198.1 m
CAPACITY: 1.6 MW
ENERGY: 7.6 GWh
CAPITAL COST: $3,100,000
B/C RATIO: 1.97
SCALE: 1:50,000
N
White Hill
BROOK
Jack Joes Pond
LONG POND
POND
Soldiers Hill

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Little Barachois Brook

SITE NAME : SITE - 1 FILE : 3014

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.596409 MW
PENSTOCK LENGTH	: 1664 M.
DESIGN FLOW	: .9899999 M^3/S
PENSTOCK DIAMETER	: .598315 M.
RATED HEAD	: 198.1 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 47 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 26 M^3/S
DISTANCE TO TOWN	: 61 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 61 KM.
USEFUL TURBINE FLOW RATIO	: .82
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3263369

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
76173.66	SEE DAM	22892	981345.8	19500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
204842.1	488134.3	146440.3	70457.66	515992.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	175734.9	306158.4	94453.11

PROJECT COST: $ 3102125 COST PER KW: $ 1943.19

Total Project Cost = $ 3,102,125

MAP NUMBER 12 B/08 DATA SHEET FILE NUMBER 3014

1. Site Identification:

River Basin: Little Barachois Brook Site: S.1

2. Location:

Lat. 48° 25' 50" Long. 58° 03' 35" Hydrologic Region 3

3. Hydrologic Data:

A = 18 km^2, MAR = 1150 mm, ACLS = 75 %

Storage Reservoir Area = 1.3 km^2

Storage Reservoir Vol, V = 2.6 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = .12$$

Mean Flow, QAV = 0.66 m^3/s

Usable Flow Ratio = 0.82

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 26 m^3/s

Q1000 = 34 m^3/s

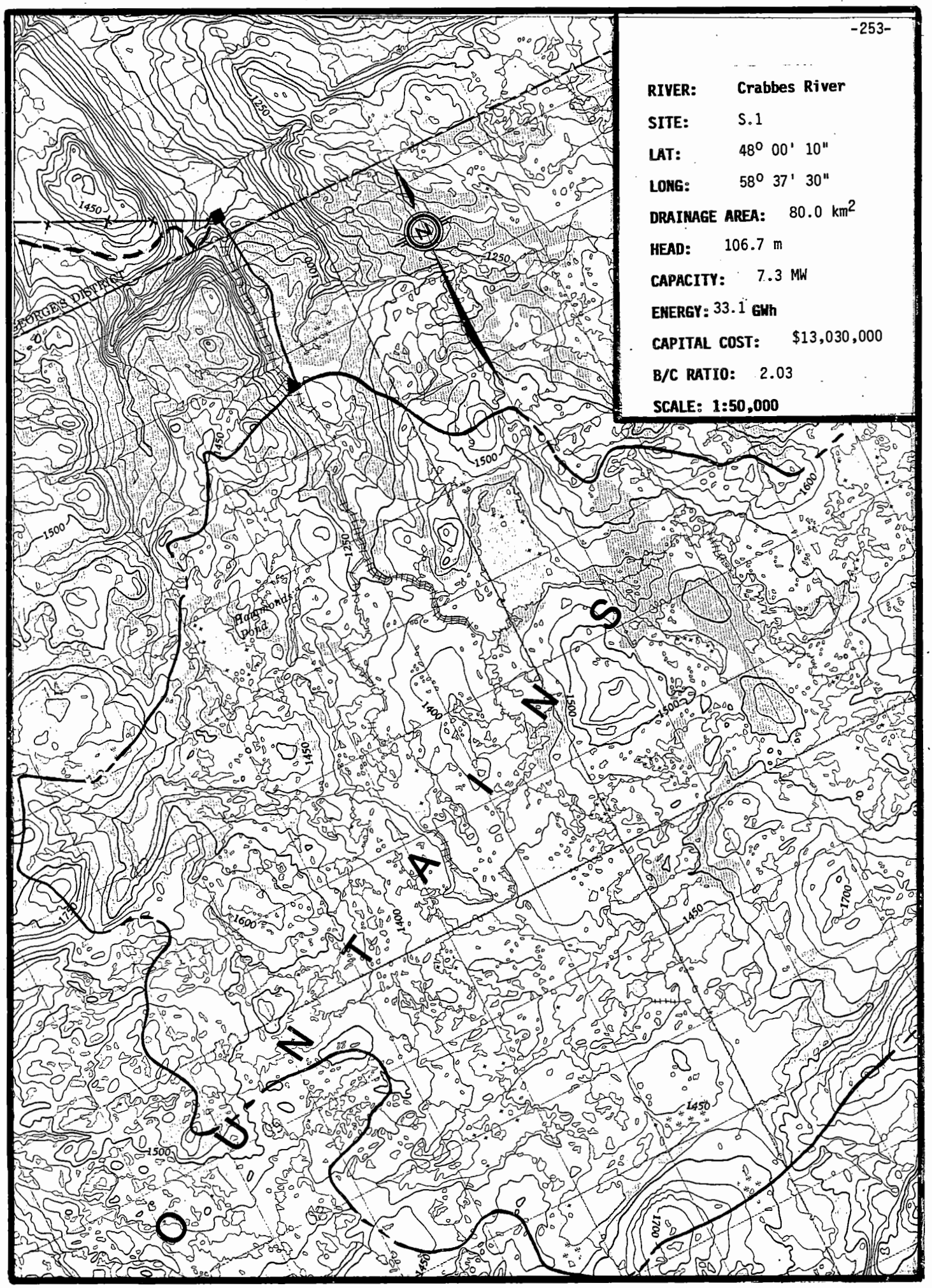
4. Site Data:

Rated Head = 198.1 m
Penstock Length = 1664 m
Access Road Length = 0.5 km
Dam Height = 3 m
Distance to Town = 61 km
Installed Capacity = 1.65 MW

Plant Design Flow = 0.98 m^3/s
T.L. Line Length = 11 km
Dam Length = 47 m
Distance to Concrete Plant = 61 km

5. Remarks:

(i) Probably upstream of complete barrier to salmon.


RIVER: Crabbes River
SITE: S.1
LAT: 48° 00' 10"
LONG: 58° 37' 30"
DRAINAGE AREA: 80.0 km²
HEAD: 106.7 m
CAPACITY: 7.3 MW
ENERGY: 33.1 GWh
CAPITAL COST: $13,030,000
B/C RATIO: 2.03
SCALE: 1:50,000
GEORGES DISTRICT
Raymonds Pond
1250
1450
1500
1400
1600
1700

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Crabbes River

SITE NAME : SITE - 1 FILE : 3015

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 7.269662 MW
PENSTOCK LENGTH	: 2038 M.
DESIGN FLOW	: 8.37 M^3/S
PENSTOCK DIAMETER	: 1.633802 M.
RATED HEAD	: 106.7 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 25 KM.
LENGTH OF DAM	: 106 M.
ACCESS ROAD LENGTH	: 17.2 KM.
FLOOD FLOW	: 185 M^3/S
DISTANCE TO TOWN	: 38 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.338416E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
450010.6	SEE DAM	156338.1	3769856	138750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
777172.7	1740867	519661.8	1425617	1319050

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	943809.9	1131106	661669.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.303391E+07 COST PER KW: $ 1792.918

Total Project Cost = $ 13,033,910

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3015

1. Site Identification:

River Basin: Crabbes River Site: S.1

2. Location:

Lat. 48° 00' 10" Long. 58° 37' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 80 km^2, MAR = 1200 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.58 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 185 m^3/s

Q1000 = 250 m^3/s

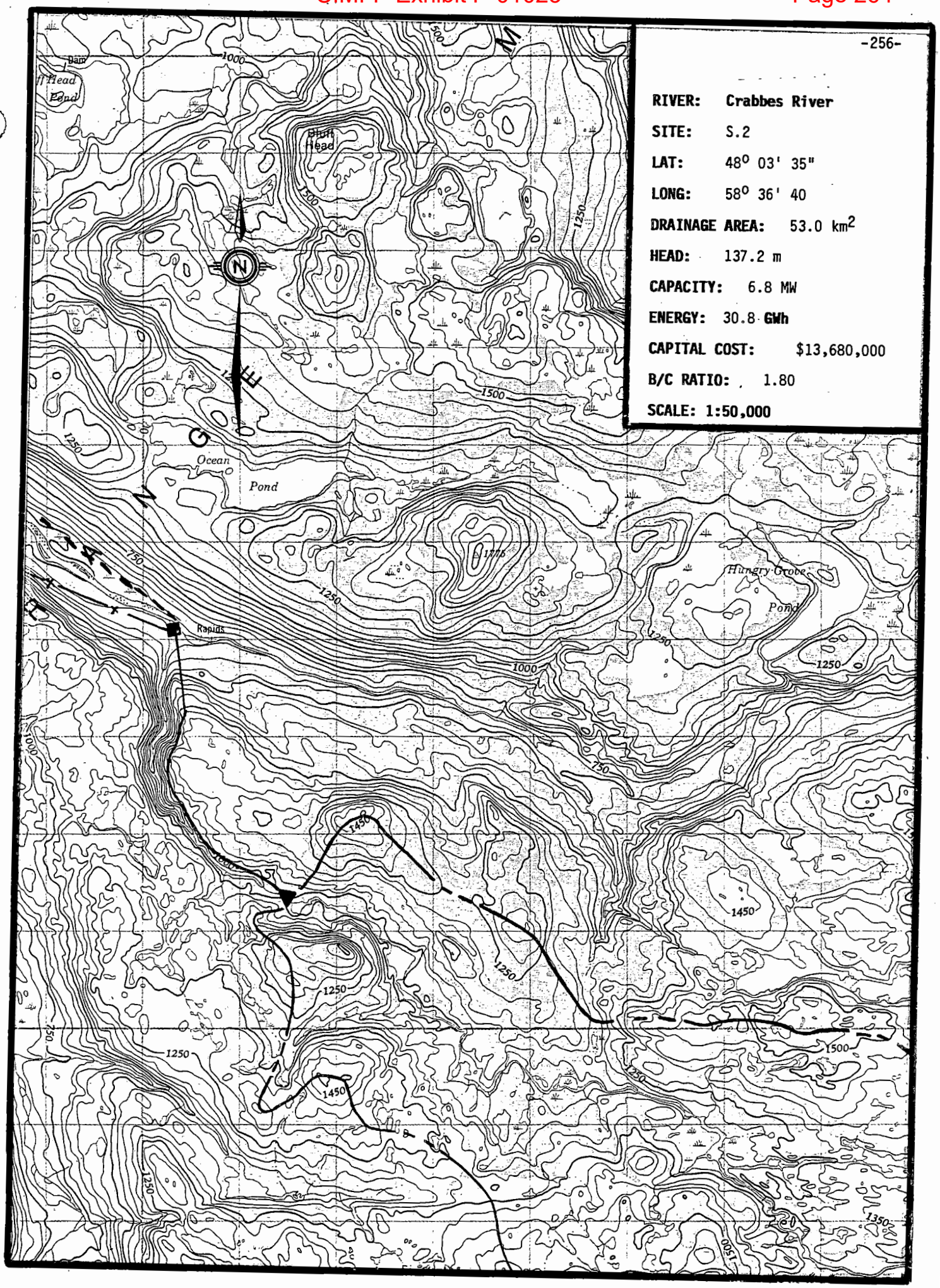
4. Site Data:

Rated Head = 106.7 m
Penstock Length = 1028 m
Access Road Length = 17.2 km
Dam Height = 6.0 m
Distance to Town = 38 km
Installed Capacity = 7.59 MW

Plant Design Flow = 8.37 m^3/s
T.L. Line Length = 25 km
Dam Length = 106 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Probably upstream of barrier to fish migration.



RIVER: Crabbes River

SITE: S.2

LAT: 48° 03' 35"

LONG: 58° 36' 40

DRAINAGE AREA: 53.0 km²

HEAD: 137.2 m

CAPACITY: 6.8 MW

ENERGY: 30.8 GWh

CAPITAL COST: $13,680,000

B/C RATIO: 1.80

SCALE: 1:50,000

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WATER SHED : Crabbes River

SITE NAME : SITE - 2 FILE : 3016

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 6.751104 MW
PENSTOCK LENGTH	: 3688 M.
DESIGN FLOW	: 6.045 M^3/S
PENSTOCK DIAMETER	: 1.371328 M.
RATED HEAD	: 137.2 M.
HEIGHT OF DAM	: 5.6 M.
TRANSMISSION LINE LENGTH	: 19.8 KM.
LENGTH OF DAM	: 115 M.
ACCESS ROAD LENGTH	: 12.9 KM.
FLOOD FLOW	: 255 M^3/S
DISTANCE TO TOWN	: 32.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.184067E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
436153.4	SEE DAM	116645.7	5525292	191250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
668397.3	1497210	446928.4	1116362	1044900

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	780852.5	1183297	667967.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.367525E+07 COST PER KW: $ 2025.633

Total Project Cost = $ 13,675,250

MAP NUMBER 12 B/2 DATA SHEET FILE NUMBER 3016

1. Site Identification:

River Basin: Crabbes River Site: S.2

2. Location:

Lat. 48°03' 35" Long. 58° 36' 40" Hydrologic Region 3

3. Hydrologic Data:

A = 53 km^2, MAR = 2400 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.03 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 255 m^3/s

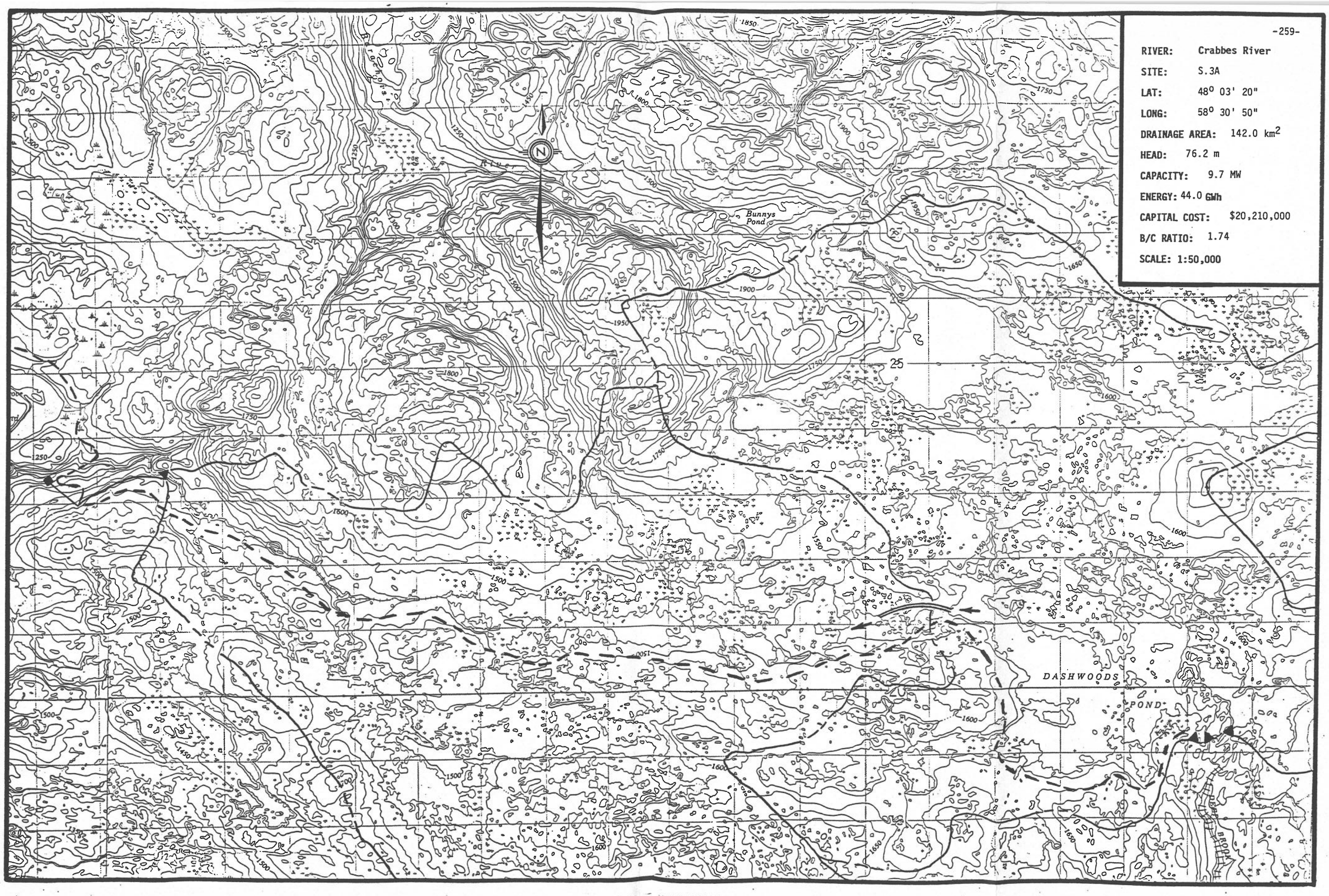
Q1000 = 390 m^3/s

4. Site Data:

Rated Head = 137.2 m
Penstock Length = 3688 m
Access Road Length = 12.9 km
Dam Height = 5.6 m
Distance to Town = 32.5 km
Installed Capacity = 7.05 MW

Plant Design Flow = 6.05 m^3/s
T.L. Line Length = 19.8 km
Dam Length = 115 m
Distance to Concrete Plant = 100 km

5. Remarks:



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WATER SHED : Crabbes River

SITE NAME : SITE - 3A FILE : 3017

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 9.657572 MW
PENSTOCK LENGTH	: 2257 M.
DESIGN FLOW	: 15.57 M^3/S
PENSTOCK DIAMETER	: 2.236562 M.
RATED HEAD	: 76.2 M.
HEIGHT OF DAM	: 6.1 M.
TRANSMISSION LINE LENGTH	: 29.3 KM.
LENGTH OF DAM	: 116 M.
ACCESS ROAD LENGTH	: 19.3 KM.
FLOOD FLOW	: 240 M^3/S
DISTANCE TO TOWN	: 34 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.835307E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
500500.6	SEE DAM	273320.2	6184202	180000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1109870	2486108	742122	1572271	1666596

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1121912	1534652	1086170

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.021012E+07 COST PER KW: $ 2092.671

Total Project Cost = $ 20,210,120

WATER SHED : Crabbes River SITE - 3A

COST DATA

(ADDITIONAL COST of $ 1,752,400 for Diversion INCLUDED)

INTEREST RATE : 10 REVENUE, $ PER MWH : 100
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 2324164

ANNUAL BENEFIT : $ 4399217

BENEFIT/COST RATIO: 1.892817

Total Project Cost = $ 20,210,120.00

Benefit / Cost Ratio = 1.89

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3017

1. Site Identification:

River Basin: Crabbes River Site: S.3A

2. Location:

Lat. 48° 03' 20" Long. 58° 30' 50" Hydrologic Region 3

3. Hydrologic Data:

A = 142 km^2, MAR = 2307 mm, ACLS = 85 %

Storage Reservoir Area = 0.2 km^2

Storage Reservoir Vol, V = 0.4 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.001 (Negligable)

Mean Flow, QAV = 10.38 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 240 m^3/s

Q1000 = 305 m^3/s

4. Site Data:

Rated Head = 76.2 m
Penstock Length = 2257 m
Access Road Length = 19.3 km
Dam Height = 6.1 m
Distance to Town = 34 km
Installed Capacity = 9.7 MW

Plant Design Flow = 15.6 m^3/s
T.L. Line Length = 29.3 km
Dam Length = 116 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes benefits of Dashwoods Pond Diversion (=65km^2).

(ii) Apply 76.2 / 121.9 = 0.625 of diversion costs = $1,752,400 against site 3A and remainder against site 4A

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Crabbes River (S3 & S4) Region: 3

Total Developed Head, H = 121.9 m Map: 12 B/01

Diverted Area = 65 km^2, MAR = 2200 mm, from LaPoile River

Location: Lat. = 48° 01' 15" Long. = 58° 16' 40"

Mean Diverted Flow = 4.53 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 4.53 x 0.78 = 3.54 m^3/s

Additional Energy = H x Q* x 0.0716

= 121.9x3.54 x 0.0716 = 30.9 GWh p.a.

Dam: Height = 2.0 m, Length = 800 m, Q150 = 140 m^3/s

Canal: Height of Land = 2 m, Length = 1000 m

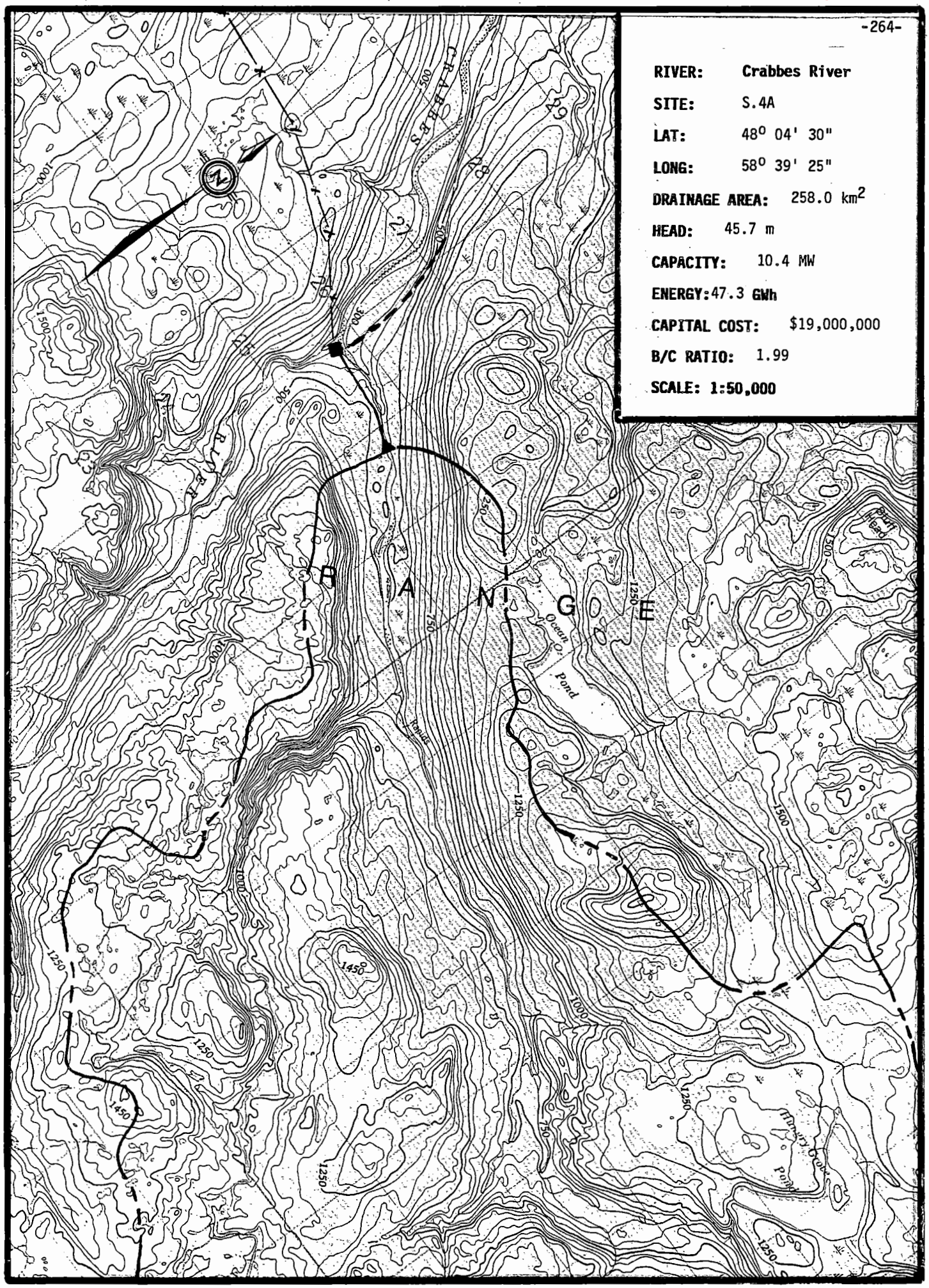
Design Flow Ratio = 1.50 Design Flow = 6.80 m^3/s

Access Road: Length = 1.90 km

Costs:

Dam + Spillway	= 697,500
Diversion Canal	= 351,100
Access Road	= 760,000
Sub-total Direct Costs	= 1,803,600
Total Cost Diversion	= 2,803,400
Additional Plant Costs	=
Total Project Cost	=

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =



RIVER:	Crabbes River
SITE:	S.4A
LAT:	48° 04' 30"
LONG:	58° 39' 25"
DRAINAGE AREA:	258.0 km^2
HEAD:	45.7 m
CAPACITY:	10.4 MW
ENERGY:	47.3 GWh
CAPITAL COST:	$19,000,000
B/C RATIO:	1.99
SCALE:	1:50,000

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WATER SHED : Crabbes River

SITE NAME : SITE - 4A FILE : 3018

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	10.37874 MW
PENSTOCK LENGTH	:	1320 M.
DESIGN FLOW	:	27.9 M^3/S
PENSTOCK DIAMETER	:	3.087394 M.
RATED HEAD	:	45.7 M.
HEIGHT OF DAM	:	7.6 M.
TRANSMISSION LINE LENGTH	:	16.5 KM.
LENGTH OF DAM	:	155 M.
ACCESS ROAD LENGTH	:	6.6 KM.
FLOOD FLOW	:	490 M^3/S
DISTANCE TO TOWN	:	21 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 2.20789E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
912771.1	SEE DAM	462014.6	5534704	367500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1420860	3182727	950067.8	631562	1017829

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	878112.3	1493248	1096186

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.899858E+07 COST PER KW: $ 1830.528

Total Project Cost = $ 18,998,580

WATER SHED : Crabbes River SITE - 4A

COST DATA

(ADDITIONAL COST of $ 1,051,000 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1424894

ANNUAL BENEFIT : $ 2836635

BENEFIT/COST RATIO: 1.99077

Total Project Cost = $ 18,998,580.00

Benefit / Cost Ratio = 1.99

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3018

1. Site Identification:

River Basin: Crabbes River Site: S.4A

2. Location:

Lat. 48° 04' 30" Long. 58° 39' 25" Hydrologic Region 80%

3. Hydrologic Data:

A = 258 km^2, MAR = 2274 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 18.6 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 490 m^3/s

Q1000 = 630 m^3/s

4. Site Data:

Rated Head = 45.7 m
Penstock Length = 1320 m
Access Road Length = 6.6 km
Dam Height = 7.6 m
Distance to Town = 21 km
Installed Capacity = 10.4 MW

Plant Design Flow = 27.9 m^3/s
T.L. Line Length = 16.5 km
Dam Length = 155 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes benefits of Dashwoods Pond Diversion (= 65 km^2)

(ii) Apply $\frac{45.7}{121.9}$ = 0.375 of Diversion costs = $1,051,000 against Site S4A and remainder against Site S3A.

RIVER: Crabbes River

SITE: S.5

LAT: 48° 04' 30"

LONG: 58° 39' 25"

DRAINAGE AREA: 162.0 km²

HEAD: 30.5 m

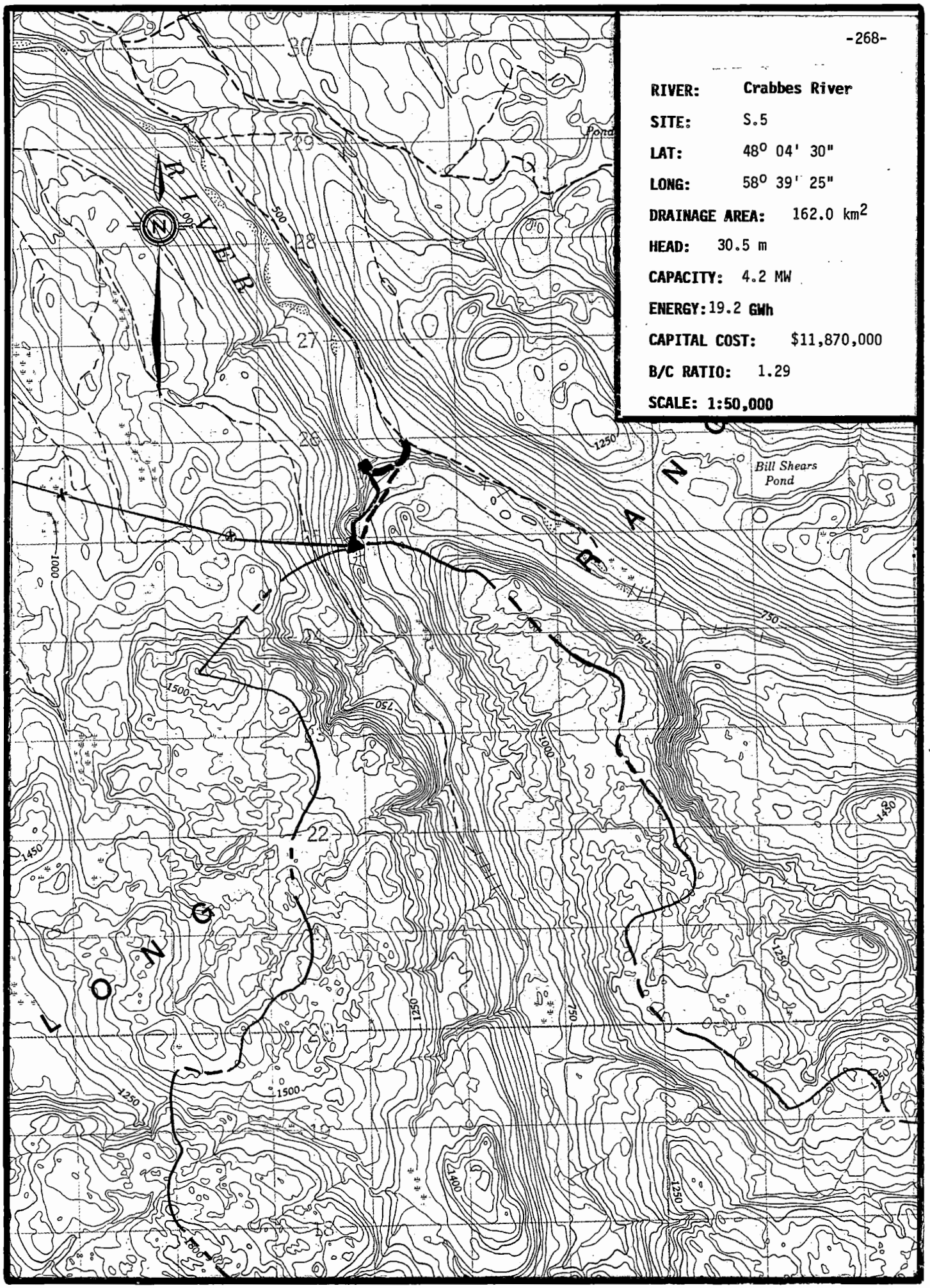
CAPACITY: 4.2 MW

ENERGY: 19.2 GWh

CAPITAL COST: $11,870,000

B/C RATIO: 1.29

SCALE: 1:50,000



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WATER SHED : Crabbes River

SITE NAME : SITE - 5 FILE : 3019

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.208177 MW
PENSTOCK LENGTH	: 1046 M.
DESIGN FLOW	: 16.95 M^3/S
PENSTOCK DIAMETER	: 2.637009 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 7.1 M.
TRANSMISSION LINE LENGTH	: 16.5 KM.
LENGTH OF DAM	: 147 M.
ACCESS ROAD LENGTH	: 6.6 KM.
FLOOD FLOW	: 420 M^3/S
DISTANCE TO TOWN	: 21 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.163315E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
782589.6	SEE DAM	295029	3551393	315000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
777121	1851863	555558.9	631562	970688.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	636880.7	1034305	465628.5

PROJECT COST: $ 1.186762E+07 COST PER KW: $ 2820.133

Total Project Cost = $ 11,867,620

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3019

1. Site Identification:

River Basin: Crabbes River Site: S.5

2. Location:

Lat. 48° 04' 30" Long. 58° 39' 25" Hydrologic Region 3

3. Hydrologic Data:

A = 162 km^2, MAR = 2200 mm, ACLS = 75 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 11.30 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 420 m^3/s

Q1000 = 580 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 1046 m
Access Road Length = 6.6 km
Dam Height = 7.1 m
Distance to Town = 21 km
Installed Capacity = 4.39 MW

Plant Design Flow = 16.95 m^3/s
T.L. Line Length = 16.5 km
Dam Length = 147 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Grand Codroy River

SITE: S.1

LAT: 47° 55' 45"

LONG: 58° 50' 00"

DRAINAGE AREA: 66.0 km²

HEAD: 61.0 m

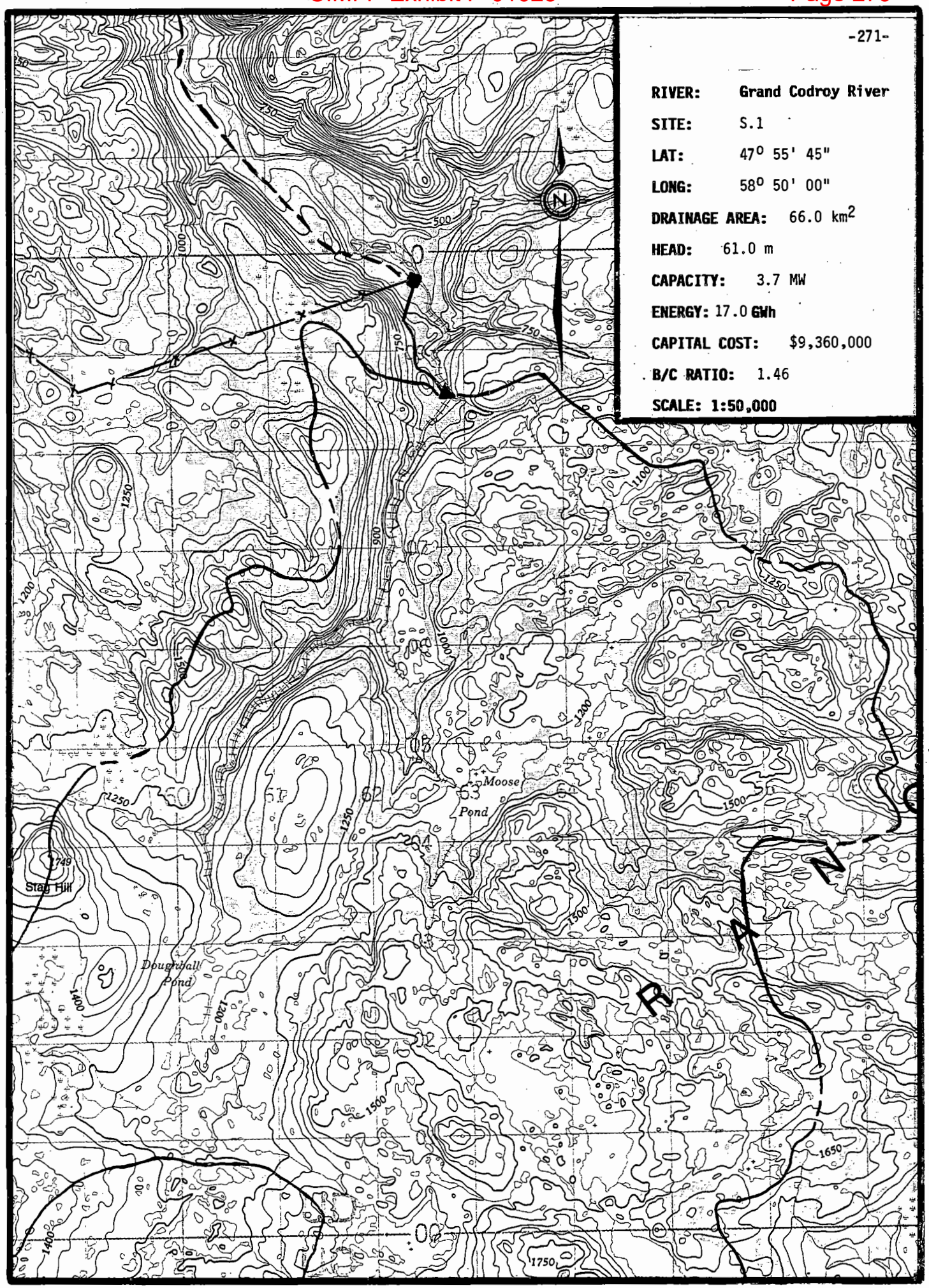
CAPACITY: 3.7 MW

ENERGY: 17.0 GWh

CAPITAL COST: $9,360,000

B/C RATIO: 1.46

SCALE: 1:50,000



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WATER SHED : Grand Codroy River

SITE NAME : SITE - 1 FILE : 3020

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.738946 MW
PENSTOCK LENGTH	: 1432 M.
DESIGN FLOW	: 7.53 M^3/S
PENSTOCK DIAMETER	: 1.688287 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.9 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 106 M.
ACCESS ROAD LENGTH	: 14 KM.
FLOOD FLOW	: 175 M^3/S
DISTANCE TO TOWN	: 22 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 75 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8903100

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
438649.3	SEE DAM	142143.7	2757329	131250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
561289.3	1337541	401262.2	1196775	703663.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	498557	833862.8	355768

PROJECT COST: $ 9358090 COST PER KW: $ 2502.869

Total Project Cost = $ 9,358,090

MAP NUMBER 110/15 DATA SHEET FILE NUMBER 3020

1. Site Identification:

River Basin: Grand Codroy River Site: S.1

2. Location:

Lat. 47° 55' 45" Long. 58° 50' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 66 km^2, MAR = 2400 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.02 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 175 m^3/s

Q1000 = 245 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 1432 m
Access Road Length = 14 km
Dam Height = 5.9 m
Distance to Town = 22 km
Installed Capacity = 3.91 MW

Plant Design Flow = 7.53 m^3/s
T.L. Line Length = 11 km
Dam Length = 106 m
Distance to Concrete Plant = 75 km

5. Remarks:

RIVER: Grand Codroy River

SITE: S.2

LAT: 47° 56' 40"

LONG: 58° 56' 35"

DRAINAGE AREA: 45.0 km²

HEAD: 45.7 m

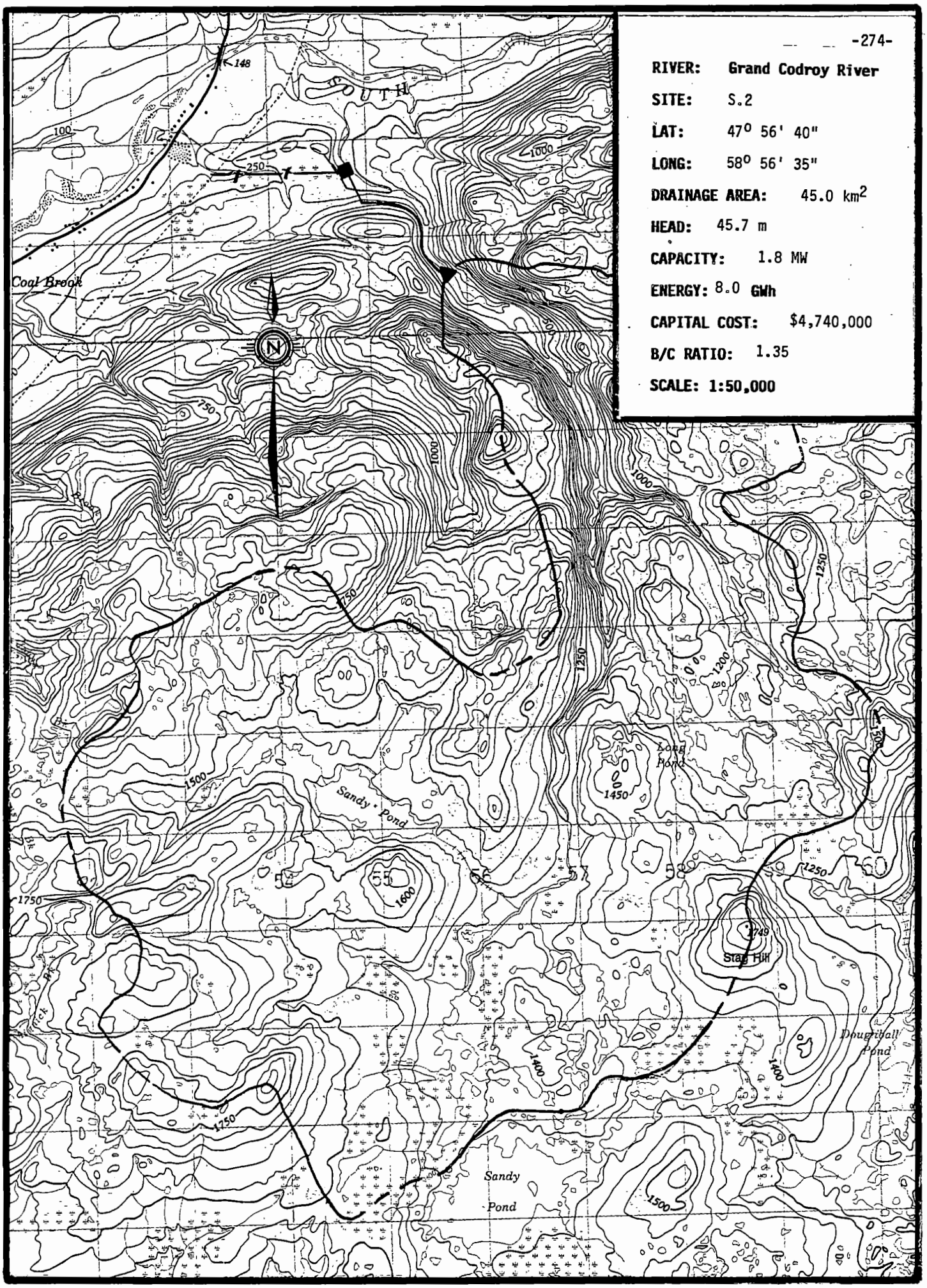
CAPACITY: 1.8 MW

ENERGY: 8.0 GWh

CAPITAL COST: $4,740,000

B/C RATIO: 1.35

SCALE: 1:50,000



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WATER SHED : Grand Codroy River

SITE NAME : SITE - 2 FILE : 3021

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	1.752111 MW
PENSTOCK LENGTH	:	1705 M.
DESIGN FLOW	:	4.71 M^3/S
PENSTOCK DIAMETER	:	1.43675 M.
RATED HEAD	:	45.7 M.
HEIGHT OF DAM	:	5.3 M.
TRANSMISSION LINE LENGTH	:	1 KM.
LENGTH OF DAM	:	100 M.
ACCESS ROAD LENGTH	:	3.3 KM.
FLOOD FLOW	:	195 M^3/S
DISTANCE TO TOWN	:	10 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	65 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 5134039

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
354031.4	SEE DAM	93181.72	1169191	146250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
365300.6	870503.4	261151	350381	167162

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	175644.2	585655.4	198738.1

PROJECT COST: $ 4737190 COST PER KW: $ 2703.705

Total Project Cost = $ 4,737,190

MAP NUMBER 110/15 DATA SHEET FILE NUMBER 3021

1. Site Identification:

River Basin: Grand Codroy River Site: S.1

2. Location:

Lat. 47° 56' 40" Long. 58° 56' 35" Hydrologic Region 3

3. Hydrologic Data:

A = 45 km^2, MAR = 2200 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 3.14 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 195 m^3/s

Q1000 = 255 m^3/s

4. Site Data:

Rated Head = 45.7 m
Penstock Length = 1705 m
Access Road Length = 3.3 km
Dam Height = 5.3 m
Distance to Town = 10 km
Installed Capacity = 1.83 MW

Plant Design Flow = 4.71 m^3/s
T.L. Line Length = 1.0 km
Dam Length = 100 m
Distance to Concrete Plant = 65 km

5. Remarks:

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WATER SHED : Grand Codroy River

SITE NAME : SITE - 3 FILE : 3022

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.030036 MW
PENSTOCK LENGTH	: 320 M.
DESIGN FLOW	: 8.325 M^3/S
PENSTOCK DIAMETER	: 2.141301 M.
RATED HEAD	: 15.2 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 18.2 KM.
LENGTH OF DAM	: 110 M.
ACCESS ROAD LENGTH	: 10 KM.
FLOOD FLOW	: 200 M^3/S
DISTANCE TO TOWN	: 34 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 90 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4353949

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
465265.9	SEE DAM	155581.4	327062.9	150000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
370236.5	882265.6	264679.7	899091	621903.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	548450	559704.8	165473.3

PROJECT COST: $ 5409715 COST PER KW: $ 5251.969

Total Project Cost = $ 5,409,715

MAP NUMBER 110/15 DATA SHEET FILE NUMBER 3022

1. Site Identification:

River Basin: Grand Codroy River Site: S.3

2. Location:

Lat. 47° 59' 15" Long. 58° 46' 10" Hydrologic Region 3

3. Hydrologic Data:

A = 73 km^2, MAR = 2400 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.55 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 200 m^3/s

Q1000 = 255 m^3/s

4. Site Data:

Rated Head = 15.2 m
Penstock Length = 320 m
Access Road Length = 10 km
Dam Height = 6.0 m
Distance to Town = 34 km
Installed Capacity = 1.08 MW

Plant Design Flow = 8.33 m^3/s
T.L. Line Length = 18.2 km
Dam Length = 110 m
Distance to Concrete Plant = 90 km

5. Remarks:

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Updated Sept. '86 by H.J.Keats

WATER SHED : Grand Codroy River

SITE NAME : SITE - 4 FILE : 3023

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.230475 MW
PENSTOCK LENGTH	: 825 M.
DESIGN FLOW	: 9.945 M^3/S
PENSTOCK DIAMETER	: 2.311439 M.
RATED HEAD	: 15.2 M.
HEIGHT OF DAM	: 6.3 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 114 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 225 M^3/S
DISTANCE TO TOWN	: 27 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 83 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5037374

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
517646.5	SEE DAM	182581.3	910398.4	168750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
419308.4	999202.9	299760.9	323114.7	466599.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	394647.6	650147.4	204332.8

PROJECT COST: $ 5536491 COST PER KW: $ 4499.475

Total Project Cost = $ 5,536,491

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3023

1. Site Identification:

River Basin: Grand Codroy River Site: S.4

2. Location:

Lat. 48° 00' 48" Long. 58° 46' 50" Hydrologic Region 3

3. Hydrologic Data:

A = 95 km^2, MAR = 2200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.63 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 225 m^3/s

Q1000 = 295 m^3/s

4. Site Data:

Rated Head	= 15.2 m	Plant Design Flow	= 9.94 m^3/s
Penstock Length	= 825 m		
Access Road Length	= 3.0 km	T.L. Line Length	= 11 km
Dam Height	= 6.3 m	Dam Length	= 114 m
Distance to Town	= 27 km	Distance to Concrete Plant	= 83 km
Installed Capacity	= 1.29 MW		

5. Remarks:

RIVER: Grand Bay River

SITE: S.1

LAT: 47° 38' 10"

LONG: 59° 08' 30"

DRAINAGE AREA: 46.0 km²

HEAD: 61.0 m

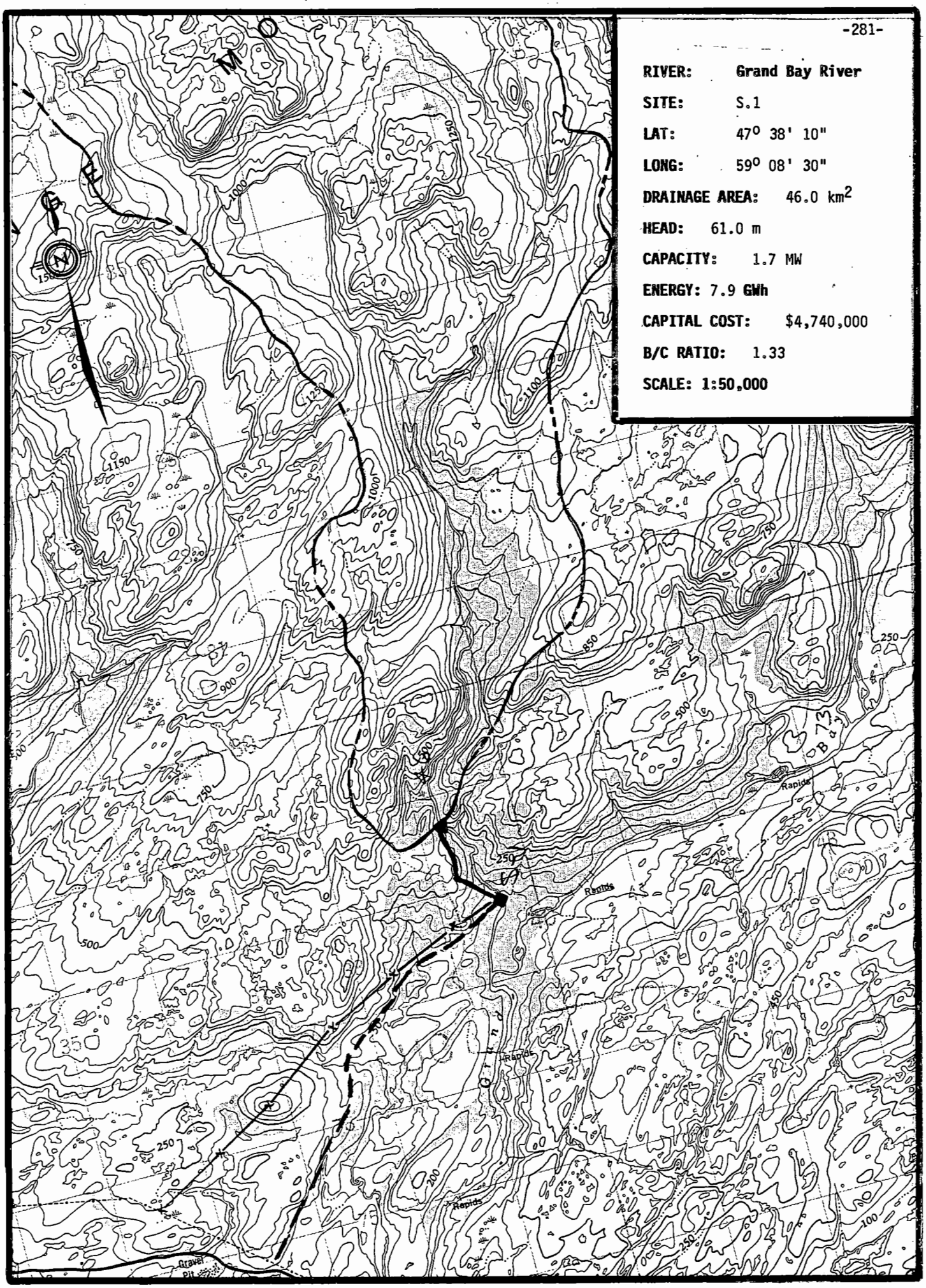
CAPACITY: 1.7 MW

ENERGY: 7.9 GWh

CAPITAL COST: $4,740,000

B/C RATIO: 1.33

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
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Updated Sept. '86 by H.J.Keats

WATER SHED : Grand Bay River

SITE NAME : SITE - 1 FILE : 3024

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.735407 MW
PENSTOCK LENGTH	: 1047 M.
DESIGN FLOW	: 3.495 M^3/S
PENSTOCK DIAMETER	: 1.213687 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 4.2 KM.
LENGTH OF DAM	: 87 M.
ACCESS ROAD LENGTH	: 6.5 KM.
FLOOD FLOW	: 120 M^3/S
DISTANCE TO TOWN	: 8 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 8 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4744561

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
286306.2	SEE DAM	71238.45	1358508	90000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
327977	781562.2	234468.7	623418.8	292391.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	72407.65	452914.5	149003.3

PROJECT COST: $ 4740197 COST PER KW: $ 2731.461

Total Project Cost = $ 4,740,197

MAP NUMBER 110/11 DATA SHEET FILE NUMBER 3024

1. Site Identification:

River Basin: Grand Bay River Site: S.1

2. Location:

Lat. 47° 38' 10" Long. 59° 08' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 46 km^2, MAR = 1600 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.33 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 120 m^3/s

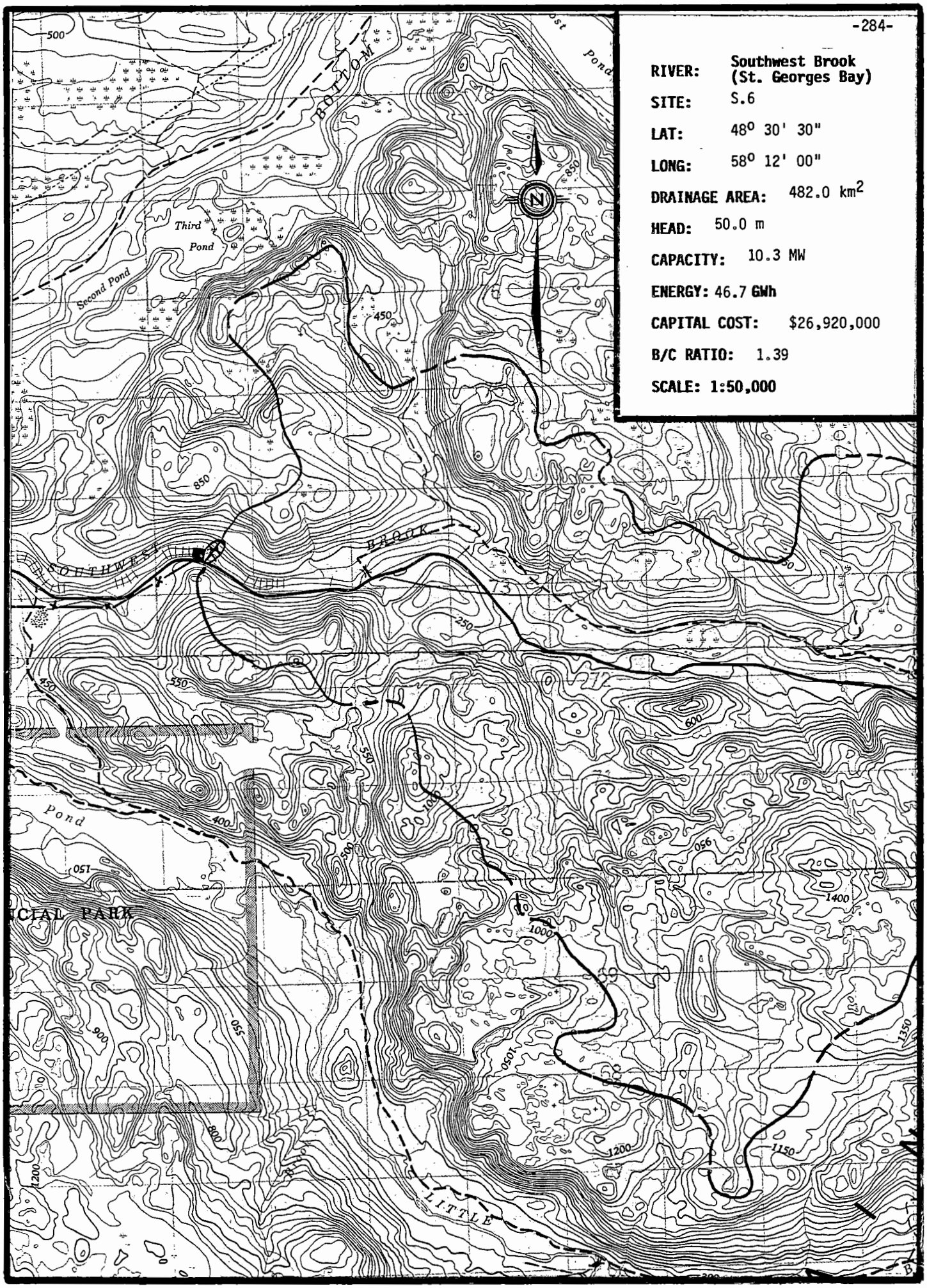
Q1000 = 160 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 1047 m
Access Road Length = 6.5 km
Dam Height = 5.0 m
Distance to Town = 8 km
Installed Capacity = 1.81 MW

Plant Design Flow = 3.50 m^3/s
T.L. Line Length = 4.2 km
Dam Length = 87 m
Distance to Concrete Plant = 8 km

5. Remarks:



RIVER: Southwest Brook (St. Georges Bay)

SITE: S.6

LAT: 48° 30' 30"

LONG: 58° 12' 00"

DRAINAGE AREA: 482.0 km²

HEAD: 50.0 m

CAPACITY: 10.3 MW

ENERGY: 46.7 GWh

CAPITAL COST: $26,920,000

B/C RATIO: 1.39

SCALE: 1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Southwest Brook

SITE NAME : SITE - 6 FILE : 3025

SITE DATA

INSTALLED CAPACITY	: 10.2564 MW
PENSTOCK LENGTH	: 100 M.
DESIGN FLOW	: 25.2 M^3/S
PENSTOCK DIAMETER	: 2.918213 M.
RATED HEAD	: 50 M.
HEIGHT OF DAM	: 46 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 250 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 580 M^3/S
DISTANCE TO TOWN	: 22 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.138688E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
9840426	3562828	421572.6	388574.3	435000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1361219	2722438	812668	70457.66	218598.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	3302352	2149691	1633641

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.691947E+07 COST PER KW: $ 2624.651

Total Project Cost = $ 26,919,470

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 3025

1. Site Identification:

River Basin: Southwest Brook Site: S.6

2. Location:

Lat. 48° 30' Long. 58° 12' Hydrologic Region 3

3. Hydrologic Data:

A = 482 km^2, MAR = 1100 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 16.8 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 420 m^3/s

Q1000 = 58 m^3/s

4. Site Data:

Rated Head = 50 m
Penstock Length = 100 m
Access Road Length = 0.5 km
Dam Height = 46 m
Distance to Town = 22 km
Installed Capacity = 10.3 MW

Plant Design Flow = 25.2 m^3/s
T.L. Line Length = 2 km
Dam Length = 250 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Forebay reservoir may inundate portions of the Burgeo Access Road.
(ii) Salmon run at this site.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Bottom Brook

SITE NAME : SITE - 2 FILE : 3026

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.864466 MW
PENSTOCK LENGTH	: 500 M.
DESIGN FLOW	: 7.65 M^3/S
PENSTOCK DIAMETER	: 1.768312 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 24 M.
TRANSMISSION LINE LENGTH	: 7.5 KM.
LENGTH OF DAM	: 350 M.
ACCESS ROAD LENGTH	: 8 KM.
FLOOD FLOW	: 280 M^3/S
DISTANCE TO TOWN	: 40 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7670355

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
4872183	1284373	144180.8	421916.8	210000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
514153.9	1225218	367565.3	743755.4	498570.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2355615	1293616	542434

PROJECT COST: $ 1.447358E+07 COST PER KW: $ 5052.804

Total Project Cost = $ 14,473,580

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 3026

1. Site Identification:

River Basin: Bottom Brook Site: S.2

2. Location:

Lat. 48° 32' 30" Long. 58° 04' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 134 km^2, MAR = 1200 mm, ACLS = 42 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5.10 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 230 m^3/s

Q1000 = 280 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 500 m
Access Road Length = 8 km
Dam Height = 24 m
Distance to Town = 40 km
Installed Capacity = 2.9 MW

Plant Design Flow = 7.65 m^3/s
T.L. Line Length = 7.5 km
Dam Length = 350 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes diversion of North Brook...cost of diversion dam included in above data, cost of side hill canal must be added.

(ii) Scheme would be much enhanced by Diversion from Island Pond (d.a. = 56 km^2).

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WATER SHED : Mint Brook

SITE NAME : SITE - 1 FILE : 3027

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.64835 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 13.5 M^3/S
PENSTOCK DIAMETER	: 2.640957 M.
RATED HEAD	: 15 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 255 M^3/S
DISTANCE TO TOWN	: 8 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 8 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6423033

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
796845.9	SEE DAM	240387.8	3401926	191250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
516928.6	1231830	369549	127000	241410.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	103922.9	752121.7	258478.7

PROJECT COST: $ 8231651 COST PER KW: $ 4993.874

Total Project Cost = $ 8,231,651

MAP NUMBER 2 D/09 DATA SHEET FILE NUMBER 3027

1. Site Identification:

River Basin: Mint Brook Site: S.1

2. Location:

Lat. 48° 44' 00" Long. 54° 18' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 336 km^2, MAR = 850 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 9.0 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 255 m^3/s

Q1000 = 395 m^3/s

4. Site Data:

Rated Head = 15 m
Penstock Length = 1000 m
Access Road Length = 1 km
Dam Height = 6 m
Distance to Town = 8 km
Installed Capacity = 1.7 MW

Plant Design Flow = 13.5 m^3/s
T.L. Line Length = 3 km
Dam Length = 200 m
Distance to Concrete Plant = 8 km

5. Remarks:

RIVER: Eel Brook

SITE: S.1

LAT: 49° 06' 00"

LONG: 55° 13' 00"

DRAINAGE AREA: 80.0 km²

HEAD: 90.0 m

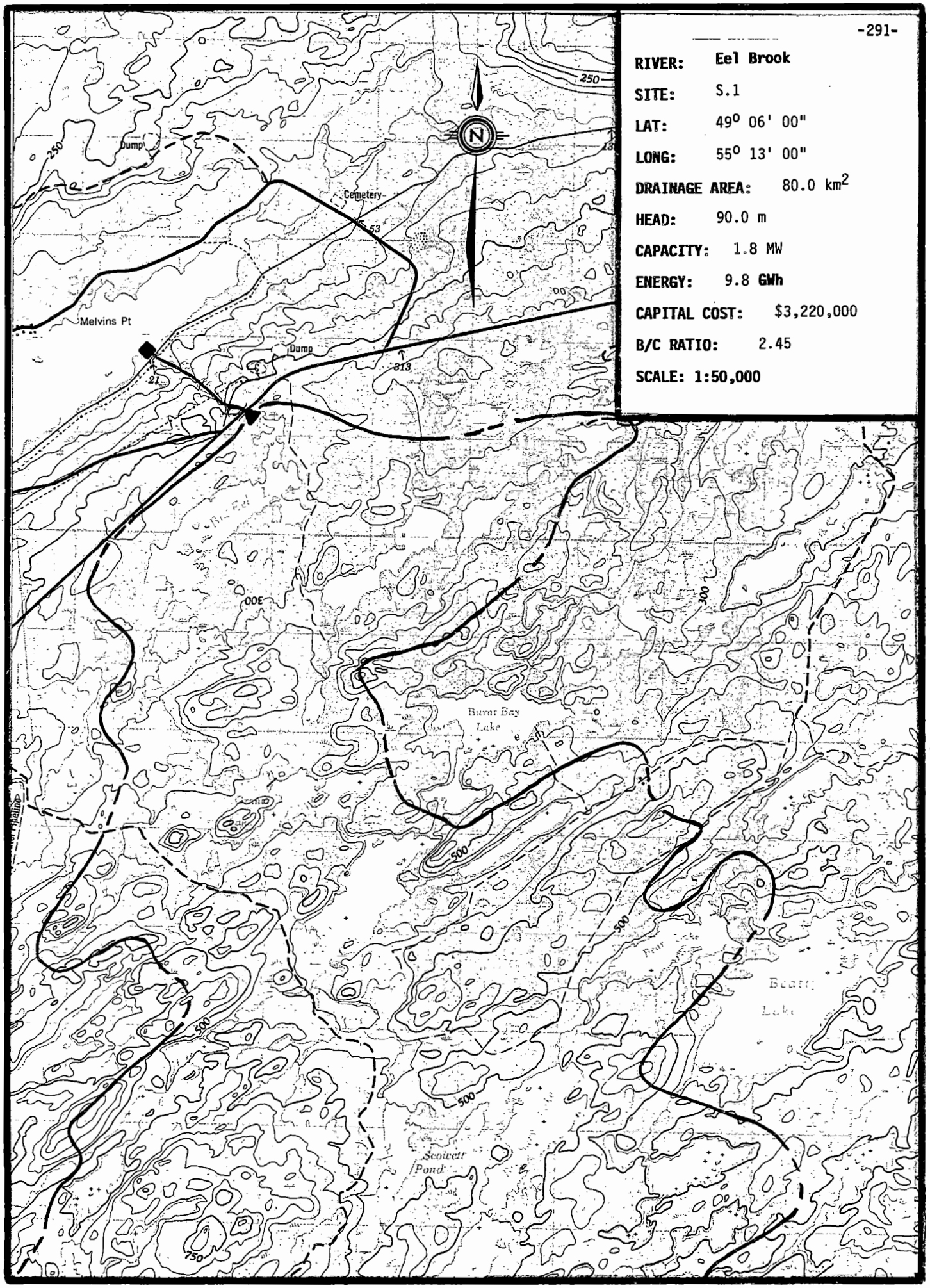
CAPACITY: 1.8 MW

ENERGY: 9.8 GWh

CAPITAL COST: $3,220,000

B/C RATIO: 2.45

SCALE: 1:50,000



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ShawMont Newfoundland Limited
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WATER SHED : Eel Brook

SITE NAME : SITE 1 FILE : 3028

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.813185 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 2.475 M^3/S
PENSTOCK DIAMETER	: .9908638 M.
RATED HEAD	: 90 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 60 M.
ACCESS ROAD LENGTH	: 0 KM.
FLOOD FLOW	: 56 M^3/S
DISTANCE TO TOWN	: 5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 20 KM.
USEFUL TURBINE FLOW RATIO	: .9299999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4469480

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
269639.7	SEE DAM	52219.13	1027357	42000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
295156.6	703352	211005.6	0	170125.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	33415.66	316014.7	101000.4

PROJECT COST: $ 3221287 COST PER KW: $ 1776.591

Total Project Cost = $ 3,221,287

MAP NUMBER 2 E/3 DATA SHEET FILE NUMBER 3028

1. Site Identification:

River Basin: EEL Brook Site: S.1

2. Location:

Lat. 49° 06' 00" Long. 55° 13' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 80 km^2, MAR = 650 mm, ACLS = 40 %

Storage Reservoir Area = 1 km^2

Storage Reservoir Vol, V = 6 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.115$$

Mean Flow, QAV = 1.65 m^3/s

Usable Flow Ratio = .93

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 56 m^3/s

Q1000 = 75 m^3/s

4. Site Data:

Rated Head	= 90 m	Plant Design Flow	= 2.5 m^3/s
Penstock Length	= 1000 m		
Access Road Length	= - km	T.L. Line Length	= 1 km
Dam Height	= 6 m	Dam Length	= 60 m
Distance to Town	= 5 km	Distance to Concrete Plant	= 20 km
Installed Capacity	= 1.9 MW		

5. Remarks:

An added 25 sq. km drainage area can be gained by diversion of Templeman and Beatty Lakes (not investigated).

RIVER: North West River (Great Gull River)

SITE: S.3

LAT: 48° 34' 00"

LONG: 55° 21' 00"

DRAINAGE AREA: 350 km²

HEAD: 30.0 m

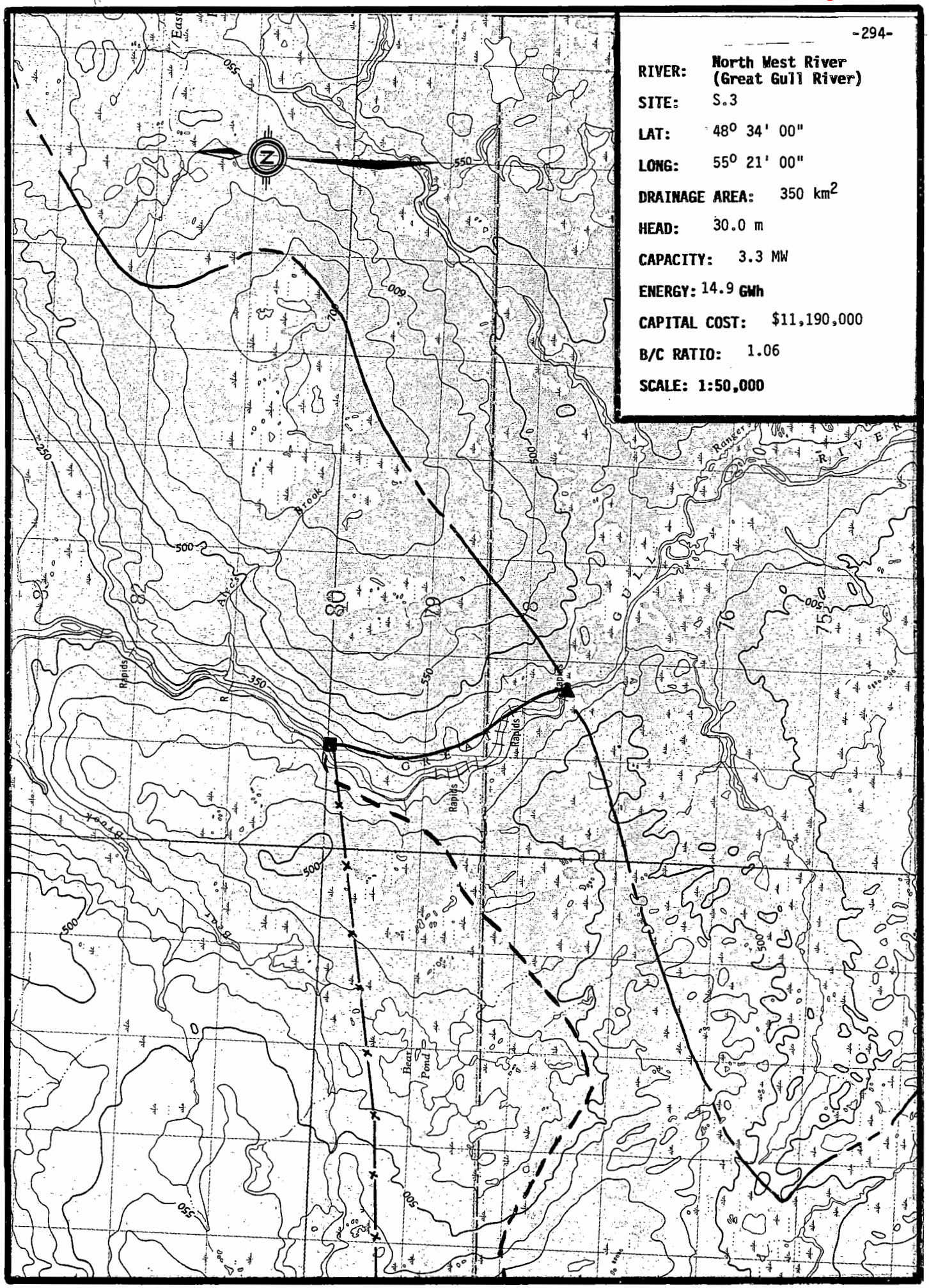
CAPACITY: 3.3 MW

ENERGY: 14.9 GWh

CAPITAL COST: $11,190,000

B/C RATIO: 1.06

SCALE: 1:50,000



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ShawMont Newfoundland Limited
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WATER SHED : North West River (Great Gull River)

SITE NAME : SITE 3 FILE : 3029

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.260069 MW
PENSTOCK LENGTH	: 2300 M.
DESIGN FLOW	: 13.35 M^3/S
PENSTOCK DIAMETER	: 2.385231 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 24 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 12 KM.
FLOOD FLOW	: 160 M^3/S
DISTANCE TO TOWN	: 54 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 54 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9474412

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
427019.5	SEE DAM	237982.6	2619385	120000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
653723.8	1557810	467343	1049803	1173492

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	994237.8	1318884	572452.8

PROJECT COST: $ 1.119213E+07 COST PER KW: $ 3433.097

Total Project Cost = $ 11,192,130

MAP NUMBER 2 D/11 DATA SHEET FILE NUMBER 3029

1. Site Identification:

River Basin: North West River (Great Gull River) Site: S.3

2. Location:

Lat. 48° 34' 00" Long. 55° 21' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 350 km^2, MAR = 800 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 8.9 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 160 m^3/s

Q1000 = 220 m^3/s

4. Site Data:

Rated Head = 30 m

Penstock Length = 2300 m

Access Road Length = 12 km

Dam Height = 6 m

Distance to Town = 54 km

Installed Capacity = 3.3 MW

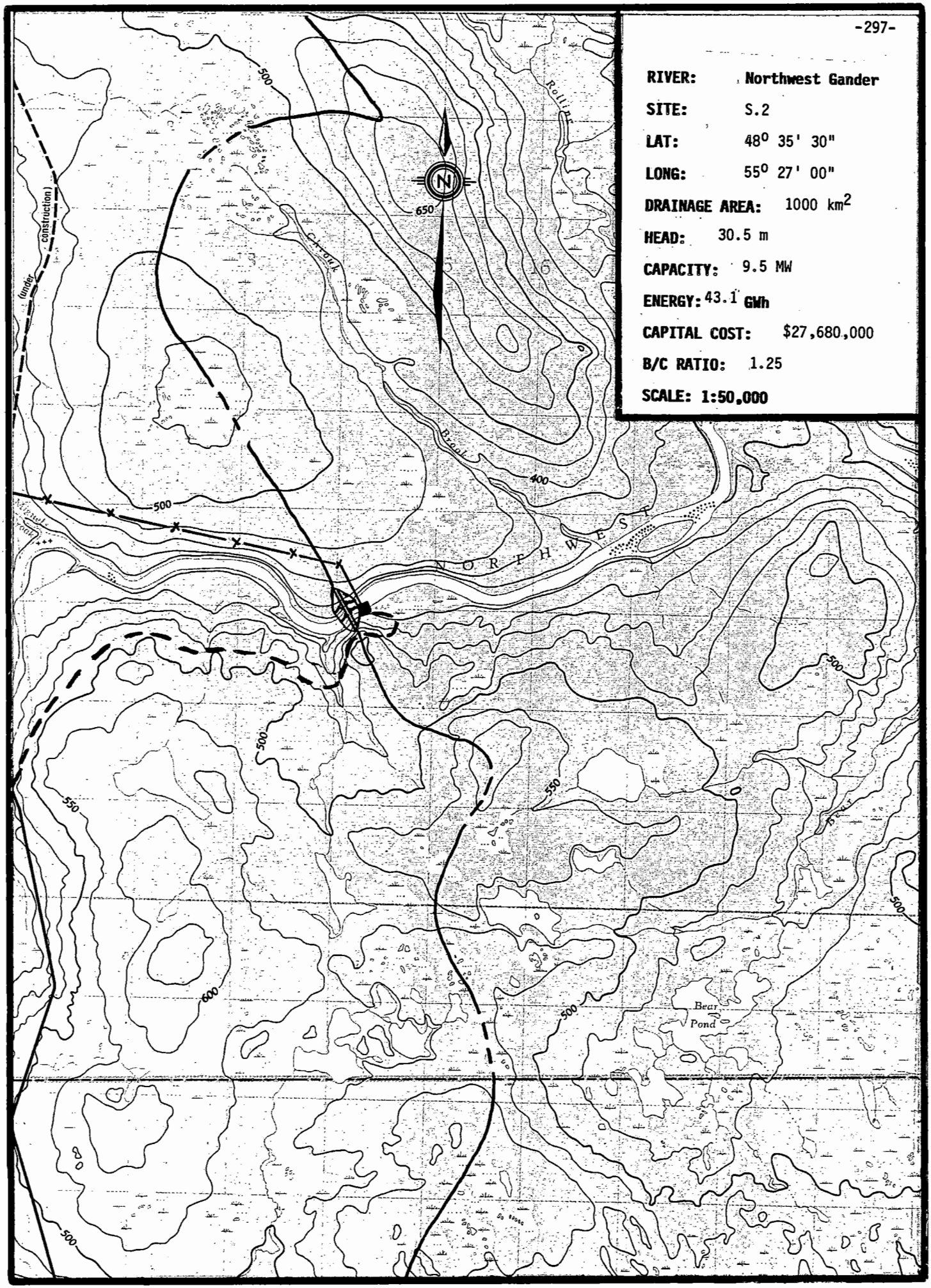
Plant Design Flow = 13 m^3/s

T.L. Line Length = 24 km

Dam Length = 100 m

Distance to Concrete Plant = 54 km

5. Remarks:


RIVER: Northwest Gander
SITE: S.2
LAT: 48° 35' 30"
LONG: 55° 27' 00"
DRAINAGE AREA: 1000 km2
HEAD: 30.5 m
CAPACITY: 9.5 MW
ENERGY: 43.1 GWh
CAPITAL COST: $27,680,000
B/C RATIO: 1.25
SCALE: 1:50,000
N
650
500
400
550
600
Rollins
Brook
Brook
NORTHWEST
Bear
Pond
(under construction)

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northwest Gander

SITE NAME : SITE 2 FILE : 3030

SITE DATA

INSTALLED CAPACITY	: 9.459086 MW
PENSTOCK LENGTH	: 130 M.
DESIGN FLOW	: 38.1 M^3/S
PENSTOCK DIAMETER	: 3.735651 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 450 M.
ACCESS ROAD LENGTH	: 4.5 KM.
FLOOD FLOW	: 500 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.260147E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
8535213	2348952	611567.6	709051.7	375000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1523225	3046451	909388.4	456072.9	1173897

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	4174470	2209745	1611188

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.768422E+07 COST PER KW: $ 2926.734

Total Project Cost = $ 27,684,220

MAP NUMBER 2 D/11 DATA SHEET FILE NUMBER 3030

1. Site Identification:

River Basin: Northwest Gander Site: S.2

2. Location:

Lat. 48° 35.5' 00" Long. 55° 27' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 1000 km^2, MAR = 800 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 25.4 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 370 m^3/s

Q1000 = 500 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 130 m
Access Road Length = 4.5 km
Dam Height = 30 m
Distance to Town = 50 km
Installed Capacity = 9.3 MW

Plant Design Flow = 38.0 m^3/s
T.L. Line Length = 20 km
Dam Length = 450 m
Distance to Concrete Plant = 50 km

5. Remarks:

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WATER SHED : North West Gander

SITE NAME : SITE 1 FILE : 3031

SITE DATA

INSTALLED CAPACITY	: 7.634302 MW
PENSTOCK LENGTH	: 130 M.
DESIGN FLOW	: 30.75 M^3/S
PENSTOCK DIAMETER	: 3.406763 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 30.5 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 1250 M.
ACCESS ROAD LENGTH	: 1.5 KM.
FLOOD FLOW	: 300 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.895881E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2.195378E+07	1595063	504281	623696.5	225000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1270034	2540068	758229.1	179259.1	845852.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	7735048	3361241	2284340

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 4.441589E+07 COST PER KW: $ 5817.938

Total Project Cost = $ 44,415,890

MAP NUMBER 2 D/12 DATA SHEET FILE NUMBER 3031

1. Site Identification:

River Basin: Northwest Gander Site: S.1

2. Location:

Lat. 48° 31' 00" Long. 55° 31' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 808 km^2, MAR = 800 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 20.5 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 300 m^3/s

Q1000 = 400 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 130 m
Access Road Length = 1.5 km
Dam Height = 30.5 m
Distance to Town = 50 km
Installed Capacity = 7.7 MW

Plant Design Flow = 30.7 m^3/s
T.L. Line Length = 15 km
Dam Length = 1250 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Relocation of 1.8 km of Route 2 is estimated to cost $540,000.

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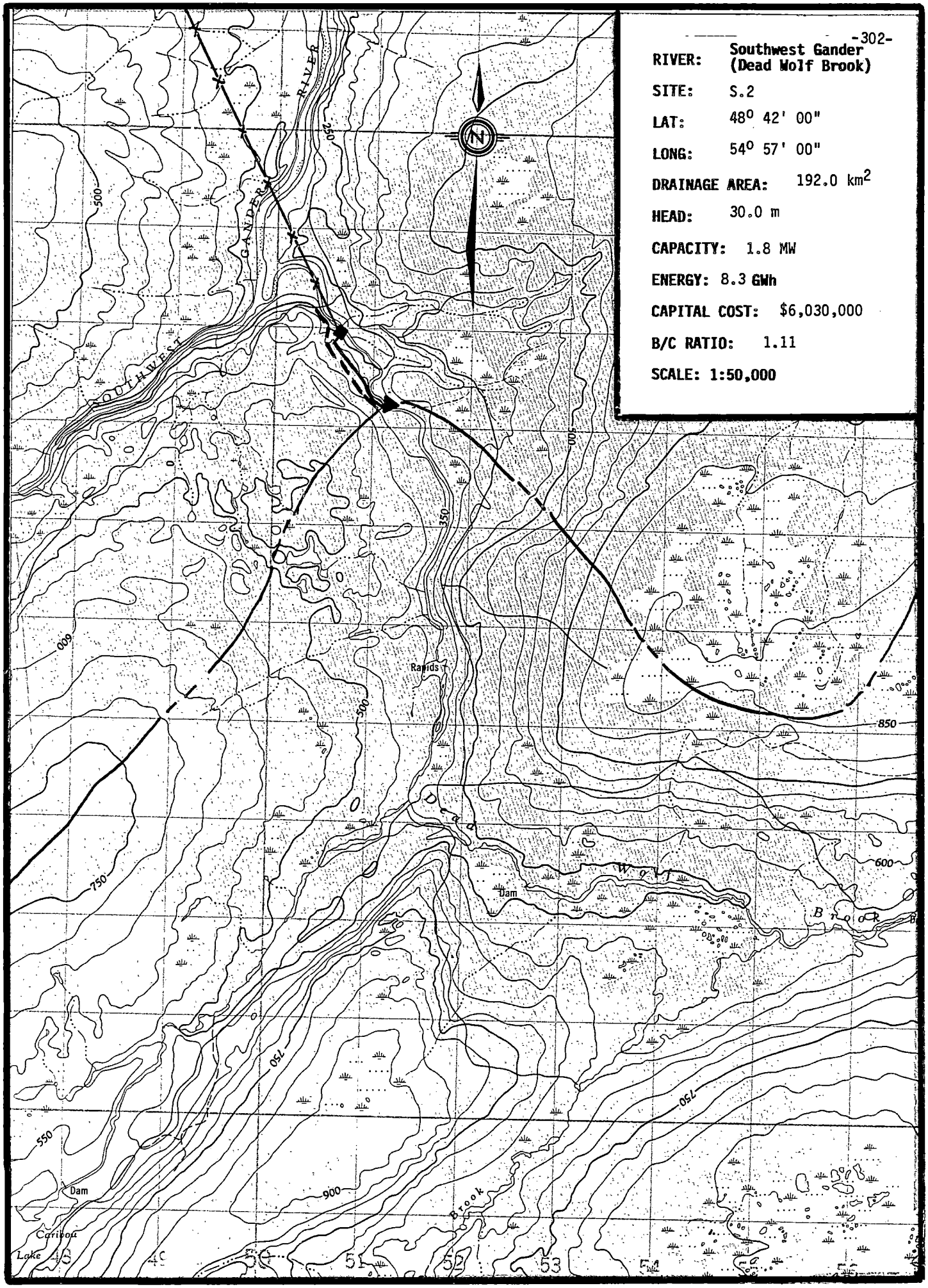
RIVER:	Southwest Gander (Dead Wolf Brook)
SITE:	S.2
LAT:	48° 42' 00"
LONG:	54° 57' 00"
DRAINAGE AREA:	192.0 km^2
HEAD:	30.0 m
CAPACITY:	1.8 MW
ENERGY:	8.3 GWh
CAPITAL COST:	$6,030,000
B/C RATIO:	1.11
SCALE:	1:50,000



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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Southwest Gander (Dead Wolf Brook)

SITE NAME : SITE 2 FILE : 3032

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.8315 MW
PENSTOCK LENGTH	: 800 M.
DESIGN FLOW	: 7.5 M^3/S
PENSTOCK DIAMETER	: 1.861444 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 35 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 190 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5904837

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
427019.5	SEE DAM	141633.9	710639	142500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
436616.7	1040448	312134.5	127000	1313018

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	496178.1	651861	226356.1

PROJECT COST: $ 6025405 COST PER KW: $ 3289.875

Total Project Cost = $ 6,025,405

MAP NUMBER 2 D/10 DATA SHEET FILE NUMBER 3032

1. Site Identification:

River Basin: Southwest Gander (Dead Wolf) Site: S.2

2. Location:

Lat. 48° 42' 00" Long. 54° 57' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 192 km^2, MAR = 800 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 5 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 190 m^3/s

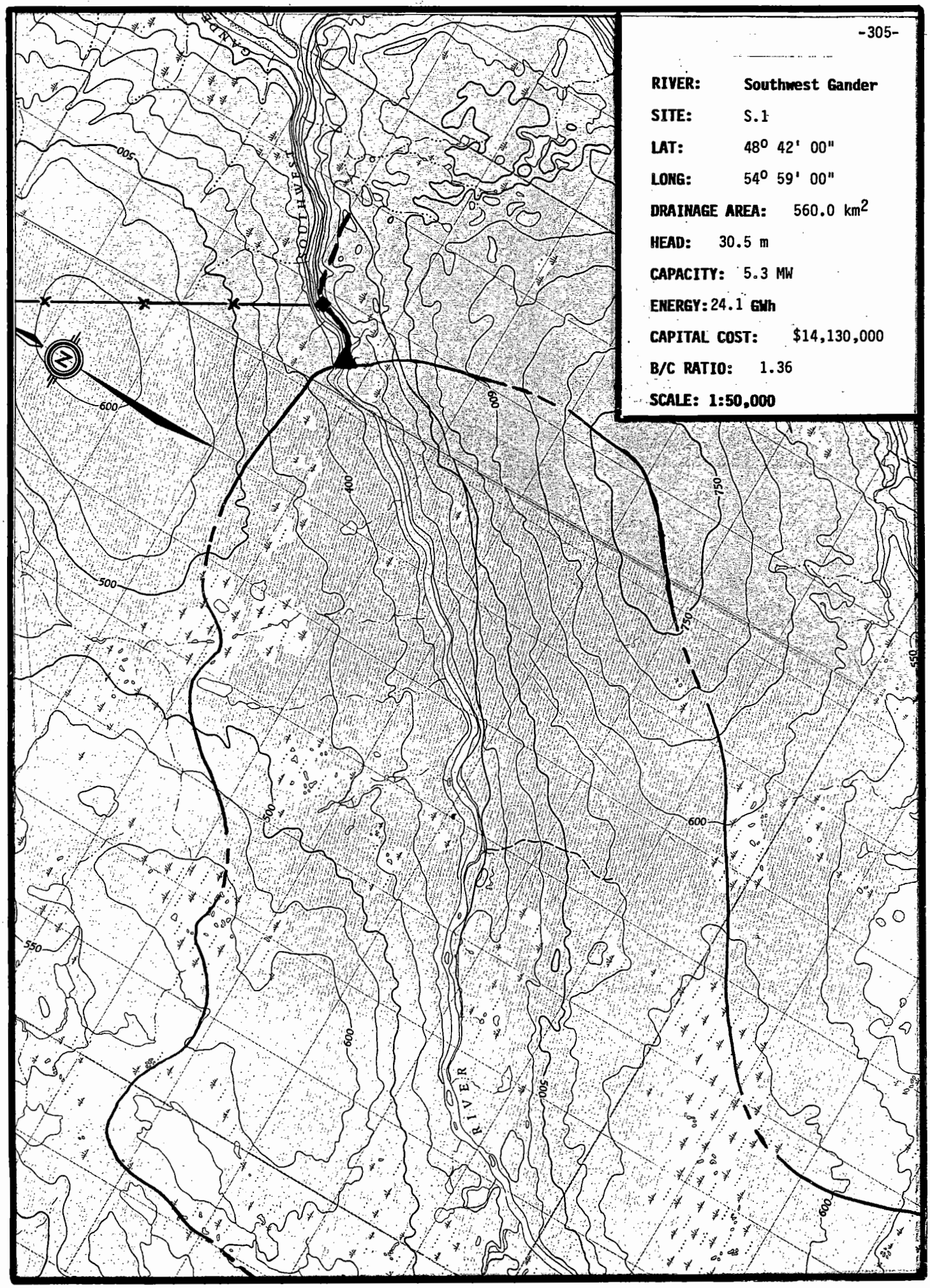
Q1000 = 250 m^3/s

4. Site Data:

Rated Head = 30 m
Penstock Length = 800 m
Access Road Length = 1 km
Dam Height = 6 m
Distance to Town = 50 km
Installed Capacity = 1.9 MW

Plant Design Flow = 7.5 m^3/s
T.L. Line Length = 35 km
Dam Length = 100 m
Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Southwest Gander

SITE: S.1

LAT: 48° 42' 00"

LONG: 54° 59' 00"

DRAINAGE AREA: 560.0 km^2

HEAD: 30.5 m

CAPACITY: 5.3 MW

ENERGY: 24.1 GWh

CAPITAL COST: $14,130,000

B/C RATIO: 1.36

SCALE: 1:50,000

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Updated Sept. '86 by H.J.Keats

WATER SHED : Southwest Gander

SITE NAME : SITE 1 FILE : 3033

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 5.288151 MW
PENSTOCK LENGTH	: 500 M.
DESIGN FLOW	: 21.3 M^3/S
PENSTOCK DIAMETER	: 2.909187 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 35 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 380 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.402973E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1523473	1204435	362371.1	1934805	285000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
929753.4	2082648	621685.9	127000	1619205

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1610399	1225327	607124.8

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.413323E+07 COST PER KW: $ 2672.621

Total Project Cost = $ 14,133,230

MAP NUMBER 2 D/10 DATA SHEET FILE NUMBER 3033

1. Site Identification:

River Basin: Southwest Gander Site: S.1

2. Location:

Lat. 48° 42' Long. 54° 59' Hydrologic Region 3

3. Hydrologic Data:

A = 560 km^2, MAR = _____ mm, ACLS = 60 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 14.2 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 280 m^3/s

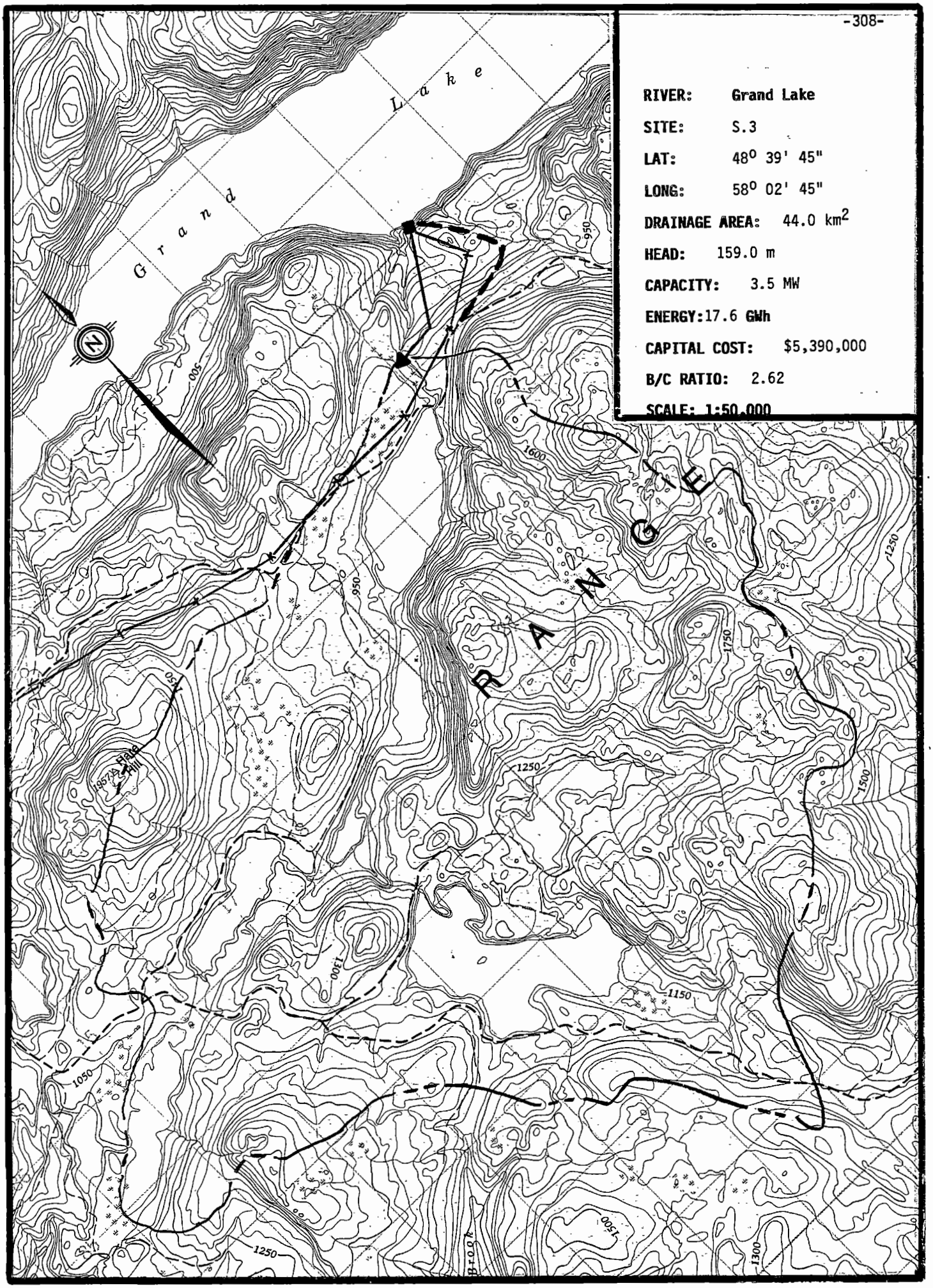
Q1000 = 380 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 500 m
Access Road Length = 1 km
Dam Height = 15 m
Distance to Town = 50 km
Installed Capacity = 5.4 MW

Plant Design Flow = 21.3 m^3/s
T.L. Line Length = 35 km
Dam Length = 200 m
Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Grand Lake

SITE: S.3

LAT: 48° 39' 45"

LONG: 58° 02' 45"

DRAINAGE AREA: 44.0 km²

HEAD: 159.0 m

CAPACITY: 3.5 MW

ENERGY: 17.6 GWh

CAPITAL COST: $5,390,000

B/C RATIO: 2.62

SCALE: 1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Grand Lake

SITE NAME : SITE - 3 FILE : 3034

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.513916 MW
PENSTOCK LENGTH	: 1375 M.
DESIGN FLOW	: 2.715 M^3/S
PENSTOCK DIAMETER	: .9521295 M.
RATED HEAD	: 159 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 10.5 KM.
LENGTH OF DAM	: 69 M.
ACCESS ROAD LENGTH	: 6.5 KM.
FLOOD FLOW	: 38 M^3/S
DISTANCE TO TOWN	: 14 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .8599999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6684721

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
218745.9	SEE DAM	56755.09	1350252	28500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
384319.9	915826.2	274747.9	623418.8	666834.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	170628.3	501645.8	199116.5

PROJECT COST: $ 5390791 COST PER KW: $ 1534.127

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 3034

1. Site Identification:

River Basin: Grand Lake Site: S.3

2. Location:

Lat. 48° 39' 45" Long. 58° 02' 45" Hydrologic Region 3

3. Hydrologic Data:

A = 44 km^2, MAR = 1300 mm, ACLS = 100 %

Storage Reservoir Area = 1.2 km^2

Storage Reservoir Vol, V = 2.4 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.04

Mean Flow, QAV = 1.81 m^3/s

Usable Flow Ratio = 0.86

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 38 m^3/s Q_2 = 18

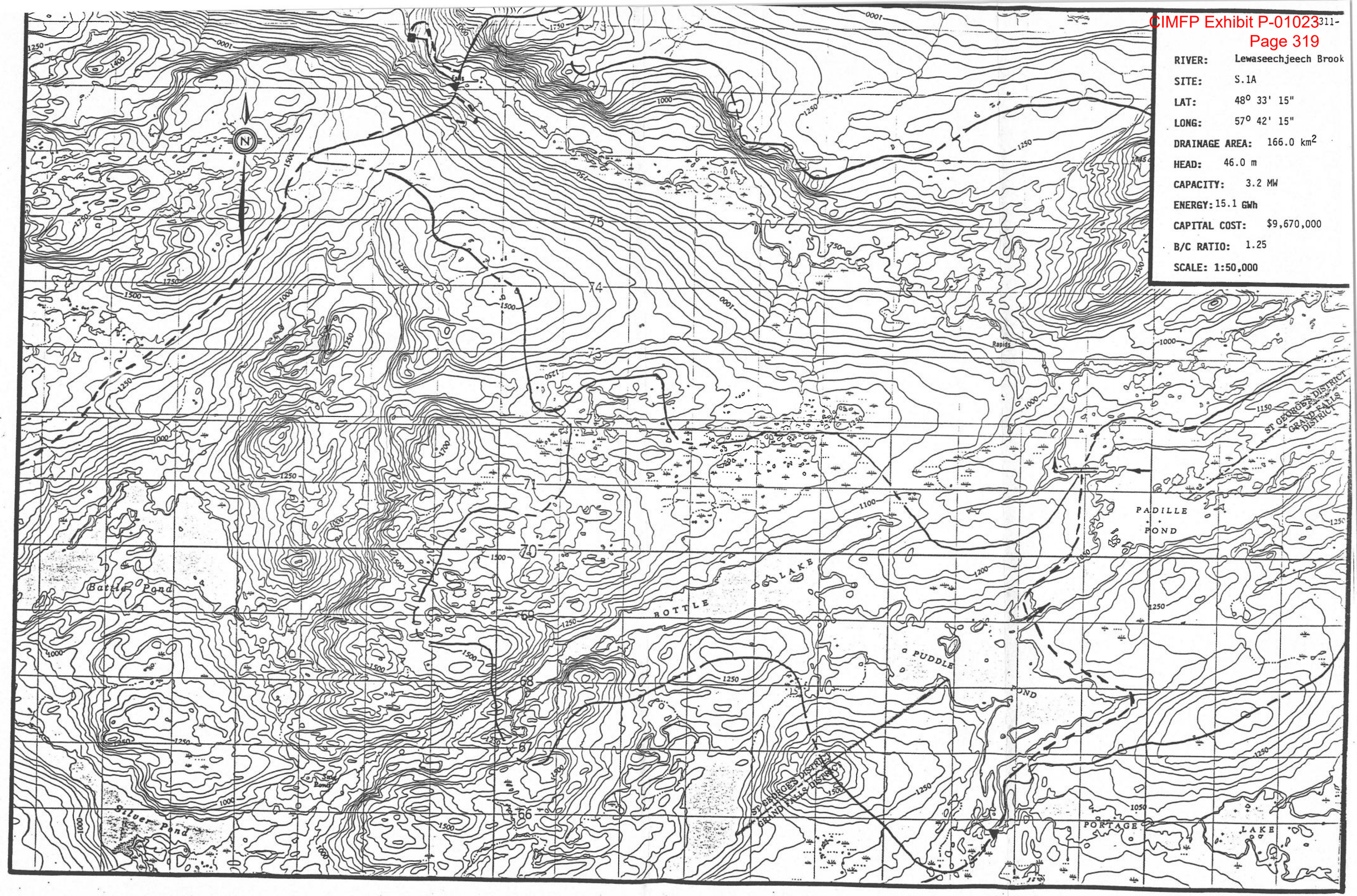
Q1000 = 45 m^3/s

4. Site Data:

Rated Head = 159 m
Penstock Length = 1357 m
Access Road Length = 6.5 km
Dam Height = 4.8 m
Distance to Town = 14 km
Installed Capacity = 3.5 MW

Plant Design Flow = 2.72 m^3/s
T.L. Line Length = 10.5 km
Dam Length = 69 m
Distance to Concrete Plant = 50 km

5. Remarks:



RIVER: Lewaseechjeech Brook

SITE: S.1A

LAT: 48° 33' 15"

LONG: 57° 42' 15"

DRAINAGE AREA: 166.0 km^2

HEAD: 46.0 m

CAPACITY: 3.2 MW

ENERGY: 15.1 GWh

CAPITAL COST: $9,670,000

B/C RATIO: 1.25

SCALE: 1:50,000

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ShawMont Newfoundland Limited
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WATER SHED : Lewaseechjeech Brook

SITE NAME : SITE - 1A FILE : 3036

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.229545 MW
PENSTOCK LENGTH	: 1125 M.
DESIGN FLOW	: 8.625 M^3/S
PENSTOCK DIAMETER	: 1.861919 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 9 KM.
LENGTH OF DAM	: 93 M.
ACCESS ROAD LENGTH	: 15 KM.
FLOOD FLOW	: 112 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8463218

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
341081.5	SEE DAM	160618.4	999591.8	84000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
559192.8	1332544	399763.3	1269057	584809.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	915231.1	828106	340345.2

PROJECT COST: $ 9669941 COST PER KW: $ 2994.212

Total Project Cost = $ 9,669,941

WATER SHED : Lewaseechjeech Brook SITE - 1A

COST DATA

(ADDITIONAL COST of $ 1,855,600 for Diversion INCLUDED)

INTEREST RATE : 10 REVENUE, $ PER MWH : 100
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5333334

ANNUAL COST : $ 1112043

ANNUAL BENEFIT : $ 1508844

BENEFIT/COST RATIO: 1.356821

Total Project Cost = $ 9,669,941.00

Benefit / Cost Ratio = 1.36

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3036

1. Site Identification:

River Basin: Lewaseechjeech Brook Site: S.1A

2. Location:

Lat. 48° 33' 15" Long. 57° 42' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 96 + 70 / 166 km^2, MAR = 1092 mm, ACLS = 40 %

Storage Reservoir Area = 0.8 km^2

Storage Reservoir Vol, V = 1.6 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.009$$

Mean Flow, QAV = 5.57 m^3/s

Usable Flow Ratio = 0.80

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 112 m^3/s

Q1000 = 154 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 1125 m
Access Road Length = 15 km
Dam Height = 5.4 m
Distance to Town = 50 km
Installed Capacity = 3.2 MW

Plant Design Flow = 8.6 m^3/s
T.L. Line Length = 9 km
Dam Length = 93 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes diversion of 70 km^2 from Padille Lake at cost of $1,855, 600.

(ii) Little Grand lake and vicinity is last strong hold of Nfld. pine marten.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Lewaseechjeech S.1 = 46 m; Deer Lake = 77 m; Grand Falls+Bishops = 45 m Region: 3

Net Developed Head, H = 78.0 m Map: 12A5

Diverted Area = 70 km^2, MAR = 1150 mm, from Padille Lake

Location: Lat. = 48° 26' 45" Long. = 57° 34' 30"

Mean Diverted Flow = 2.55 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 2.55 = 1.99 m^3/s

Additional Energy = H x Q* x 0.0716

= 78 x 1.99 x 0.0716 = 11.1 GWh p.a.

Dam: Height = 4.0 m, Length = 100 m, Q150 = 60 m^3/s

Canal: Height of Land = 3 m, Length = 250 m

Design Flow Ratio = 1.5 Design Flow = 3.83 m^3/s

Access Road: Length = 20 km from S.W. Brook - Burgeo Road

Costs:	Dam + Spillway	= 279,600
	Diversion Canal	= 117,600
	Access Road	= 800,000
	Sub-total Direct Costs	= 1,197,200
	Total Cost Diversion	= 1,855,600
	Additional Plant Costs	= 599,000 [from S.1 only]
	Total Project Cost	= 2,455,000

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = 3.62$$

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Lewaseechjeech Brook

SITE NAME : SITE - 2 FILE : 3037

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.63052 MW
PENSTOCK LENGTH	: 2175 M.
DESIGN FLOW	: 7.485 M^3/S
PENSTOCK DIAMETER	: 1.632898 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 5.9 M.
TRANSMISSION LINE LENGTH	: 9 KM.
LENGTH OF DAM	: 91 M.
ACCESS ROAD LENGTH	: 18.5 KM.
FLOOD FLOW	: 80 M^3/S
DISTANCE TO TOWN	: 55 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.005112E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
382366	SEE DAM	141378.9	4020560	60000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
603648.2	1438481	431544.3	1516699	672040

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1015419	1025522	472394.3

PROJECT COST: $ 1.178005E+07 COST PER KW: $ 2544.002

Total Project Cost = $ 11,780,050

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3037

1. Site Identification:

River Basin: Lewaseechjeech Brook Site: S.2

2. Location:

Lat. 48° 34' 40" Long. 57° 39' 55" Hydrologic Region 3

3. Hydrologic Data:

A = 150 km^2, MAR = 1050 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.99 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 80 m^3/s

Q1000 = 102 m^3/s

Q_2 = 40

4. Site Data:

Rated Head = 76 m

Penstock Length = 2175 m

Access Road Length = 18.5 km

Dam Height = 5.9 m

Distance to Town = 55 km

Installed Capacity = 4.6 MW

Plant Design Flow = 7.49 m^3/s

T.L. Line Length = 9 km

Dam Length = 91 m

Distance to Concrete Plant = 60 km

5. Remarks:

(i) T.W.L. governed by optimum FSL at Little Grand Lake.

(ii) Diversions: from Lake of the Hills, Lat. 48° 33' 15" (36 km^2)
Long. 57° 23' 45"

from Upper Star Lake, Lat. 48° 39' 00" (27 km^2)
Long. 57° 27' 30"

and from Red Indian Brook,
via Upper Star Lake, Lat. 48° 42' 30" (38 km^2)
Long. 57° 29' 50"

Flows better used via Star Lake & Red Indian Brook developments, not tested.

(iii) Habitat for Newfoundland Pine Marten.

RIVER: Lewaseechjeech Brook

SITE: S.2

LAT: 48° 34' 40"

LONG: 57° 39' 55"

DRAINAGE AREA: 150.0 km²

HEAD: 76.0 m

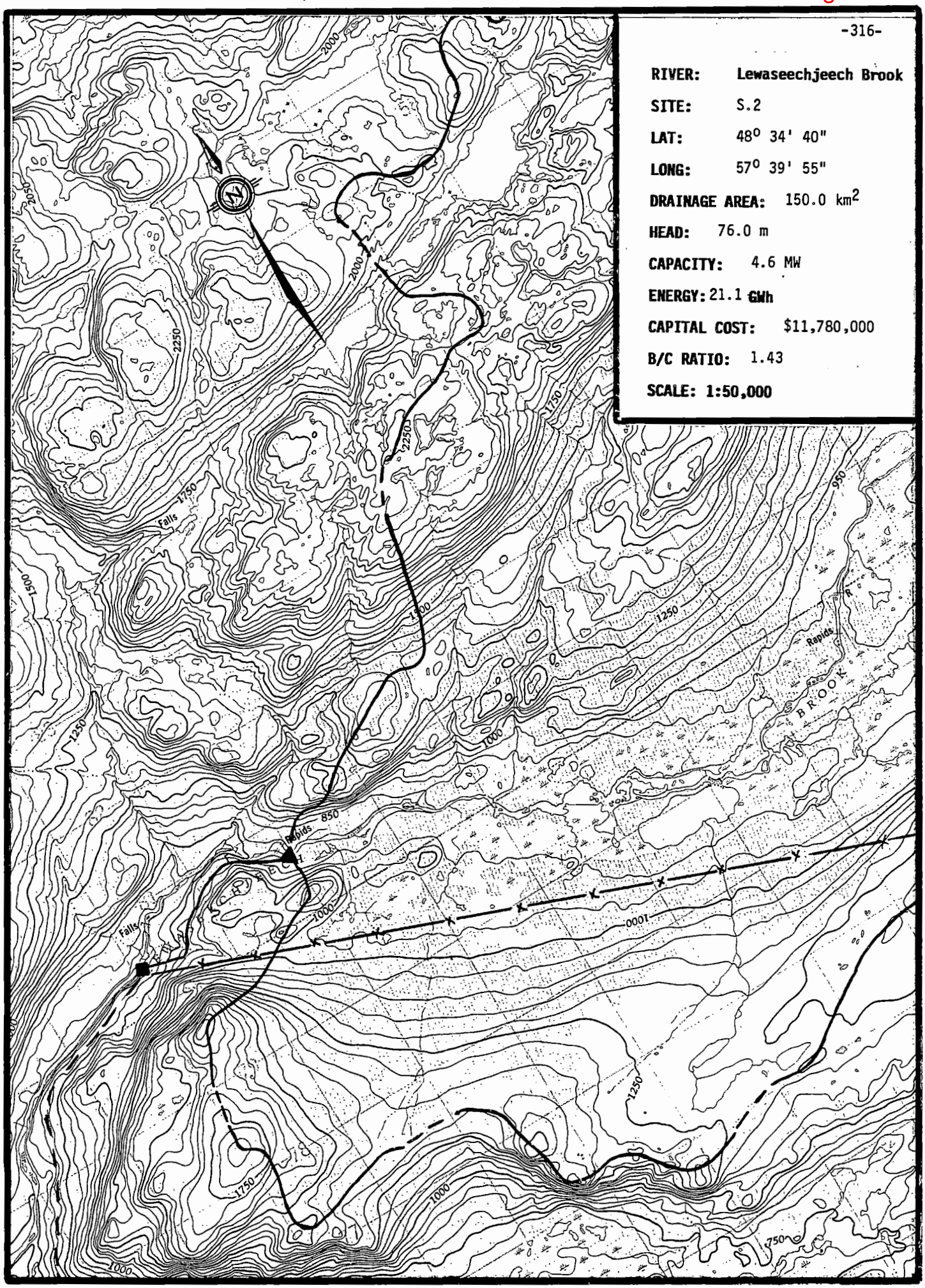
CAPACITY: 4.6 MW

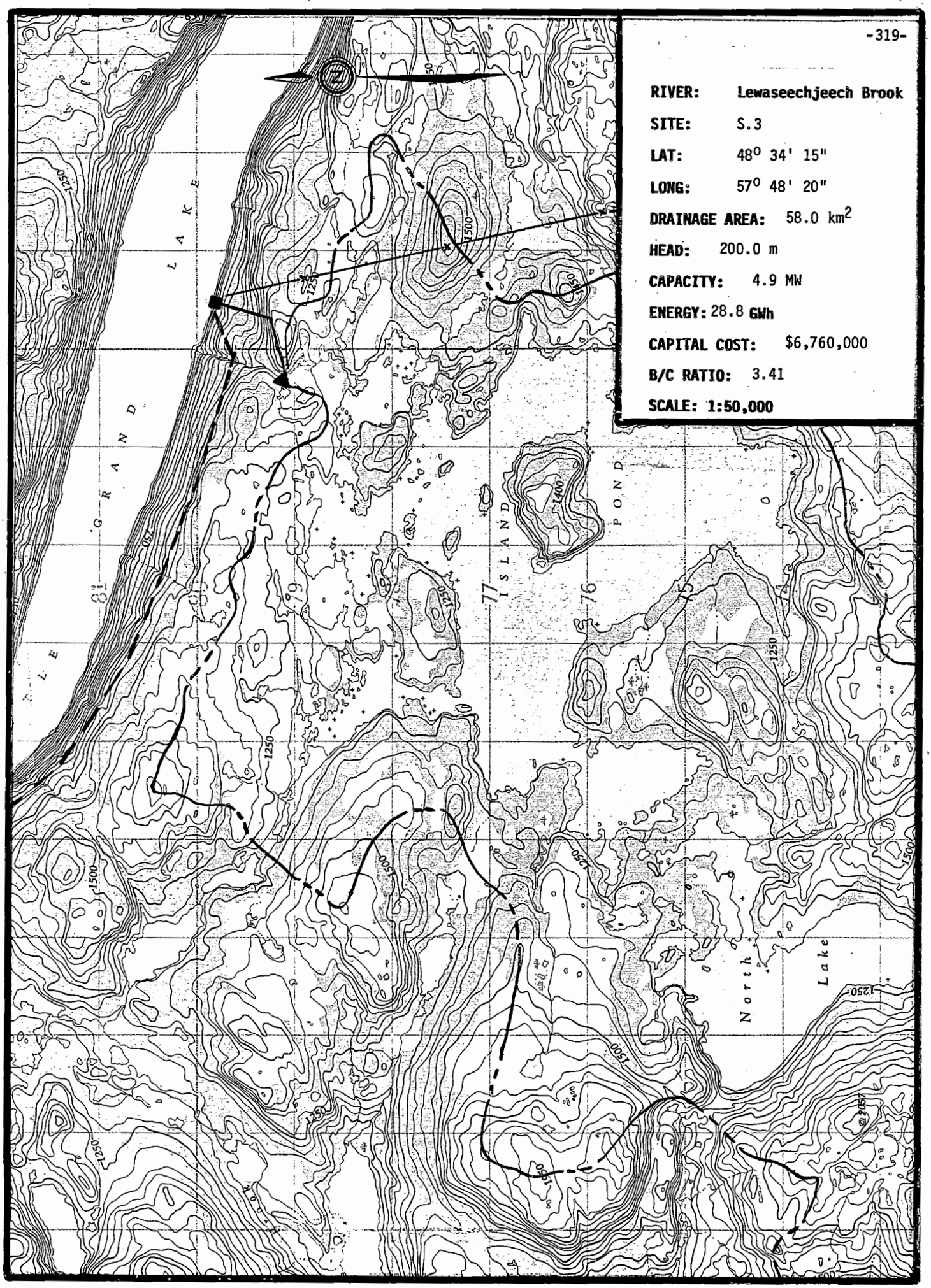
ENERGY: 21.1 GWh

CAPITAL COST: $11,780,000

B/C RATIO: 1.43

SCALE: 1:50,000





RIVER: Lewaseechjeech Brook

SITE: S.3

LAT: 48° 34' 15"

LONG: 57° 48' 20"

DRAINAGE AREA: 58.0 km²

HEAD: 200.0 m

CAPACITY: 4.9 MW

ENERGY: 28.8 GWh

CAPITAL COST: $6,760,000

B/C RATIO: 3.41

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Lewaseechjeech Brook

SITE NAME : SITE - 3 FILE : 3039

SITE DATA

INSTALLED CAPACITY	: 4.93284 MW
PENSTOCK LENGTH	: 1275 M.
DESIGN FLOW	: 3.03 M^3/S
PENSTOCK DIAMETER	: .9665996 M.
RATED HEAD	: 200 M.
HEIGHT OF DAM	: 4.9 M.
TRANSMISSION LINE LENGTH	: 9 KM.
LENGTH OF DAM	: 70 M.
ACCESS ROAD LENGTH	: 15.5 KM.
FLOOD FLOW	: 37 M^3/S
DISTANCE TO TOWN	: 45 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: 1
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8343806

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
228466.9	SEE DAM	62648.46	1273585	27750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
449712.7	956835.6	287050.7	1304925	689009.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	598752.2	613802.4	271221.2

PROJECT COST: $ 6763760 COST PER KW: $ 1371.17

Total Project Cost = $ 6,763,760

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3039

1. Site Identification:

River Basin: Lewaseechjeech Brook Site: S.3

2. Location:

Lat. 48° 34' 15" Long. 57° 48' 20" Hydrologic Region 3

3. Hydrologic Data:

A = 58 km^2, MAR = 1100 mm, ACLS = 100 %

Storage Reservoir Area = 12.5 km^2

Storage Reservoir Vol, V = 25 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.40$$

Mean Flow, QAV = 2.02 m^3/s

Usable Flow Ratio = 1.00

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 37 m^3/s Q_2 = 18

Q1000 = 46 m^3/s

4. Site Data:

Rated Head = 200 m
Penstock Length = 1275 m
Access Road Length = 15.5 km
Dam Height = 4.9 m
Distance to Town = 45 km
Installed Capacity = 4.9 MW

Plant Design Flow = 3.03 m^3/s
T.L. Line Length = 9 km
Dam Length = 70 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) T.W.L. will be governed by eventual optimized FSL for Little Grand lake G.S.

(ii) Access via barge to power house might be worth considering.

(iii) Little Grand Lake area is home of remaining population of Newfoundland Pine Marten.

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WATER SHED : Indian Bay Brook

SITE NAME : SITE 1 FILE : 3042

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.30769 MW
PENSTOCK LENGTH	: 600 M.
DESIGN FLOW	: 18.9 M^3/S
PENSTOCK DIAMETER	: 3.052083 M.
RATED HEAD	: 15 M.
HEIGHT OF DAM	: 11 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 400 M.
ACCESS ROAD LENGTH	: 5 KM.
FLOOD FLOW	: 375 M^3/S
DISTANCE TO TOWN	: 7 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE\PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .84
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8463794

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1916518	991333.8	325407.6	2476852	281250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
654214.5	1558979	467693.7	498801.9	361562.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	415294.1	1001669	386656.4

PROJECT COST: $ 1.133623E+07 COST PER KW: $ 4912.372

Total Project Cost = $ 11,336,230

MAP NUMBER 2 F/04 DATA SHEET FILE NUMBER 3042

1. Site Identification:

River Basin: Indian Bay Brook Site: S.1

2. Location:

Lat. 49° 02' 30" Long. 53° 56' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 530 km^2, MAR = 750 mm, ACLS = 100 %

Storage Reservoir Area = 5 km^2

Storage Reservoir Vol, V = 10 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.03$$

Mean Flow, QAV = 12.6 m^3/s

Usable Flow Ratio = 0.84

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 275 m^3/s

Q1000 = 375 m^3/s

4. Site Data:

Rated Head	= 15 m	Plant Design Flow	= 18.5 m^3/s
Penstock Length	= 600 m		
Access Road Length	= 5 km	T.L. Line Length	= 5 km
Dam Height	= 11 m	Dam Length	= 490 m
Distance to Town	= 7 km	Distance to Concrete Plant	= 50 km
Installed Capacity	= 2.4 MW		

5. Remarks:

(i) Possible diversion @ Lat. 49° 10' 00", Long. 54° 06' 00" would add an additional 170 M^2 to D/A.

(ii) Salmon River.

RIVER: South Brook

SITE: S.1

LAT: 49° 16' 15"

LONG: 56° 08' 15"

DRAINAGE AREA: 370.0 km²

HEAD: 30.0 m

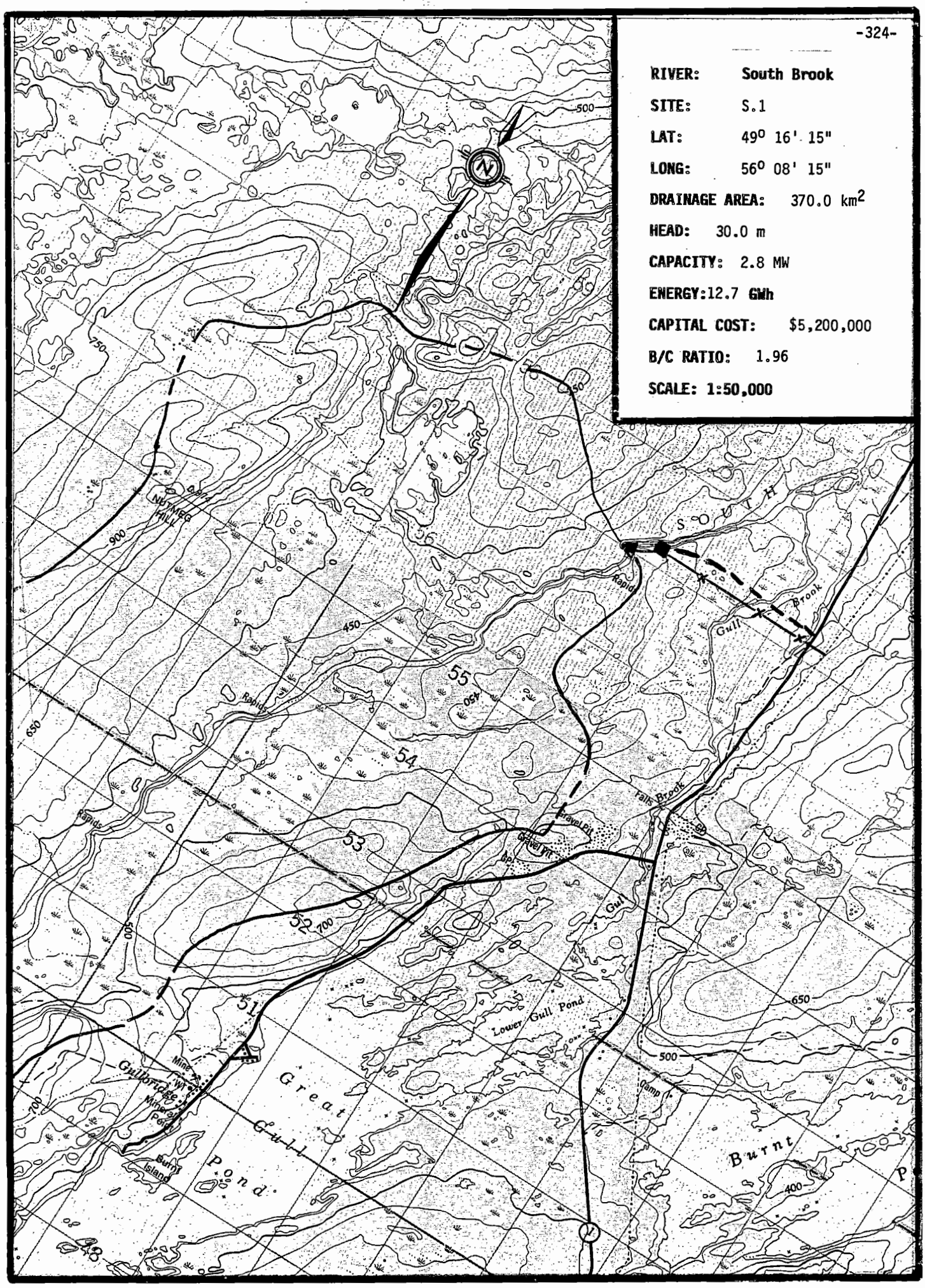
CAPACITY: 2.8 MW

ENERGY: 12.7 GWh

CAPITAL COST: $5,200,000

B/C RATIO: 1.96

SCALE: 1:50,000



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WATER SHED : South Brook

SITE NAME : SITE 1 FILE : 3043

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.791206 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 11.43 M^3/S
PENSTOCK DIAMETER	: 2.231174 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 6.5 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 114 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 200 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8341720

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
543089	SEE DAM	206944.4	319524.4	150000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
586394.3	1397365	419209.6	228917.6	259926.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	356826.2	531327.2	200378

PROJECT COST: $ 5199902 COST PER KW: $ 1862.959

Total Project Cost = $ 5,199,902

MAP NUMBER 12 H/08 DATA SHEET FILE NUMBER 3043

1. Site Identification:

River Basin: South Brook Site: S.1

2. Location:

Lat. 49° 16' 15" Long. 56° 08' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 370 km^2, MAR = 650 mm, ACLS = 20 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 7.62 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 200 m^3/s

Q1000 = 270 m^3/s

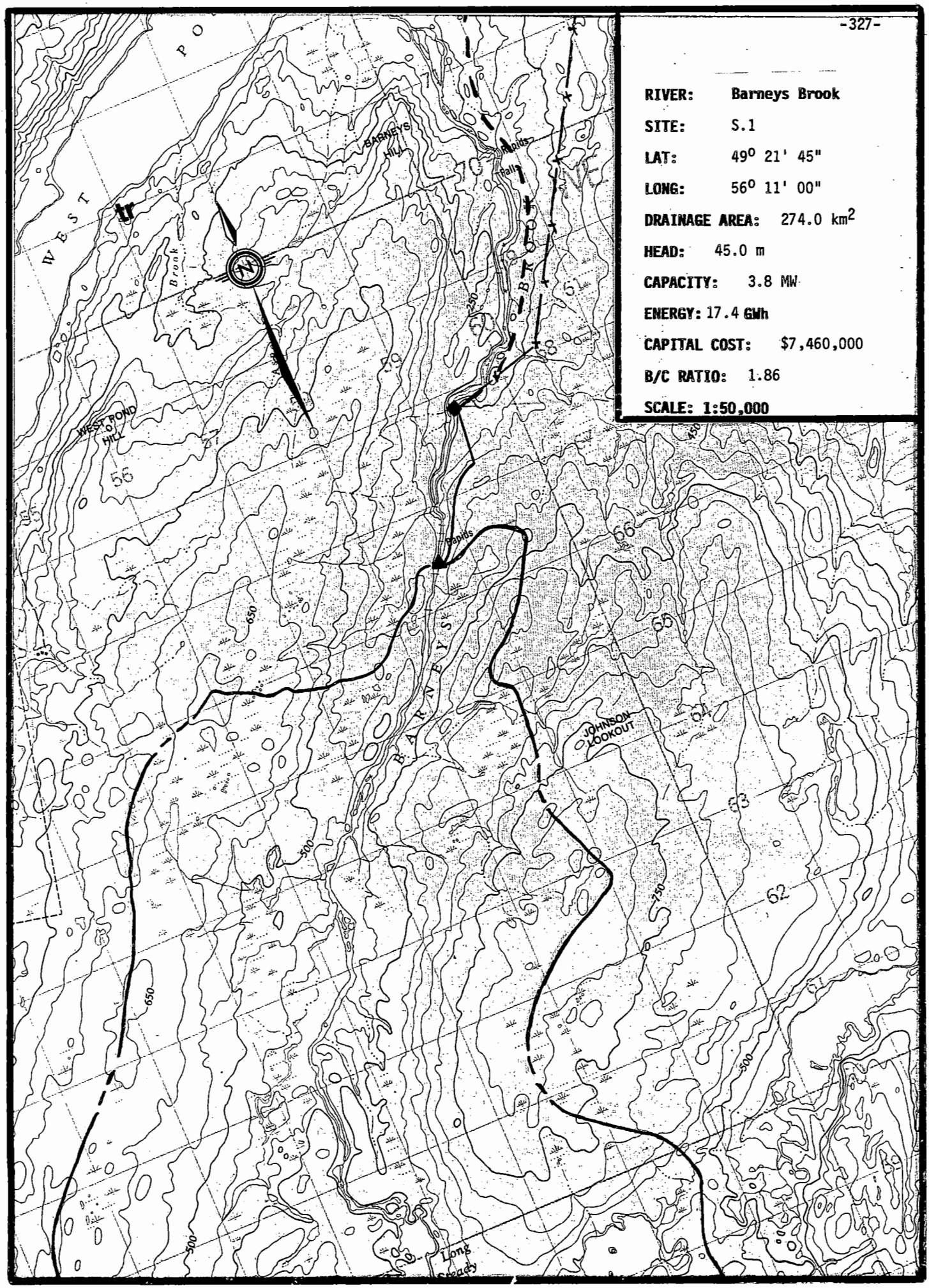
4. Site Data:

Rated Head = 30 m
Penstock Length = 300 m
Access Road Length = 2 km
Dam Height = 6.46 m
Distance to Town = 20 km
Installed Capacity = 2.8 MW

Plant Design Flow = 11.43 m^3/s
T.L. Line Length = 2 km
Dam Length = 114 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Site inaccessible to salmon.



RIVER: Barneys Brook

SITE: S.1

LAT: 49° 21' 45"

LONG: 56° 11' 00"

DRAINAGE AREA: 274.0 km^2

HEAD: 45.0 m

CAPACITY: 3.8 MW

ENERGY: 17.4 GWh

CAPITAL COST: $7,460,000

B/C RATIO: 1.86

SCALE: 1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Barneys Brook

SITE NAME : SITE 1 FILE : 3044

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.813183 MW
PENSTOCK LENGTH	: 1500 M.
DESIGN FLOW	: 10.41 M^3/S
PENSTOCK DIAMETER	: 2.024998 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 6.3 M.
TRANSMISSION LINE LENGTH	: 7 KM.
LENGTH OF DAM	: 95 M.
ACCESS ROAD LENGTH	: 7 KM.
FLOOD FLOW	: 91 M^3/S
DISTANCE TO TOWN	: 16 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9750877

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
439309.1	SEE DAM	190246.9	1449675	68250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
633001.6	1508430	452528.8	663952.5	535493.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	298370.3	856264.2	368216.7

PROJECT COST: $ 7463739 COST PER KW: $ 1957.351

Total Project Cost = $ 7,463,739

MAP NUMBER 12 H/08 DATA SHEET FILE NUMBER 3044

1. Site Identification:

River Basin: Barneys Brook Site: S.1

2. Location:

Lat. 49° 21' 45" Long. 56° 11' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 274 km^2, MAR = 800 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 6.94 m^3/s

Usable Flow Ratio = .78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 91 m^3/s

Q1000 = 125 m^3/s

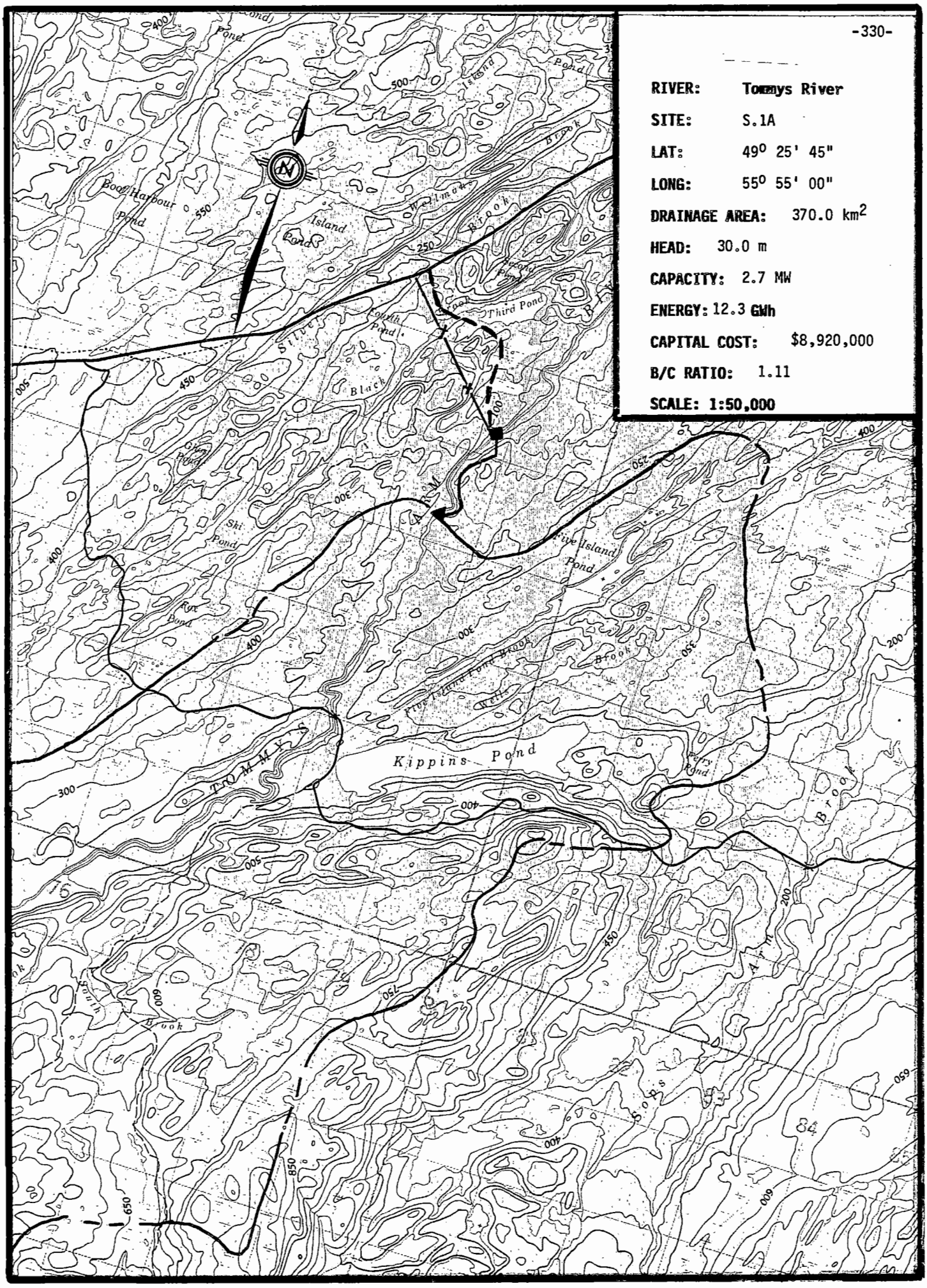
4. Site Data:

Rated Head = 45 m
Penstock Length = 1500 m
Access Road Length = 7 km
Dam Height = 6.3 m
Distance to Town = 16 km
Installed Capacity = 4.0 MW

Plant Design Flow = 10.42 m^3/s
T.L. Line Length = 7 km
Dam Length = 95 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Part of Barneys Brook drainage area may be diverted into Kitty's Brook drainage area.


-330-
RIVER: Tommys River
SITE: S.1A
LAT: 49° 25' 45"
LONG: 55° 55' 00"
DRAINAGE AREA: 370.0 km²
HEAD: 30.0 m
CAPACITY: 2.7 MW
ENERGY: 12.3 GWh
CAPITAL COST: $8,920,000
B/C RATIO: 1.11
SCALE: 1:50,000
Boat Harbour Pond
Island Pond
Welmoth Brook
Third Pond
Silver Pond
Black Pond
Ski Pond
Rye Pond
Five Island Pond
Five Island Pond Brook
Kippins Pond
Perry Pond
TOMMYS
ARM
Brook
Pond

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WATER SHED : Tommys River

SITE NAME : SITE - 1A FILE : 3045

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.706957 MW
PENSTOCK LENGTH	: 1100 M.
DESIGN FLOW	: 11.085 M^3/S
PENSTOCK DIAMETER	: 2.201962 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 5.6 M.
TRANSMISSION LINE LENGTH	: 12 KM.
LENGTH OF DAM	: 83 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 60 M^3/S
DISTANCE TO TOWN	: 15 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8134689

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
325223.2	SEE DAM	201314.1	1156209	45000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
573947.8	1367705	410311.6	323114.7	663135

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	214520.4	734894.9	285164.2

PROJECT COST: $ 8919140 COST PER KW: $ 3294.896

Total Project Cost = $ 8,919,140

WATER SHED : Tommys River SITE - 1A

COST DATA

(ADDITIONAL COST of $ 2,618,600 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 668935.5

ANNUAL BENEFIT : $ 739843.8

BENEFIT/COST RATIO: 1.106002

Total Project Cost = $ 8,919,140.00

Benefit / Cost Ratio = 1.11

MAP NUMBER 2 E/05 DATA SHEET FILE NUMBER 3045

1. Site Identification:

River Basin: Tommy's River Site: S.1A

2. Location:

Lat. 49° 25' 45" Long. 55° 55' Hydrologic Region 3

3. Hydrologic Data:

A = 370 km^2, MAR = 630 mm, ACLS = 50 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 7.39 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 60 m^3/s

Q1000 = 82 m^3/s

4. Site Data:

Rated Head = 30 m
Penstock Length = 1100 m
Access Road Length = 3 km
Dam Height = 5.6 m
Distance to Town = 15 km
Installed Capacity = 2.72 MW

Plant Design Flow = 11.1 m^3/s
T.L. Line Length = 12 km
Dam Length = 83 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Includes diversion at Lat. 49° 13' 50", Long. 56° 07' 15" from Great Gull Pond, area = 158 km^2

(ii) Capital cost of Diversion + related works = $2,618,600

(iii) Site accessible to salmon.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Tommy's River Region: 3

Total Developed Head, H = 30 m Map: 12 H/01

Diverted Area = 158 km^2, MAR = 670 mm, from Dawes Pond

Location: Lat. = 49° 13' 50" Long. = 56° 07' 15"

Mean Diverted Flow = 3.36 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 3.36 = 2.61 m^3/s

Additional Energy = H x Q* x 0.0716

= 30 x 2.61 x 0.0716 = 5.62 GWh p.a.

Dam: Height = 30 m, Length = 60 m, Q150 = 50 m^3/s

Canal: Height of Land = 6.0 m, Length = 1100 m

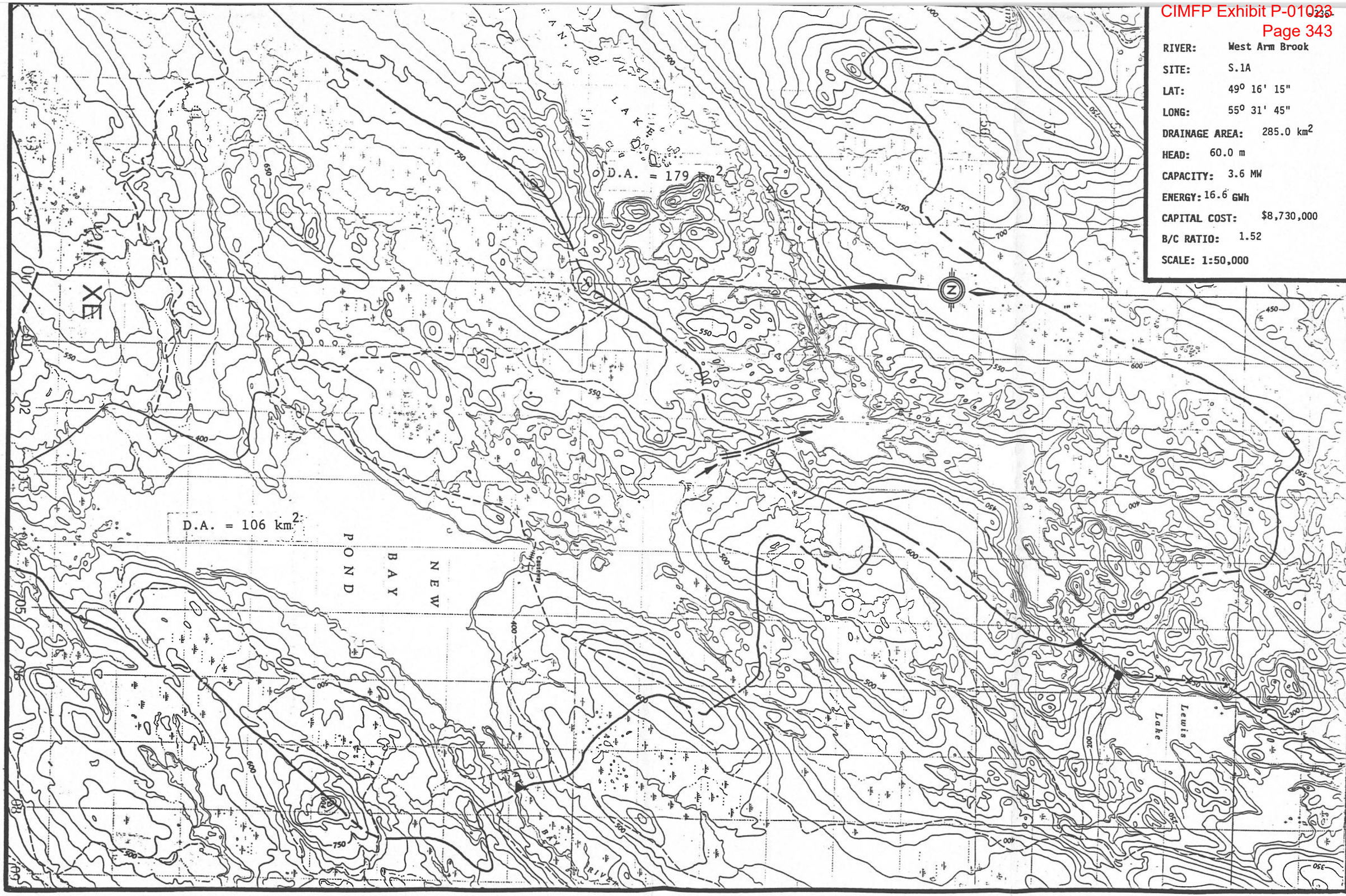
Design Flow Ratio = 1.50 Design Flow = 5.04 m^3/s

Access Road: Length = 0.5 km

Costs:

Dam + Spillway	= 133,200
Diversion Canal	= 1,504,000
Access Road	= 20,000
Sub-total Direct Costs	= 1,657,200
Total Cost Diversion	= 2,568,600
Additional Plant Costs	= 50,000 (for culvert under TCH)
Total Project Cost	= 2,618,600

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =


RIVER: West Arm Brook
SITE: S.1A
LAT: 49° 16' 15"
LONG: 55° 31' 45"
DRAINAGE AREA: 285.0 km²
HEAD: 60.0 m
CAPACITY: 3.6 MW
ENERGY: 16.6 GWh
CAPITAL COST: $8,730,000
B/C RATIO: 1.52
SCALE: 1:50,000
D.A. = 179 km²
D.A. = 106 km²
NEW BAY POND
Lewis Lake
Causeway

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WATER SHED : West Arm Brook

SITE NAME : SITE - 1A FILE : 3046

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.641022 MW
PENSTOCK LENGTH	: 900 M.
DESIGN FLOW	: 7.455 M^3/S
PENSTOCK DIAMETER	: 1.68493 M.
RATED HEAD	: 60 M.
HEIGHT OF DAM	: 14 M.
TRANSMISSION LINE LENGTH	: 12 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 54 M^3/S
DISTANCE TO TOWN	: 40 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8746937

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1391327	252060.1	140868.8	723640.9	40500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
554155.1	1320540	396161.9	127000	738429.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	635238.8	755162.6	316530.9

PROJECT COST: $ 8728316 COST PER KW: $ 2397.216

Total Project Cost = $ 8,728,316

WATER SHED : West Arm Brook SITE - 1A

COST DATA

(ADDITIONAL COST of $ 1,336,700 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 654623.7

ANNUAL BENEFIT : $ 995134.8

BENEFIT/COST RATIO: 1.520163

Total Project Cost = $ 8,728,316.00

Benefit / Cost Ratio = 1.52

MAP NUMBER 2 E/05 & 2E/04 DATA SHEET FILE NUMBER 3046

1. Site Identification:

River Basin: West Arm Brook (Pt. Leamington) Site: S.1A

2. Location:

Lat. 49° 16' 15" Long. 55° 31' 45" Hydrologic Region 3

3. Hydrologic Data:

179 + 106

A = 285 km^2, MAR = 550 mm, ACLS = 95 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 4.97 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 54 m^3/s

Q1000 = 70 m^3/s

4. Site Data:

Rated Head = 60 m
Penstock Length = 900 m
Access Road Length = 1 km
Dam Height = 14 m
Distance to Town = 40 km
Installed Capacity = 3.7 MW

Plant Design Flow = 7.46 m^3/s
T.L. Line Length = 12 km
Dam Length = 200 m
Distance to Concrete Plant = 40 km

5. Remarks:

(i) Includes diversion from New Bay Pond, Lat. 49° 11' 15"; Long. 55° 31' 20"; drainage area = 106 km^2; cost = $1,336,700.

(ii) Plant near upper limit of zone accessible to salmon.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: West ARm Brook (Pt. Leamington) Region: 3

Total Developed Head, H = 60 m Map: 2 E/04

Diverted Area = 106 km^2, MAR = 550 mm, from New Bay Pond

Location: Lat. = 49° 11' 15" Long. = 55° 31' 20"

Mean Diverted Flow = 1.85 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 1.85 = 1.44 m^3/s

Additional Energy = H x Q* x 0.0716

= 60 x 1.44 x 0.0716 = 6.19 GWh p.a.

Dam: Height = 7.0 m, Length = 20 m, Q150 = 37 m^3/s

Canal: Height of Land = 4 m, Length = 700 m

Design Flow Ratio = 1.5 Design Flow = 2.78 m^3/s

Access Road: Length = 6.0 km

Costs:

Dam + Spillway	= 155,100
Diversion Canal	= 467,200
Access Road	= 240,000
Sub-total Direct Costs	= 862,300
Total Cost Diversion	= 1,336,700
Additional Plant Costs	=
Total Project Cost	=

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =

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WATER SHED : Second Burnt Pond

SITE NAME : SITE 1 FILE : 3047

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.7746 MW
PENSTOCK LENGTH	: 5000 M.
DESIGN FLOW	: 4.485 M^3/S
PENSTOCK DIAMETER	: 1.31013 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 5.3 M.
TRANSMISSION LINE LENGTH	: 8.5 KM.
LENGTH OF DAM	: 75 M.
ACCESS ROAD LENGTH	: 8 KM.
FLOOD FLOW	: 42 M^3/S
DISTANCE TO TOWN	: 21 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 30 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6604231

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
273273.2	SEE DAM	89165.79	7096737	31500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
421777.5	1005087	301526.1	743755.4	532453.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	287783	1076165	438510.5

PROJECT COST: $ 1.229773E+07 COST PER KW: $ 4432.255

Total Project Cost = $ 12,297,730

MAP NUMBER 2 D/16 DATA SHEET FILE NUMBER 3047

1. Site Identification:

River Basin: Second Burnt Pond Site: S.1

2. Location:

Lat. 48° 45' 10" Long. 54° 24' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 118 km^2, MAR = 800 mm, ACLS = 100 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.99 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 42 m^3/s

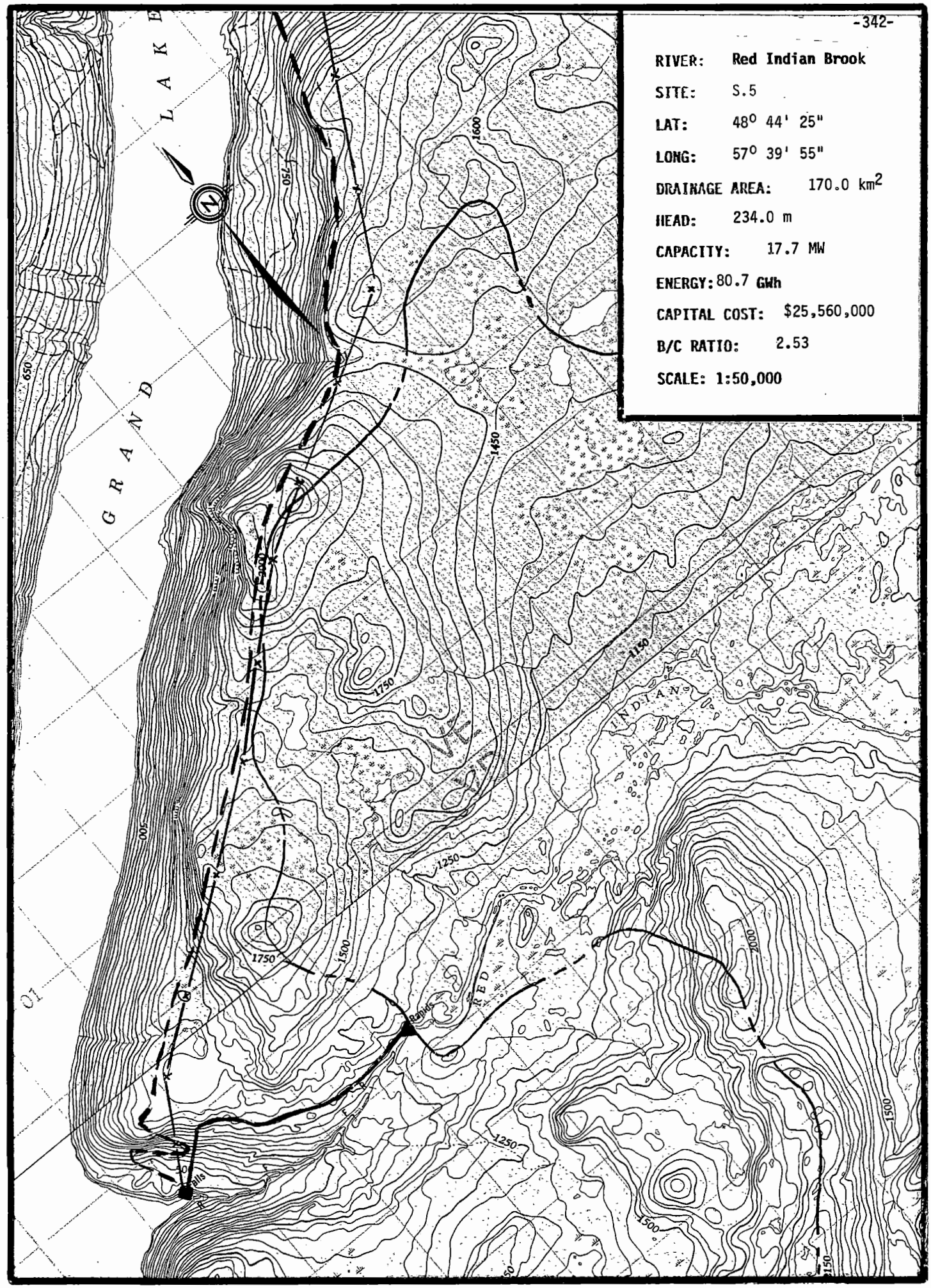
Q1000 = 55 m^3/s

4. Site Data:

Rated Head = 76 m
Penstock Length = 5000 m
Access Road Length = 8 km
Dam Height = 5.27 m
Distance to Town = 21 km
Installed Capacity = 2.89 MW

Plant Design Flow = 4.48 m^3/s
T.L. Line Length = 8.4 km
Dam Length = 75 m
Distance to Concrete Plant = 30 km

5. Remarks:



RIVER: Red Indian Brook

SITE: S.5

LAT: 48° 44' 25"

LONG: 57° 39' 55"

DRAINAGE AREA: 170.0 km^2

HEAD: 234.0 m

CAPACITY: 17.7 MW

ENERGY: 80.7 GWh

CAPITAL COST: $25,560,000

B/C RATIO: 2.53

SCALE: 1:50,000

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WATER SHED : Grand Lake (Red Indian Brook)

SITE NAME : SITE 5 FILE : 3048

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 17.71427 MW
PENSTOCK LENGTH	: 3250 M.
DESIGN FLOW	: 9.299999 M^3/S
PENSTOCK DIAMETER	: 1.531539 M.
RATED HEAD	: 234 M.
HEIGHT OF DAM	: 6.2 M.
TRANSMISSION LINE LENGTH	: 19.5 KM.
LENGTH OF DAM	: 108 M.
ACCESS ROAD LENGTH	: 30 KM.
FLOOD FLOW	: 180 M^3/S
DISTANCE TO TOWN	: 53 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 82 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.290213E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
481130.1	SEE DAM	171888.4	6044246	135000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1199065	2685905	801762.8	5718689	1422276

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2830176	2013514	2051411

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.555506E+07 COST PER KW: $ 1442.626

Total Project Cost = $ 25,555,060

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3048

1. Site Identification:

River Basin: Grand Lake (Red Indian Brook) Site: S.5

2. Location:

Lat. 48° 44' 25" Long. 57° 39' 55" Hydrologic Region 3

3. Hydrologic Data:

A = 170 km^2, MAR = 1150 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.20 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 180 m^3/s Q_2 = 85

Q1000 = 260 m^3/s

4. Site Data:

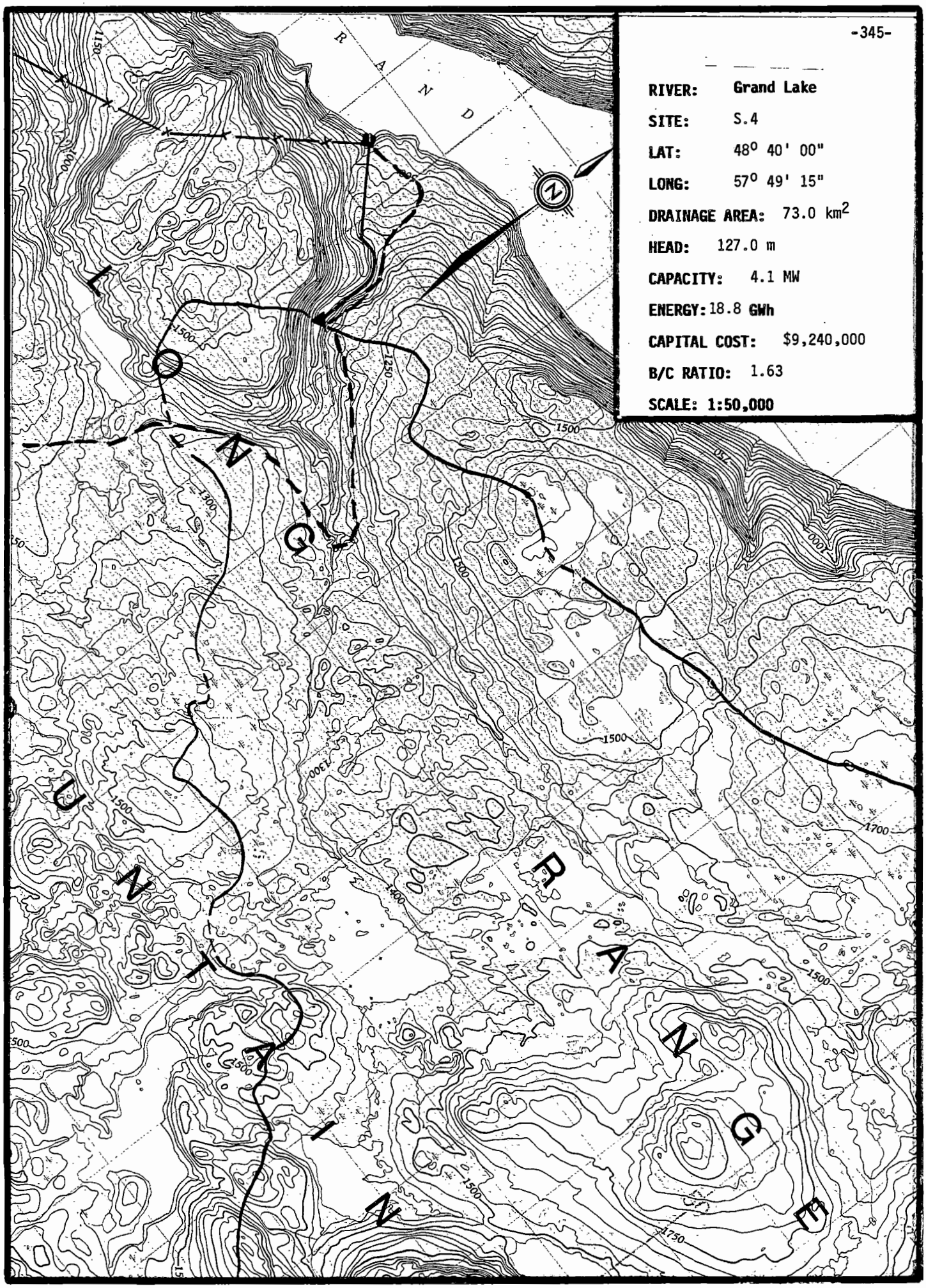
Rated Head = 234 m
Penstock Length = 3250 m
Access Road Length = 30 km
Dam Height = 6.2 m
Distance to Town = 53 km
Installed Capacity = 17.7 MW

Plant Design Flow = 9.30 m^3/s
T.L. Line Length = 19.5 km
Dam Length = 108 m
Distance to Concrete Plant = 82 km

5. Remarks:

(i) Use weighted average cost of $250,000 per km for access road.

(ii) Access by barge should be considered.



RIVER: Grand Lake

SITE: S.4

LAT: 48° 40' 00"

LONG: 57° 49' 15"

DRAINAGE AREA: 73.0 km²

HEAD: 127.0 m

CAPACITY: 4.1 MW

ENERGY: 18.8 GWh

CAPITAL COST: $9,240,000

B/C RATIO: 1.63

SCALE: 1:50,000

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WATER SHED : Grand Lake

SITE NAME : SITE 4 FILE : 3049

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 4.124782 MW
PENSTOCK LENGTH	: 1950 M.
DESIGN FLOW	: 3.99 M^3/S
PENSTOCK DIAMETER	: 1.159462 M.
RATED HEAD	: 127 M.
HEIGHT OF DAM	: 5.2 M.
TRANSMISSION LINE LENGTH	: 28 KM.
LENGTH OF DAM	: 90 M.
ACCESS ROAD LENGTH	: 15 KM.
FLOOD FLOW	: 115 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 64 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8056960

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
312951.6	SEE DAM	80257.86	2399137	86250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
465133.1	1108402	332520.7	1269057	1429757

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	575340.5	822565.1	359123

PROJECT COST: $ 9240495 COST PER KW: $ 2240.239

Total Project Cost = $ 9,240,495

MAP NUMBER 12 A/12 DATA SHEET FILE NUMBER 3049

1. Site Identification:

River Basin: Grand Lake Site: S.4

2. Location:

Lat. 48° 40' 00" Long. 57° 49' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 73 km^2, MAR = 1150 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.66 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 115 m^3/s Q_2 = 59

Q1000 = 150 m^3/s

4. Site Data:

Rated Head = 127 m
Penstock Length = 1950 m
Access Road Length = 15 km
Dam Height = 5.2 m
Distance to Town = 35 km
Installed Capacity = 4.1 MW

Plant Design Flow = 3.99 m^3/s
T.L. Line Length = 28 km
Dam Length = 90 m
Distance to Concrete Plant = 64 km

5. Remarks:

RIVER: Grand Lake (Conners Brook)

SITE: S.6

LAT: 48° 49' 15"

LONG: 57° 33' 15"

DRAINAGE AREA: 74.0 km²

HEAD: 158.0 m

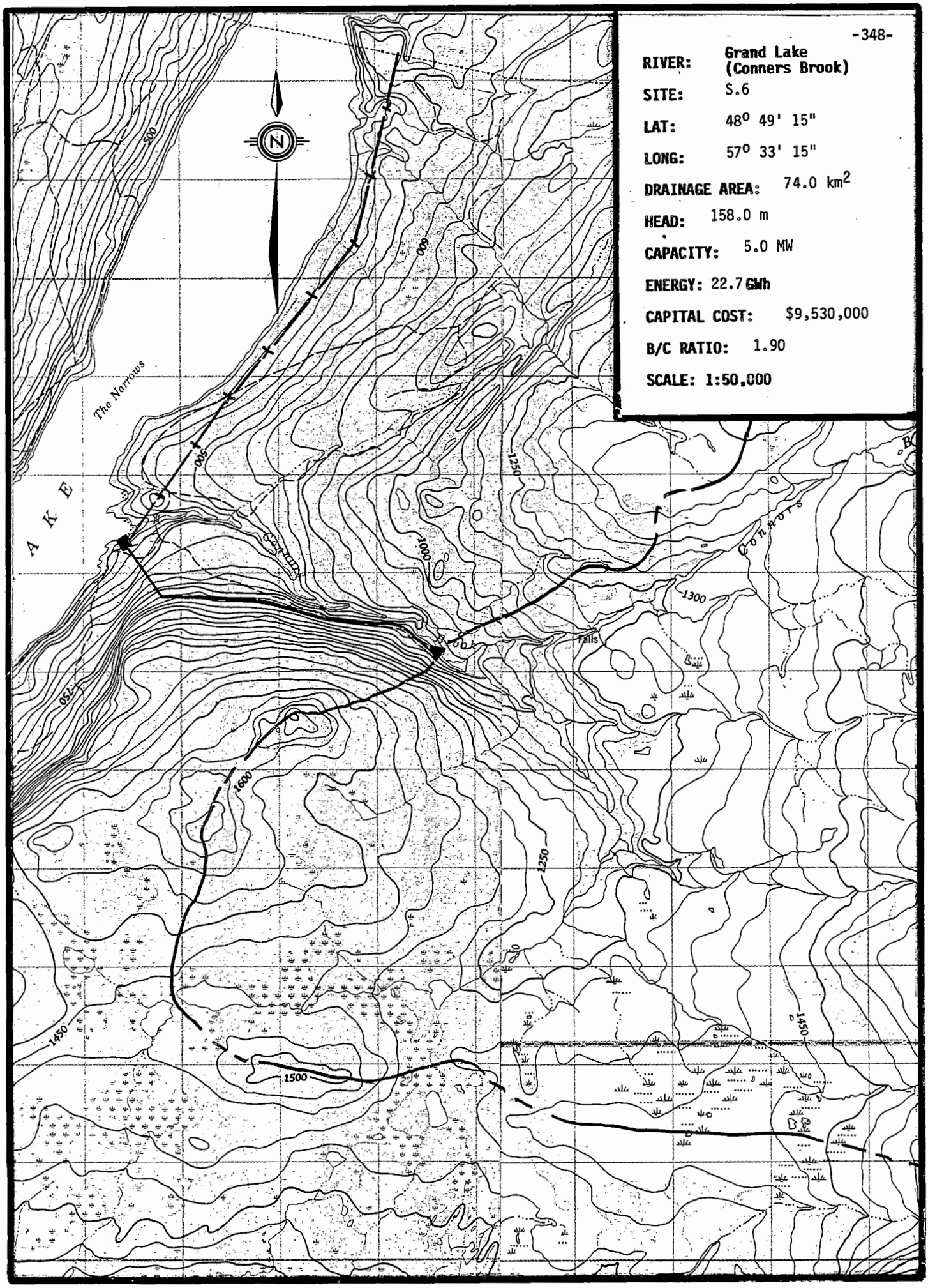
CAPACITY: 5.0 MW

ENERGY: 22.7 GWh

CAPITAL COST: $9,530,000

B/C RATIO: 1.90

SCALE: 1:50,000



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WATER SHED : Grand Lake (Conners Brook)

SITE NAME : SITE 6 FILE : 3050

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.977284 MW
PENSTOCK LENGTH	: 3675 M.
DESIGN FLOW	: 3.87 M^3/S
PENSTOCK DIAMETER	: 1.109876 M.
RATED HEAD	: 158 M.
HEIGHT OF DAM	: 5.1 M.
TRANSMISSION LINE LENGTH	: 6 KM.
LENGTH OF DAM	: 94 M.
ACCESS ROAD LENGTH	: 2.5 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 58 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 200 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8907220

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
316143.3	SEE DAM	78082.16	4298628	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
491465.1	1171151	351345.2	276727.7	548265.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	650434.4	842819.2	386711.1

PROJECT COST: $ 9528022 COST PER KW: $ 1914.301

Total Project Cost = $ 9,528,022

MAP NUMBER 12 A/13 DATA SHEET FILE NUMBER 3050

1. Site Identification:

River Basin: Grand Lake (Connors Brook) Site: S.6

2. Location:

Lat. 48° 49' 15" Long. 57° 33' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 74 km^2, MAR = 1100 mm, ACLS = 0 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.58 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

Q_2 = 75

4. Site Data:

Rated Head = 158 m

Penstock Length = 3675 m

Access Road Length = 2.5 km

Dam Height = 5.1 m

Distance to Town = 58 km

Installed Capacity = 5.0 MW

Plant Design Flow = 3.87 m^3/s

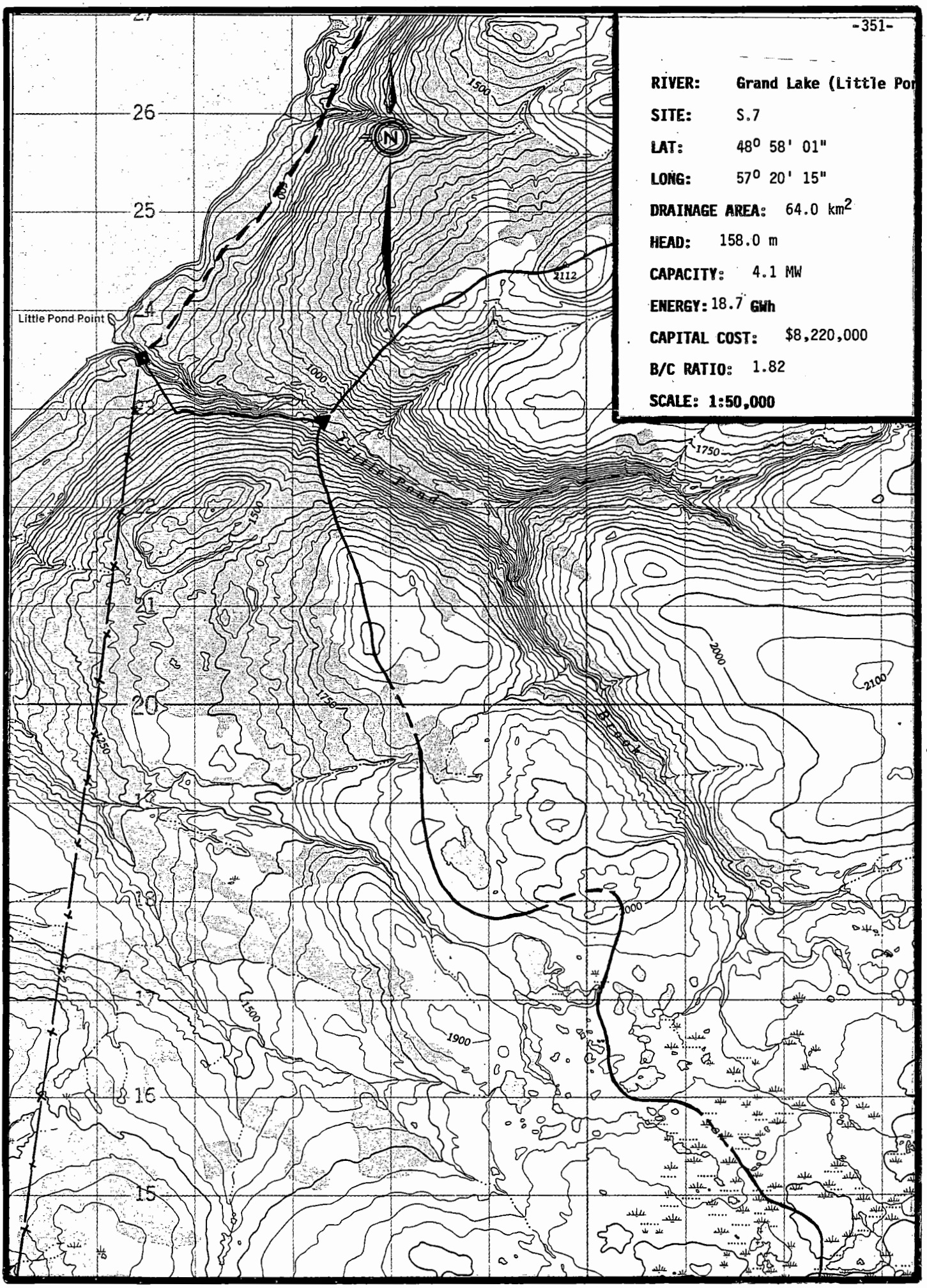
T.L. Line Length = 6 km

Dam Length = 94 m

Distance to Concrete Plant = 200 km

5. Remarks:

(i) Equipment and materials can be barged to this site via Grand Lake.


RIVER: Grand Lake (Little Por
SITE: S.7
LAT: 48° 58' 01"
LONG: 57° 20' 15"
DRAINAGE AREA: 64.0 km²
HEAD: 158.0 m
CAPACITY: 4.1 MW
ENERGY: 18.7 GWh
CAPITAL COST: $8,220,000
B/C RATIO: 1.82
SCALE: 1:50,000
Little Pond Point
Little Pond
Brook
N
1500
1000
1750
2000
2100
2112
1900
1250
26
25
24
23
22
21
20
19
18
17
16
15

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WATER SHED : Grand Lake (Little Pond Brook)

SITE NAME : SITE 7 FILE : 3052

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	:	4.109153 MW
PENSTOCK LENGTH	:	2175 M.
DESIGN FLOW	:	3.195 M^3/S
PENSTOCK DIAMETER	:	1.022071 M.
RATED HEAD	:	158 M.
HEIGHT OF DAM	:	5 M.
TRANSMISSION LINE LENGTH	:	12.5 KM.
LENGTH OF DAM	:	89 M.
ACCESS ROAD LENGTH	:	16 KM.
FLOOD FLOW	:	115 M^3/S
DISTANCE TO TOWN	:	30 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	60 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 7611765

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
292223.1	SEE DAM	65710.64	2314735	86250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
429758.5	1024105	307231.6	1340620	793648

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	504508.7	738240.9	318131.4

PROJECT COST: $ 8215163 COST PER KW: $ 1999.235

Total Project Cost = $ 8,215,163

MAP NUMBER 12 A/14 DATA SHEET FILE NUMBER 3052

1. Site Identification:

River Basin: Grand lake (Little Pond Brook) Site: S.7

2. Location:

Lat. 48° 58' 01" Long. 57° 20' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 64 km^2, MAR = 1050 mm, ACLS = 0 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.13 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 115 m^3/s Q_2 = 62

Q1000 = 155 m^3/s

4. Site Data:

Rated Head = 158 m
Penstock Length = 2175 m
Access Road Length = 16 km
Dam Height = 5 m
Distance to Town = 30 km
Installed Capacity = 4.1 MW

Plant Design Flow = 3.20 m^3/s
T.L. Line Length = 12.5 km
Dam Length = 89 m
Distance to Concrete Plant = 60 km

5. Remarks:

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WATER SHED : Lloyds River

SITE NAME : SITE 1 FILE : 3053

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.399753 MW
PENSTOCK LENGTH	: 2150 M.
DESIGN FLOW	: 9.509999 M^3/S
PENSTOCK DIAMETER	: 2.052095 M.
RATED HEAD	: 31 M.
HEIGHT OF DAM	: 6.2 M.
TRANSMISSION LINE LENGTH	: 19 KM.
LENGTH OF DAM	: 105 M.
ACCESS ROAD LENGTH	: 21 KM.
FLOOD FLOW	: 155 M^3/S
DISTANCE TO TOWN	: 70 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7310377

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
469085.1	SEE DAM	175377.7	2105722	116250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
521516.4	1242762	372828.7	1689235	886730.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1363999	1196502	475802.1

PROJECT COST: $ 1.061581E+07 COST PER KW: $ 4423.709

Total Project Cost = $ 10,615,810

MAP NUMBER 12 B/01 DATA SHEET FILE NUMBER 3053

1. Site Identification:

River Basin: Lloyds River Site: S.1

2. Location:

Lat. 48° 10' 00" Long. 58° 00' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 125 km^2, MAR = 1600 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 6.34 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s

Q1000 = 210 m^3/s

Q_2 = 75

4. Site Data:

Rated Head = 31 m

Penstock Length = 2150 m

Access Road Length = 21 km

Dam Height = 6.2 m

Distance to Town = 70 km

Installed Capacity = 2.4 MW

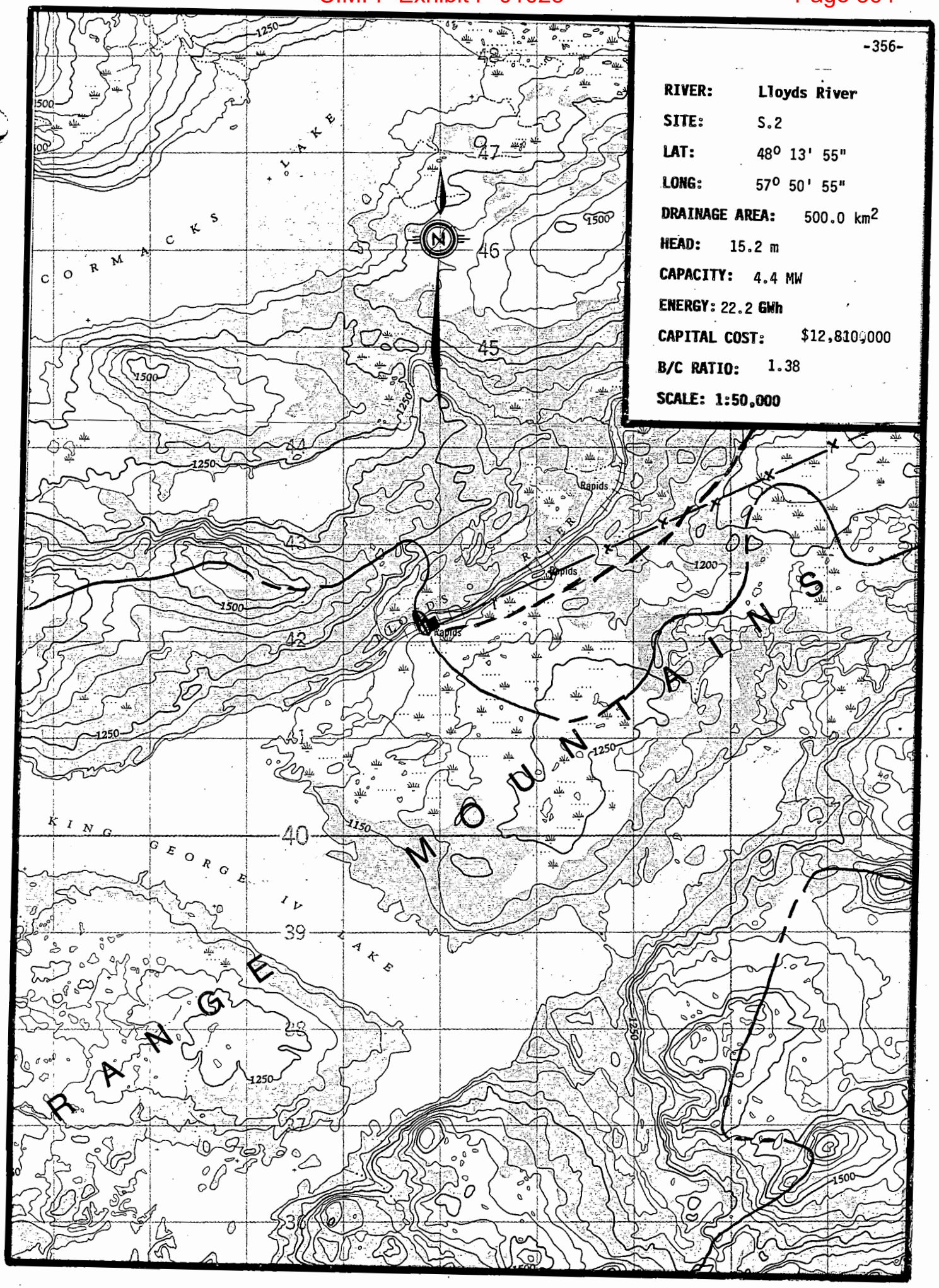
Plant Design Flow = 9.51 m^3/s

T.L. Line Length = 19 km

Dam Length = 105 m

Distance to Concrete Plant = 100 km

5. Remarks:


-356-
RIVER: Lloyds River
SITE: S.2
LAT: 48° 13' 55"
LONG: 57° 50' 55"
DRAINAGE AREA: 500.0 km²
HEAD: 15.2 m
CAPACITY: 4.4 MW
ENERGY: 22.2 GWh
CAPITAL COST: $12,810,000
B/C RATIO: 1.38
SCALE: 1:50,000
CORMACKS LAKE
KING GEORGE IV LAKE
RANGE MOUNTAINS
Rapids
Rapids
Rapids
1250
1500
1200
1150
47
46
45
44
43
42
41
40
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37
36

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WATER SHED : Lloyds River

SITE NAME : SITE 2 FILE : 3054

SITE DATA

INSTALLED CAPACITY	: 4.413377 MW
PENSTOCK LENGTH	: 75 M.
DESIGN FLOW	: 35.67 M^3/S
PENSTOCK DIAMETER	: 4.003157 M.
RATED HEAD	: 15.2 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 9 KM.
LENGTH OF DAM	: 130 M.
ACCESS ROAD LENGTH	: 9.5 KM.
FLOOD FLOW	: 480 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8599999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.435677E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2341610	SEE DAM	576347.8	451020.7	360000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1025233	2181346	654403.7	860733.5	659507.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2082297	1107838	508608.5

PROJECT COST: $ 1.280894E+07 COST PER KW: $ 2902.3

Total Project Cost = $ 12,808,940

MAP NUMBER 12 A/04 DATA SHEET FILE NUMBER 3054

1. Site Identification:

River Basin: Lloyds River Site: S.2

2. Location:

Lat. 48° 13' 55" Long. 57° 50' 55" Hydrologic Region 3

3. Hydrologic Data:

A = 500 km^2, MAR = 1500 mm, ACLS = 80 %

Storage Reservoir Area = 19.5 km^2

Storage Reservoir Vol, V = 39 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.05$$

Mean Flow, QAV = 23.78 m^3/s

Usable Flow Ratio = 0.86

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 480 m^3/s

Q1000 = 610 m^3/s

Q_2 = 230

4. Site Data:

Rated Head = 15.2 m

Penstock Length = 75 m

Access Road Length = 9.5 km

Dam Height = 15 m

Distance to Town = 60 km

Installed Capacity = 5.3 MW

Plant Design Flow = 35.66 m^3/s

T.L. Line Length = 9 km

Dam Length = 130 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Plant located at outlet of George iv Lake, at site of diversion dam for Lloyd's River Diversion - ref. "Report on Stage II Diversions & Power Development Expansions - Bay d'Espoir Development" & SNL Report SM.4.67.

RIVER: Lloyds River

SITE: S.3

LAT: 48° 18' 45"

LONG: 57° 39' 00"

DRAINAGE AREA: 690.0 km²

HEAD: 30.5 m

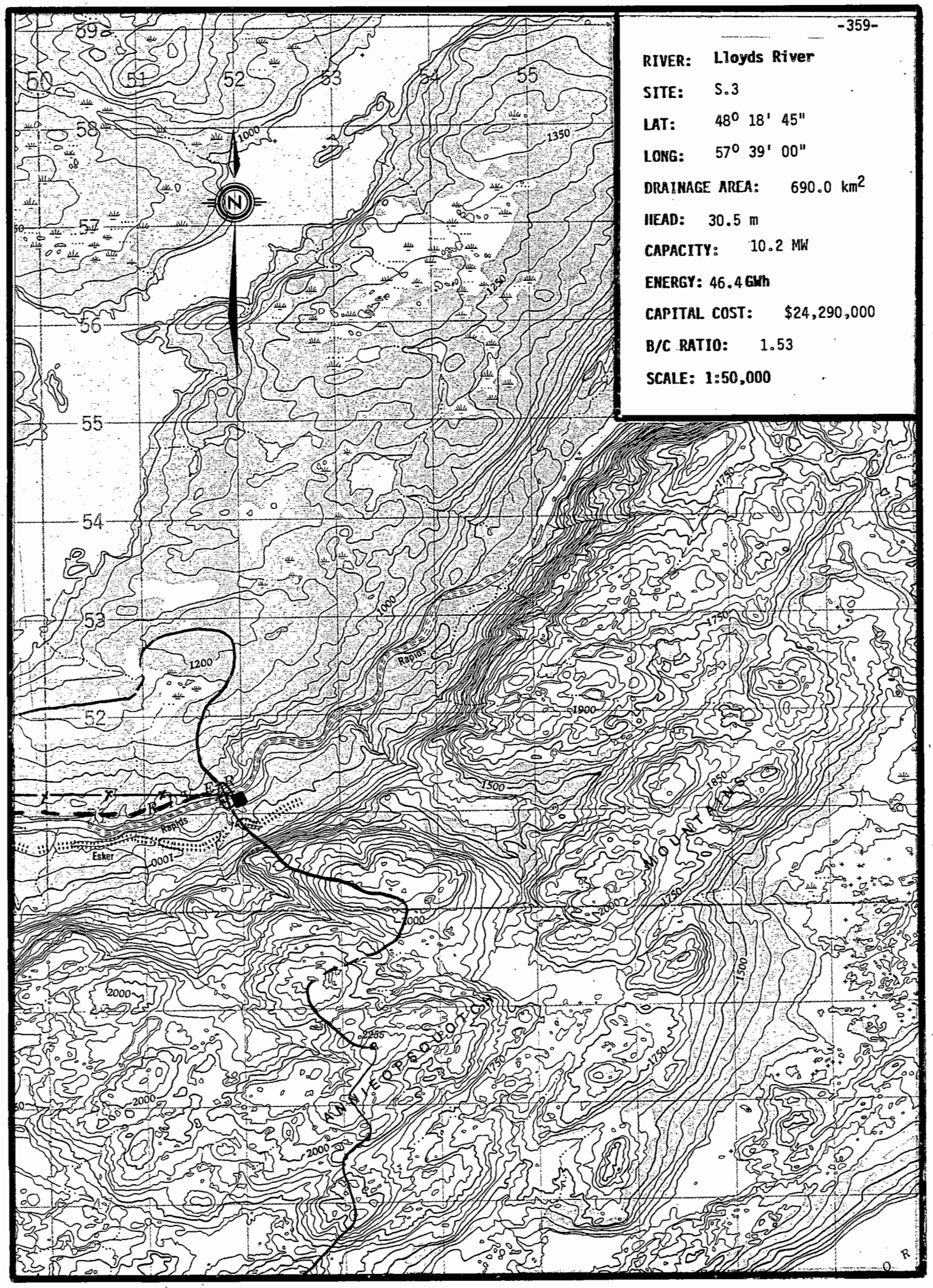
CAPACITY: 10.2 MW

ENERGY: 46.4 GWh

CAPITAL COST: $24,290,000

B/C RATIO: 1.53

SCALE: 1:50,000



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WATER SHED : Lloyds River

SITE NAME : SITE 3 FILE : 3055

SITE DATA

INSTALLED CAPACITY	:	10.18155 MW
PENSTOCK LENGTH	:	129 M.
DESIGN FLOW	:	41.01 M^3/S
PENSTOCK DIAMETER	:	3.85577 M.
RATED HEAD	:	30.5 M.
HEIGHT OF DAM	:	30.5 M.
TRANSMISSION LINE LENGTH	:	4 KM.
LENGTH OF DAM	:	300 M.
ACCESS ROAD LENGTH	:	4 KM.
FLOOD FLOW	:	510 M^3/S
DISTANCE TO TOWN	:	50 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 2.400755E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
6077142	2412834	653450.6	735636.1	382500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1621276	3242552	967926	412624.1	282515.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	4069639	1960287	1468325

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.428671E+07 COST PER KW: $ 2385.364

Total Project Cost = $ 24,286,710

WATER SHED : Lloyds River SITE 3

COST DATA

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1821503

ANNUAL BENEFIT : $ 2782741

BENEFIT/COST RATIO: 1.527717

Total Project Cost = $ 24,286,710.00

Benefit / Cost Ratio = 1.53

MAP NUMBER 12 A/05 DATA SHEET FILE NUMBER 3055

1. Site Identification:

River Basin: Lloyds River Site: S.3

2. Location:

Lat. 48° 18' 45" Long. 57° 39' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 690 km^2, MAR = 1250 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 27.34 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 390 m^3/s

Q1000 = 510 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 129 m
Access Road Length = 4 km
Dam Height = 30.5 m
Distance to Town = 50 km
Installed Capacity = 10.2 MW

Plant Design Flow = 41.01 m^3/s
T.L. Line Length = 4 km
Dam Length = 100 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diverstion at Lat. 48° 19' 00" (72 km^2)
Long. 57° 41' 30"

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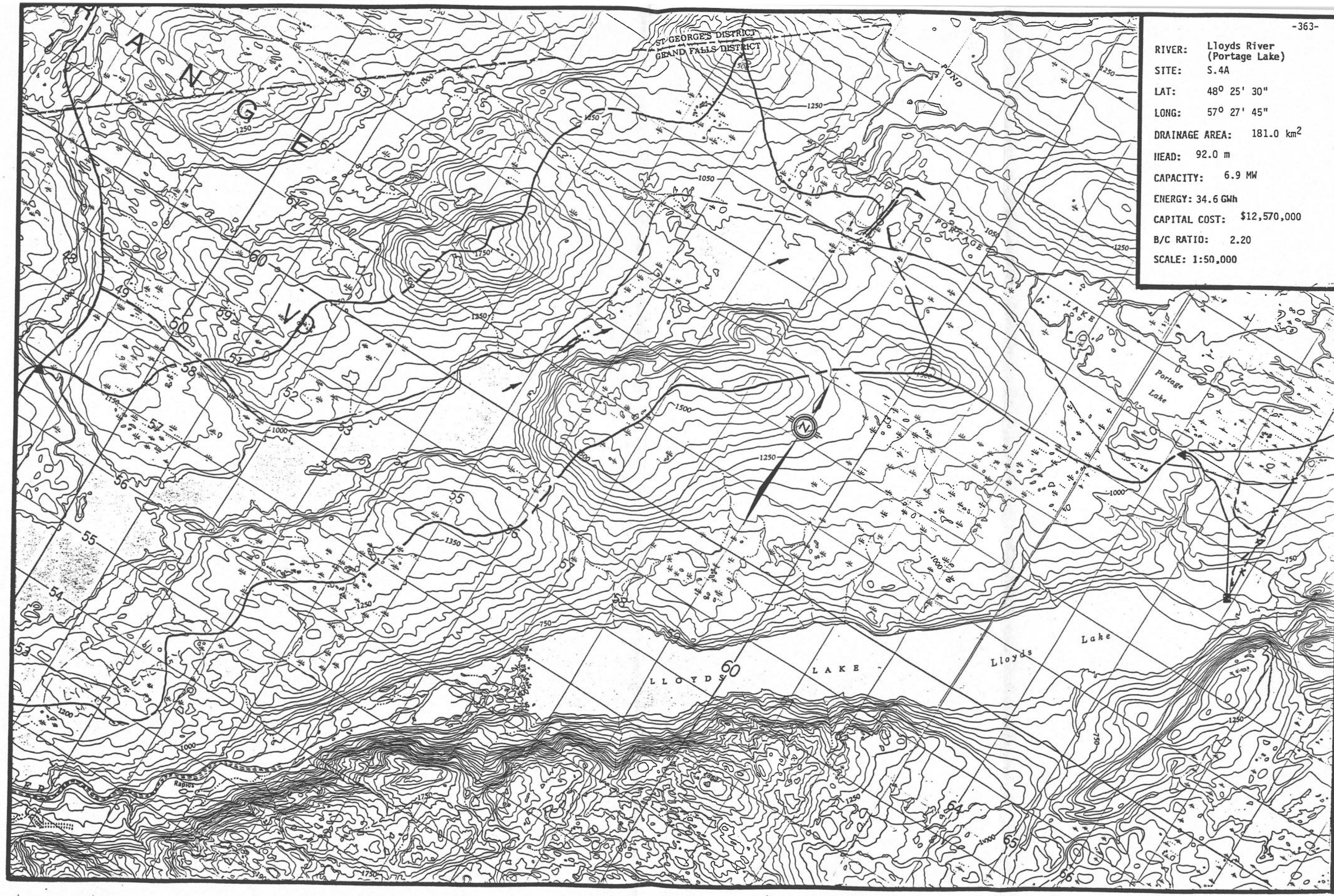

RIVER: Lloyds River (Portage Lake)

SITE: S.4A

LAT: 48° 25' 30"

LONG: 57° 27' 45"

DRAINAGE AREA: 181.0 km²

HEAD: 92.0 m

CAPACITY: 6.9 MW

ENERGY: 34.6 GWh

CAPITAL COST: $12,570,000

B/C RATIO: 2.20

SCALE: 1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Lloyds River (Portage Lake)

SITE NAME : SITE - 4A FILE : 3057

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 6.897185 MW
PENSTOCK LENGTH	: 1100 M.
DESIGN FLOW	: 9.21 M^3/S
PENSTOCK DIAMETER	: 1.738089 M.
RATED HEAD	: 92 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: 18.5 KM.
LENGTH OF DAM	: 81 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 58 M^3/S
DISTANCE TO TOWN	: 65 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8599999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.329527E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
309633.5	SEE DAM	170390.6	2195108	43500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
784806.3	1757966	524766	323114.7	989518.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	724324.6	819160.7	448989.1

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.257468E+07 COST PER KW: $ 1823.161

Total Project Cost = $ 12,574,680

WATER SHED : Lloyds River (Portage Lake) SITE - 4A

COST DATA

(ADDITIONAL COST of $ 3,483,400 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5733333

ANNUAL COST : $ 943100.9

ANNUAL BENEFIT : $ 2078425

BENEFIT/COST RATIO: 2.20382

Total Project Cost = $ 12,574,680.00

Benefit / Cost Ratio = 2.20

MAP NUMBER 12 A/06 DATA SHEET FILE NUMBER 3057

1. Site Identification:

River Basin: Lloyds River (Portage Lake) Site: S.4A

2. Location:

Lat. 48° 25' 30" Long. 57° 27' 45" Hydrologic Region 3

3. Hydrologic Data:
(110 + 71)

A = 181 km^2, MAR = 1070 mm, ACLS = 100 %

Storage Reservoir Area = 3.5 km^2

Storage Reservoir Vol, V = 7.0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.04

Mean Flow, QAV = 6.14 m^3/s

Usable Flow Ratio = 0.86

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 58 m^3/s

Q1000 = 72 m^3/s

4. Site Data:

Rated Head = 92 m
Penstock Length = 1100 m
Access Road Length = 3 km
Dam Height = 5.5 m
Distance to Town = 65 km
Installed Capacity = 6.9 MW

Plant Design Flow = 9.21 m^3/s
T.L. Line Length = 18.5 km
Dam Length = 81 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes diversion of 71 km^2 from S.W. Brook (S.ville) at cost of $2,283,400

(ii) Add $1,200,000. for Power Canal.

(iii) T.W.L. may be affected by Lloyds S.5.

SUMMARY SHEET DIVERSION SCHEMES

Lloyds S.4A [Portage Lake]

Plant/s: Grand Falls, Bishops Falls Region: 3

Total Developed Head, H = 137 m Map: 12 A/05

Diverted Area = 71 km^2, MAR = 1100 mm, from S.W. Brook (S'ville)

Location: Lat. = 48° 21' 50' Long. = 57° 42' 00"

Mean Diverted Flow = 2.48 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) − F.QAV

= 0.78 x 2.48 = 1.93 m^3/s

Additional Energy = H x Q* x 0.0716

= 137 x 1.93 x 0.0716 = 18.9 GWh p.a.

Dam: Height = 4.0 m, Length = 220 m, [including S. Cut off Dam] Q150 = 50 m^3/s

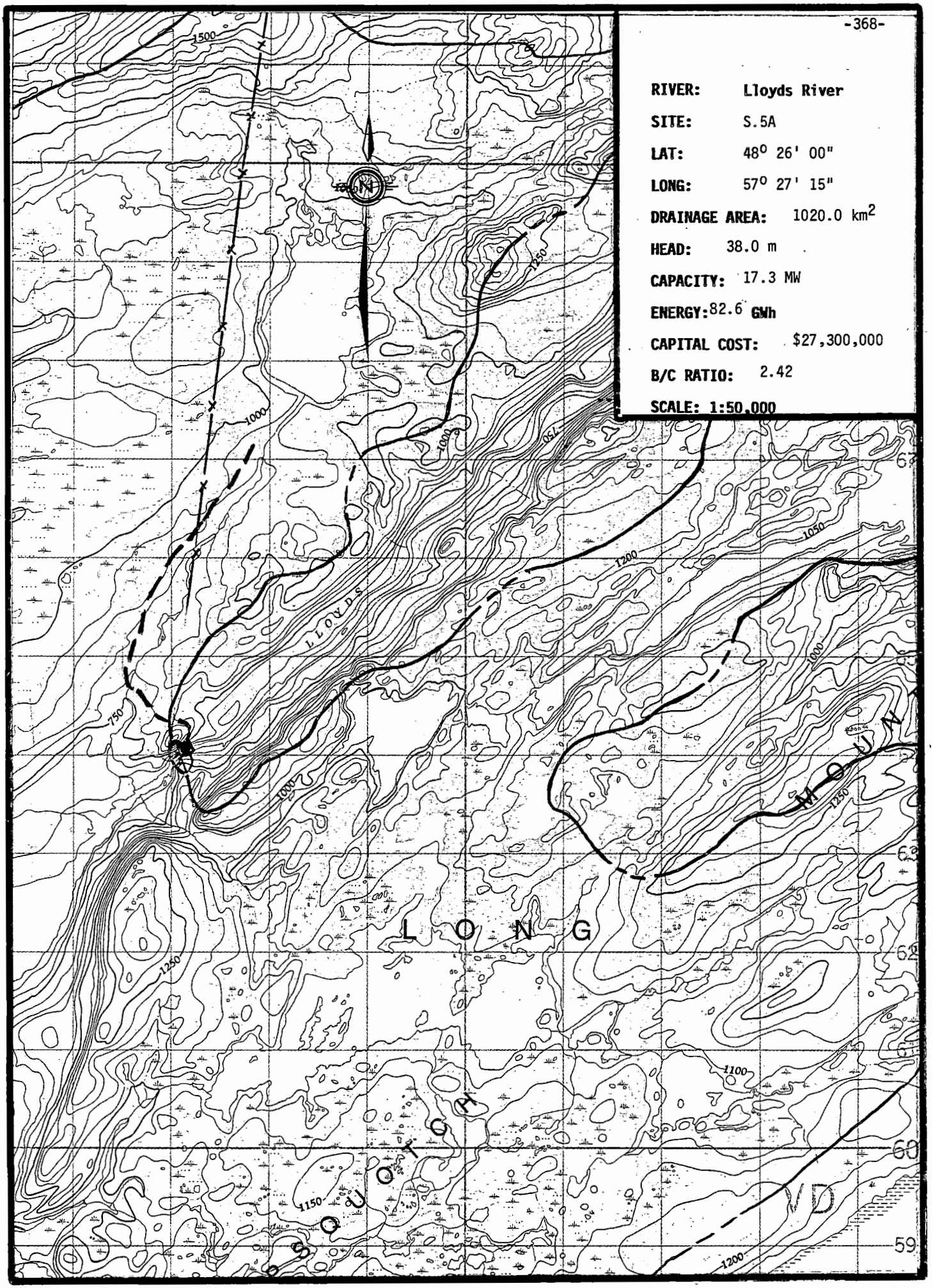
Canal: Height of Land = 3 m, Length = 900 m

Design Flow Ratio = 1.5 Design Flow = 2.90 m^3/s

Access Road: Length = 14.0 km

Costs:	Dam + Spillway	= 514,400
	Diversion Canal	= 398,800
	Access Road	= 560,000
	Sub-total Direct Costs	= 1,473,200
	Total Cost Diversion	= 2,283,400
	Additional Plant Costs	= 1,000,000
	Total Project Cost	= 3,283,400

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = \frac{18.9}{3.28 \times 1.25} = 4.61$$



RIVER:	Lloyds River
SITE:	S.5A
LAT:	48° 26' 00"
LONG:	57° 27' 15"
DRAINAGE AREA:	1020.0 km^2
HEAD:	38.0 m
CAPACITY:	17.3 MW
ENERGY:	82.6 GWh
CAPITAL COST:	$27,300,000
B/C RATIO:	2.42
SCALE:	1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Lloyds River

SITE NAME : SITE 5A FILE : 3059

SITE DATA

INSTALLED CAPACITY	: 17.25078 MW
PENSTOCK LENGTH	: 155 M.
DESIGN FLOW	: 55.77 M^3/S
PENSTOCK DIAMETER	: 4.267298 M.
RATED HEAD	: 38 M.
HEIGHT OF DAM	: 32 M.
TRANSMISSION LINE LENGTH	: 19 KM.
LENGTH OF DAM	: 130 M.
ACCESS ROAD LENGTH	: 4 KM.
FLOOD FLOW	: 690 M^3/S
DISTANCE TO TOWN	: 67 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .82
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3.504566E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
3082101	3157496	861732.4	1021176	517500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2331386	4662772	1391872	412624.1	1376280

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	4183491	2138355	2161712

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.72985E+07 COST PER KW: $ 1582.451

Total Project Cost = $ 27,298,500

MAP NUMBER 12 A/06 DATA SHEET FILE NUMBER 3059

1. Site Identification:

River Basin: Lloyds River Site: S.5A

2. Location:

Lat. 48° 26' 00" Long. 57° 27' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 1020 km^2, MAR = 1150 mm, ACLS = 80 %

Storage Reservoir Area = 14.5 km^2

Storage Reservoir Vol, V = 29 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.025$$

Mean Flow, QAV = 37.18 m^3/s

Usable Flow Ratio = 0.82

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 520 m^3/s

Q1000 = 690 m^3/s

4. Site Data:

Rated Head = 38 m

Penstock Length = 155 m

Access Road Length = 4 km

Dam Height = 32 m

Distance to Town = 67 km

Installed Capacity = 17.3 MW

Plant Design Flow = 55.78 m^3/s

T.L. Line Length = 19 km

Dam Length = 130 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Lloyds River (Otter Brook)

SITE: S.6

LAT: 48° 29' 15"

LONG: 57° 20' 15"

DRAINAGE AREA: 48.0 km²

HEAD: 113.0 m

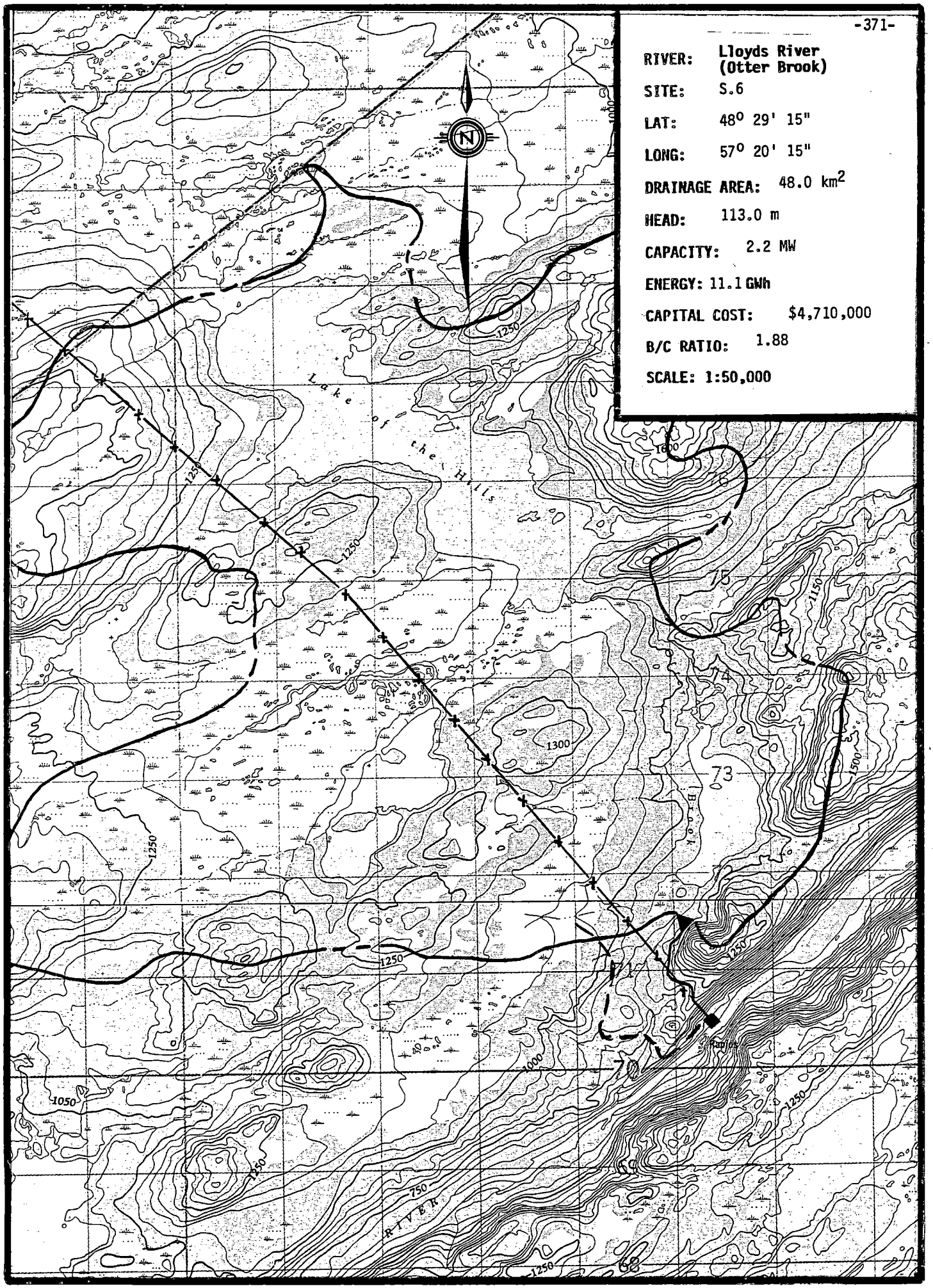
CAPACITY: 2.2 MW

ENERGY: 11.1 GWh

CAPITAL COST: $4,710,000

B/C RATIO: 1.88

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Lloyds River (Otter Brook)

SITE NAME : SITE 6 FILE : 3060

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.207568 MW
PENSTOCK LENGTH	: 1225 M.
DESIGN FLOW	: 2.4 M^3/S
PENSTOCK DIAMETER	: .9471753 M.
RATED HEAD	: 113 M.
HEIGHT OF DAM	: 4.7 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 72 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 52 M^3/S
DISTANCE TO TOWN	: 70 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8599999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4966270

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
220331.1	SEE DAM	50792.79	1195888	39000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
312817	745436.1	223630.9	323114.7	580413.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	417467.2	448102.6	156375.9

PROJECT COST: $ 4713370 COST PER KW: $ 2135.096

Total Project Cost = $ 4,713,370

MAP NUMBER 12A/06 DATA SHEET FILE NUMBER 3060

1. Site Identification:

River Basin: Lloyds River (Otter Brook) Site: S.6

2. Location:

Lat. 48° 29' 15" Long. 57° 20' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 48 km^2, MAR = 1050 mm, ACLS = 80 %

Storage Reservoir Area = 1 km^2

Storage Reservoir Vol, V = 2 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.04

Mean Flow, QAV = 1.60 m^3/s

Usable Flow Ratio = 0.86

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 52 m^3/s Q_2 = 24

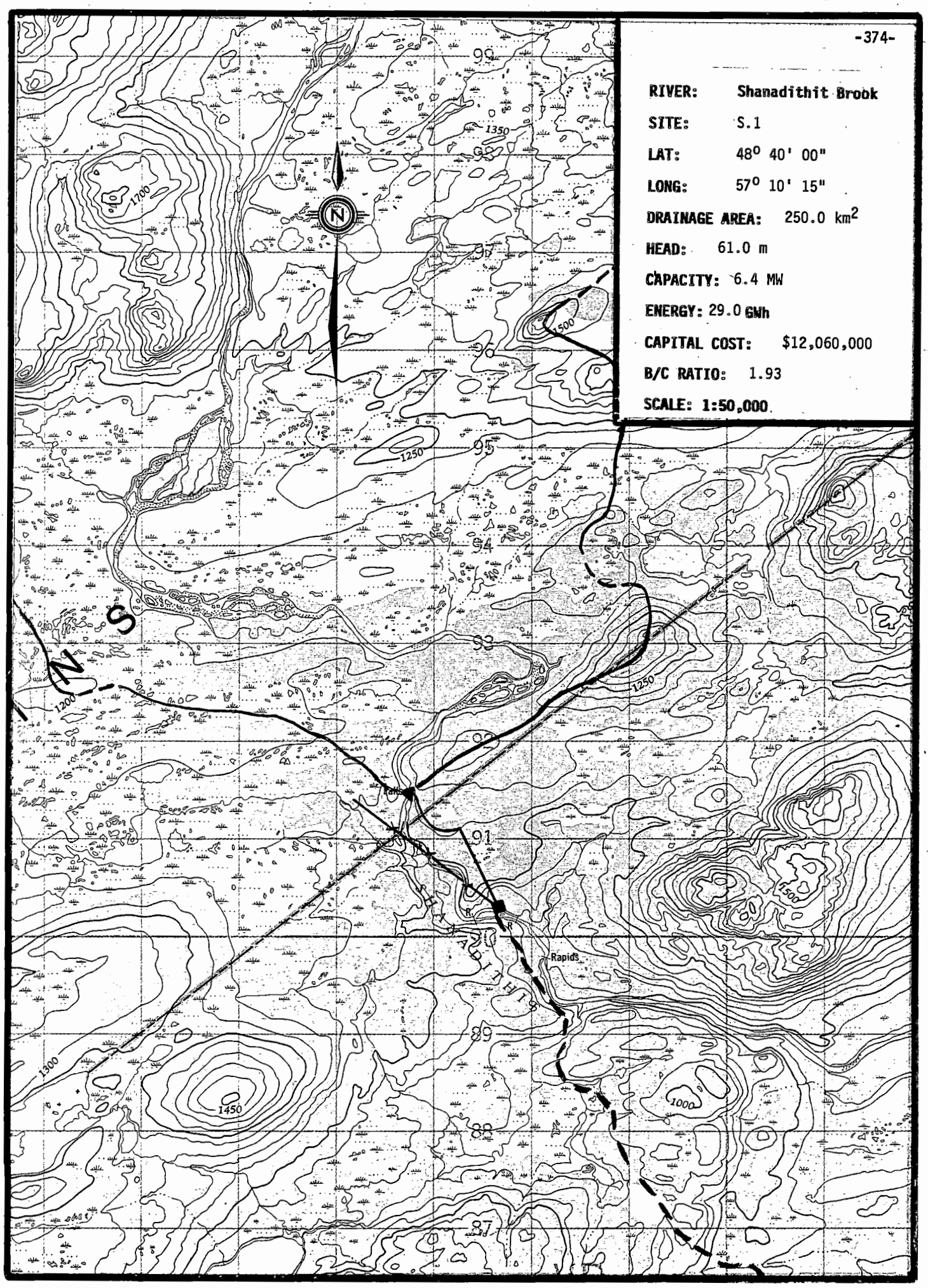
Q1000 = 71 m^3/s

4. Site Data:

Rated Head = 113 m
Penstock Length = 1225 m
Access Road Length = 3 km
Dam Height = 4.7 m
Distance to Town = 70 km
Installed Capacity = 2.2 MW

Plant Design Flow = 2.4 m^3/s
T.L. Line Length = 11 km
Dam Length = 72 m
Distance to Concrete Plant = 100 km

5. Remarks:


RIVER: Shanadithit Brook
SITE: S.1
LAT: 48° 40' 00"
LONG: 57° 10' 15"
DRAINAGE AREA: 250.0 km²
HEAD: 61.0 m
CAPACITY: 6.4 MW
ENERGY: 29.0 GWh
CAPITAL COST: $12,060,000
B/C RATIO: 1.93
SCALE: 1:50,000
N
S
Rapids
1350
1700
1500
1250
1200
1300
1450
1000

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Shanadithit Brook

SITE NAME : SITE 1 FILE : 3062

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 6.375572 MW
PENSTOCK LENGTH	: 1600 M.
DESIGN FLOW	: 12.84 M^3/S
PENSTOCK DIAMETER	: 2.123769 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 6.7 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 123 M.
ACCESS ROAD LENGTH	: 8.5 KM.
FLOOD FLOW	: 260 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.37909E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
609330.6	SEE DAM	229784.4	4103442	195000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
851382.6	1907097	569282.8	783086.5	130409.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1053805	1058461	571779.6

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.206286E+07 COST PER KW: $ 1892.043

Total Project Cost = $ 12,062,860

MAP NUMBER 12A/11 DATA SHEET FILE NUMBER 3062

1. Site Identification:

River Basin: Shanadithit Brook Site: S.1

2. Location:

Lat. 48° 40' 00" Long. 57° 10' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 250 km^2, MAR = 1080 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 8.56 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 260 m^3/s

Q1000 = 375 m^3/s

Q_2 = 125

4. Site Data:

Rated Head = 61 m

Penstock Length = 1600 m

Access Road Length = 8.5 km

Dam Height = 6.7 m

Distance to Town = 50 km

Installed Capacity = 6.3 MW

Plant Design Flow = 12.84 m^3/s

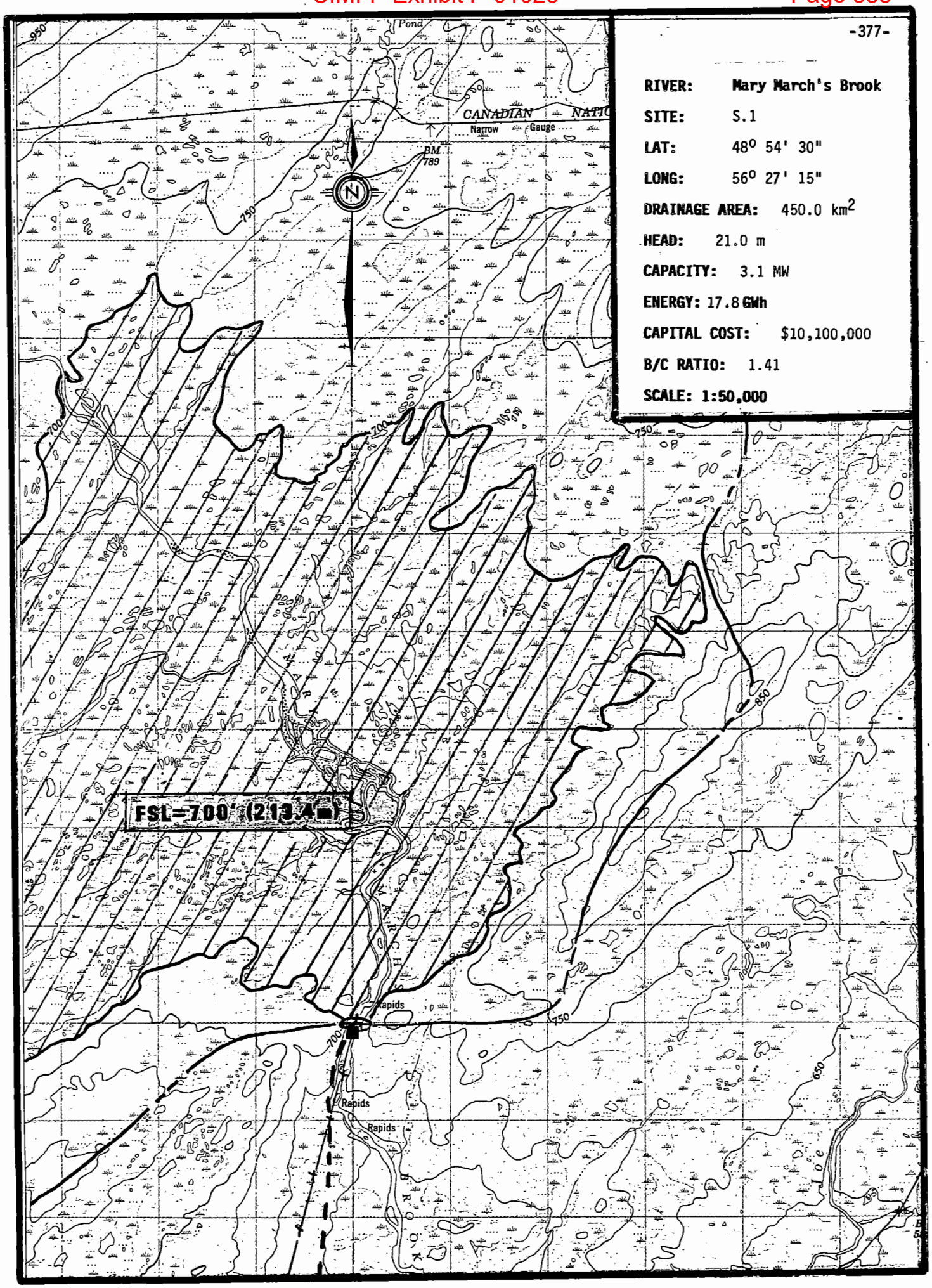
T.L. Line Length = 2 km

Dam Length = 123 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) It may be more economic to divert about 230 km^2 of Shanadithit Brook into Star Lake from Lat. 48° 42' 30", Long. 57° 11' via a 6.5 km long canal which parallels the 1150' contour.


-377-
RIVER: Mary March's Brook
SITE: S.1
LAT: 48° 54' 30"
LONG: 56° 27' 15"
DRAINAGE AREA: 450.0 km²
HEAD: 21.0 m
CAPACITY: 3.1 MW
ENERGY: 17.8 GWh
CAPITAL COST: $10,100,000
B/C RATIO: 1.41
SCALE: 1:50,000
FSL=700' (213.4m)
CANADIAN
Narrow
Gauge
BM 789
Pond
Rapids
Rapids
Rapids
950
750
700
850
650

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Mary March Brook

SITE NAME : SITE 1 FILE : 3063

SITE DATA

INSTALLED CAPACITY	: 3.110253 MW
PENSTOCK LENGTH	: 97 M.
DESIGN FLOW	: 18.195 M^3/S
PENSTOCK DIAMETER	: 2.864437 M.
RATED HEAD	: 21 M.
HEIGHT OF DAM	: 21 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 245 M.
ACCESS ROAD LENGTH	: 6.5 KM.
FLOOD FLOW	: 210 M^3/S
DISTANCE TO TOWN	: 6.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 40 KM.
USEFUL TURBINE FLOW RATIO	: .9799999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9951869

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2911316	939395.9	314462.5	367629.5	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
716651.7	1524791	457437.3	623418.8	408814.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	412872.5	897070.5	368522

PROJECT COST: $ 1.009988E+07 COST PER KW: $ 3247.286

Total Project Cost = $ 10,099,880

MAP NUMBER 12 A/16 DATA SHEET FILE NUMBER 3063

1. Site Identification:

River Basin: Mary March's Brook Site: S.1

2. Location:

Lat. 48° 54' 30" Long. 56° 27' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 450 km^2, MAR = 850 mm, ACLS = 95 %

Storage Reservoir Area = 44 km^2

Storage Reservoir Vol, V = 88 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.23$$

Mean Flow, QAV = 12.13 m^3/s

Usable Flow Ratio = 0.98

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 155 m^3/s Q_2 = 75

Q1000 = 210 m^3/s

4. Site Data:

Rated Head = 21 m
Penstock Length = 97 m
Access Road Length = 6.5 km
Dam Height = 21 m
Distance to Town = 6.5 km
Installed Capacity = 3.2 MW

Plant Design Flow = 18.19 m^3/s
T.L. Line Length = 5 km
Dam Length = 245 m
Distance to Concrete Plant = 40 km

5. Remarks:

(i) Would create a very large shallow reservoir area 44 km^2 and might be considered environmentally unacceptable.

RIVER: Clench Brook

SITE: S.1

LAT: 48° 46' 20"

LONG: 56° 52' 15"

DRAINAGE AREA: 107.0 km²

HEAD: 61.0 m

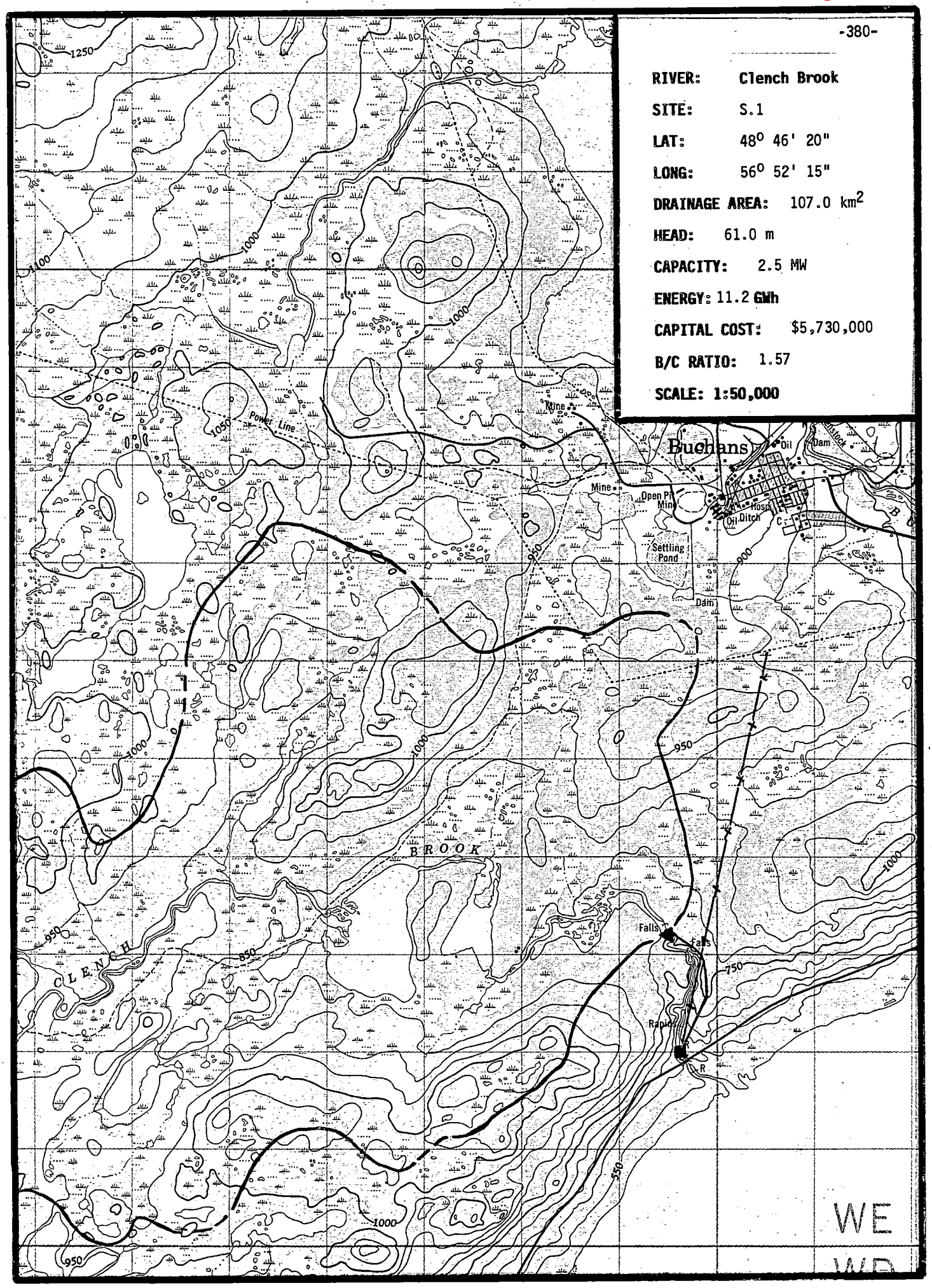
CAPACITY: 2.5 MW

ENERGY: 11.2 GWh

CAPITAL COST: $5,730,000

B/C RATIO: 1.57

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Clench Brook

SITE NAME : SITE 1 FILE : 3064

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.465321 MW
PENSTOCK LENGTH	: 1450 M.
DESIGN FLOW	: 4.965 M^3/S
PENSTOCK DIAMETER	: 1.411463 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 3.5 KM.
LENGTH OF DAM	: 78 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 48 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6327369

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
291144.5	SEE DAM	97710.08	2248266	36000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
419347.3	999295.6	299788.7	127000	309655.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	172914.8	535822.1	196081.3

PROJECT COST: $ 5733027 COST PER KW: $ 2325.469

Total Project Cost = $ 5,733,027

MAP NUMBER 12 A/15 DATA SHEET FILE NUMBER 3064

1. Site Identification:

River Basin: Clench Brook Site: S.1

2. Location:

Lat. 48° 46' 20" Long. 56° 52' 15" Hydrologic Region 3

3. Hydrologic Data:

A = 107 km^2, MAR = 975 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.31 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 48 m^3/s Q_2 = 23

Q1000 = 63 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 1450 m
Access Road Length = 1 km
Dam Height = 5.4 m
Distance to Town = 10 km
Installed Capacity = 2.4 MW

Plant Design Flow = 4.96 m^3/s
T.L. Line Length = 3.5 km
Dam Length = 78 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Buchans Brook

SITE: S.1

LAT: 48° 49' 10"

LONG: 56° 47' 40"

DRAINAGE AREA: 104.0 km²

HEAD: 31.0 m

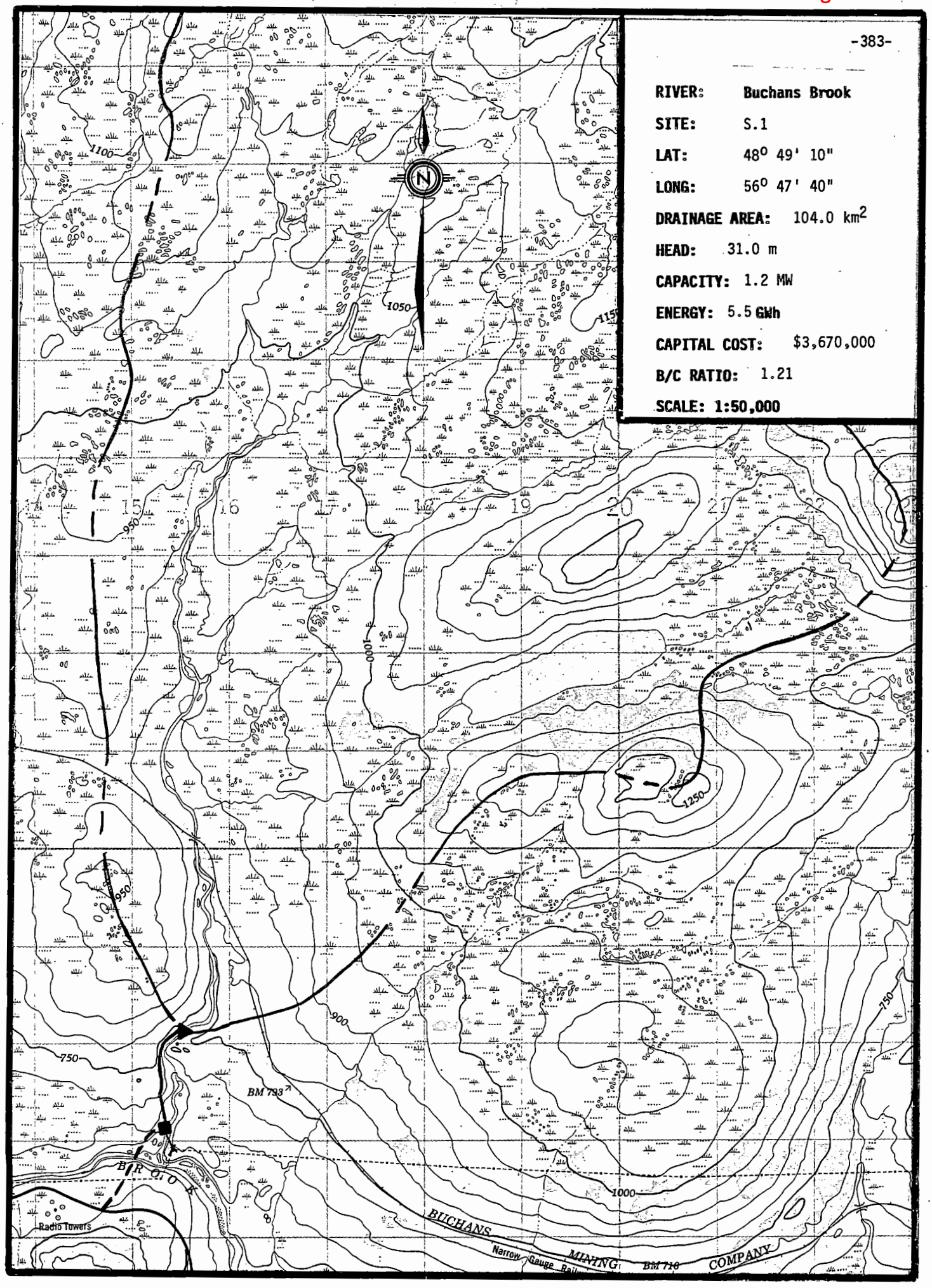
CAPACITY: 1.2 MW

ENERGY: 5.5 GWh

CAPITAL COST: $3,670,000

B/C RATIO: 1.21

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Buchans Brook

SITE NAME : SITE 1 FILE : 3065

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	1.215017 MW
PENSTOCK LENGTH	:	1050 M.
DESIGN FLOW	:	4.815 M^3/S
PENSTOCK DIAMETER	:	1.531427 M.
RATED HEAD	:	31 M.
HEIGHT OF DAM	:	5.4 M.
TRANSMISSION LINE LENGTH	:	.1 KM.
LENGTH OF DAM	:	96 M.
ACCESS ROAD LENGTH	:	1.5 KM.
FLOOD FLOW	:	145 M^3/S
DISTANCE TO TOWN	:	5 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.78
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 4183702

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
350968.2	SEE DAM	95049.24	767394	108750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
323861.3	771754.5	231526.3	179259.1	101096.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	150421.7	452235.9	136071.5

PROJECT COST: $ 3668388 COST PER KW: $ 3019.207

Total Project Cost = $ 3,668,388

MAP NUMBER 12 A/15 DATA SHEET FILE NUMBER 3065

1. Site Identification:

River Basin: Buchans Brook Site: S.1

2. Location:

Lat. 48° 49' 10" Long. 56° 47' 40" Hydrologic Region 3

3. Hydrologic Data:

A = 104 km^2, MAR = 975 mm, ACLS = 20 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 3.21 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 145 m^3/s Q_2 = 70

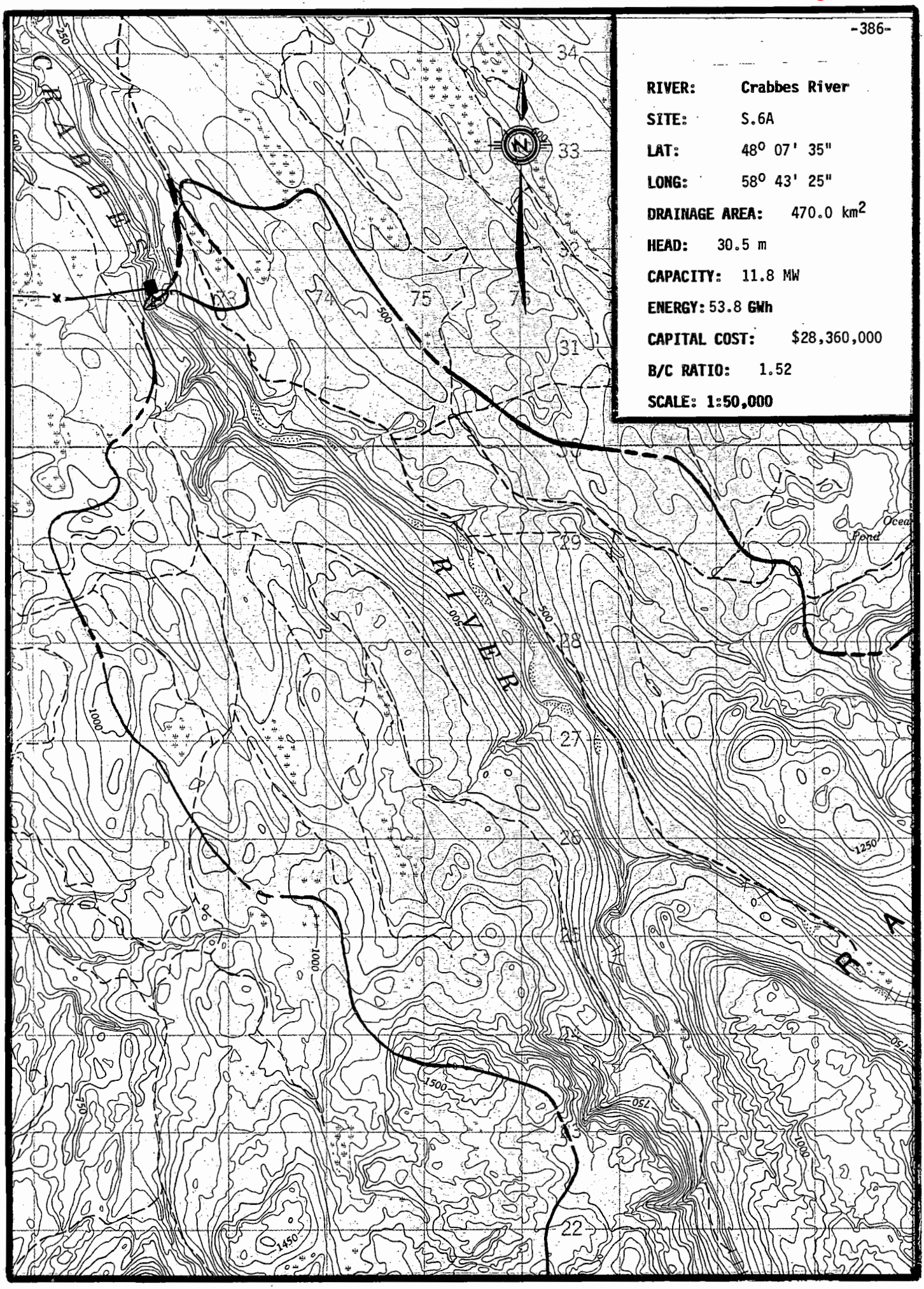
Q1000 = 190 m^3/s

4. Site Data:

Rated Head = 31 m
Penstock Length = 1050 m
Access Road Length = 1.5 km
Dam Height = 5.4 m
Distance to Town = 5 km
Installed Capacity = 1.2 MW

Plant Design Flow = 4.82 m^3/s
T.L. Line Length = 0.1 km
Dam Length = 96 m
Distance to Concrete Plant = 100 km

5. Remarks:


-386-
RIVER: Crabbes River
SITE: S.6A
LAT: 48° 07' 35"
LONG: 58° 43' 25"
DRAINAGE AREA: 470.0 km²
HEAD: 30.5 m
CAPACITY: 11.8 MW
ENERGY: 53.8 GWh
CAPITAL COST: $28,360,000
B/C RATIO: 1.52
SCALE: 1:50,000
CRABBE
RIVER
N
34
33
32
31
30
29
28
27
26
25
24
23
22
73
74
75
76
500
1000
1250
1450
1500
750
250

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Crabbes River

SITE NAME : SITE - 6A FILE : 3066

SITE DATA

INSTALLED CAPACITY	: 11.80524 MW
PENSTOCK LENGTH	: 130 M.
DESIGN FLOW	: 47.55 M^3/S
PENSTOCK DIAMETER	: 4.109068 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 30.5 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 300 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 1500 M^3/S
DISTANCE TO TOWN	: 16 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.710451E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
6077142	5597246	746530.5	811375.5	1125000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1837779	3675559	1097182	127000	362822.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2805537	2242679	1850214

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.835607E+07 COST PER KW: $ 2401.99

Total Project Cost = $ 28,356,070

MAP NUMBER 12 B/02 DATA SHEET FILE NUMBER 3066

1. Site Identification:

River Basin: Crabbes River Site: S.6A

2. Location:

Lat. 48° 07' 35" Long. 58° 43' 25" Hydrologic Region 3

3. Hydrologic Data:

A = 470 km^2, MAR = 2120 mm, ACLS = 60 %
(Includes Dashwoods Pond Diversion)
Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 31.7 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 1100 m^3/s

Q1000 = 1500 m^3/s

4. Site Data:

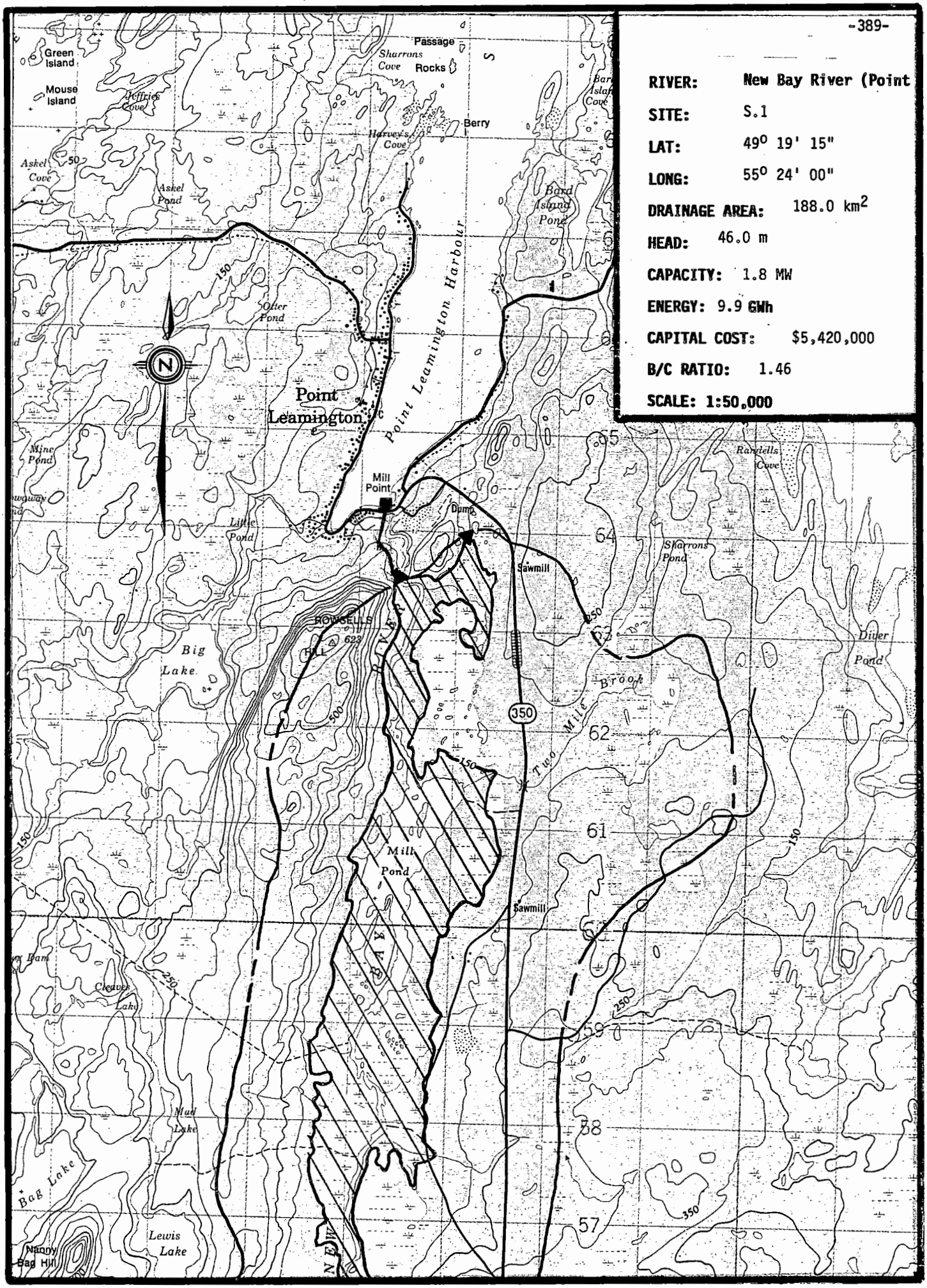
Rated Head = 30.5 m
Penstock Length = 130 m
Access Road Length = 1.0 km
Dam Height = 30.5 m
Distance to Town = 16 km
Installed Capacity = 11.8 MW

Plant Design Flow = 47.6 m^3/s
T.L. Line Length = 5 km
Dam Length = 300 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes benefits of Dashwoods Pond Diversion (not shown on sketch because of distance from P.H. site).

(ii) Plant would adversely effect access to upstream spawning areas.


-389-
RIVER: New Bay River (Point
SITE: S.1
LAT: 49° 19' 15"
LONG: 55° 24' 00"
DRAINAGE AREA: 188.0 km²
HEAD: 46.0 m
CAPACITY: 1.8 MW
ENERGY: 9.9 GWh
CAPITAL COST: $5,420,000
B/C RATIO: 1.46
SCALE: 1:50,000
Green Island
Mouse Island
Jeffries Cove
Askel Cove
Askel Pond
Passage Rocks
Sharrons Cove
Berry
Harvey's Cove
Bard Island Pond
Otter Pond
Point Leamington
Point Leamington Harbour
Mine Pond
Mill Point
Dump
Little Pond
Sawmill
Randells Cove
Sharrons Pond
Howsells Hill
Big Lake
Brook
Two Mile
Diver Pond
Mill Pond
Sawmill
Cleaver Lake
Mud Lake
Bag Lake
Lewis Lake
Nandy Bag Hill
New Bay
350
150
250
500
64
63
62
61
59
58
57

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : New Bay River (Point Leamington)

SITE NAME : SITE - 1 FILE : 3067

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.842245 MW
PENSTOCK LENGTH	: 900 M.
DESIGN FLOW	: 4.92 M^3/S
PENSTOCK DIAMETER	: 1.462613 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 10 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 220 M.
ACCESS ROAD LENGTH	: 0 KM.
FLOOD FLOW	: 150 M^3/S
DISTANCE TO TOWN	: .5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .9199999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5341023

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
998610.4	459679.8	96912.66	628256	112500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
377490.3	899551.2	269865.4	0	148953.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	113554.1	531386.9	180631.4

PROJECT COST: $ 5417392 COST PER KW: $ 2940.647

Total Project Cost = $ 5,417,392

WATER SHED : New Bay River (Point Leamington) SITE - 1

COST DATA

(ADDITIONAL COST of $ 600,000 for Reservoir Clearing INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .6133333

ANNUAL COST : $ 406304.4

ANNUAL BENEFIT : $ 593880.7

BENEFIT/COST RATIO: 1.461665

Total Project Cost = $ 5,417,392.00

Benefit / Cost Ratio = 1.46

MAP NUMBER 2 E/06 DATA SHEET FILE NUMBER 3067

1. Site Identification:

River Basin: New Bay River (Pt. Leamington) Site: S.1

2. Location:

Lat. 49° 19' 15" Long. 55° 24' Hydrologic Region 3

3. Hydrologic Data:

A = 188 km^2, MAR = 550 mm, ACLS = 60 %

Storage Reservoir Area = 5.57 km^2

Storage Reservoir Vol, V = 11.5 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.11$$

Mean Flow, QAV = 3.28 m^3/s

Usable Flow Ratio = 0.92

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 110 m^3/s

Q1000 = 150 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 900 m
Access Road Length = - km
Dam Height = 10 m
Distance to Town = 0.5 km
Installed Capacity = 1.8 MW

Plant Design Flow = 4.92 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 220 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Several partial obstruction interfere with salmon access.

(ii) Add $600,000 for reservoir clearing.

-393-

RIVER: Harrys River (North & East Brooks)

SITE: S.2

LAT: 48° 43' 00"

LONG: 58° 17' 00"

DRAINAGE AREA: 92.0 km²

HEAD: 69.0 m

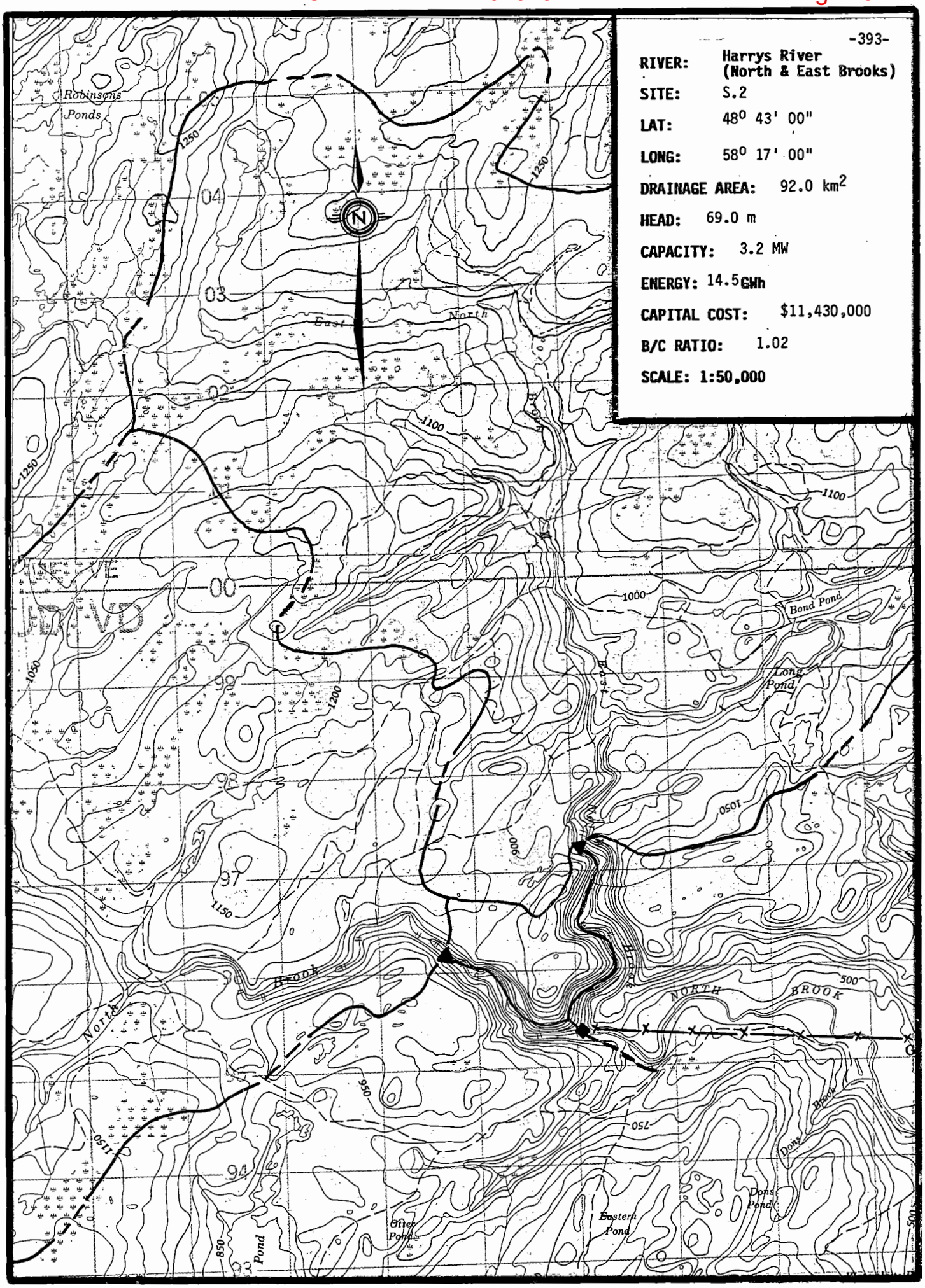
CAPACITY: 3.2 MW

ENERGY: 14.5 GWh

CAPITAL COST: $11,430,000

B/C RATIO: 1.02

SCALE: 1:50,000



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WATER SHED : Harry's River (North Brook)

SITE NAME : SITE - 2 FILE : 3068

SITE DATA

INSTALLED CAPACITY	: 3.193037 MW
PENSTOCK LENGTH	: 160 M.
DESIGN FLOW	: 5.685 M^3/S
PENSTOCK DIAMETER	: 1.470502 M.
RATED HEAD	: 69 M.
HEIGHT OF DAM	: 7.5 M.
TRANSMISSION LINE LENGTH	: 4.8 KM.
LENGTH OF DAM	: 160 M.
ACCESS ROAD LENGTH	: 4.8 KM.
FLOOD FLOW	: 145 M^3/S
DISTANCE TO TOWN	: 5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7588719

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
919958.2	SEE DAM	110374.7	260553.7	108750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
481363.8	1024178	307253.5	481791.1	404564.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	180481.4	461676.3	177272.7

PROJECT COST: $ 1.142942E+07 COST PER KW: $ 3579.482

Total Project Cost = $ 11,429,420

WATER SHED : Harry's River (North Brook) SITE - 2

COST DATA

(ADDITIONAL COST of $ 6,511,200 for L.P.Penstock INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 857206.3

ANNUAL BENEFIT : $ 872695.3

BENEFIT/COST RATIO: 1.018069

Total Project Cost = $ 11,429,420.00

Benefit / Cost Ratio = 1.02

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 3068

1. Site Identification:

River Basin: Harry's River Site: S.2

2. Location:

Lat. 48° 43' 00" Long. 58° 17' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 92 km^2, MAR = 1300 mm, ACLS = 10 %

Storage Reservoir Area = - km^2

Storage Reservoir Vol, V = ____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = ____

Mean Flow, QAV = 3.79 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 145 m^3/s for 46 km^2

Q1000 = 195 m^3/s

4. Site Data:

Rated Head = 69 m
Penstock Length = 160 m
Access Road Length = 4.8 km
Dam Height = 7.5 m
Distance to Town = 5.0 km
Installed Capacity = 3.2 MW

Plant Design Flow = 5.79 m^3/s
T.L. Line Length = 4.8 km
Dam Length = 160 m (two dams)
Distance to Concrete Plant = 60 km

5. Remarks:

(i) Add cost of 4100 m of low pressure penstock at $11,200 plus incremented cost to cover second intake at $6,500,000 for a total of $6,511,200.

(ii) Add:

- cost of low pressure penstock = $6,500,000
- increase cost to account for second intake = $ 11,200

∴ Total Extra Cost = $6,511,200

RIVER: Sandy Brook via DIvers

SITE: S.1

LAT: 48° 51' 15"

LONG: 55° 50' 50"

DRAINAGE AREA: 290.0 km^2

HEAD: 30.0 m

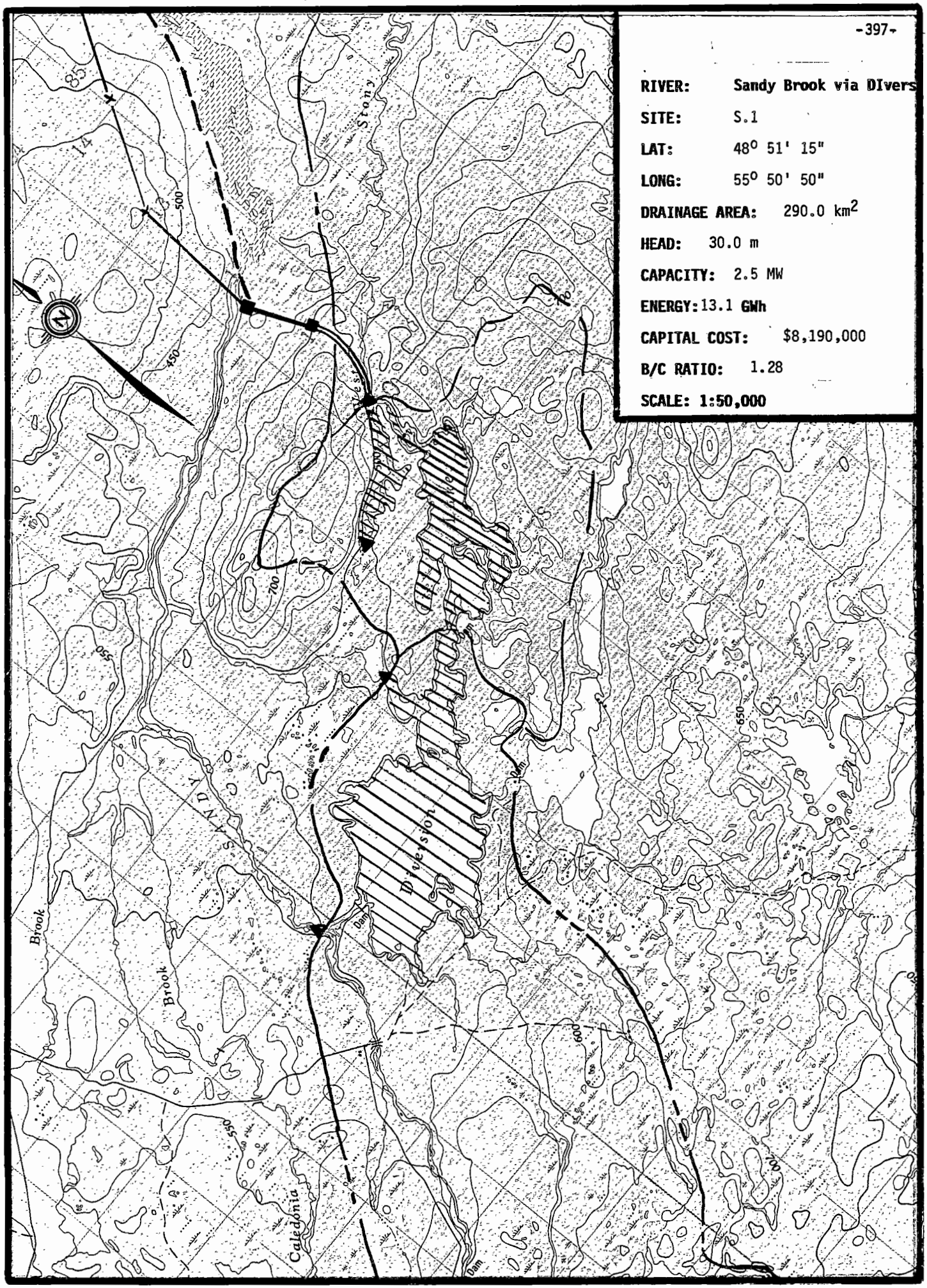
CAPACITY: 2.5 MW

ENERGY: 13.1 GWh

CAPITAL COST: $8,190,000

B/C RATIO: 1.28

SCALE: 1:50,000



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WATER SHED : Sandy Brook via Diversion Lake

SITE NAME : SITE - 1 FILE : 3069

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.52747 MW
PENSTOCK LENGTH	: 650 M.
DESIGN FLOW	: 10.35 M^3/S
PENSTOCK DIAMETER	: 2.137952 M.
RATED HEAD	: 30 M.
HEIGHT OF DAM	: 7.5 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 420 M.
ACCESS ROAD LENGTH	: 5 KM.
FLOOD FLOW	: 210 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 20 KM.
USEFUL TURBINE FLOW RATIO	: .89
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7689690

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1296162	512625.2	189259.8	663305.1	157500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
547035.7	1303575	391072.3	498801.9	375269.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	401008.5	761260.3	291517.9

PROJECT COST: $ 8188393 COST PER KW: $ 3239.759

Total Project Cost = $ 8,188,393

WATER SHED : Sandy Brook via Diversion Lake SITE - 1

COST DATA

(ADDITIONAL COST of $ 800,000 for Forebay Canal INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5933333

ANNUAL COST : $ 614129.5

ANNUAL BENEFIT : $ 788206.6

BENEFIT/COST RATIO: 1.283454

Total Project Cost = $ 8,188,393.00

Benefit / Cost Ratio = 1.28

MAP NUMBER 2 D/13 DATA SHEET FILE NUMBER 3069

1. Site Identification:

River Basin: Sandy Brook via Diversion Lake Site: S.1

2. Location:

Lat. 48° 51' 15" Long. 55° 50' 50" Hydrologic Region 3

3. Hydrologic Data:

A = 290 km^2, MAR = 750 mm, ACLS = 75 %

Storage Reservoir Area = 15.6+6.0 km^2 Sandy & Diversion Lakes

Storage Reservoir Vol, V = - $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.08$$

Mean Flow, QAV = 6.90 m^3/s

Usable Flow Ratio = 0.89

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 160 m^3/s

Q1000 = 210 m^3/s

4. Site Data:

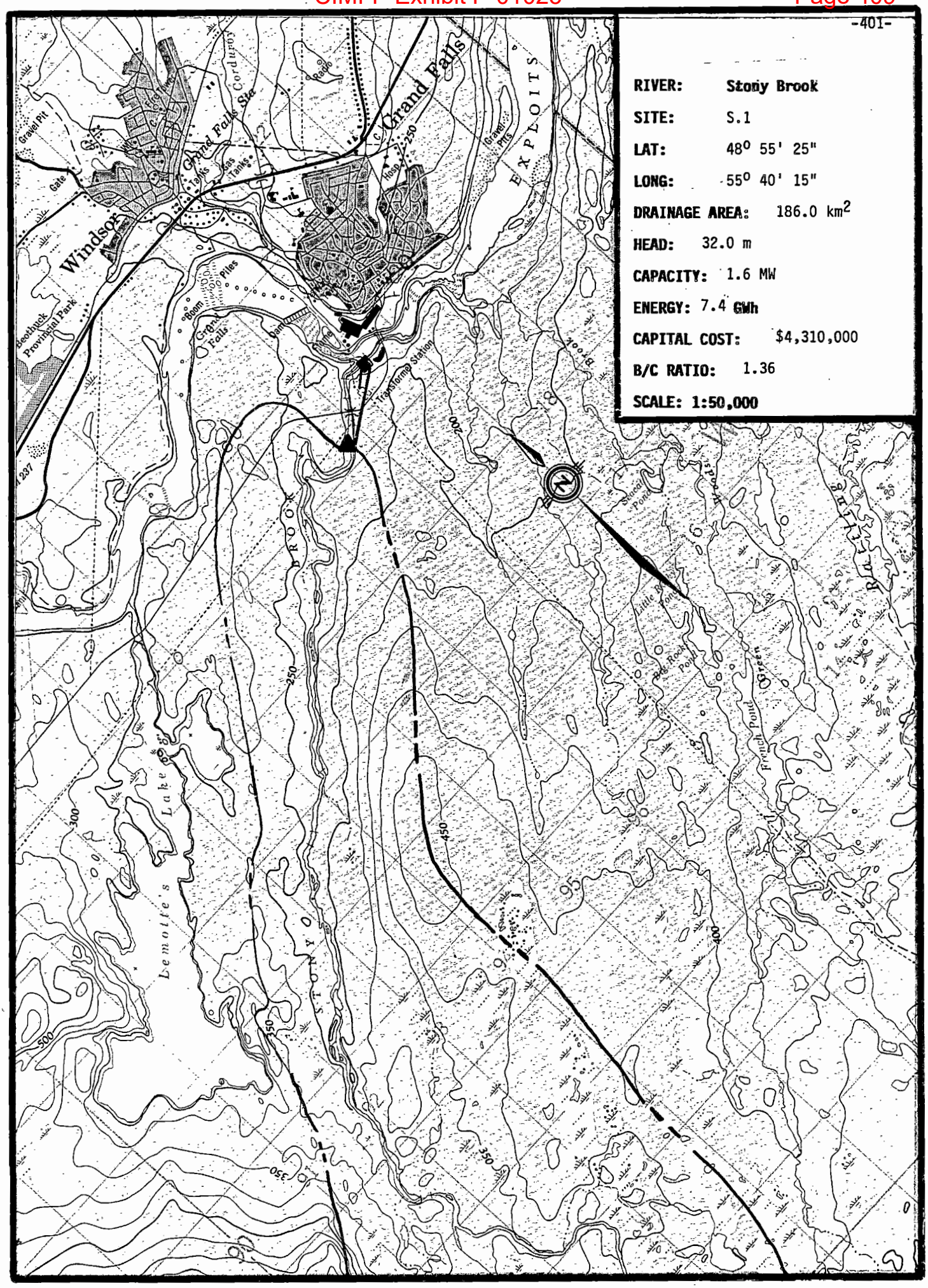
Rated Head = 30.0 m
Penstock Length = 650 m
Access Road Length = 5.0 km
Dam Height = 7.5 m
Distance to Town = 20 km
Installed Capacity = 2.5 MW

Plant Design Flow = 10.3 m^3/s
T.L. Line Length = 5.0 km
Dam Length = 420 m
Distance to Concrete Plant = 20 km

5. Remarks:

(i) Costs include all cut off dams.

(ii) Add cost of Forebay Canal $800,000, dug canal.



RIVER: Stony Brook

SITE: S.1

LAT: 48° 55' 25"

LONG: 55° 40' 15"

DRAINAGE AREA: 186.0 km²

HEAD: 32.0 m

CAPACITY: 1.6 MW

ENERGY: 7.4 GWh

CAPITAL COST: $4,310,000

B/C RATIO: 1.36

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Stony Brook

SITE NAME : SITE - 1 FILE : 3070

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.613674 MW
PENSTOCK LENGTH	: 830 M.
DESIGN FLOW	: 6.195 M^3/S
PENSTOCK DIAMETER	: 1.699133 M.
RATED HEAD	: 32 M.
HEIGHT OF DAM	: 10 M.
TRANSMISSION LINE LENGTH	: .2 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: .3 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: .5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: .5 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5238658

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
951569.9	SEE DAM	119247.5	672981.6	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
390657.6	930928.9	279278.7	45641.17	124487.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	5298.003	497998.2	162589.2

PROJECT COST: $ 4308179 COST PER KW: $ 2669.796

Total Project Cost = $ 4,308,179

MAP NUMBER 2 D/13 DATA SHEET FILE NUMBER 3070

1. Site Identification:

River Basin: Stony Brook Site: S.1

2. Location:

Lat. 48° 55' 25" Long. 55' 40" 15" Hydrologic Region 3

3. Hydrologic Data:

A = 186 km^2, MAR = 700 mm, ACLS = 37 %

Storage Reservoir Area = - km^2

Storage Reservoir Vol, V = - $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = -

Mean Flow, QAV = 4.13 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 140 m^3/s

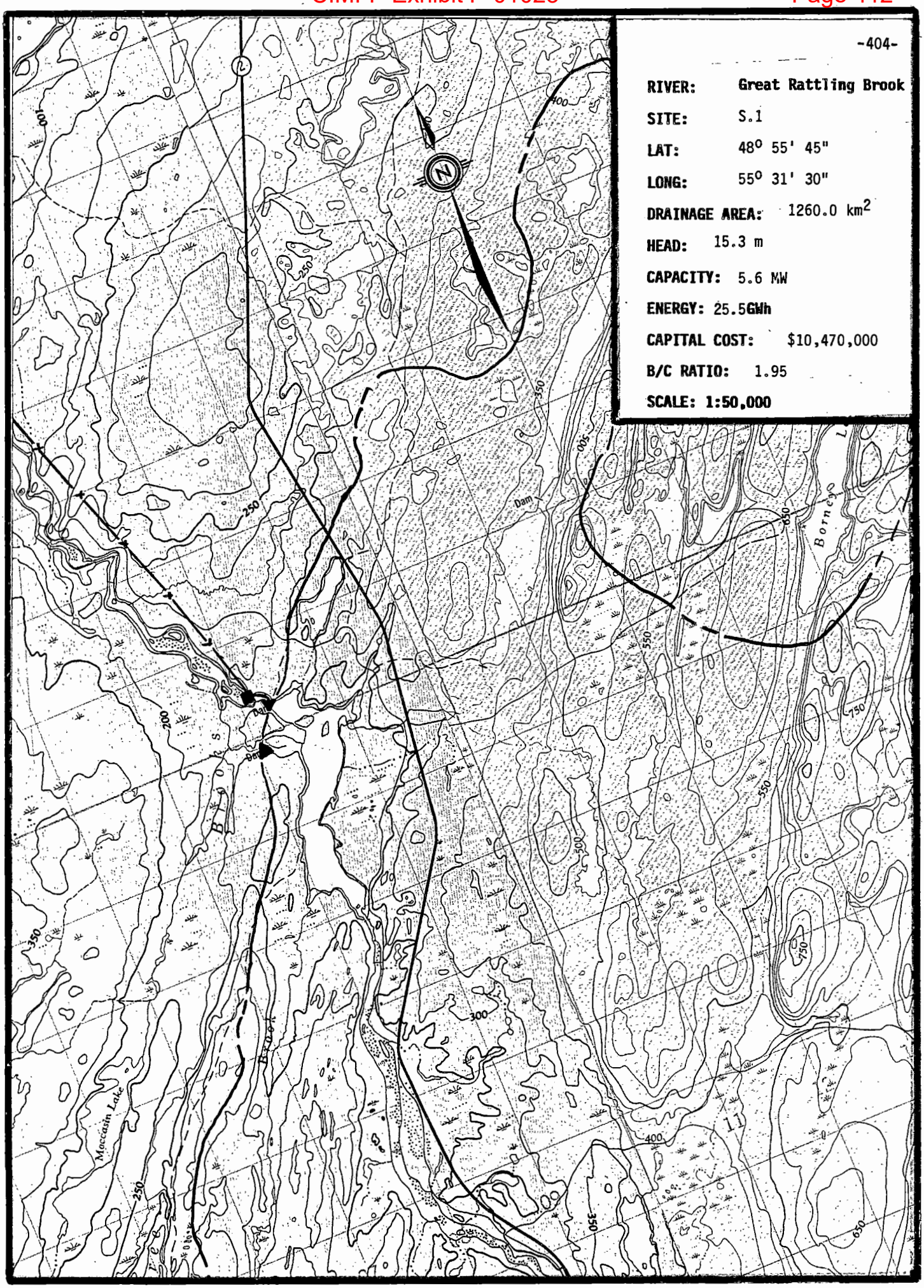
Q1000 = 170 m^3/s

4. Site Data:

Rated Head = 32 m
Penstock Length = 830 m
Access Road Length = 0.3 km
Dam Height = 10 m
Distance to Town = 0.5 km
Installed Capacity = 1.6 MW

Plant Design Flow = 6.19 m^3/s
T.L. Line Length = 0.2 km
Dam Length = 100 m
Distance to Concrete Plant = 0.5 km

5. Remarks:


-404-
RIVER: Great Rattling Brook
SITE: S.1
LAT: 48° 55' 45"
LONG: 55° 31' 30"
DRAINAGE AREA: 1260.0 km²
HEAD: 15.3 m
CAPACITY: 5.6 MW
ENERGY: 25.5GWh
CAPITAL COST: $10,470,000
B/C RATIO: 1.95
SCALE: 1:50,000
Dam
Dam
Moccasin Lake
Borneo L
N

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Great Rattling Brook

SITE NAME : SITE - 1 FILE : 3071

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 5.596917 MW
PENSTOCK LENGTH	: 200 M.
DESIGN FLOW	: 44.94 M^3/S
PENSTOCK DIAMETER	: 4.417189 M.
RATED HEAD	: 15.3 M.
HEIGHT OF DAM	: 9.399999 M.
TRANSMISSION LINE LENGTH	: 7 KM.
LENGTH OF DAM	: 153 M.
ACCESS ROAD LENGTH	: .3 KM.
FLOOD FLOW	: 260 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 10 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.741655E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1263312	SEE DAM	709548.1	1384832	195000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1245268	2789400	832656.6	45641.17	386967.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	215382.1	934103.6	463179.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.046529E+07 COST PER KW: $ 1869.831

Total Project Cost = $ 10,465,290

MAP NUMBER 2 D/13 2 D/14 DATA SHEET FILE NUMBER 3071

1. Site Identification:

River Basin: Great Rattling Brook Site: S.1

2. Location:

Lat. 48° 55' 45" Long. 55° 31' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 1260 km^2, MAR = 750 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 29.96 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 260 m^3/s

Q1000 = 360 m^3/s

Q_2 = 140

4. Site Data:

Rated Head = 15.3 m

Penstock Length = 200 m

Access Road Length = 0.3 km

Dam Height = 9.4 m

Distance to Town = 10 km

Installed Capacity = 5.6 MW

Plant Design Flow = 44.93 m^3/s

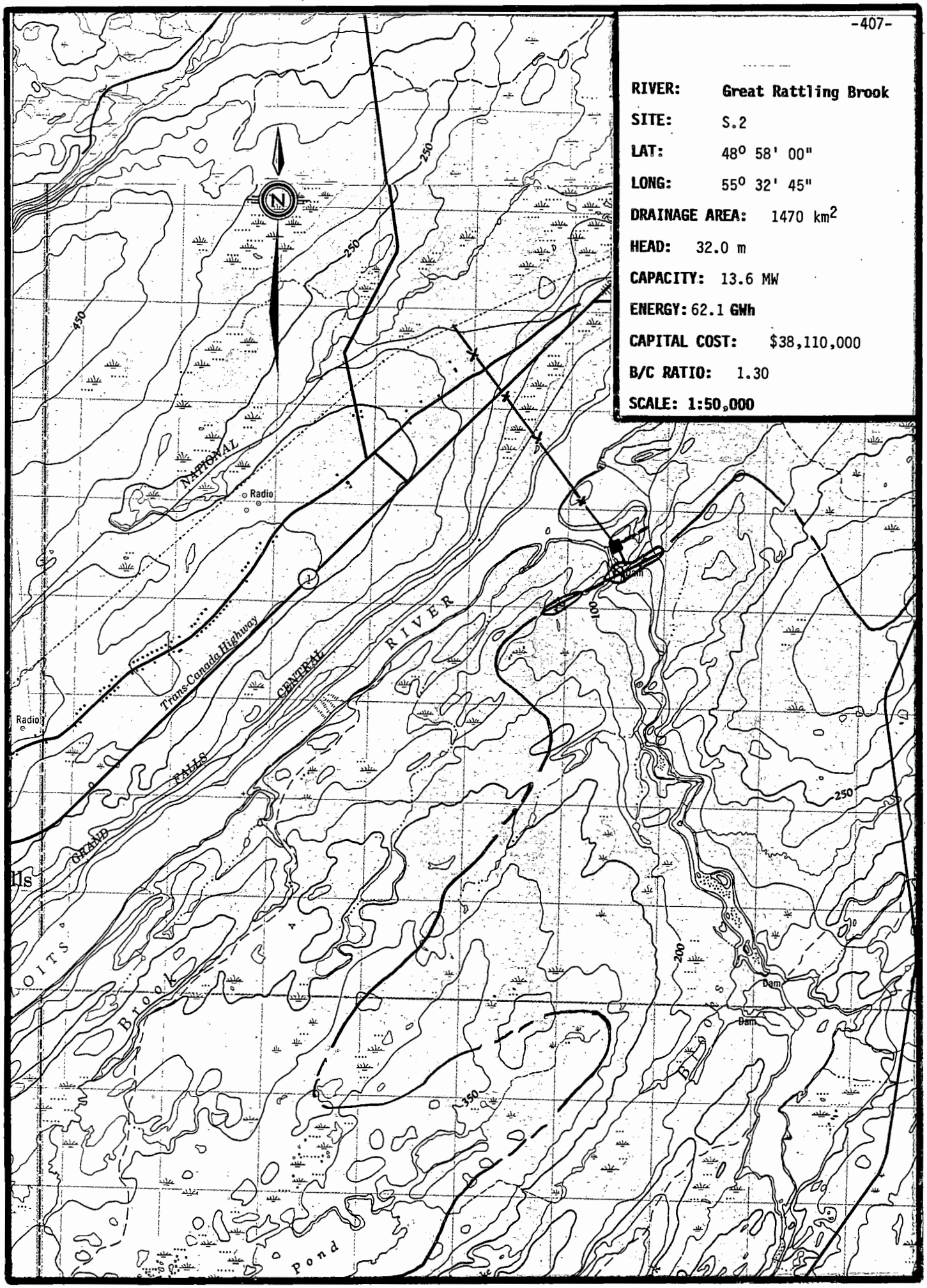
T.L. Line Length = 7 km

Dam Length = 153 m

Distance to Concrete Plant = 10 km

5. Remarks:

(i) Salmon River.


RIVER: Great Rattling Brook
SITE: S.2
LAT: 48° 58' 00"
LONG: 55° 32' 45"
DRAINAGE AREA: 1470 km²
HEAD: 32.0 m
CAPACITY: 13.6 MW
ENERGY: 62.1 GWh
CAPITAL COST: $38,110,000
B/C RATIO: 1.30
SCALE: 1:50,000
N
250
450
NATIONAL
Radio
Trans-Canada Highway
CENTRAL
RIVER
Dam
100
GRAND
FALLS
Radio
250
200
Dam
Dam
350
Brook
Pond

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Great Rattling Brook

SITE NAME : SITE - 2 FILE : 3072

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 13.63613 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 52.35 M^3/S
PENSTOCK DIAMETER	: 4.253865 M.
RATED HEAD	: 32 M.
HEIGHT OF DAM	: 28 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 1150 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 400 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 10 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3.014795E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1.788427E+07	1882557	814023.6	1967542	300000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2039549	4568589	1363758	70457.66	240649.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1390530	2910792	2677530

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 3.811025E+07 COST PER KW: $ 2794.8

Total Project Cost = $ 38,110,250

MAP NUMBER 2 D/13 DATA SHEET FILE NUMBER 3072

1. Site Identification:

River Basin: Great Rattling Brook Site: S.2

2. Location:

Lat. 48° 58' 00" Long. 55° 32' 45" Hydrologic Region 3

3. Hydrologic Data:

A = 1470 km^2, MAR = 750 mm, ACLS = 75 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 34.9 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = _____ m^3/s

Q1000 = 400 m^3/s

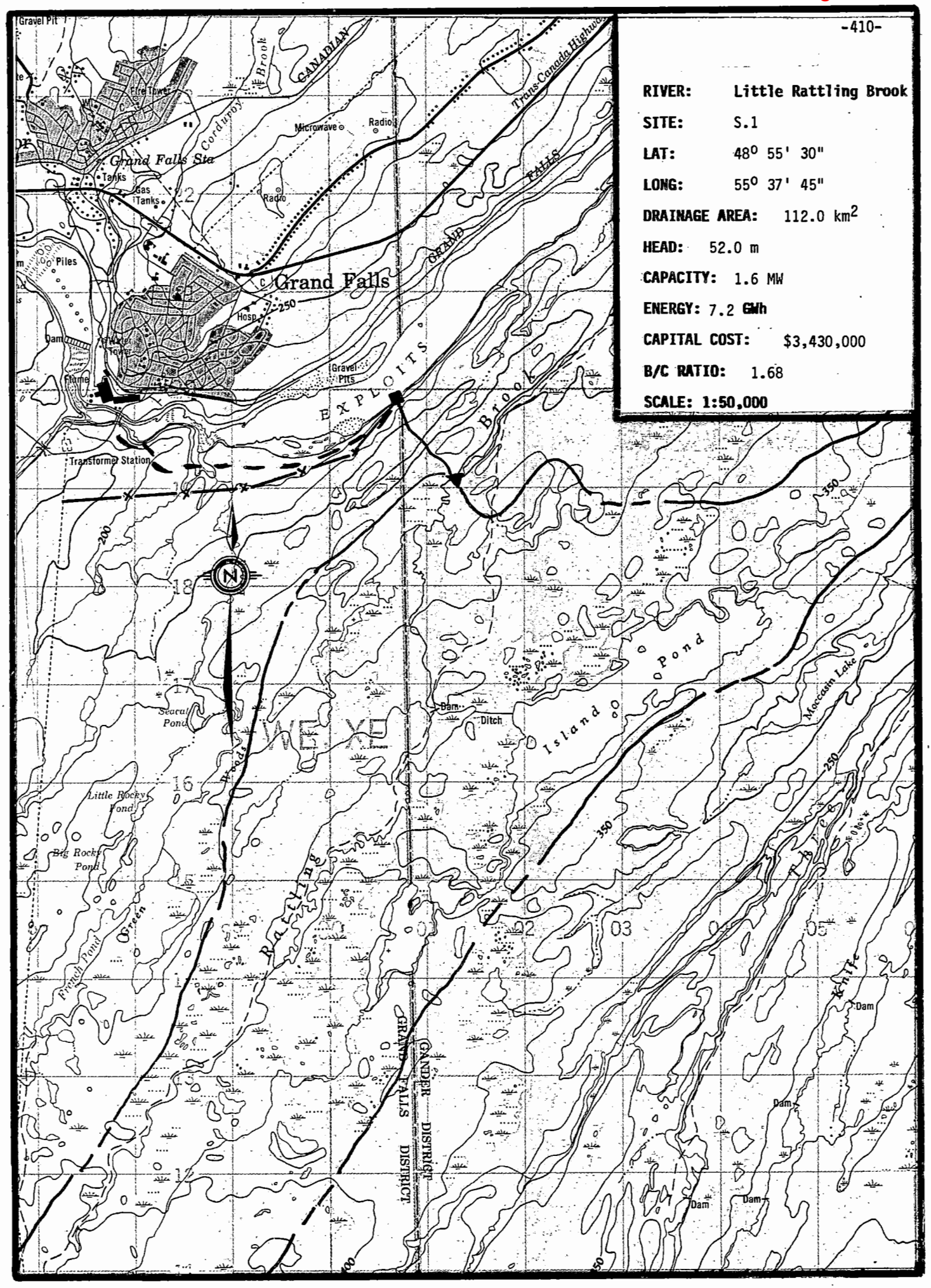
4. Site Data:

Rated Head = 32 m
Penstock Length = 300 m
Access Road Length = 0.5 km
Dam Height = 28 m
Distance to Town = 10 km
Installed Capacity = 13.7 MW

Plant Design Flow = 52.4 m^3/s
T.L. Line Length = 3.0 km
Dam Length = 1150 m
Distance to Concrete Plant = 10 km

5. Remarks:

(i) Salmon River.


-410-
RIVER: Little Rattling Brook
SITE: S.1
LAT: 48° 55' 30"
LONG: 55° 37' 45"
DRAINAGE AREA: 112.0 km²
HEAD: 52.0 m
CAPACITY: 1.6 MW
ENERGY: 7.2 GWh
CAPITAL COST: $3,430,000
B/C RATIO: 1.68
SCALE: 1:50,000
Grand Falls
Grand Falls Sta
Transformer Station
Exploits Brook
Island Pond
Little Rattling Brook
Grand Falls District
Gander District
Trans-Canada Highway
Canadian National
Corduroy Brook
Microwave
Radio
Fire Tower
Tanks
Gas Tanks
Piles
Dam
Flume
Hosp
Gravel Pits
Ditch
Seacul Pond
Little Rocky Pond
Big Rocky Pond
French Pond
Green Pond
Moccasin Lake
Knife Pond
Woods
Dam

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ShawMont Newfoundland Limited
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WATER SHED : Little Rattling Brook

SITE NAME : SITE - 1 FILE : 3073

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.580951 MW
PENSTOCK LENGTH	: 950 M.
DESIGN FLOW	: 3.735 M^3/S
PENSTOCK DIAMETER	: 1.277071 M.
RATED HEAD	: 52 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 82 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 78 M^3/S
DISTANCE TO TOWN	: 3 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 3 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4571454

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
271453.9	SEE DAM	75626.41	579237.7	58500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
324914.9	774265.3	232279.6	323114.7	236974.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	20863.74	401873.6	127463

PROJECT COST: $ 3426568 COST PER KW: $ 2167.41

Total Project Cost = $ 3,426,568

MAP NUMBER 2 D/13 DATA SHEET FILE NUMBER 3073

1. Site Identification:

River Basin: Little Rattling Brook Site: S.1

2. Location:

Lat. 48° 55' 30" Long. 55° 37' 45" Hydrologic Region 3

3. Hydrologic Data:

A = 112 km^2, MAR = 700 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.49 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 78 m^3/s

Q1000 = 91 m^3/s

Q_2 = 42

4. Site Data:

Rated Head = 52 m

Penstock Length = 950 m

Access Road Length = 3 km

Dam Height = 5 m

Distance to Town = 3 km

Installed Capacity = 1.6 MW

Plant Design Flow = 3.73 m^3/s

T.L. Line Length = 3 km

Dam Length = 82 m

Distance to Concrete Plant = 3 km

5. Remarks:

RIVER: Noel Paul's Brook

SITE: S.1

LAT: 48° 45' 00"

LONG: 56° 16' 30"

DRAINAGE AREA: 961.0 km²

HEAD: 21.0 m

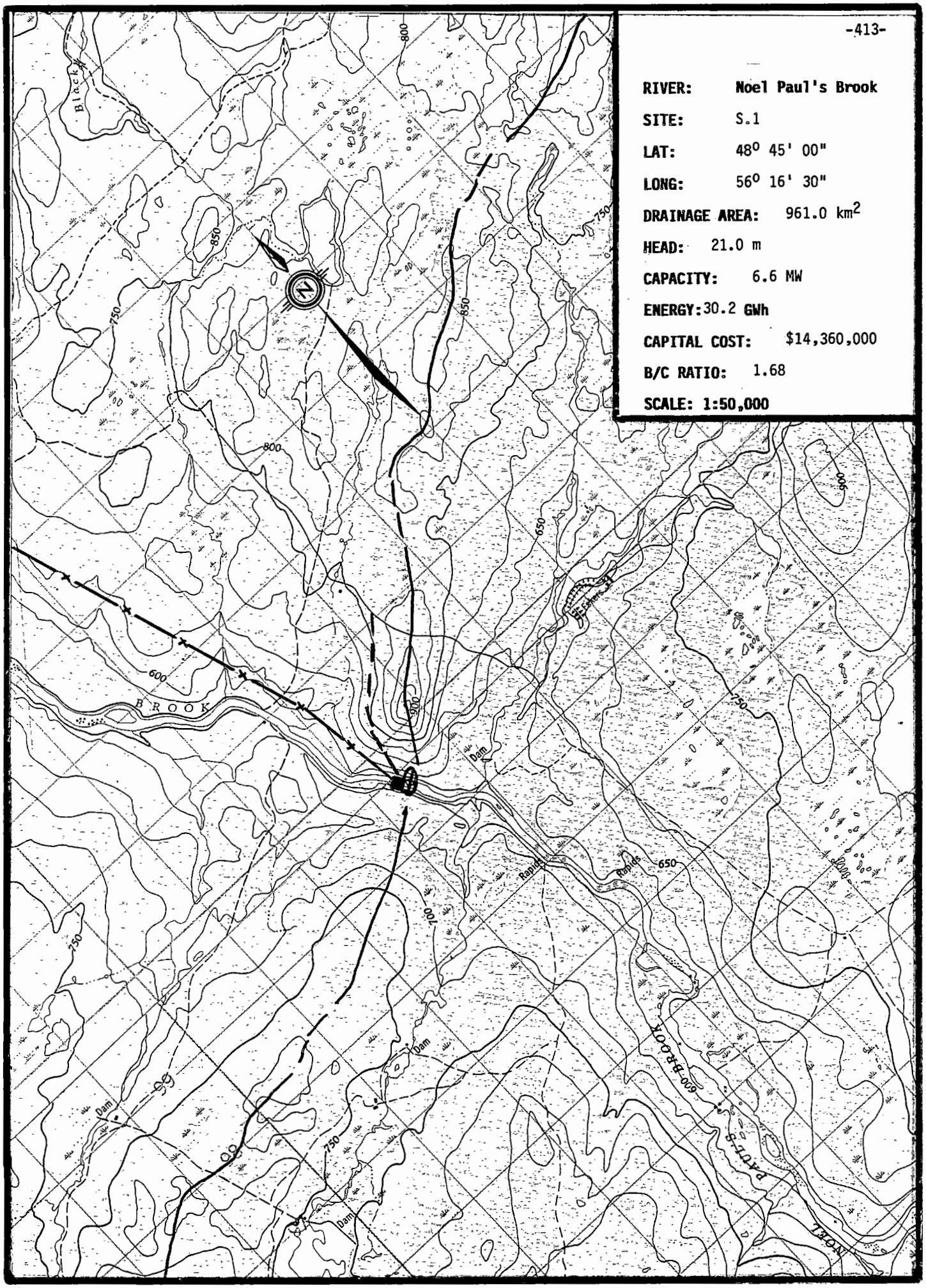
CAPACITY: 6.6 MW

ENERGY: 30.2 GWh

CAPITAL COST: $14,360,000

B/C RATIO: 1.68

SCALE: 1:50,000



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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Noel Paul's Brook

SITE NAME : SITE - 1 FILE : 3074

SITE DATA

INSTALLED CAPACITY	: 6.638455 MW
PENSTOCK LENGTH	: 97 M.
DESIGN FLOW	: 38.835 M^3/S
PENSTOCK DIAMETER	: 3.968495 M.
RATED HEAD	: 21 M.
HEIGHT OF DAM	: 21 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 210 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 380 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.853135E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2534178	1491931	622175.6	576165.2	285000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1288749	2577498	769402.3	127000	809636

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1344497	1236320	694884.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.435744E+07 COST PER KW: $ 2162.768

Total Project Cost = $ 14,357,440

MAP NUMBER 12 A/09 DATA SHEET FILE NUMBER 3074

1. Site Identification:

River Basin: Noel Paul's Brook Site: S.1

2. Location:

Lat. 48° 45' 00" Long. 56° 16' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 961 km^2, MAR = 850 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 25.89 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 280 m^3/s

Q1000 = 380 m^3/s

Q_2 = 140

4. Site Data:

Rated Head = 21 m

Penstock Length = 97 m

Access Road Length = 1 km

Dam Height = 21 m

Distance to Town = 30 km

Installed Capacity = 6.7 MW

Plant Design Flow = 38.84 m^3/s

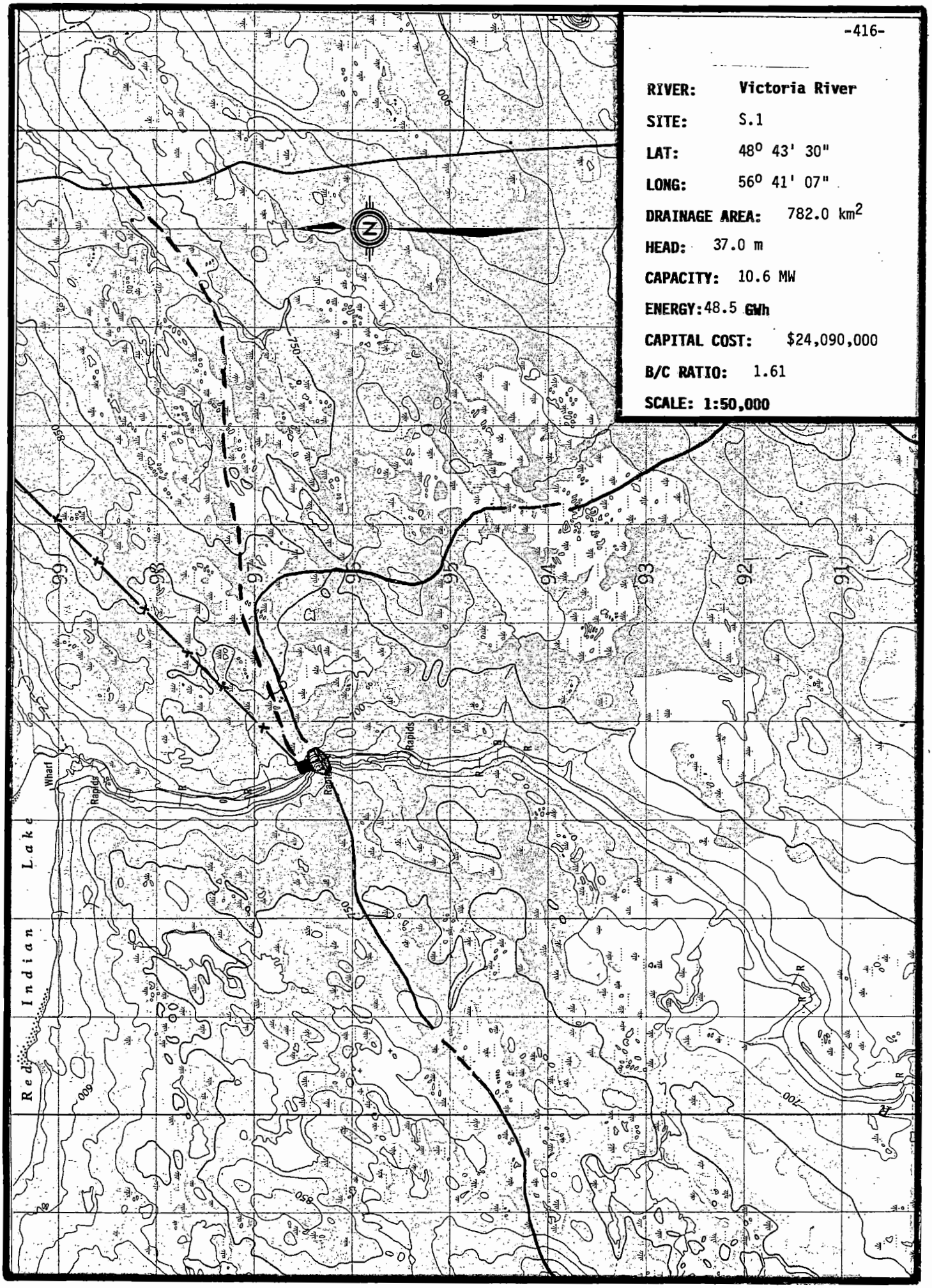
T.L. Line Length = 15 km

Dam Length = 210 m

Distance to Concrete Plant = 60 km

5. Remarks:

(i) Fisheries & Oceans (Canada) are developing salmon spawning areas in Noel Paul's Brook.



RIVER:	Victoria River
SITE:	S.1
LAT:	48° 43' 30"
LONG:	56° 41' 07"
DRAINAGE AREA:	782.0 km^2
HEAD:	37.0 m
CAPACITY:	10.6 MW
ENERGY:	48.5 GWh
CAPITAL COST:	$24,090,000
B/C RATIO:	1.61
SCALE:	1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Victoria River (Below Victoria Dam)

SITE NAME : SITE - 1 FILE : 3075

SITE DATA

INSTALLED CAPACITY	: 10.63918 MW
PENSTOCK LENGTH	: 150 M.
DESIGN FLOW	: 35.325 M^3/S
PENSTOCK DIAMETER	: 3.519635 M.
RATED HEAD	: 37 M.
HEIGHT OF DAM	: 37 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 260 M.
ACCESS ROAD LENGTH	: 6 KM.
FLOOD FLOW	: 480 M^3/S
DISTANCE TO TOWN	: 14 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.373369E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
7209031	2633080	571328.6	752869.3	360000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1567621	3135243	935893.4	582414.5	1220207

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1688905	1943423	1489870

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.408989E+07 COST PER KW: $ 2264.262

Total Project Cost = $ 24,089,890

MAP NUMBER 12 A/10 DATA SHEET FILE NUMBER 3075

1. Site Identification:

River Basin: Victoria River (Below Victoria Dam) Site: S.1

2. Location:

Lat. 48° 43' 30" Long. 56° 41' 07" Hydrologic Region 3

3. Hydrologic Data:

A = 782 km^2, MAR = 950 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 23.55 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 360 m^3/s

Q1000 = 480 m^3/s

Q_2 = 180

4. Site Data:

Rated Head = 37 m

Penstock Length = 150 m

Access Road Length = 6 km

Dam Height = 37 m

Distance to Town = 14 km

Installed Capacity = 10.5 MW

Plant Design Flow = 35.32 m^3/s

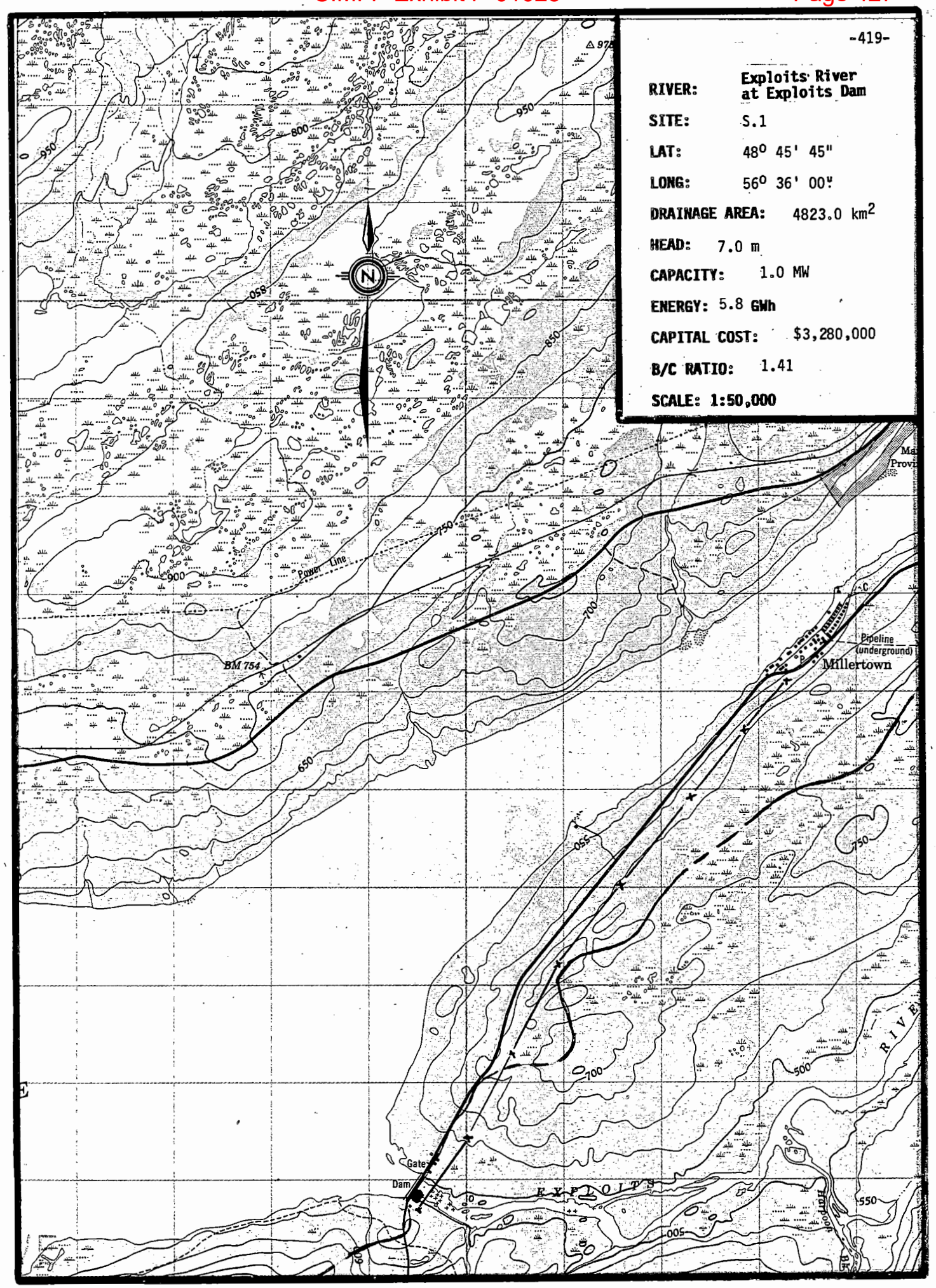
T.L. Line Length = 20 km

Dam Length = 260 m

Distance to Concrete Plant = 60 km

5. Remarks:

RIVER:	Exploits River at Exploits Dam
SITE:	S.1
LAT:	48° 45' 45"
LONG:	56° 36' 00"
DRAINAGE AREA:	4823.0 km²
HEAD:	7.0 m
CAPACITY:	1.0 MW
ENERGY:	5.8 GWh
CAPITAL COST:	$3,280,000
B/C RATIO:	1.41
SCALE:	1:50,000



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WATER SHED : Exploits River at Exploits Dam

SITE NAME : SITE - 1 FILE : 3076

SITE DATA

INSTALLED CAPACITY	: .9986315 MW
PENSTOCK LENGTH	: 7 M.
DESIGN FLOW	: 17.526 M^3/S
PENSTOCK DIAMETER	: 3.287308 M.
RATED HEAD	: 7 M.
HEIGHT OF DAM	: 0 M.
TRANSMISSION LINE LENGTH	: 7 KM.
LENGTH OF DAM	: 0 M.
ACCESS ROAD LENGTH	: .1 KM.
FLOOD FLOW	: 0 M^3/S
DISTANCE TO TOWN	: 52 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 110 KM.
USEFUL TURBINE FLOW RATIO	: 8.400001E-02
MAXIMUM TURBINE FLOW RATIO	: .127
LEAST COST	: $ 5136843

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
0	SEE DAM	304037.1	31973.85	0

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
475255.6	1011182	303354.7	17939.23	351109.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	296032.5	318343.2	87721.16

PROJECT COST: $ 3276949 COST PER KW: $ 3281.44

Total Project Cost = $ 3,276,949

WATER SHED : Exploits River at Exploits Dam SITE - 1

COST DATA

(ADDITIONAL COST of $ 80,000 for Unwatering INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .6614174

ANNUAL COST : $ 245771.2

ANNUAL BENEFIT : $ 347165.2

BENEFIT/COST RATIO: 1.412555

Total Project Cost = $ 3,276,949.00

Benefit / Cost Ratio = 1.41

MAP NUMBER 12 A/15 DATA SHEET FILE NUMBER 3076

1. Site Identification:

River Basin: Exploits River at Exploits Dam Site: S.1

2. Location:

Lat. 48° 45' 45" Long. 56° 36' 00" Hydrologic Region 3

3. Hydrologic Data:

A = 4823 km^2, MAR = 900 mm, ACLS = ____ %

Storage Reservoir Area = ____ km^2

Storage Reservoir Vol, V = ____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_$$

Mean Flow, QAV = 138 m^3/s

Usable Flow Ratio = 0.084

Max. Turbinable Flow Ratio = 0.127

Flood Flow: Q150 = ____ m^3/s

Q1000 = ____ m^3/s

4. Site Data:

Rated Head = 70 m
Penstock Length = 7.0 m
Access Road Length = 0.1 km
Dam Height = - m
Distance to Town = 52 km
Installed Capacity = 1.0 MW (partial development via 1 unit)

Plant Design Flow = 17.5 m^3/s
T.L. Line Length = 7.0 km
Dam Length = - m
Distance to Concrete Plant = 110 km

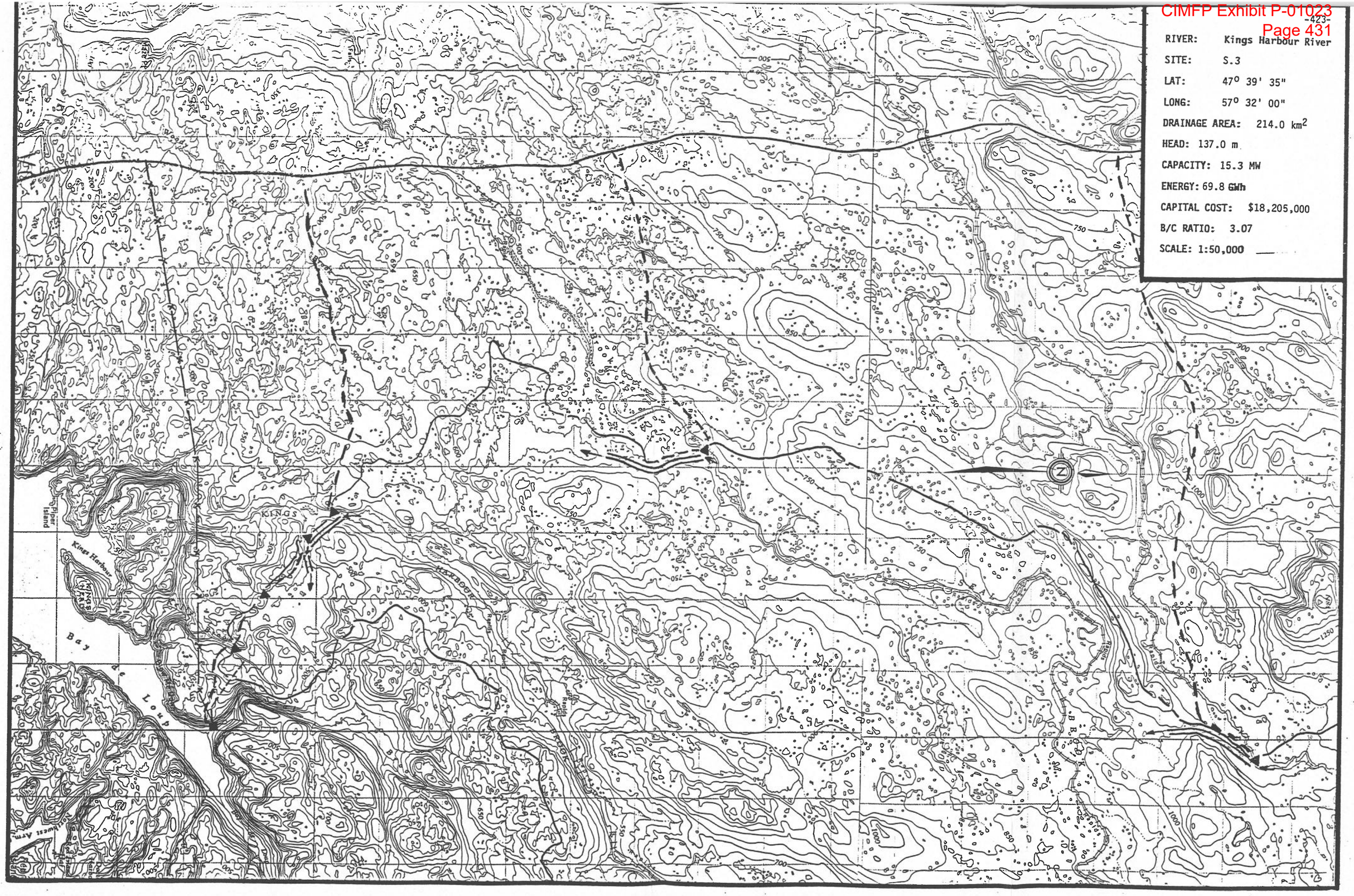
5. Remarks:

(i) Add $80,000 for unwatering.

(ii) Plant would be located downstream of one of eight low level sluices of Exploits Dam.

(iii) Technical feasibility would depend on whether loss of flood handling capacity can be tolerated and on impact on adjacent fish passage now under construction.

(iv) Operation would be intermittent depending on reservoir W.Ls and storage management requirements.


RIVER: Kings Harbour River
SITE: S.3
LAT: 47° 39' 35"
LONG: 57° 32' 00"
DRAINAGE AREA: 214.0 km²
HEAD: 137.0 m
CAPACITY: 15.3 MW
ENERGY: 69.8 GWh
CAPITAL COST: $18,205,000
B/C RATIO: 3.07
SCALE: 1:50,000
KINGS
HARBOUR
Kings Harbour
Piper Island
Bay de Loup
Northwest Arm
Rapids
Brook
Z

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WATER SHED : Kings Harbour River

SITE NAME : SITE - 3 FILE : 3077

SITE DATA

INSTALLED CAPACITY	: 15.32257 MW
PENSTOCK LENGTH	: 80 M.
DESIGN FLOW	: 13.74 M^3/S
PENSTOCK DIAMETER	: 1.952378 M.
RATED HEAD	: 137 M.
HEIGHT OF DAM	: 6 M.
TRANSMISSION LINE LENGTH	: 8 KM.
LENGTH OF DAM	: 450 M.
ACCESS ROAD LENGTH	: 5 KM.
FLOOD FLOW	: 245 M^3/S
DISTANCE TO TOWN	: 13 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.31962E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1101504	518410.5	244230.6	185099.4	183750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1304828	2609655	779001.6	498801.9	605864.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	638016.3	897344.6	770761.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.820527E+07 COST PER KW: $ 1188.134

Total Project Cost = $ 18,205,270

WATER SHED : Kings Harbour River SITE - 3

COST DATA

(ADDITIONAL COST of $ 7,868,000 for Diversions INCLUDED)

INTEREST RATE	: 6	REVENUE, $ PER MWH	: 60
O & M PERCENTAGE	: 1.5	CAPACITY FACTOR	: .52

ANNUAL COST : $ 1365395

ANNUAL BENEFIT : $ 4187843

BENEFIT/COST RATIO: 3.067129

Total Project Cost = $ 18,205,270.00

Benefit / Cost Ratio = 3.07

MAP NUMBER 11 P/13 DATA SHEET FILE NUMBER 3077

1. Site Identification:

River Basin: Kings Harbour River Site: S.3

2. Location:

Lat. 47° 39' 35" Long. 57° 32' 00" Hydrologic Region 2

3. Hydrologic Data:

A = 214 km^2, MAR = 1350 mm, ACLS = 60 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 9.16 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 180 m^3/s

Q1000 = 245 m^3/s

4. Site Data:

Rated Head = 137 m
Penstock Length = 80 m
Access Road Length = 5.0 km
Dam Height = 6 m
Distance to Town = 13 km
Installed Capacity = 15.3 MW

Plant Design Flow = 13.7 m^3/s
T.L. Line Length = 8.0 km
Dam Length = 450 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Additional Costs include:

- Dry Pond Brook Diversion = $2,531,000
- Scal Brook Diversion = $1,772,000
- Forebay Canal = $ 765,000
- Power Tunnel = $2,800,000

Total Additional Costs = $7,868,000

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Kings Harbour Brook, S.3 Region: 2

Total Developed Head, H = 137 m Map: 11 P/13

Diverted Area = 52 km^2, MAR = 1400 mm, from Dry Pond Brook

Location: Lat. = 47° 48' 10" Long. = 57° 31' 45"

Mean Diverted Flow = 2.31 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 2.31 = 1.80 m^3/s

Additional Energy = H x Q* x 0.0716

= 137 x 1.80 x 0.0716 = 17.7 GWh p.a.

Dam: Height = 4.0 m, Length = 250 m, Q150 = 65 m^3/s

Canal: Height of Land = 3 m, Length = 1500 m

Design Flow Ratio = 1.5 Design Flow = 3.47 m^3/s

Access Road: Length = 9.0 km

Costs:

Dam + Spillway	= 583,800
Diversion Canal	= 689,400
Access Road	= 360,000
Sub-total Direct Costs	= 1,633,200
Total Cost Diversion	= 2,531,400
Additional Plant Costs	=
Total Project Cost	=

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Kings Harbour Brook, S.3 Region: 2

Total Developed Head, H = 137 m Map: 11 P/12

Diverted Area = 56 km^2, MAR = 1400 mm, from Seal Brook

Location: Lat. = 47° 43' 45" Long. = 57° 35' 30"

Mean Diverted Flow = 2.49 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.78 x 2.49 = 1.94 m^3/s

Additional Energy = H x Q* x 0.0716

= 137 x 1.94 x 0.0716 = 19.1 GWh p.a.

Dam: Height = 3 m, Length = 60 m, Q150 = 160 m^3/s

Canal: Height of Land = 3 m, Length = 1300 m

Design Flow Ratio = 1.50 Design Flow = 1.5(2.49+2.31) m^3/s

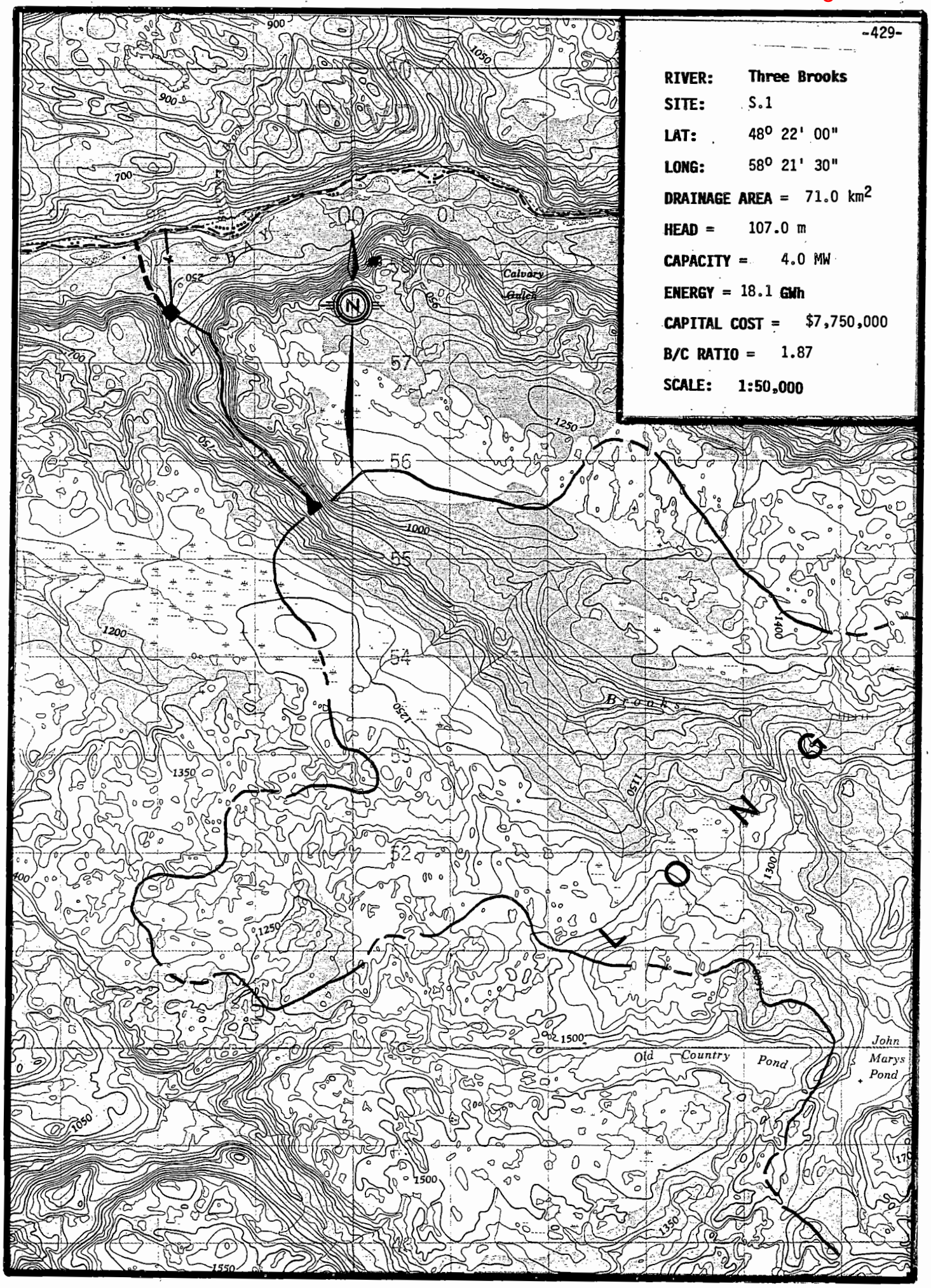
= 7.20

Access Road: Length = 5.0 km

Costs:

Dam + Spillway	= 215,700
Diversion Canal	= 727,200
Access Road	= 200,000
Sub-total Direct Costs	= 1,142,900
Total Cost Diversion	= 1,771,500
Additional Plant Costs	=
Total Project Cost	=

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =



RIVER: Three Brooks

SITE: S.1

LAT: 48° 22' 00"

LONG: 58° 21' 30"

DRAINAGE AREA = 71.0 km²

HEAD = 107.0 m

CAPACITY = 4.0 MW

ENERGY = 18.1 GWh

CAPITAL COST = $7,750,000

B/C RATIO = 1.87

SCALE: 1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Three Brooks

SITE NAME : SITE - 1 FILE : 3078

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.971669 MW
PENSTOCK LENGTH	: 2600 M.
DESIGN FLOW	: 4.56 M^3/S
PENSTOCK DIAMETER	: 1.2578 M.
RATED HEAD	: 107 M.
HEIGHT OF DAM	: 5.3 M.
TRANSMISSION LINE LENGTH	: .7 KM.
LENGTH OF DAM	: 98 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: 12 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 20 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8147185

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
347652.4	SEE DAM	90506.61	3517488	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
480977.4	1146159	343847.6	323114.7	238852.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	132267.2	699878	297267

PROJECT COST: $ 7745510 COST PER KW: $ 1950.19

Total Project Cost = $ 7,745,510

WATER SHED : Three Brooks SITE - 1

COST DATA

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 580913.2

ANNUAL BENEFIT : $ 1085505

BENEFIT/COST RATIO: 1.868618

Total Project Cost = $ 7,745,510.00

Benefit / Cost Ratio = 1.87

MAP NUMBER 12/B08 DATA SHEET FILE NUMBER 3078

1. Site Identification:

River Basin: Three Brooks Site: S.1

2. Location:

Lat. 48° 22' 00" Long. 58° 21' 30" Hydrologic Region 3

3. Hydrologic Data:

A = 71 km^2, MAR = 1350 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.04 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

Q1000 = 220 m^3/s Q_2 = 81

4. Site Data:

Rated Head	= 107 m	Plant Design Flow	= 4.56 m^3/s
Penstock Length	= 2600 m		
Access Road Length	= 3 km	T.L. Line Length	= 0.7 km
Dam Height	= 5.3 m	Dam Length	= 98 m
Distance to Town	= 12 km	Distance to Concrete Plant	= 20 km
Installed Capacity	= 4.0 MW		

5. Remarks:

(i) Hillside probably too steep for side hill canal side slope > 0.25

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WATER SHED : Portland Creek

SITE NAME : SITE - 1 FILE : 4001

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 1.099999 MW
PENSTOCK LENGTH	: 990 M.
DESIGN FLOW	: 1.755 M^3/S
PENSTOCK DIAMETER	: .8735766 M.
RATED HEAD	: 77 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 33 KM.
LENGTH OF DAM	: 51 M.
ACCESS ROAD LENGTH	: 36 KM.
FLOOD FLOW	: 49 M^3/S
DISTANCE TO TOWN	: 45 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 10 KM.
USEFUL TURBINE FLOW RATIO	: .84
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2919940

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
82319.7	SEE DAM	38323.17	882567.9	36750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
219700.3	523541.2	157062.4	2670918	1040109

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	733349.3	674960.9	207133

PROJECT COST: $ 7266735 COST PER KW: $ 6606.131

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4001

1. Site Identification:

River Basin: Portland Creek Site: S.1

2. Location:

Lat. 50° 07' 00" Long. 57° 15' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 32 km^2, MAR = 1150 mm, ACLS = 80 %

Storage Reservoir Area = 1.0 km^2

Storage Reservoir Vol, V = 2 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.05$$

Mean Flow, QAV = 1.17 m^3/s

Usable Flow Ratio = 0.84

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 36 m^3/s

Q1000 = 49 m^3/s

4. Site Data:

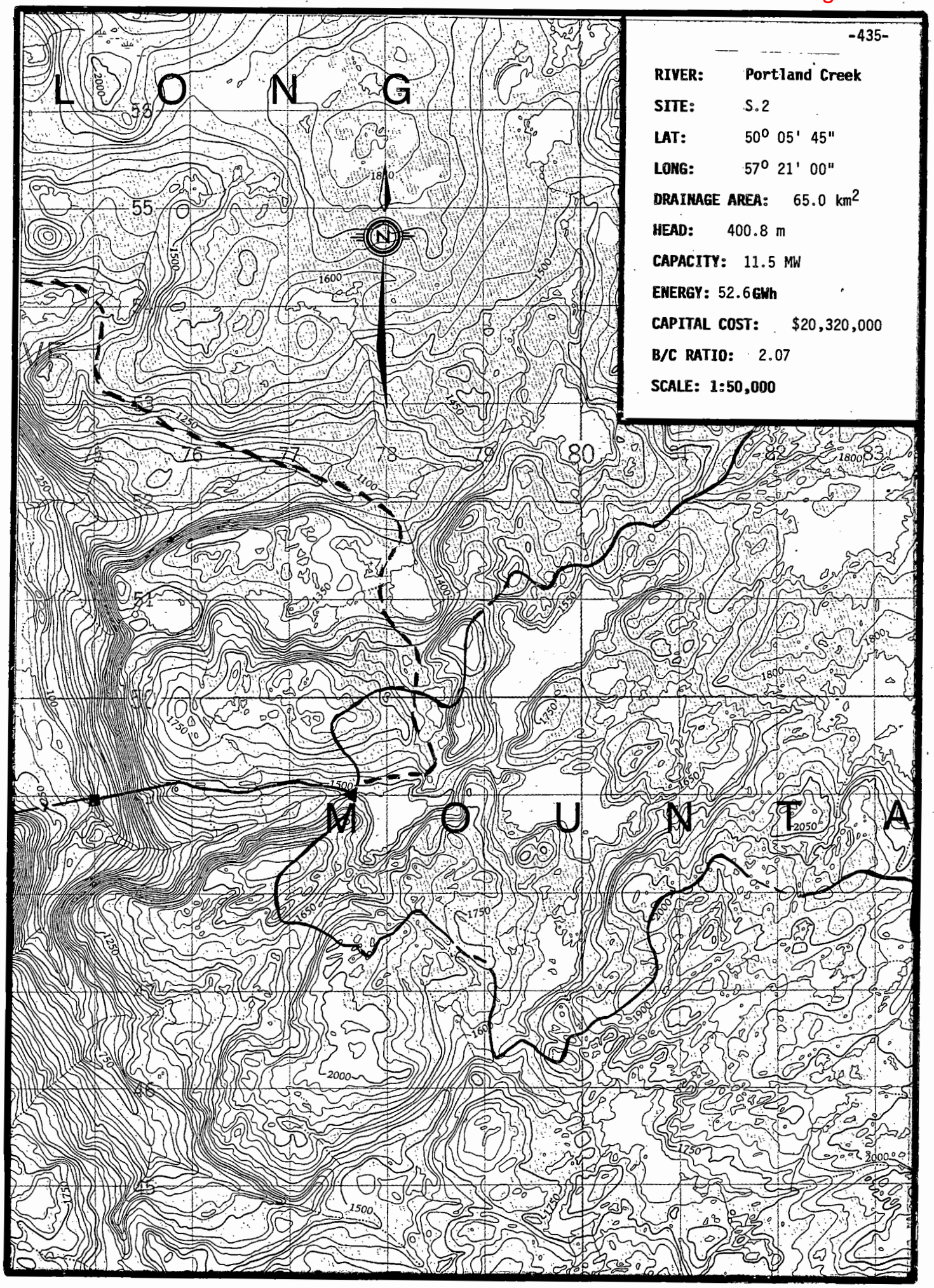
Rated Head = 77 m
Penstock Length = 990 m
Access Road Length = 36 km
Dam Height = 3 m
Distance to Town = 45 km
Installed Capacity = 1.152 MW

Plant Design Flow = 1.76 m^3/s
T.L. Line Length = 33 km
Dam Length = 51 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Two additional dams are required: dam lengths were increased to 151 m to account for this.

(ii) May be economical if other sites developed on Portland Creek.



RIVER: Portland Creek

SITE: S.2

LAT: 50° 05' 45"

LONG: 57° 21' 00"

DRAINAGE AREA: 65.0 km²

HEAD: 400.8 m

CAPACITY: 11.5 MW

ENERGY: 52.6 GWh

CAPITAL COST: $20,320,000

B/C RATIO: 2.07

SCALE: 1:50,000

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ShawMont Newfoundland Limited
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WATER SHED : Portland Creek

SITE NAME : SITE - 2 FILE : 4002

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 11.54929 MW
PENSTOCK LENGTH	: 3200 M.
DESIGN FLOW	: 3.54 M^3/S
PENSTOCK DIAMETER	: .9376312 M.
RATED HEAD	: 400.8 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 27.5 KM.
LENGTH OF DAM	: 55 M.
ACCESS ROAD LENGTH	: 27.5 KM.
FLOOD FLOW	: 70 M^3/S
DISTANCE TO TOWN	: 37 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 225 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.412711E+07

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
88441.55	SEE DAM	72063.43	3549127	52500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
697740.6	1562939	466549	4248800	1670381

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2164746	1424995	1103579

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.031816E+07 COST PER KW: $ 1759.256

WATER SHED : Portland Creek SITE - 2

COST DATA

(ADDITIONAL COST of $ 3,216,300 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1523862

ANNUAL BENEFIT : $ 3156560

BENEFIT/COST RATIO: 2.071421

Total Project Cost = $ 20,318,160.00

Benefit / Cost Ratio = 2.07

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4002

1. Site Identification:

River Basin: Portland Creek Site: S.2

2. Location:

Lat. 50° 05' 45" Long. 57° 21' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 65 km^2, MAR = 1150 mm, ACLS = 95 %

Storage Reservoir Area = 0.5 km^2

Storage Reservoir Vol, V = 1 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.01$$

Mean Flow, QAV = 2.36 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 51 m^3/s

Q1000 = 70 m^3/s

4. Site Data:

Rated Head	= 400.8 m	Plant Design Flow	= 3.55 m^3/s
Penstock Length	= 2900 m		
Access Road Length	= 27.5 km	T.L. Line Length	= 27.5 km
Dam Height	= 3 m	Dam Length	= 55 m
Distance to Town	= 37 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 12.11 MW		

5. Remarks:

(i) Possible diversion at Lat. 50° 04' 14", Long. 57° 17' 30", not included.

(ii) Possible access road route from end of existing woods road 17 kms

upgrade woods raod	12 kms @	$ 33,000/km
run road in good ground	6 kms @	$ 100,000/km
new road hard conditions	11 kms @	$ 400,000/km
major bridge		$ 500,000/L.S.
Total	29 kms =	$5,900,000

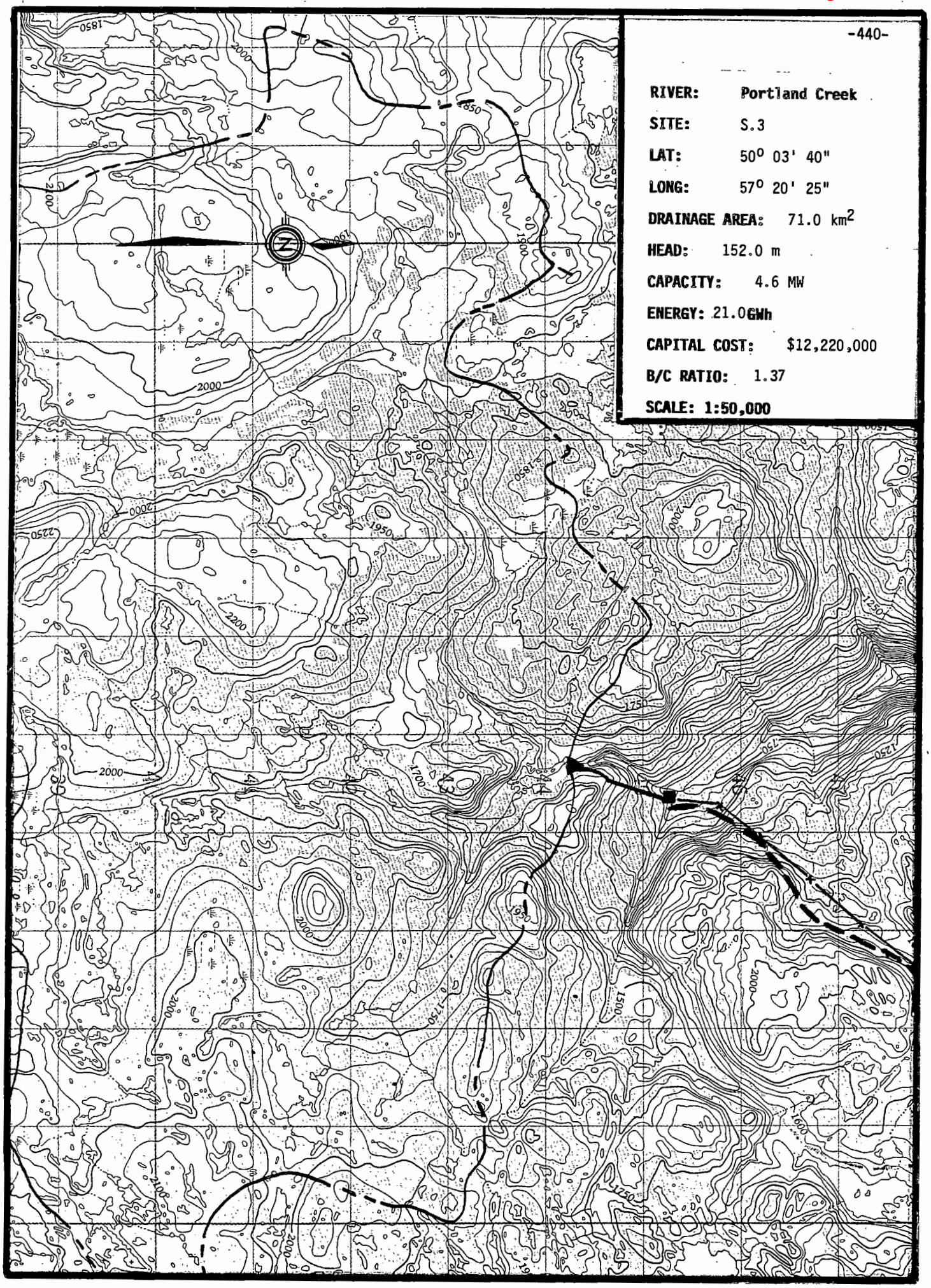
∴ use road cost = $200,000 per km.

(iii) Alternative access via barge through Portland Creek Pond and Inner Pond.

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4002

5. Remarks (Cont'd)

(iv) Economics would be enhanced if other Portland Creek sites were developed.


RIVER: Portland Creek
SITE: S.3
LAT: 50° 03' 40"
LONG: 57° 20' 25"
DRAINAGE AREA: 71.0 km²
HEAD: 152.0 m
CAPACITY: 4.6 MW
ENERGY: 21.0 GWh
CAPITAL COST: $12,220,000
B/C RATIO: 1.37
SCALE: 1:50,000

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WATER SHED : Portland Creek

SITE NAME : SITE - 3 FILE : 4003

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 4.602681 MW
PENSTOCK LENGTH	: 1110 M.
DESIGN FLOW	: 3.72 M^3/S
PENSTOCK DIAMETER	: 1.097099 M.
RATED HEAD	: 152 M.
HEIGHT OF DAM	: 5.1 M.
TRANSMISSION LINE LENGTH	: 27 KM.
LENGTH OF DAM	: 82 M.
ACCESS ROAD LENGTH	: 27 KM.
FLOOD FLOW	: 77 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8433609

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
279576.8	SEE DAM	75353.01	1281161	57750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
471617.8	1123855	337156.6	4183047	1442767

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1422008	1060800	489764.2

PROJECT COST: $ 1.222486E+07 COST PER KW: $ 2656.029

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4003

1. Site Identification:

River Basin: Portland Creek Site: S.3

2. Location:

Lat. 50° 03' 40" Long. 57° 20' 25" Hydrologic Region 4

3. Hydrologic Data:

A = 71 km^2, MAR = 1100 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.48 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 77 m^3/s

Q1000 = 102 m^3/s

4. Site Data:

Rated Head = 152 m

Penstock Length = 1110 m

Access Road Length = 27 km

Dam Height = 5.10 m

Distance to Town = 35 km

Installed Capacity = 4.806 MW

Plant Design Flow = 3.72 m^3/s

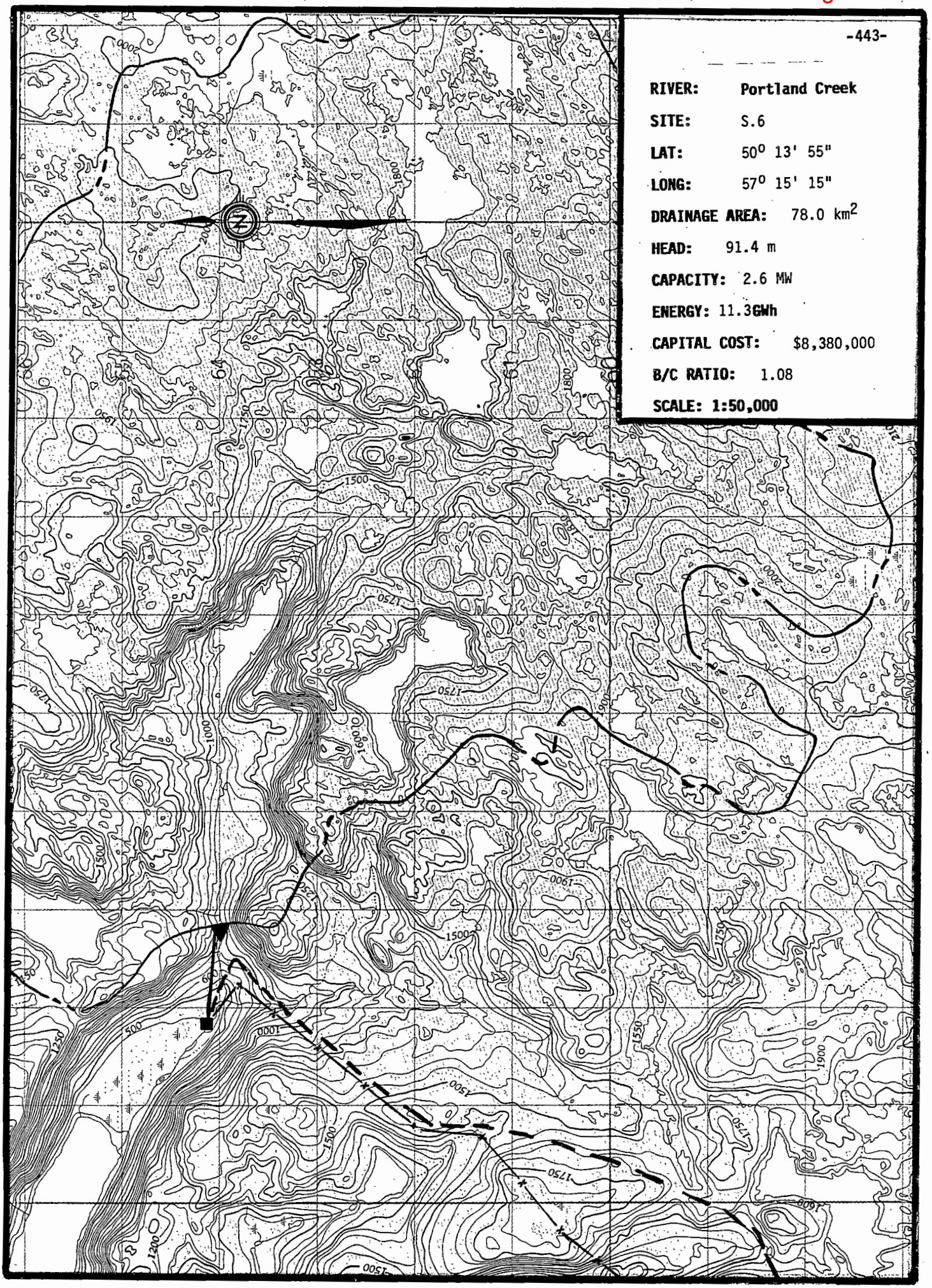
T.L. Line Length = 27 km

Dam Length = 82 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Economics would be enhanced if Portland Creek sites S.2, S.3 and S.4 were constructed together and access road and T.L. cost shared.



RIVER: Portland Creek

SITE: S.6

LAT: 50° 13' 55"

LONG: 57° 15' 15"

DRAINAGE AREA: 78.0 km²

HEAD: 91.4 m

CAPACITY: 2.6 MW

ENERGY: 11.3GWh

CAPITAL COST: $8,380,000

B/C RATIO: 1.08

SCALE: 1:50,000

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WATER SHED : Portland Creek

SITE NAME : SITE - 6 FILE : 4005

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	:	2.622586 MW
PENSTOCK LENGTH	:	1050 M.
DESIGN FLOW	:	3.525 M^3/S
PENSTOCK DIAMETER	:	1.151109 M.
RATED HEAD	:	91.4 M.
HEIGHT OF DAM	:	5 M.
TRANSMISSION LINE LENGTH	:	28.6 KM.
LENGTH OF DAM	:	73 M.
ACCESS ROAD LENGTH	:	17.6 KM.
FLOOD FLOW	:	46 M^3/S
DISTANCE TO TOWN	:	50 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 6026201

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
244486	SEE DAM	71788.55	1281062	34500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
380108.5	905790.2	271737.1	1453749	1252622

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	800815.8	698831.4	267524.5

PROJECT COST: $ 8377638 COST PER KW: $ 3194.419

WATER SHED : Portland Creek SITE - 6

COST DATA

(ADDITIONAL COST of $ 714,622 for DIVERSION INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 628322.8

ANNUAL BENEFIT : $ 680026

BENEFIT/COST RATIO: 1.082288

Total Project Cost = $ 8,377,638.00

Benefit / Cost Ratio = 1.08

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4005

1. Site Identification:

River Basin: Portland Creek Site: S.6

2. Location:

Lat. 50° 13' 55" Long. 57° 15' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 78 km^2, MAR = 950 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.35 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 46 m^3/s

Q1000 = 60.5 m^3/s

4. Site Data:

Rated Head = 91.4 m
Penstock Length = 1050 m
Access Road Length = 17.6 km
Dam Height = 5.0 m
Distance to Town = 50 km
Installed Capacity = 2.735 MW

Plant Design Flow = 3.52 m^3/s
T.L. Line Length = 28.6 km
Dam Length = 73 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Possible diversion at Lat. 59° 16' 15", Long. 57° 09' 15"

(ii) Access from existing woods road.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Portland Creek S.6 Region: 4

Total Developed Head, H = 91.4 m Map: 12 I/5

Diverted Area = 17 km^2, MAR = 1100 mm, from Same

Location: Lat. = 50° 16' 15" Long. = 57° 09' 30"

Mean Diverted Flow = 0.59 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.76(2.35+0.59) - 1.74 = 0.49 m^3/s

Additional Energy = H x Q* x 0.0716

= 91.4 x 0.49 x 0.0716 = 3.21 GWh p.a.

Dam: Height = 2 m, Length = 40 m, Q150 = 16 m^3/s

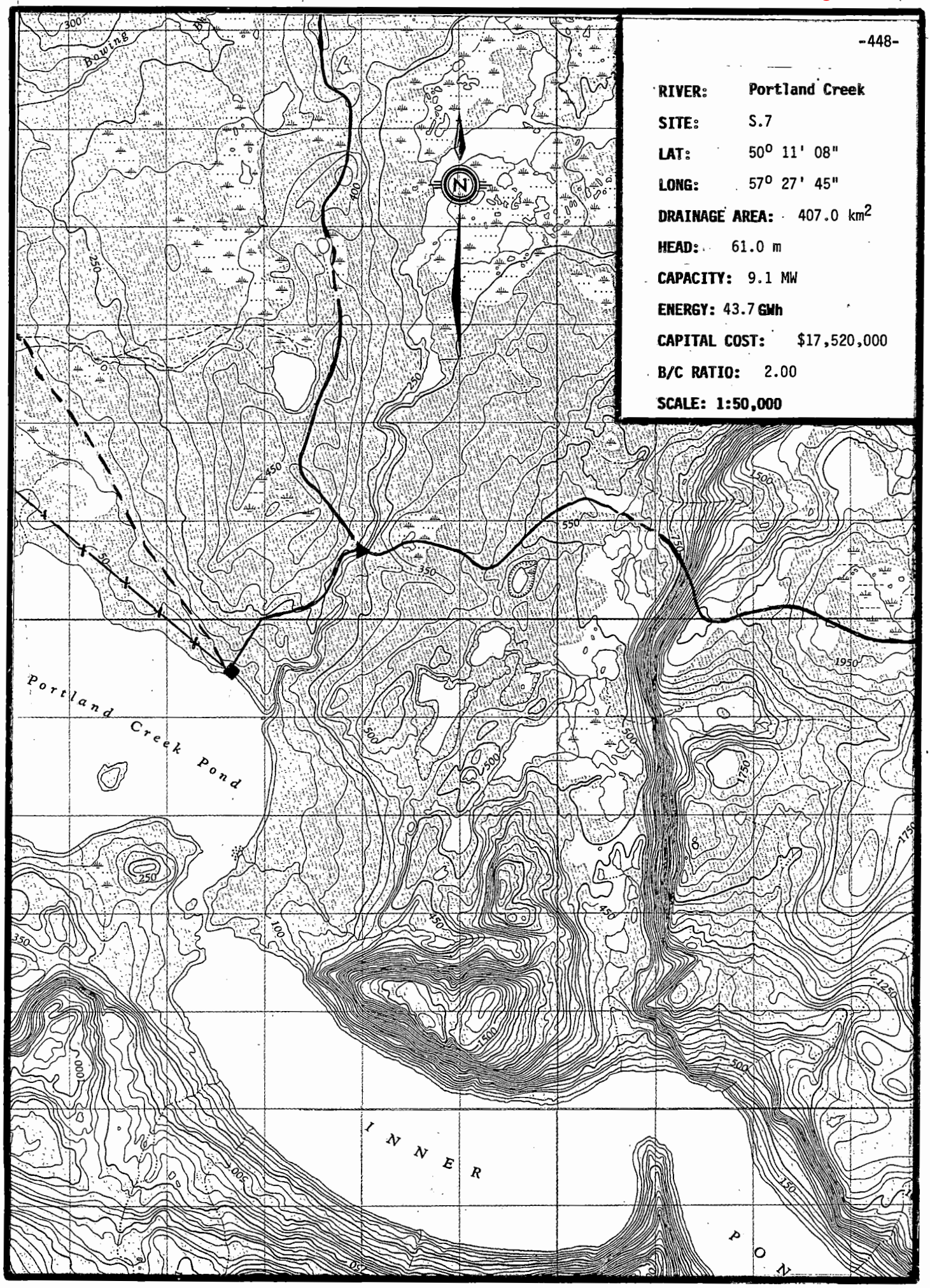
Canal: Height of Land = 3 m, Length = 250 m

Design Flow Ratio = 1.19 Design Flow = 0.70 m^3/s

Access Road: Length = 8 km

Costs:	Dam + Spillway	= 47,677
	Diversion Canal	= 93,369
	Access Road	= 320,000
	Sub-total Direct Costs	= 461,046
	Total Cost Diversion	= 714,622
	Additional Plant Costs	= -
	Total Project Cost	= 714,622

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = 3.59$$


-448-
RIVER: Portland Creek
SITE: S.7
LAT: 50° 11' 08"
LONG: 57° 27' 45"
DRAINAGE AREA: 407.0 km²
HEAD: 61.0 m
CAPACITY: 9.1 MW
ENERGY: 43.7 GWh
CAPITAL COST: $17,520,000
B/C RATIO: 2.00
SCALE: 1:50,000
N
Bowing
Portland Creek Pond
INNER
POND

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WATER SHED : Portland Creek

SITE NAME : SITE - 7 FILE : 4006

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	9.131369 MW
PENSTOCK LENGTH	:	2150 M.
DESIGN FLOW	:	18.39 M^3/S
PENSTOCK DIAMETER	:	2.478532 M.
RATED HEAD	:	61 M.
HEIGHT OF DAM	:	7.3 M.
TRANSMISSION LINE LENGTH	:	14 KM.
LENGTH OF DAM	:	120 M.
ACCESS ROAD LENGTH	:	14 KM.
FLOOD FLOW	:	195 M^3/S
DISTANCE TO TOWN	:	12 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.82
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.851511E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
680758.5	SEE DAM	317494.1	6729132	146250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1148860	2573447	768193	1196775	841852.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	650142.5	1466923	1001622

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.752145E+07 COST PER KW: $ 1918.819

Total Project Cost = $ 17,521,450

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4006

1. Site Identification:

River Basin: Portland Creek Site: S.7

2. Location:

Lat. 50° 11' 08" Long. 57° 27' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 407 km^2, MAR = 950 mm, ACLS = 70 %

Storage Reservoir Area = 7.5 km^2

Storage Reservoir Vol, V = 15 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.039$$

Mean Flow, QAV = 12.26 m^3/s

Usable Flow Ratio = 0.82

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 195 m^3/s

Q1000 = 255 m^3/s

4. Site Data:

Rated Head	= 61 m	Plant Design Flow	= 18.39 m^3/s
Penstock Length	= 2150 m		
Access Road Length	= 14 km	T.L. Line Length	= 14 km
Dam Height	= 7.3 m	Dam Length	= 120 m
Distance to Town	= 12 km	Distance to Concrete Plant	= 100 km
Installed Capacity	= 9.535 MW		

5. Remarks:

(i) Access - 12 km over existing woods road
- 4.5km of new road.

RIVER: Parsons Pond

SITE: S.1A

LAT: 49° 56' 15"

LONG: 57° 29' 30"

DRAINAGE AREA: 84.0 km^2

HEAD: 282.0 m

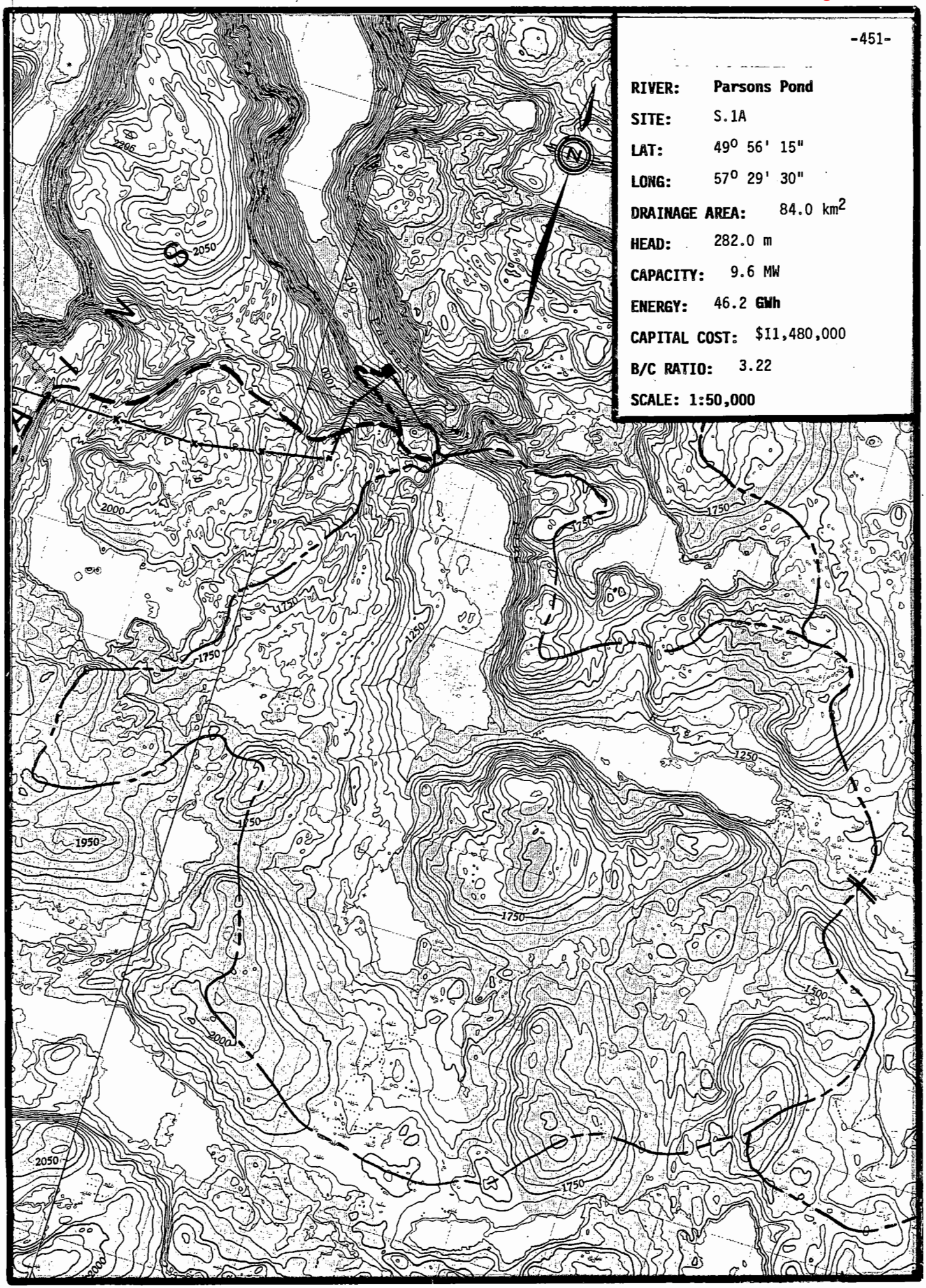
CAPACITY: 9.6 MW

ENERGY: 46.2 GWh

CAPITAL COST: $11,480,000

B/C RATIO: 3.22

SCALE: 1:50,000



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WATER SHED : Parsons Pond

SITE NAME : SITE - 1A FILE : 4008

SITE DATA

INSTALLED CAPACITY	: 9.641014 MW
PENSTOCK LENGTH	: 1143 M.
DESIGN FLOW	: 4.2 M^3/S
PENSTOCK DIAMETER	: 1.060066 M.
RATED HEAD	: 282 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 22 KM.
LENGTH OF DAM	: 220 M.
ACCESS ROAD LENGTH	: 34 KM.
FLOOD FLOW	: 67.5 M^3/S
DISTANCE TO TOWN	: 22 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .82
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.328304E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
317416.3	SEE DAM	84049.72	1326993	50625

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
687476.6	1374953	410433.9	2544255	1287023

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	795172.3	916700.5	611733

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.148173E+07 COST PER KW: $ 1190.926

WATER SHED : Parsons Pond SITE - 1A

COST DATA

(ADDITIONAL COST of $ 1,074,900 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5466667

ANNUAL COST : $ 861129.9

ANNUAL BENEFIT : $ 2770133

BENEFIT/COST RATIO: 3.216859

Total Project Cost = $ 11,481,730.00

Benefit / Cost Ratio = 3.22

File No. 4008 Map No. 12 H/14

DATA SHEET

1. Site Identification:

River Basin: Parsons Pond Site: S.1A

2. Location:

Lat. 49° 56' 15" Long. 57° 29' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 84 km^2, MAR = 1050 mm, ACLS = 80 %

Storage Reservoir Area = 2 km^2

Storage Reservoir Vol, V = 4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.045$$

Mean Flow, QAV = 2.80 m^3/s

Usable Flow Ratio = 0.82

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 67.5 m^3/s

Q1000 = 89 m^3/s

4. Site Data:

Rated Head = 282 m
Penstock Length = 1143 m
Access Road Length = 34 km
Dam Height = 3 m
Distance to Town = 22 km
Installed Capacity = 10.043 MW

Plant Design Flow = 4.19 m^3/s
T.L. Line Length = 22 km
Dam Length = 220 m
Distance to Concrete Plant = 100 km

5. Remarks:

Costs of Diversion = $1,074,900.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Parsons Pond Region: 4

Total Developed Head, H = 282 m Map: 12H/14

Diverted Area = 46 km^2, MAR = 1050 mm, from Main River*

Location: Lat. = 49° 54' 15" Long. = 57° 24' 15"

Mean Diverted Flow = 1.53 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.74 x 1.53 = 1.13 m^3/s

Additional Energy = H x Q* x 0.0716

= 1.13 x 282 x 0.0716 = 22.8 GWh p.a.

Dam: Height = 4 m, Length = 80 m, Q150 = 26 m^3/s

Canal: Height of Land = 3 m, Length = 240 m

Design Flow Ratio = 1.5 Design Flow = 2.30 m^3/s

Access Road: Length = 9.5 km

Costs:		
	Dam + Spillway	= 211,400
	Diversion Canal	= 102,100
	Access Road	= 380,000
	Sub-total Direct Costs	= 693,500
	Total Cost Diversion	= 1,074,900
	Additional Plant Costs	= 3,404,000
	Total Project Cost	= 4,478,900

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ = 4.27

*Proposed Main River Development shown in the ADB Water Resources Report Vol. 4 H = 260 m < Parson's Pond.

RIVER: Lomond River

SITE: S.1

LAT: 49° 21' 30"

LONG: 57° 37' 45"

DRAINAGE AREA: 163.0 km^3

HEAD: 30.5 m

CAPACITY: 2.5 MW

ENERGY: 10.8 GWh

CAPITAL COST: $6,090,000

B/C RATIO: 1.42

SCALE: 1:50,000

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WATER SHED : Lomond River

SITE NAME : SITE - 1 FILE : 4009

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.502562 MW
PENSTOCK LENGTH	: 661 M.
DESIGN FLOW	: 10.08 M^3/S
PENSTOCK DIAMETER	: 2.108903 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 6.3 M.
TRANSMISSION LINE LENGTH	: 3.9 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 3.9 KM.
FLOOD FLOW	: 139 M^3/S
DISTANCE TO TOWN	: 35 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7596540

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
460064.9	SEE DAM	184810.4	665344.8	104250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
540122.5	1287100	386130.1	403839.3	328453.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
258300	575139.4	652682.8	245072.8

PROJECT COST: $ 6091311 COST PER KW: $ 2434.03

MAP NUMBER 12 H/05 DATA SHEET FILE NUMBER 4009

1. Site Identification:

River Basin: Lamond River Site: S.1

2. Location:

Lat. 49° 21' 30" Long. 57° 37' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 163 km^2, MAR = 1300 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 6.72 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 139 m^3/s

Q1000 = 170 m^3/s

4. Site Data:

Rated Head = 30.5 m
Penstock Length = 661 m
Access Road Length = 3.9 km
Dam Height = 6.3 m
Distance to Town = 35 km
Installed Capacity = 2.613 MW

Plant Design Flow = 10.08 m^3/s
T.L. Line Length = 3.9 km
Dam Length = 100 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Fishway required.

(ii) Storage available at Bonne Bay Big Pond (depending on height of houses above Lake level).

(iii) Appears to be accessible to salmon hence may have environmental problems.

RIVER: Goose Arm Brook

SITE: S.1

LAT: 49° 14' 05"

LONG: 57° 43' 55"

DRAINAGE AREA: 61.0 km²

HEAD: 76.0 m

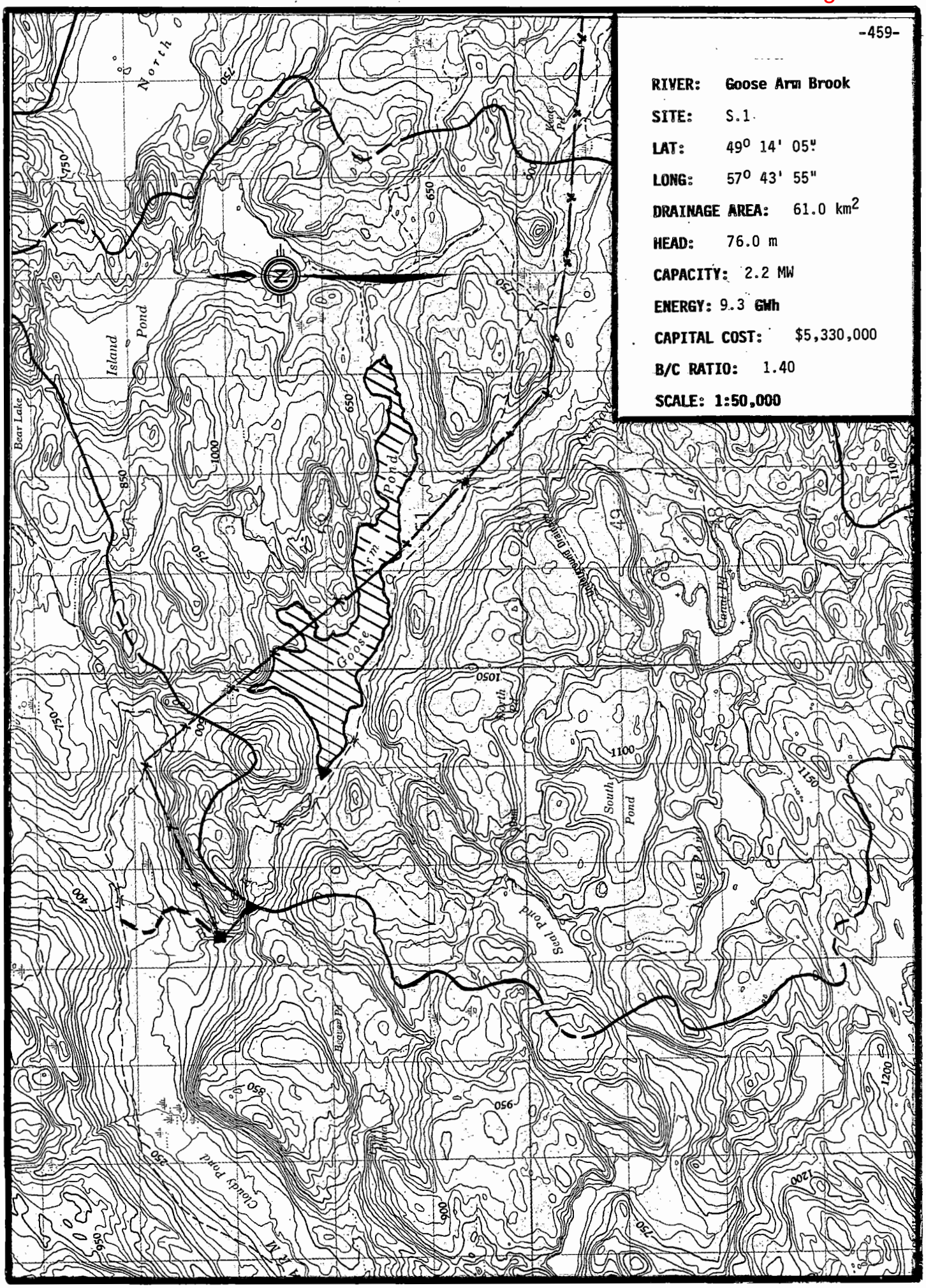
CAPACITY: 2.2 MW

ENERGY: 9.3 GWh

CAPITAL COST: $5,330,000

B/C RATIO: 1.40

SCALE: 1:50,000



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WATER SHED : Goose Arm Brook

SITE NAME : SITE - 1 FILE : 4010

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 2.152867 MW
PENSTOCK LENGTH	: 460 M.
DESIGN FLOW	: 3.48 M^3/S
PENSTOCK DIAMETER	: 1.174724 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 5 M.
TRANSMISSION LINE LENGTH	: 30 KM.
LENGTH OF DAM	: 76 M.
ACCESS ROAD LENGTH	: 5 KM.
FLOOD FLOW	: 53 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5363794

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
253510.4	SEE DAM	70963.22	574606.8	39750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
353146.7	751376	225412.8	498801.9	1220989

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	378760.3	474093	165444.7

PROJECT COST: $ 5334154 COST PER KW: $ 2477.698

Total Project Cost = $ 5,334,154

WATER SHED : Goose Arm Brook SITE - 1

COST DATA

(ADDITIONAL COST of $ 327,300 for Storage INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 400061.6

ANNUAL BENEFIT : $ 558229.8

BENEFIT/COST RATIO: 1.39536

Total Project Cost = $ 5,334,154.00

Benefit / Cost Ratio = 1.40

MAP NUMBER 12 H/04 DATA SHEET FILE NUMBER 4010

1. Site Identification:

River Basin: Goose Arm Brook Site: S.1

2. Location:

Lat. 49° 14' 05" Long. 57° 43' 55" Hydrologic Region 4

3. Hydrologic Data:

A = 61 km^2, MAR = 1200 mm, ACLS = 95 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.32 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 53 m^3/s

Q1000 = 70.5 m^3/s

4. Site Data:

Rated Head = 76 m
Penstock Length = 460 m
Access Road Length = 5 km
Dam Height = 5 m
Distance to Town = 50 km
Installed Capacity = 2.251 MW

Plant Design Flow = 3.48 m^3/s
T.L. Line Length = 30 km
Dam Length = 76 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Many abondaned woods roads traverse this area.

(ii) Goose storage site available upstream.

File No. 4010

SUMMARY SHEET UPSTREAM STORAGE SCHEME

Plant/s: Goose Arm Brook S.1 Region: 4

Total Developed Head, H = 76 m Map: 12 H/14

Area Controlled by Reservoir = 59 km^2

Surface Area Reservoir, As = 2.2 km^2

MAR = ... mm, QAV res. = 2.25 m^3/s

Qav proj. = 2.32 m^3/s

% of Run-off Passing through storage = 0.96 %

Storage Factor = $\frac{As}{Qav, proj.}$ x 0.0634 = 0.06

Net Water Use Factor, q* = (0.88 - 0.74) = 0.14

Additional Usable Flow, Q* = q* x Qav proj. = 0.32 m^3/s

Additional Energy = H x Q* x 0.0716 = 1.77 GWh p.a.

Dam: Height = 3 m, Length = 60 m

Access Road: Length = 1.5 km

Control Structure: Design Flow = 3.48 m^3/s

Reservoir: Surface Area = 2.2 km^2

Costs:		
	Dam and Spillway	= 95,500
	Access Road	= 60,000
	Control Structure	= 20,100
	Reservoir Clearing	= 35,600
	Sub-Total Direct Costs	= 211,200
	Cost of Storage Scheme	= 327,300

Benefit/Cost Ratio (Storage Scheme) = $\frac{\text{Additional Energy} \times 10^6}{\text{Cost of Storage} \times 1.15}$ = 4.70

Benefit/Cost Ratio (Total Project) = $\frac{\text{Total Energy} \times 10^6}{\text{Total Project Cost} \times 1.25}$ = 1.67

RIVER: Old Mans Brook

SITE: S.1A

LAT: 49° 07' 15"

LONG: 57° 55' 00"

DRAINAGE AREA: 139.0 km²

HEAD: 85.3 m

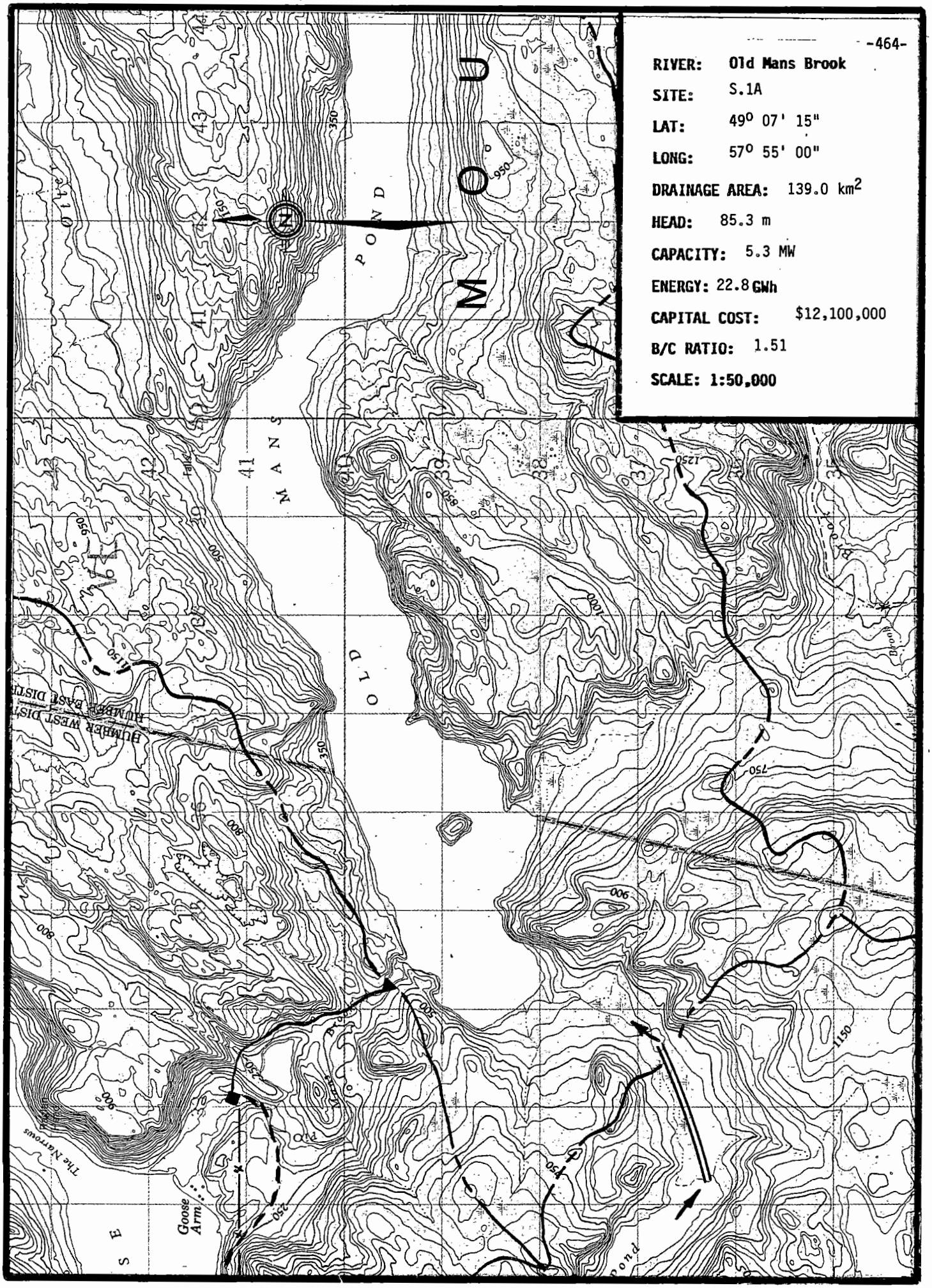
CAPACITY: 5.3 MW

ENERGY: 22.8 GWh

CAPITAL COST: $12,100,000

B/C RATIO: 1.51

SCALE: 1:50,000



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WATER SHED : Old Mans Brook

SITE NAME : SITE - 1A FILE : 4011

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	5.280471 MW
PENSTOCK LENGTH	:	2200 M.
DESIGN FLOW	:	7.605 M^3/S
PENSTOCK DIAMETER	:	1.617746 M.
RATED HEAD	:	85.3 M.
HEIGHT OF DAM	:	3 M.
TRANSMISSION LINE LENGTH	:	14 KM.
LENGTH OF DAM	:	79 M.
ACCESS ROAD LENGTH	:	3 KM.
FLOOD FLOW	:	200 M^3/S
DISTANCE TO TOWN	:	14 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	50 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.088068E+07

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
124754.9	SEE DAM	143417.2	4020821	150000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
646281.2	1447670	432140.3	323114.7	709521.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	205727.6	854671.8	406376.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.20961E+07 COST PER KW: $ 2290.723

Total Project Cost = $ 12,096,100

WATER SHED : Old Mans Brook SITE - 1A

COST DATA

(ADDITIONAL COST of $ 2,631,600 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 907207.2

ANNUAL BENEFIT : $ 1369205

BENEFIT/COST RATIO: 1.509253

Total Project Cost = $ 12,096,100.00

Benefit / Cost Ratio = 1.51

MAP NUMBER 12 H/04 DATA SHEET FILE NUMBER 4011

1. Site Identification:

River Basin: Old Mans Brook Site: S.1A

2. Location:

Lat. 49° 07' 15" Long. 57° 55' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 139 km^2, MAR = 1150 mm, ACLS = 40 %

Storage Reservoir Area = 12.8 km^2

Storage Reservoir Vol, V = 25.6 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.16$$

Mean Flow, QAV = 5.07 m^3/s

Usable Flow Ratio = 0.93

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 200 m^3/s

Q1000 = 265 m^3/s

4. Site Data:

Rated Head = 85.3 m
Penstock Length = 2200 m
Access Road Length = 3 km
Dam Height = 3 m
Distance to Town = 14 km
Installed Capacity = 5.510 MW

Plant Design Flow = 7.60 m^3/s
T.L. Line Length = 14 km
Dam Length = 79 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Diversion of Frenchmans Pond = $2, 631,600.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Old Mans Pond S.1 Region: 4

Total Developed Head, H = 85.3 m Map: 12 H/04

Diverted Area = 38 km^2, MAR = 1150 mm, from Cox's Brook

Location: Lat. = ... Long. = ...

Mean Diverted Flow = 1.39 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.74 x 1.39 = 1.03 m^3/s

Additional Energy = H x Q* x 0.0716

= 85.3x1.03 x 0.0716 = 6.29 GWh p.a.

Dam: Height = 7.6 m, Length = 275 m, Q150 = 32 m^3/s

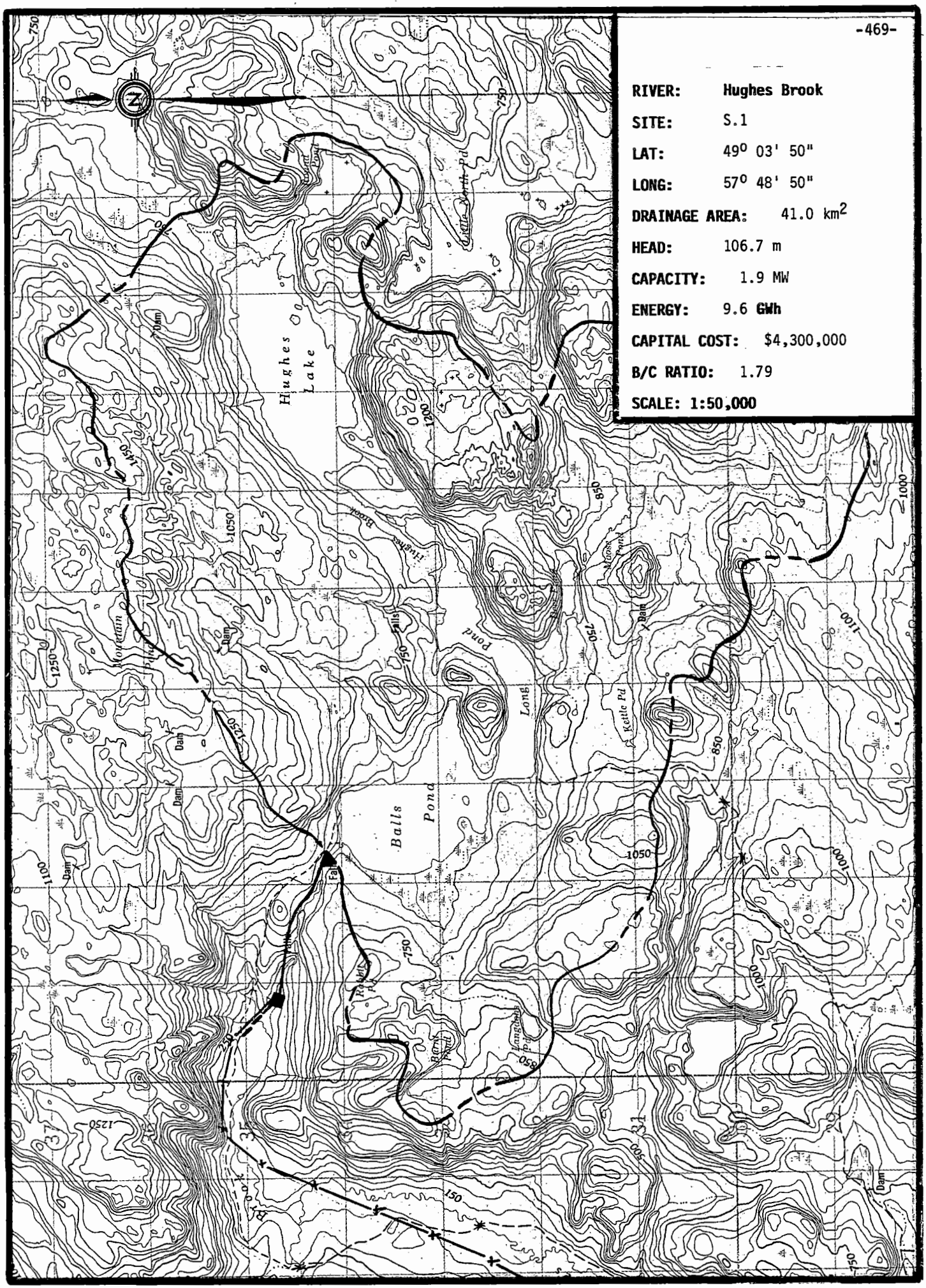
Canal: Height of Land = 4 m, Length = 750 m

Design Flow Ratio = 1.5 Design Flow = 2.09 m^3/s

Access Road: Length = 2.0 km

Costs:		
	Dam + Spillway	= 1,135,800
	Diversion Canal	= 482,000
	Access Road	= 80,000
	Sub-total Direct Costs	= 1,697,800
	Total Cost Diversion	= 2,631,600
	Additional Plant Costs	= 1,200,000
	Total Project Cost	= 3,831,600

$$\text{Benefit/Cost Ratio} = \frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25} = \frac{6.29}{3.83} \times \frac{1}{1.25} = 1.31$$



RIVER: Hughes Brook

SITE: S.1

LAT: 49° 03' 50"

LONG: 57° 48' 50"

DRAINAGE AREA: 41.0 km²

HEAD: 106.7 m

CAPACITY: 1.9 MW

ENERGY: 9.6 GWh

CAPITAL COST: $4,300,000

B/C RATIO: 1.79

SCALE: 1:50,000

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SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Hughes Brook

SITE NAME : SITE - 1 FILE : 4013

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.863014 MW
PENSTOCK LENGTH	: 1682 M.
DESIGN FLOW	: 2.145 M^3/S
PENSTOCK DIAMETER	: .9097901 M.
RATED HEAD	: 106.7 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 11.8 KM.
LENGTH OF DAM	: 53 M.
ACCESS ROAD LENGTH	: 1.7 KM.
FLOOD FLOW	: 45 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 18 KM.
USEFUL TURBINE FLOW RATIO	: .8850001
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4382550

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
85383.44	SEE DAM	45908.86	1569254	33750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
283414.2	675370	202611	199381.7	573456

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	83852.18	413517.5	137084.7

PROJECT COST: $ 4302984 COST PER KW: $ 2309.69

Total Project Cost = $ 4,302,984

MAP NUMBER 12 H/04 DATA SHEET FILE NUMBER 4013

1. Site Identification:

River Basin: Hughes Brook Site: S.1

2. Location:

Lat. 49° 3' 50" Long. 57° 48' 50" Hydrologic Region 4

3. Hydrologic Data:

A = 41 km^2, MAR = 1100 mm, ACLS = 75 %

Storage Reservoir Area = 2.4 km^2

Storage Reservoir Vol, V = 4.8 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.11$$

Mean Flow, QAV = 1.43 m^3/s

Usable Flow Ratio = .885

Max. Turbinable Flow Ratio = 1.5

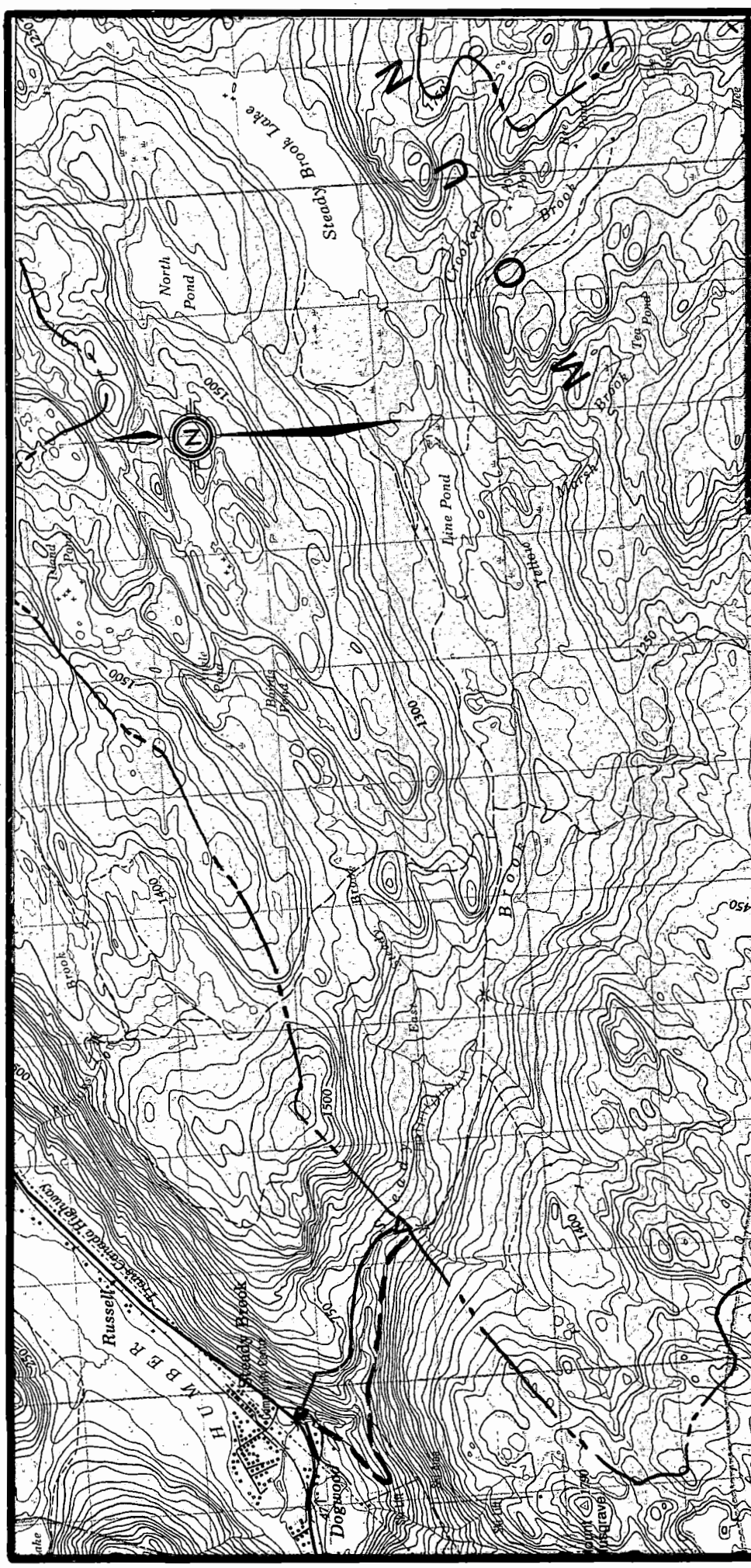
Flood Flow: Q150 = 45 m^3/s

Q1000 = 60 m^3/s

4. Site Data:

Rated Head	= 106.7m	Plant Design Flow	= 2.14 m^3/s
Penstock Length	= 1682 m		
Access Road Length	= 1.7km	T.L. Line Length	= 11.8 km
Dam Height	= 3 m	Dam Length	= 53 m
Distance to Town	= 18 km	Distance to Concrete Plant	= 18 km
Installed Capacity	= 1.941 MW		

5. Remarks:



RIVER:	Steady Brook
SITE:	S.1
LAT:	48° 57' 05"
LONG:	57° 49' 15"
DRAINAGE AREA:	72.0 km^2
HEAD:	182.9 m
CAPACITY:	5.6 MW
ENERGY:	24.2 GWh
CAPITAL COST:	$6,030,000
B/C RATIO:	3.22
SCALE:	1:50,000

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WATER SHED : Steady Brook

SITE NAME : SITE - 1 FILE : 4014

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 5.605354 MW
PENSTOCK LENGTH	: 2154 M.
DESIGN FLOW	: 3.765 M^3/S
PENSTOCK DIAMETER	: 1.074582 M.
RATED HEAD	: 182.9 M.
HEIGHT OF DAM	: 5.1 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 88 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 110 M^3/S
DISTANCE TO TOWN	: 1 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 5 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9471700

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
297922.4	SEE DAM	76172.89	2427590	82500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
518521	1161487	346712.6	228917.6	36004.54

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	14005.06	568618.5	266961.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 6025413 COST PER KW: $ 1074.939

Total Project Cost = $ 6,025,413

File No. 4014 Map No. 12 A/13

DATA SHEET

1. Site Identification:

River Basin: Steady Brook Site: S.1

2. Location:

Lat. 48° 57' 5" Long. 57° 49' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 72 km^2, MAR = 1100 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 2.51 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = _____

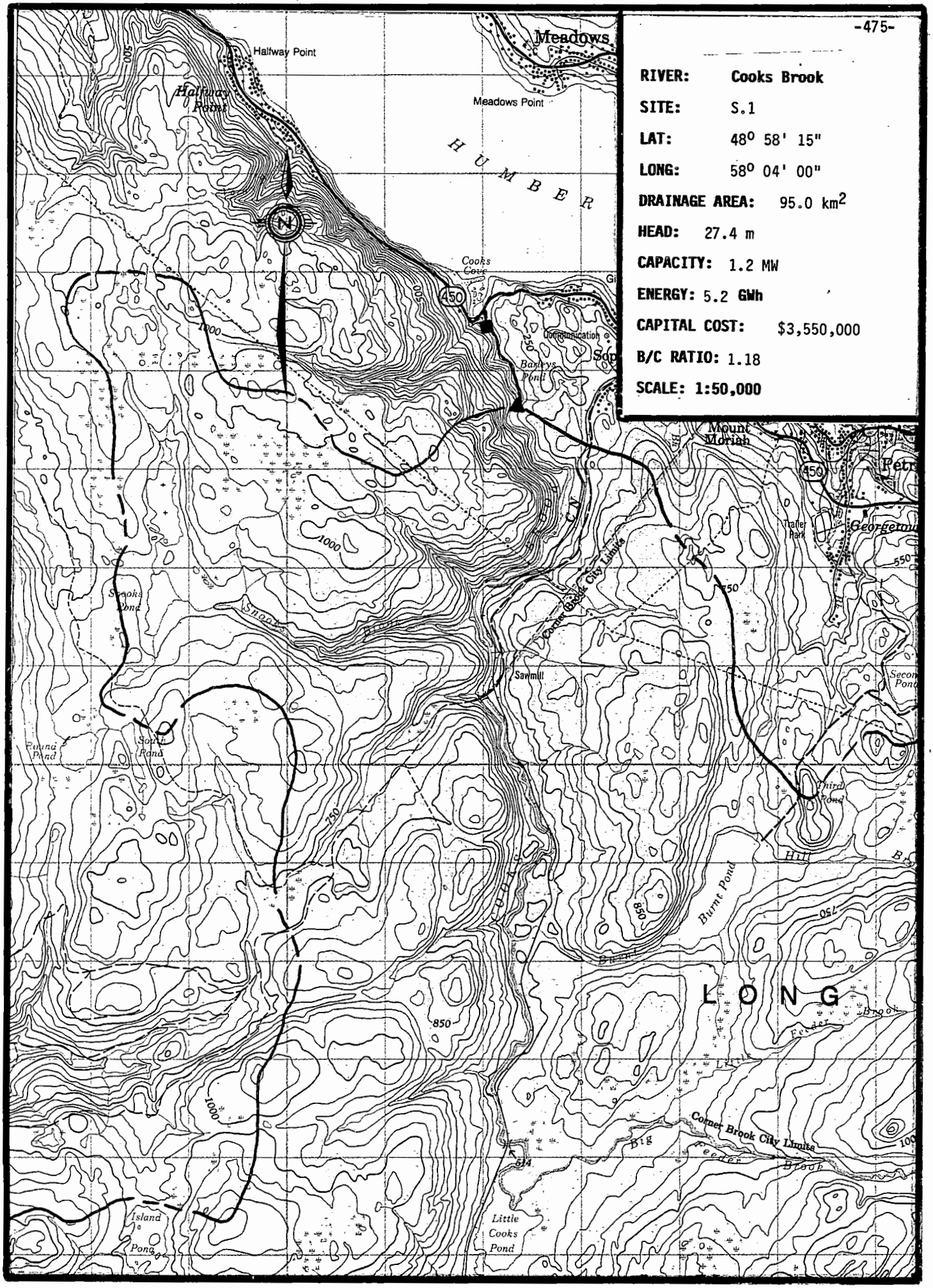
Flood Flow: Q150 = 110 m^3/s

Q1000 = 145 m^3/s

4. Site Data:

Rated Head	= 182.9 m	Plant Design Flow	= 3.77 m^3/s
Penstock Length	= 2154 m		
Access Road Length	= 2 km	T.L. Line Length	= 0.5 km
Dam Height	= 5.1 m	Dam Length	= 88 m
Distance to Town	= 1 km	Distance to Concrete Plant	= 5 km
Installed Capacity	= 5.861 MW		

5. Remarks:


-475-
RIVER: Cooks Brook
SITE: S.1
LAT: 48° 58' 15"
LONG: 58° 04' 00"
DRAINAGE AREA: 95.0 km²
HEAD: 27.4 m
CAPACITY: 1.2 MW
ENERGY: 5.2 GWh
CAPITAL COST: $3,550,000
B/C RATIO: 1.18
SCALE: 1:50,000
Meadows
Halfway Point
Meadows Point
HUMBER
Cooks Cove
Communication
Barleys Pond
Mount Moriah
Trailer Park
Corner Brook City Limits
Sawmill
Burnt Pond
LONG
Big Feeder Brook
Little Cooks Pond
Island Pond
Snooks Pond
South Pond
Third Pond
Second Pond

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WATER SHED : Cooks Brook

SITE NAME : SITE - 1 FILE : 4015

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.20774 MW
PENSTOCK LENGTH	: 990 M.
DESIGN FLOW	: 5.415 M^3/S
PENSTOCK DIAMETER	: 1.638826 M.
RATED HEAD	: 27.4 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 101 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: .5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 10 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4291506

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
377659.6	SEE DAM	105645.4	774233.8	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
336741.4	802447.6	240734.3	70457.66	118151.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	14594.31	444632.1	133331.6

PROJECT COST: $ 3546129 COST PER KW: $ 2936.17

MAP NUMBER 12 B/16 DATA SHEET FILE NUMBER 4015

1. Site Identification:

River Basin: Cooks Brook Site: S.1

2. Location:

Lat. 48° 58' 15" Long. 58° 04' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 95 km^2, MAR = 1200 mm, ACLS = 40 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 3.61 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 170 m^3/s

Q1000 = 240 m^3/s

4. Site Data:

Rated Head = 27.4 m
Penstock Length = 990 m
Access Road Length = 0.5 km
Dam Height = 5.5 m
Distance to Town = 0.5 km
Installed Capacity = 1.262 MW

Plant Design Flow = 5.42 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 101 m
Distance to Concrete Plant = 10 km

5. Remarks:

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WATER SHED : Fox Island River

SITE NAME : SITE - 1 FILE : 4016

SITE DATA

INSTALLED CAPACITY	: 4.930642 MW
PENSTOCK LENGTH	: 150 M.
DESIGN FLOW	: 9.93 M^3/S
PENSTOCK DIAMETER	: 1.901571 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 48 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 400 M.
ACCESS ROAD LENGTH	: 6 KM.
FLOOD FLOW	: 560 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 30 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.117038E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1.609009E+07	3574321	182333.4	334652.3	420000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
681231.5	1449429	434828.6	582414.5	497027.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	3880433	2539870	1316415

PROJECT COST: $ 3.198304E+07 COST PER KW: $ 6486.588

MAP NUMBER 12 B/10 DATA SHEET FILE NUMBER 4016

1. Site Identification:

River Basin: Fox Island River Site: S.1

2. Location:

Lat. 48° 42' 00" Long. 58° 36' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 167 km^2, MAR = 1250 mm, ACLS = 10 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 6.62 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 420 m^3/s

Q1000 = 560 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 150 m
Access Road Length = 6 km
Dam Height = 48 m
Distance to Town = 30 km
Installed Capacity = 4.9 MW

Plant Design Flow = 9.9 m^3/s
T.L. Line Length = 5 km
Dam Length = 400 m
Distance to Concrete Plant = 30 km

5. Remarks:

RIVER: Harry's River

SITE: S.4

LAT: 48° 41' 45"

LONG: 58° 14' 30"

DRAINAGE AREA: 510.0 km²

HEAD: 21.0 m

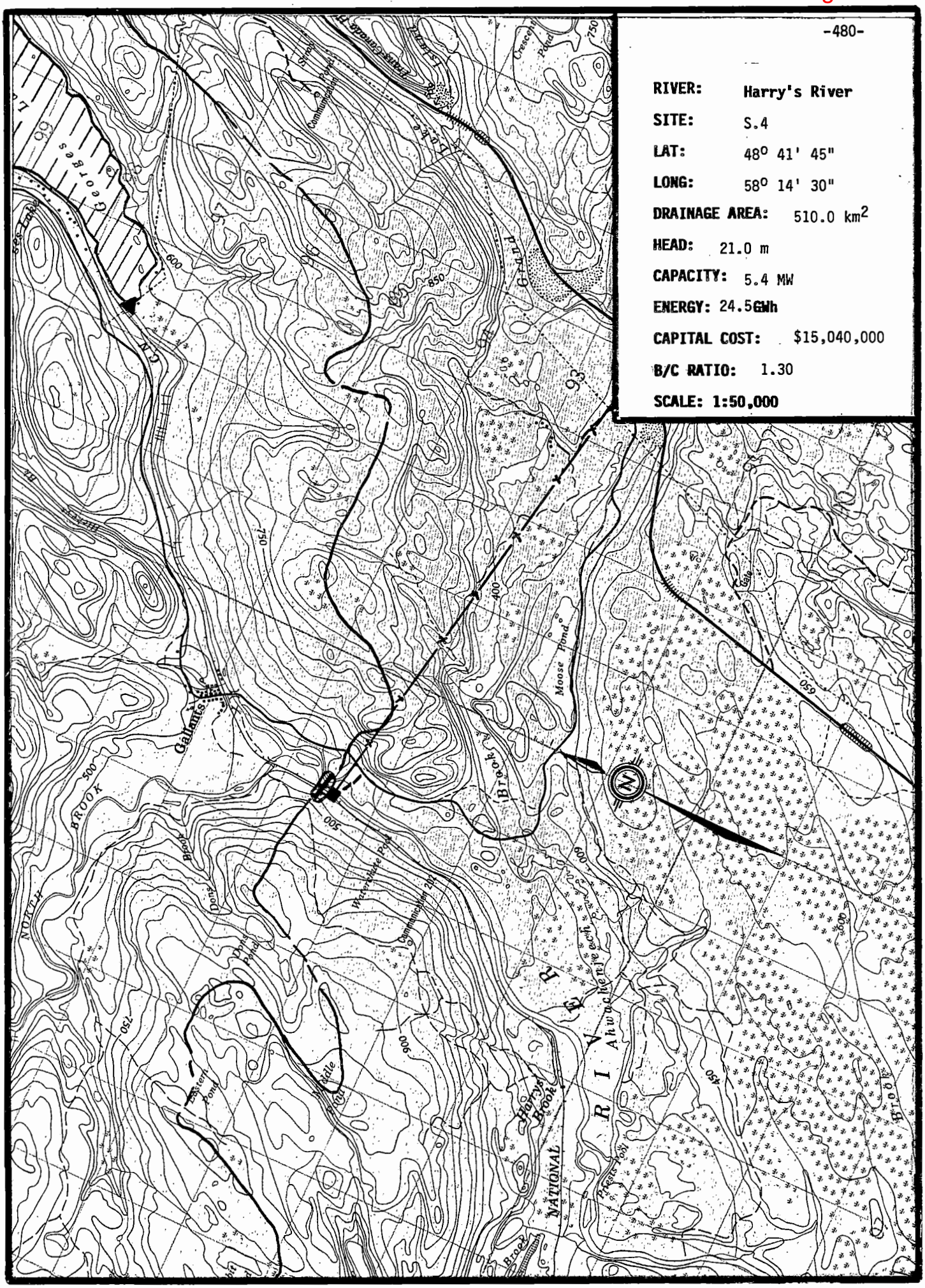
CAPACITY: 5.4 MW

ENERGY: 24.5GWh

CAPITAL COST: $15,040,000

B/C RATIO: 1.30

SCALE: 1:50,000



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WATER SHED : Harrys River

SITE NAME : SITE - 4 FILE : 4017

SITE DATA

INSTALLED CAPACITY	: 5.38461 MW
PENSTOCK LENGTH	: 70 M.
DESIGN FLOW	: 31.5 M^3/S
PENSTOCK DIAMETER	: 3.626881 M.
RATED HEAD	: 21 M.
HEIGHT OF DAM	: 24 M.
TRANSMISSION LINE LENGTH	: 5.5 KM.
LENGTH OF DAM	: 250 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 720 M^3/S
DISTANCE TO TOWN	: 2 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 30 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.560841E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
3599220	2683039	515337.2	366331	540000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1077028	2154057	643002	70457.66	307845.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	340736.3	1224860	612929.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.503824E+07 COST PER KW: $ 2792.819

Total Project Cost = $ 15,038,240

WATER SHED : Harrys River SITE - 4

COST DATA

(ADDITIONAL COST of $ 903,400 for Storage INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .52

ANNUAL COST : $ 1127868

ANNUAL BENEFIT : $ 1471678

BENEFIT/COST RATIO: 1.304832

Total Project Cost = $ 15,038,240.00

Benefit / Cost Ratio = 1.30

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 4017

1. Site Identification:

River Basin: Harry's River Site: S.4

2. Location:

Lat. 58° 41.7' 00" Long. 58° 14.5' Hydrologic Region 4

3. Hydrologic Data:

A = 510 km^2, MAR = 1300 mm, ACLS = 72 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 21 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 580 m^3/s

Q1000 = 720 m^3/s

4. Site Data:

Rated Head = 21 m
Penstock Length = 70 m
Access Road Length = 0.5 km
Dam Height = 24 m
Distance to Town = 2 km
Installed Capacity = 5.4 MW

Plant Design Flow = 31.5 m^3/s
T.L. Line Length = 5.5 km
Dam Length = 250 m
Distance to Concrete Plant = 30 km

5. Remarks:

(i) HWL ~ 450' and TWL ~ 380'.

File No. 4017

SUMMARY SHEET UPSTREAM STORAGE SCHEME

Plant/s: Harry's River S.4 Region: 4

Total Developed Head, H = 21 m Map: 12 B/09

Area Controlled by Reservoir = 474 km^2

Surface Area Reservoir, As = 15.8 km^2

MAR = 1300 mm, QAV res. = 19.53 m^3/s

Qav proj. = 21.02 m^3/s

% of Run-off Passing through storage = 92.9 %

Storage Factor = $\frac{As}{Qav, proj.}$ x 0.0634 = 0.048

Net Water Use Factor, q* = (0.825 - 0.74) = 0.085

Additional Usable Flow, Q* = q* x Qav proj. = 1.79 m^3/s

Additional Energy = H x Q* x 0.0716 = 2.69 GWh p.a.

Dam: Height = 3 m, Length = 220 m

Access Road: Length = 0.2 km

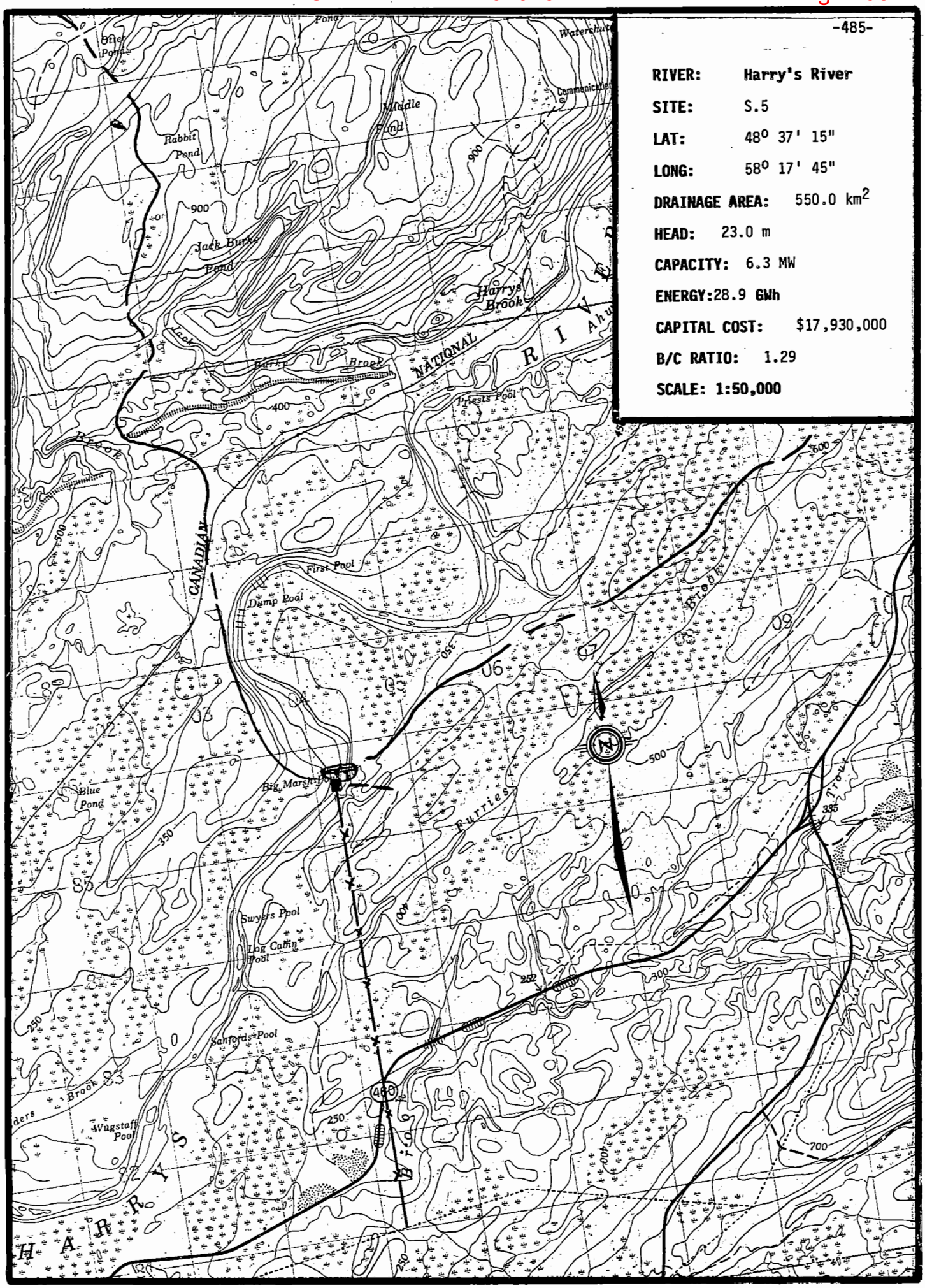
Control Structure: Design Flow = 31.5 m^3/s

Reservoir: Surface Area = 15.8 km^2

Costs:		
	Dam and Spillway	= 350,000
	Access Road	= 8,000
	Control Structure	= 129,400
	Reservoir Clearing	= 95,400
	Sub-Total Direct Costs	= 582,800
	Cost of Storage Scheme	= 903,400

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Cost of Storage} \times 1.15}$ = 2.59
(Storage Scheme)

Benefit/Cost Ratio = $\frac{\text{Total Energy} \times 10^6}{\text{Total Project Cost} \times 1.25}$ = 1.44
(Total Project)


-485-
RIVER: Harry's River
SITE: S.5
LAT: 48° 37' 15"
LONG: 58° 17' 45"
DRAINAGE AREA: 550.0 km2
HEAD: 23.0 m
CAPACITY: 6.3 MW
ENERGY: 28.9 GWh
CAPITAL COST: $17,930,000
B/C RATIO: 1.29
SCALE: 1:50,000
Rabbit Pond
Middle Pond
Jack Burke Pond
Harrys Brook
Jack Burke Brook
NATIONAL
Priests Pool
CANADIAN
First Pool
Dump Pool
Big Marsh Pool
Blue Pond
Furries
Swyers Pool
Log Cabin Pool
Sanfords Pool
Wingstaff Pool
Trout
HARRYS
Big

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WATER SHED : Harrys River

SITE NAME : SITE - 5 FILE : 4018

SITE DATA

INSTALLED CAPACITY	: 6.346758 MW
PENSTOCK LENGTH	: 77 M.
DESIGN FLOW	: 33.9 M^3/S
PENSTOCK DIAMETER	: 3.695852 M.
RATED HEAD	: 23 M.
HEIGHT OF DAM	: 26 M.
TRANSMISSION LINE LENGTH	: 5 KM.
LENGTH OF DAM	: 300 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 740 M^3/S
DISTANCE TO TOWN	: 17 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 55 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.746568E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4774809	2892544	550543.6	413718.2	555000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1200523	2401046	716730.1	323114.7	297062.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1446803	1511280	847634.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.793081E+07 COST PER KW: $ 2825.192

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 4018

1. Site Identification:

River Basin: Harry's River Site: S.5

2. Location:

Lat. 48° 37' 15" Long. 58° 17' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 550 km^2, MAR = 1300 mm, ACLS = _____ %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 22.6 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 600 m^3/s

Q1000 = 740 m^3/s

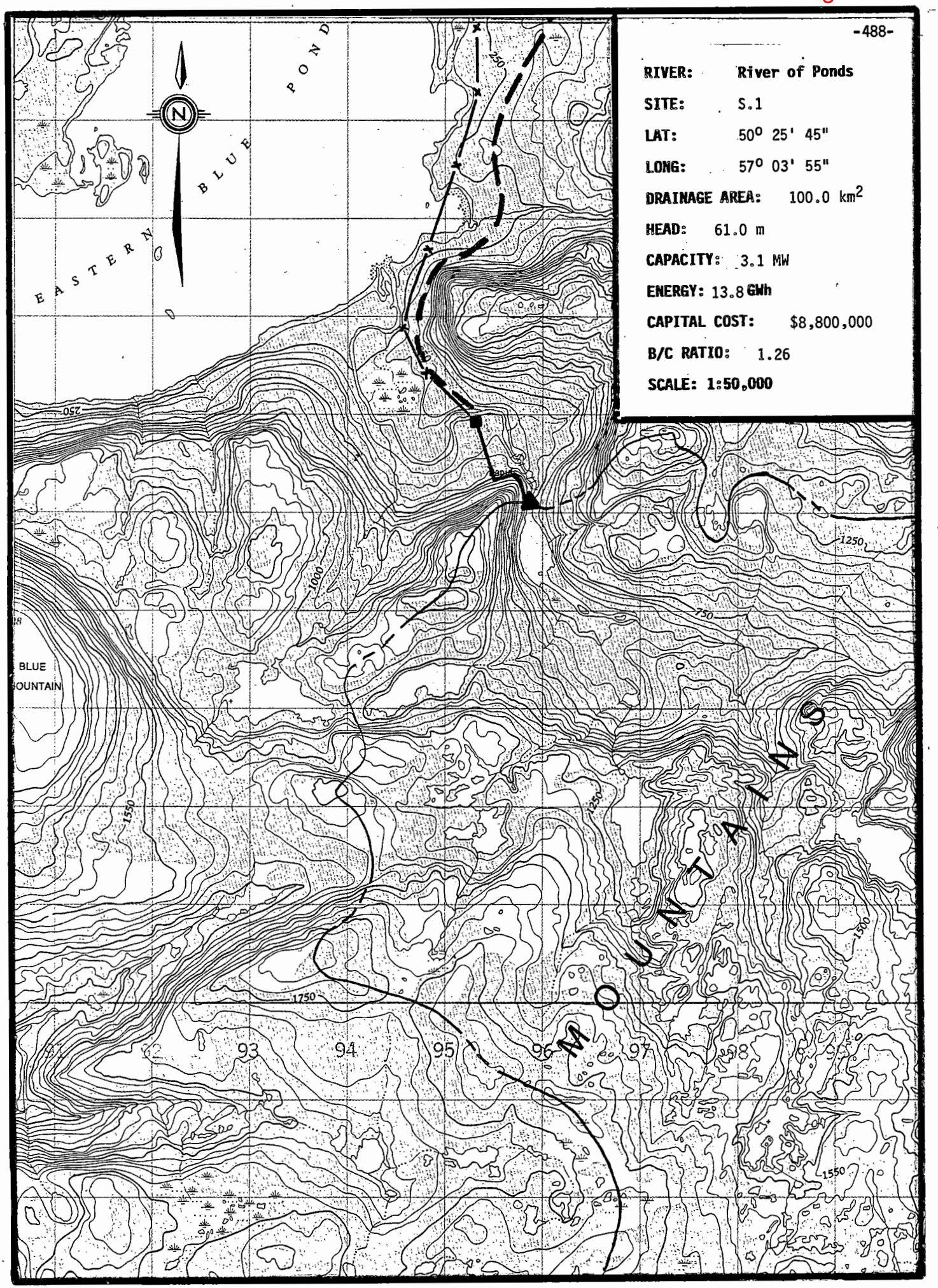
4. Site Data:

Rated Head = 23 m
Penstock Length = 77 m
Access Road Length = 3.0 km
Dam Height = 26 m
Distance to Town = 17 km
Installed Capacity = 6.4 MW

Plant Design Flow = 34.0 m^3/s
T.L. Line Length = 5.0 km
Dam Length = 300 m
Distance to Concrete Plant = 55 km

5. Remarks:

(i) HWL ~ 300 TWL ~ 225' → 75' = 23m.


-488-
RIVER: River of Ponds
SITE: S.1
LAT: 50° 25' 45"
LONG: 57° 03' 55"
DRAINAGE AREA: 100.0 km²
HEAD: 61.0 m
CAPACITY: 3.1 MW
ENERGY: 13.8 GWh
CAPITAL COST: $8,800,000
B/C RATIO: 1.26
SCALE: 1:50,000
N
EASTERN BLUE POND
BLUE MOUNTAIN
MOUNTAINS
250
1000
1250
750
1550
1750
1500
93
94
95
96
97

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : River of Ponds

SITE NAME : SITE - 1 FILE : 4019

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.068617 MW
PENSTOCK LENGTH	: 1150 M.
DESIGN FLOW	: 6.18 M^3/S
PENSTOCK DIAMETER	: 1.550777 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 30 KM.
LENGTH OF DAM	: 80 M.
ACCESS ROAD LENGTH	: 13.5 KM.
FLOOD FLOW	: 190 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .77
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7571465

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
126254.6	SEE DAM	118987.6	1996630	142500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP. ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
488789.9	1164776	349432.8	1160346	1368767

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	769567.3	790758.7	319217.2

PROJECT COST: $ 8796027 COST PER KW: $ 2866.447

Total Project Cost = $ 8,796,027

MAP NUMBER 12 I/06 DATA SHEET FILE NUMBER 4019

1. Site Identification:

River Basin: River of Ponds Site: S.1

2. Location:

Lat. 50° 25' 45" Long. 57° 03' 55" Hydrologic Region 4

3. Hydrologic Data:

A = 100 km^2, MAR = 1300 mm, ACLS = 60 %

Storage Reservoir Area = 0.4 km^2

Storage Reservoir Vol, V = 0.8 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.01$$

Mean Flow, QAV = 4.12 m^3/s

Usable Flow Ratio = 0.77

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 190 m^3/s

Q1000 = 150 m^3/s

Q_2 = 95

4. Site Data:

Rated Head = 61 m
Penstock Length = 1150 m
Access Road Length = 13.5 km
Dam Height = 3 m
Distance to Town = 50 km
Installed Capacity = 3.1 MW

Plant Design Flow = 6.18 m^3/s
T.L. Line Length = 30 km
Dam Length = 80 m
Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: River of Ponds

SITE: S.2

LAT: 50° 28' 15"

LONG: 57° 00' 20"

DRAINAGE AREA: 92.0 km²

HEAD: 61.0 m

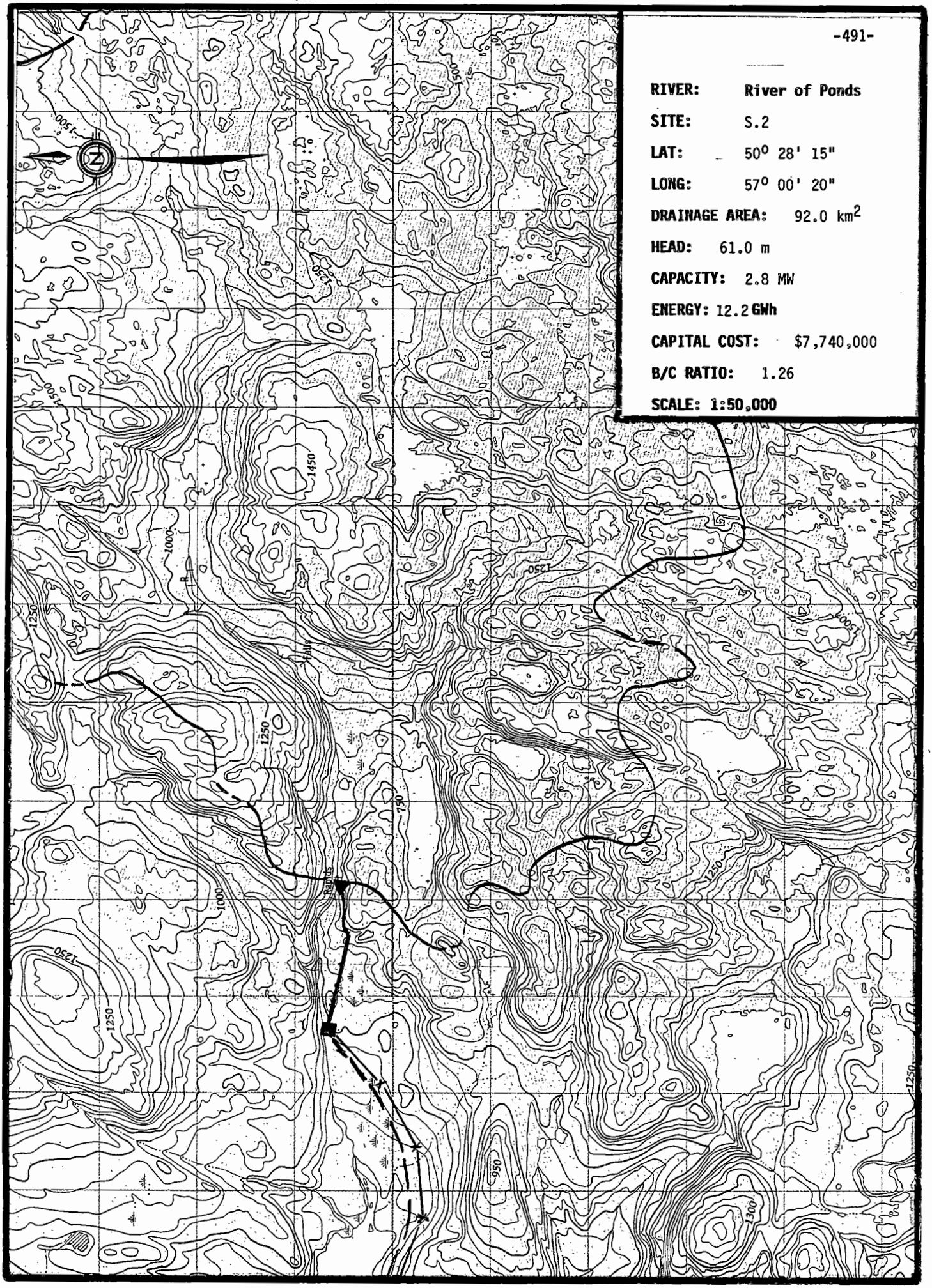
CAPACITY: 2.8 MW

ENERGY: 12.2 GWh

CAPITAL COST: $7,740,000

B/C RATIO: 1.26

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : River of Ponds

SITE NAME : SITE - 2 FILE : 4020

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.82283 MW
PENSTOCK LENGTH	: 1600 M.
DESIGN FLOW	: 5.685 M^3/S
PENSTOCK DIAMETER	: 1.496092 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: 18 KM.
LENGTH OF DAM	: 101 M.
ACCESS ROAD LENGTH	: 3.5 KM.
FLOOD FLOW	: 180 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7070471

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
377659.6	SEE DAM	110374.7	2660134	135000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
461043.1	1098656	329596.8	368350.7	899754.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	316867.9	704085.9	274769.2

PROJECT COST: $ 7736292 COST PER KW: $ 2740.616

Total Project Cost = $ 7,736,292

MAP NUMBER 12 I/05 DATA SHEET FILE NUMBER 4020

1. Site Identification:

River Basin: River of Ponds Site: S.2

2. Location:

Lat. 50° 28' 15" Long. 57° 00' 20" Hydrologic Region 4

3. Hydrologic Data:

A = 92 km^2, MAR = 1300 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.79 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 180 m^3/s

Q1000 = 230 m^3/s

Q_2 = 85

4. Site Data:

Rated Head = 61 m

Penstock Length = 1600 m

Access Road Length = 3.5 km

Dam Height = 5.5 m

Distance to Town = 18 km

Installed Capacity = 2.8 MW

Plant Design Flow = 5.69 m^3/s

T.L. Line Length = 18 km

Dam Length = 101 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: River of Ponds

SITE: S.3

LAT: 50° 28' 05"

LONG: 57° 14' 00"

DRAINAGE AREA: 690.0 km²

HEAD: 37.0 m

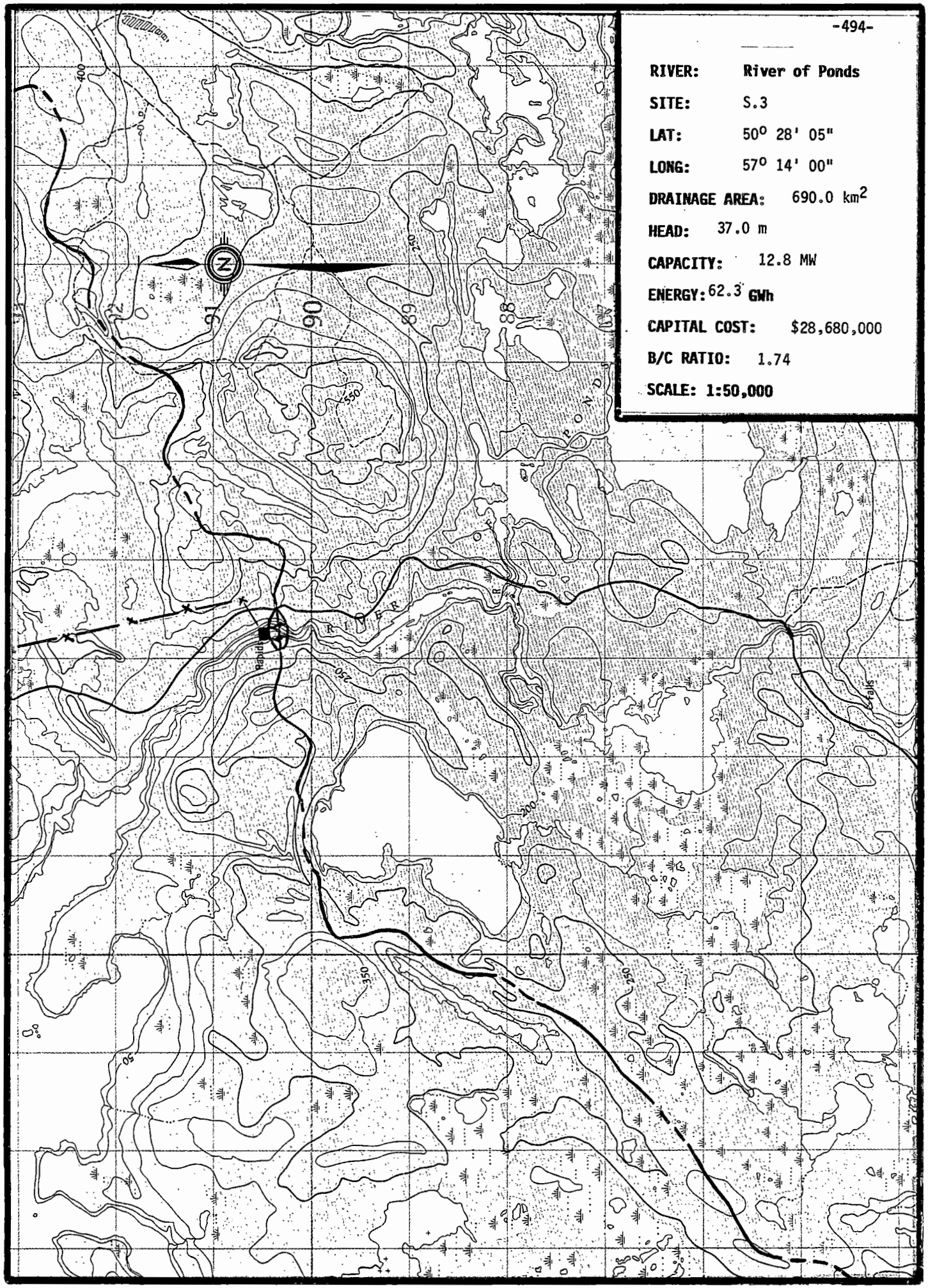
CAPACITY: 12.8 MW

ENERGY: 62.3 GWh

CAPITAL COST: $28,680,000

B/C RATIO: 1.74

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : River of Ponds

SITE NAME : SITE - 3 FILE : 4021

SITE DATA

INSTALLED CAPACITY	: 12.84382 MW
PENSTOCK LENGTH	: 150 M.
DESIGN FLOW	: 42.645 M^3/S
PENSTOCK DIAMETER	: 3.816503 M.
RATED HEAD	: 37 M.
HEIGHT OF DAM	: 37 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 390 M.
ACCESS ROAD LENGTH	: 0 KM.
FLOOD FLOW	: 420 M^3/S
DISTANCE TO TOWN	: 12 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .83
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.769681E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1.038385E+07	2372630	676851.3	843137	315000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1837227	3674453	1096852	0	759112.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2506082	2259294	1954028

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.867852E+07 COST PER KW: $ 2232.865

Total Project Cost = $ 28,678,520

MAP NUMBER 12 I/05 DATA SHEET FILE NUMBER 4021

1. Site Identification:

River Basin: River of Ponds Site: S.3

2. Location:

Lat. 50° 28' 05" Long. 57° 14' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 690 km^2, MAR = 1300 mm, ACLS = 95 %

Storage Reservoir Area = 24.5 km^2

Storage Reservoir Vol, V = 49 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.05$$

Mean Flow, QAV = 28.43 m^3/s

Usable Flow Ratio = 0.83

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 340 m^3/s

Q1000 = 420 m^3/s

Q_2 = 160

4. Site Data:

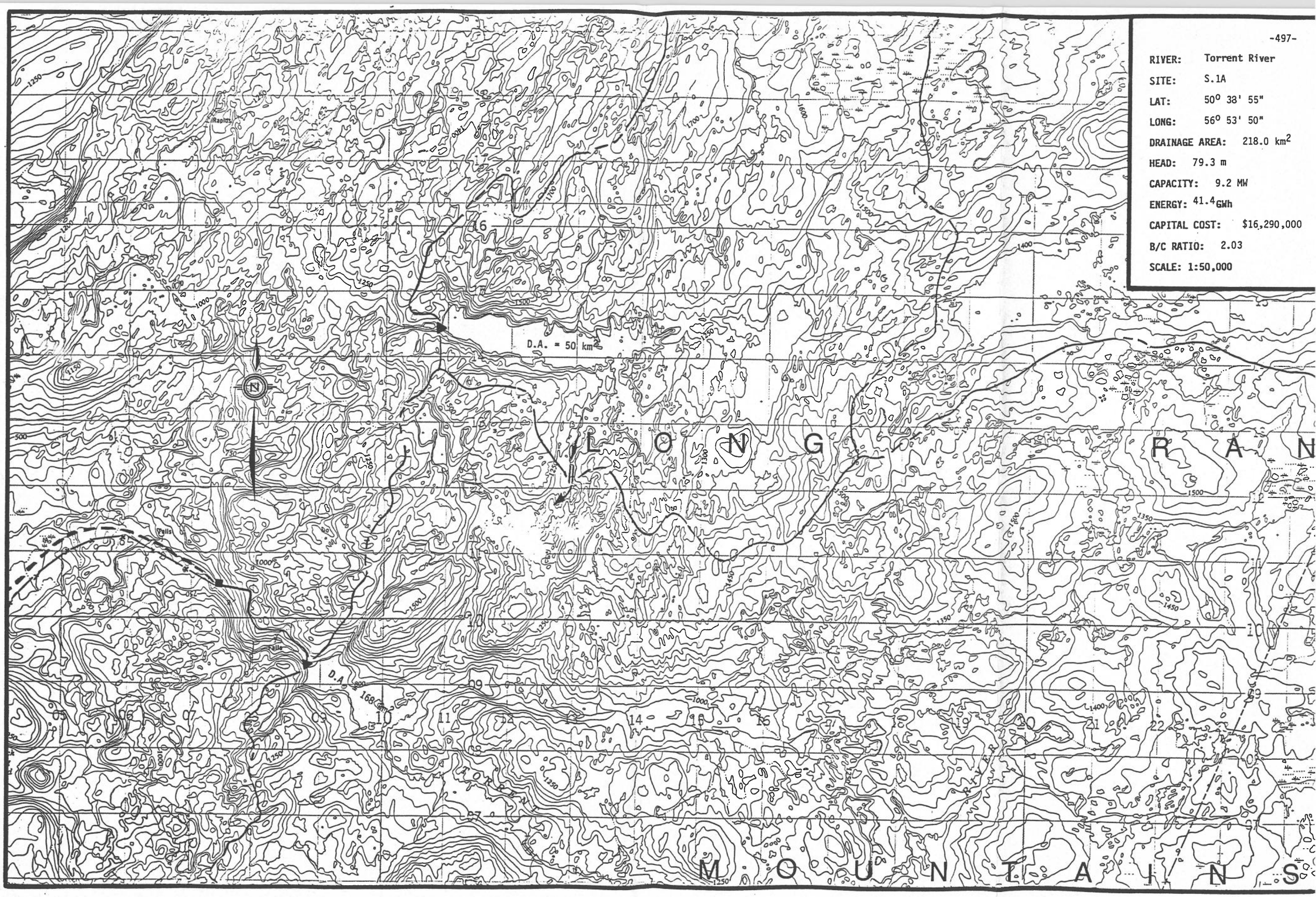
Rated Head = 37 m
Penstock Length = 150 m
Access Road Length = 0 km
Dam Height = 37 m
Distance to Town = 12 km
Installed Capacity = 12.8 MW

Plant Design Flow = 42.65 m^3/s
T.L. Line Length = 11 km
Dam Length = 390 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Similar to River of Ponds Development discussed in ADB - Report Volumn 4.

(ii) Lower portion of river accessible to salmon.


-497-
RIVER: Torrent River
SITE: S.1A
LAT: 50° 38' 55"
LONG: 56° 53' 50"
DRAINAGE AREA: 218.0 km²
HEAD: 79.3 m
CAPACITY: 9.2 MW
ENERGY: 41.4 GWh
CAPITAL COST: $16,290,000
B/C RATIO: 2.03
SCALE: 1:50,000
D.A. = 50 km²
L O N G
R A N
M O U N T A I N S

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Torrent River

SITE NAME : SITE - 1A FILE : 4022

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	9.198403 MW
PENSTOCK LENGTH	:	2050 M.
DESIGN FLOW	:	14.25 M^3/S
PENSTOCK DIAMETER	:	2.14098 M.
RATED HEAD	:	79.3 M.
HEIGHT OF DAM	:	6.8 M.
TRANSMISSION LINE LENGTH	:	21 KM.
LENGTH OF DAM	:	116 M.
ACCESS ROAD LENGTH	:	8 KM.
FLOOD FLOW	:	140 M^3/S
DISTANCE TO TOWN	:	21 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.77
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.746229E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
591414.6	SEE DAM	252374.5	5311854	105000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1050616	2353380	702501.5	743755.4	1215484

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	653270.9	1285627	868382.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.629156E+07 COST PER KW: $ 1771.129

Total Project Cost = $ 16,291,560

WATER SHED : Torrent River SITE - 1A

COST DATA

(ADDITIONAL COST of $ 1,157,900 for DIVERSION INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5133333

ANNUAL COST : $ 1221867

ANNUAL BENEFIT : $ 2481803

BENEFIT/COST RATIO: 2.031156

Total Project Cost = $ 16,291,560.00

Benefit / Cost Ratio = 2.03

MAP NUMBER 12 I/10 DATA SHEET FILE NUMBER 4022

1. Site Identification:

River Basin: Torrent River Site: S.1

2. Location:

Lat. 50° 38' 55" Long. 56° 53' 50" Hydrologic Region 4

3. Hydrologic Data:

168+50

A = 218 km^2, MAR = 1375 mm, ACLS = 90 %

Storage Reservoir Area = 1.6 km^2

Storage Reservoir Vol, V = 3.2 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.01

Mean Flow, QAV = 9.50 m^3/s

Usable Flow Ratio = 0.77

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 189 m^3/s

Q1000 = 245 m^3/s

Q_2 = 92

4. Site Data:

Rated Head = 79.3 m

Penstock Length = 2050 m

Access Road Length = 8.0 km

Dam Height = 6.8 m

Distance to Town = 21 km

Installed Capacity = 9.2 MW

Plant Design Flow = 14.25 m^3/s

T.L. Line Length = 21 km

Dam Length = 116 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Diversion possibilities as below:
50 km^2 from Torrent River S.2 at Lat. 50° 41' 00"
Long. 56° 51' 00"

(ii) Cost of diversion = $1,157,900.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Torrent River S.1 Region: 4

Total Developed Head, H = 79.3 m Map: 12 I/10

Diverted Area = 50 km^2, MAR = 1300 mm, from Torrent S.2

Location: Lat. = 50° 41' 00" Long. = 56° 51' 00"

Mean Diverted Flow = 2.06 m^3/s,

Additional Usable FLow, Q* = 0.71(7.46+2.06)-5.74
F'(QAV + QDV) - F.QAV

= 6.76 - 5.74 = 1.02 m^3/s

Additional Energy = H x Q* x 0.0716

= 79.3 x 1.02 x 0.0716 = 5.79 GWh p.a.

Dam: Height = 4.0 m, Length = 80 m, Q150 = 46 m^3/s

Canal: Height of Land = 2 m, Length = 400 m

Design Flow Ratio = 1.17 Design Flow = 2.42 m^3/s

Access Road: Length = 10.5 km

Costs:	Dam + Spillway	= 226,400
	Diversion Canal	= 100,700
	Access Road	= 420,000
	Sub-total Direct Costs	= 747,100
	Total Cost Diversion	= 1,157,900
	Additional Plant Costs	= -
	Total Project Cost	= 1,159,900

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ = 3.93

-502-

RIVER: Torrent River

SITE: S.2

LAT: 50° 39' 40"

LONG: 56° 57' 15"

DRAINAGE AREA: 46.0 km²

HEAD: 137.0 m

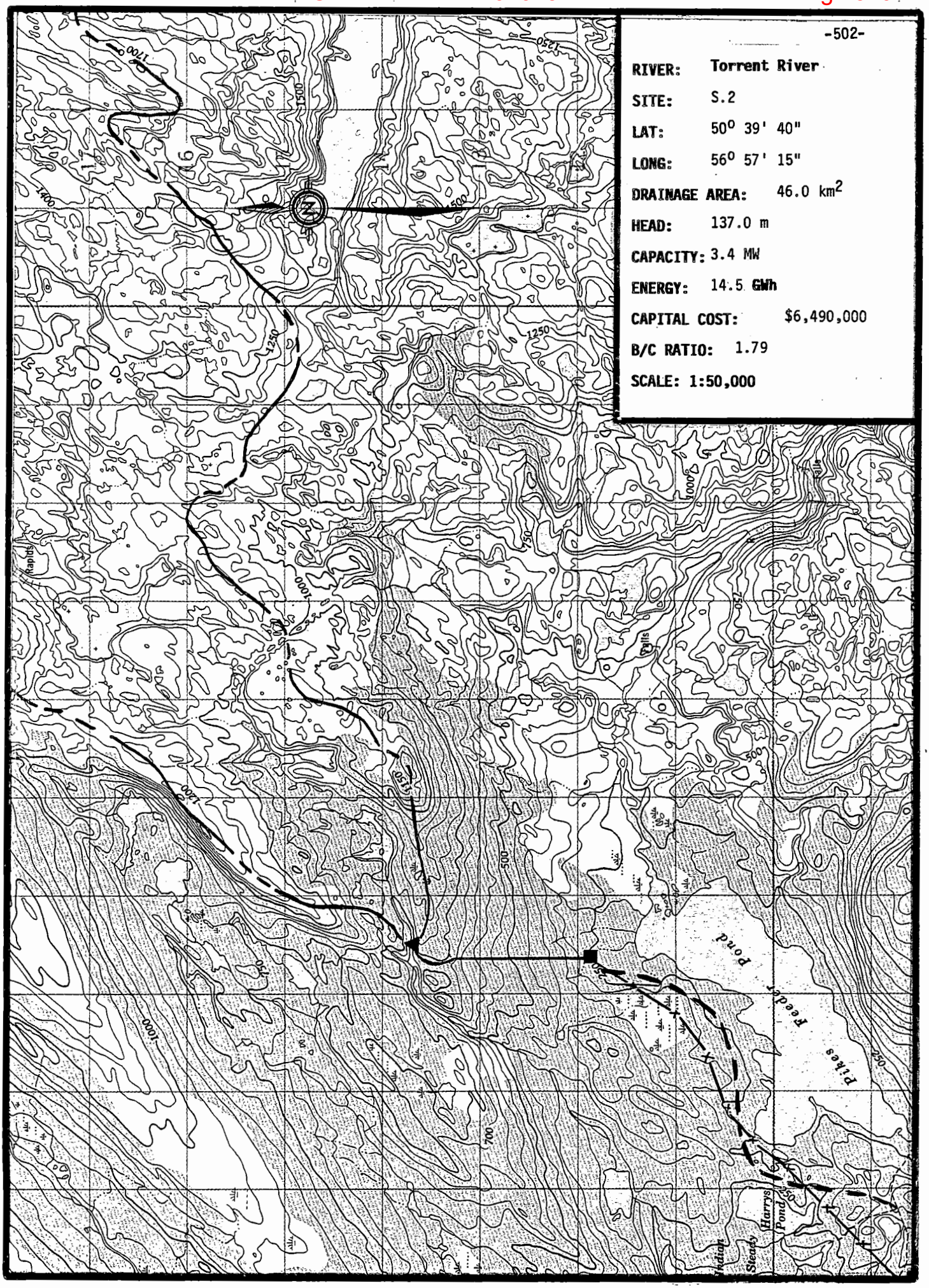
CAPACITY: 3.4 MW

ENERGY: 14.5 GWh

CAPITAL COST: $6,490,000

B/C RATIO: 1.79

SCALE: 1:50,000



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ShawMont Newfoundland Limited
Updated Sept, '86 by H.J.Keats

WATER SHED : Torrent River

SITE NAME : SITE - 2 FILE : 4023

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.41245 MW
PENSTOCK LENGTH	: 1850 M.
DESIGN FLOW	: 3.06 M^3/S
PENSTOCK DIAMETER	: 1.023505 M.
RATED HEAD	: 137 M.
HEIGHT OF DAM	: 4.9 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 75 M.
ACCESS ROAD LENGTH	: 6 KM.
FLOOD FLOW	: 54 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .73
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6769540

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
243103	SEE DAM	63206.43	1972004	40500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
396663.4	945240.3	283572.1	582414.5	841915.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	282324.4	596095.6	239434.2

PROJECT COST: $ 6486473 COST PER KW: $ 1900.826

Total Project Cost = $ 6,486,473

MAP NUMBER 12 I/10 DATA SHEET FILE NUMBER 4023

1. Site Identification:

River Basin: Torrent River Site: S.2

2. Location:

Lat. 50° 39' 40" Long. 56° 57' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 46 km^2, MAR = 1400 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = ____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 2.04 m^3/s

Usable Flow Ratio = 0.73

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 54 m^3/s

Q1000 = 79 m^3/s

4. Site Data:

Rated Head = 137 m
Penstock Length = 1850 m
Access Road Length = 6 km
Dam Height = 4.9 m
Distance to Town = 18 km
Installed Capacity = 3.4 MW

Plant Design Flow = 3.06 m^3/s
T.L. Line Length = 15 km
Dam Length = 75 m
Distance to Concrete Plant = 100 km

5. Remarks:

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Torrent River

SITE NAME : SITE - 3 FILE : 4024

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	:	4.833817 MW
PENSTOCK LENGTH	:	1350 M.
DESIGN FLOW	:	19.47 M^3/S
PENSTOCK DIAMETER	:	2.798955 M.
RATED HEAD	:	30.5 M.
HEIGHT OF DAM	:	15 M.
TRANSMISSION LINE LENGTH	:	13 KM.
LENGTH OF DAM	:	350 M.
ACCESS ROAD LENGTH	:	15 KM.
FLOOD FLOW	:	480 M^3/S
DISTANCE TO TOWN	:	15 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.77
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 1.303342E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2520979	1445174	334226.8	4960770	360000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
856300.1	2040545	612163.5	1269057	865642.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1262891	1575134	769660.9

PROJECT COST: $ 1.887254E+07 COST PER KW: $ 3904.273

Total Project Cost = $ 18,872,540

MAP NUMBER 12 I/11 DATA SHEET FILE NUMBER 4024

1. Site Identification:

River Basin: Torrent River Site: S.3

2. Location:

Lat. 50° 37' 08" Long. 57° 00' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 315 km^2, MAR = 1300 mm, ACLS = 50 %

Storage Reservoir Area = 2.8 km^2

Storage Reservoir Vol, V = 5.6 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0.01

Mean Flow, QAV = 12.98 m^3/s

Usable Flow Ratio = 0.77

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 390 m^3/s

Q1000 = 480 m^3/s

Q_2 = 190

4. Site Data:

Rated Head = 30.5 m

Penstock Length = 1350 m

Access Road Length = 150 km

Dam Height = 15 m

Distance to Town = 15 km

Installed Capacity = 4.8 MW

Plant Design Flow = 19.47 m^3/s

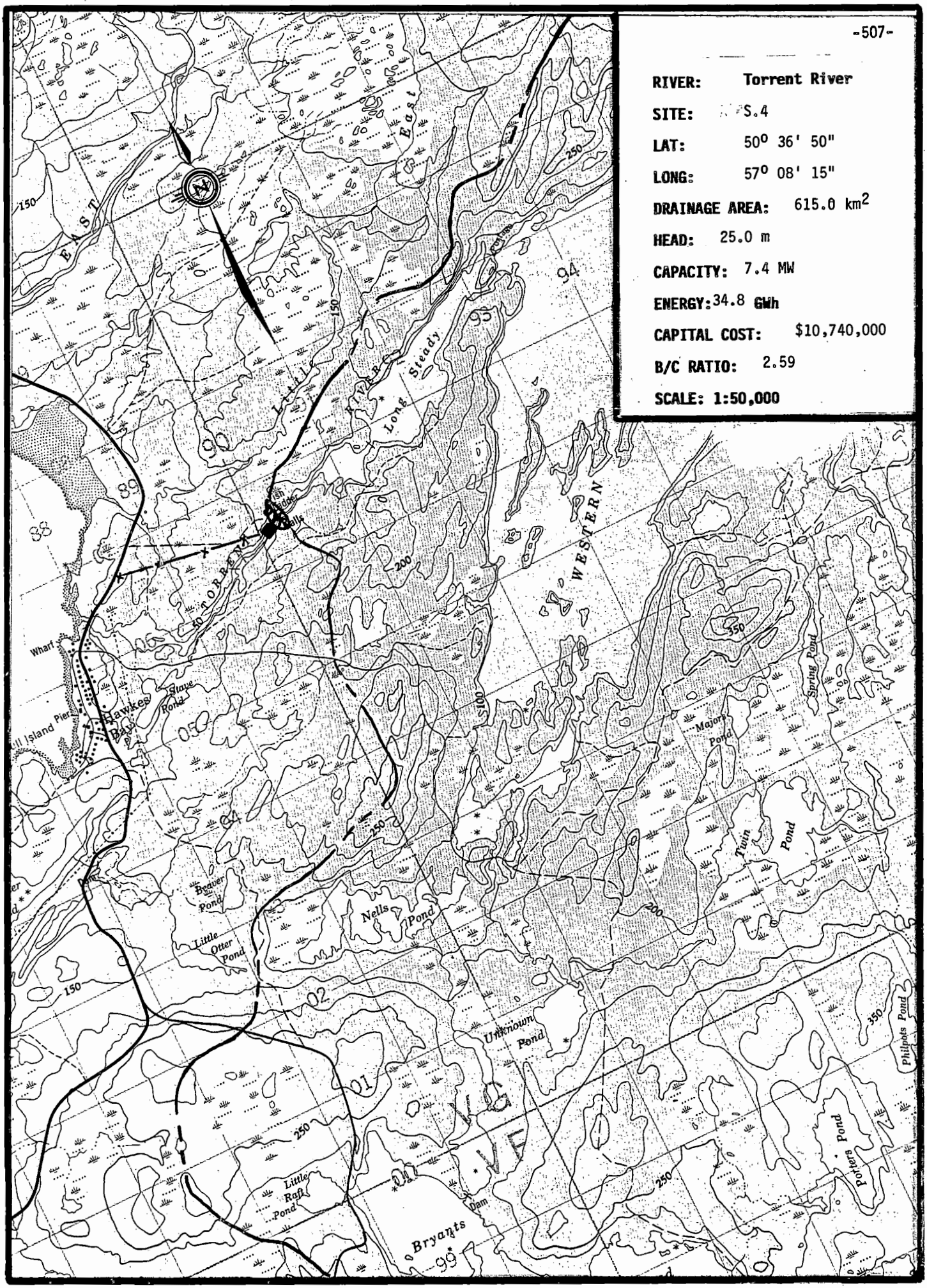
T.L. Line Length = 13 km

Dam Length = 350 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) River accessible to salmon since construction of fishway.


-507-
RIVER: Torrent River
SITE: S.4
LAT: 50° 36' 50"
LONG: 57° 08' 15"
DRAINAGE AREA: 615.0 km2
HEAD: 25.0 m
CAPACITY: 7.4 MW
ENERGY: 34.8 GWh
CAPITAL COST: $10,740,000
B/C RATIO: 2.59
SCALE: 1:50,000
EAST
East
Little
RIVER
Long
Steady
NORTHERN
WESTERN
Falls
Wharf
Hawkes Bay
Slave Pond
Beaver Pond
Little Otter Pond
Nells Pond
Unknown Pond
Majors Pond
Twin Pond
Spring Pond
Philpots Pond
Potters Pond
Little Rap Pond
Bryants
Dam
150
200
250
350
550
94
93
89
88
99

SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Torrent River

SITE NAME : SITE - 4 FILE : 4025

SITE DATA

INSTALLED CAPACITY	: 7.438942 MW
PENSTOCK LENGTH	: 80 M.
DESIGN FLOW	: 36.555 M^3/S
PENSTOCK DIAMETER	: 3.77334 M.
RATED HEAD	: 25 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 2.5 KM.
LENGTH OF DAM	: 140 M.
ACCESS ROAD LENGTH	: 0 KM.
FLOOD FLOW	: 420 M^3/S
DISTANCE TO TOWN	: 2 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.949054E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1105154	1302226	589201.8	442534.3	315000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1334465	2668929	796695.3	0	167265.1

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	515527	949493	551569.5

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.073806E+07 COST PER KW: $ 1443.493

Total Project Cost = $ 10,738,060

MAP NUMBER 12 I/11 DATA SHEET FILE NUMBER 4025

1. Site Identification:

River Basin: Torrent River Site: S.4

2. Location:

Lat. 50° 36' 50" Long. 57° 08' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 615 km^2, MAR = 1250 mm, ACLS = 90 %

Storage Reservoir Area = 11 km^2

Storage Reservoir Vol, V = 22 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.03$$

Mean Flow, QAV = 24.37 m^3/s

Usable Flow Ratio = 0.80

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 340 m^3/s

Q1000 = 420 m^3/s

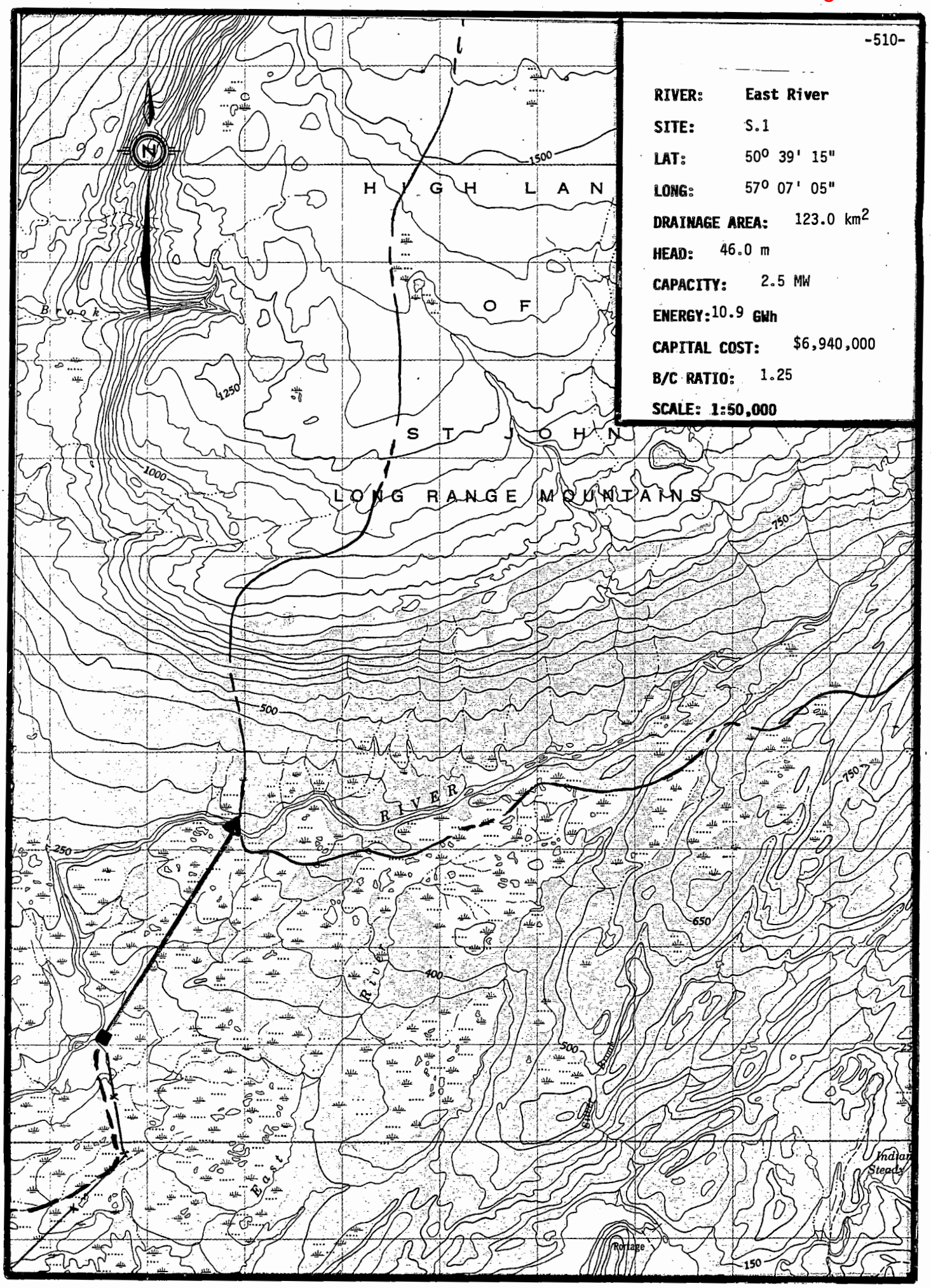
4. Site Data:

Rated Head = 25 m
Penstock Length = 80 m
Access Road Length = 0 km
Dam Height = 15 m
Distance to Town = 2 km
Installed Capacity = 7.4 MW

Plant Design Flow = 36.55 m^3/s
T.L. Line Length = 2.5 km
Dam Length = 140 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Existing fishway at same location (9 m falls).



RIVER:	East River
SITE:	S.1
LAT:	50° 39' 15"
LONG:	57° 07' 05"
DRAINAGE AREA:	123.0 km^2
HEAD:	46.0 m
CAPACITY:	2.5 MW
ENERGY:	10.9 GWh
CAPITAL COST:	$6,940,000
B/C RATIO:	1.25
SCALE:	1:50,000

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ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : East River

SITE NAME : SITE - 1 FILE : 4026

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.516237 MW
PENSTOCK LENGTH	: 2550 M.
DESIGN FLOW	: 6.72 M^3/S
PENSTOCK DIAMETER	: 1.67245 M.
RATED HEAD	: 46 M.
HEIGHT OF DAM	: 5.7 M.
TRANSMISSION LINE LENGTH	: 3 KM.
LENGTH OF DAM	: 107 M.
ACCESS ROAD LENGTH	: 5 KM.
FLOOD FLOW	: 205 M^3/S
DISTANCE TO TOWN	: 7 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6896931

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
419831	SEE DAM	128305.2	2035135	153750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
469557.4	1118945	335683.6	498801.9	291142

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	278866	872976.9	339081.6

PROJECT COST: $ 6942076 COST PER KW: $ 2758.912

Total Project Cost = $ 6,942,076

MAP NUMBER 12 I/11 DATA SHEET FILE NUMBER 4026

1. Site Identification:

River Basin: East River Site: S.1

2. Location:

Lat. 50° 39' 15" Long. 57° 07' 05" Hydrologic Region 4

3. Hydrologic Data:

A = 123 km^2, MAR = 1150 mm, ACLS = 20 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 4.48 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 205 m^3/s Q_2 = 100

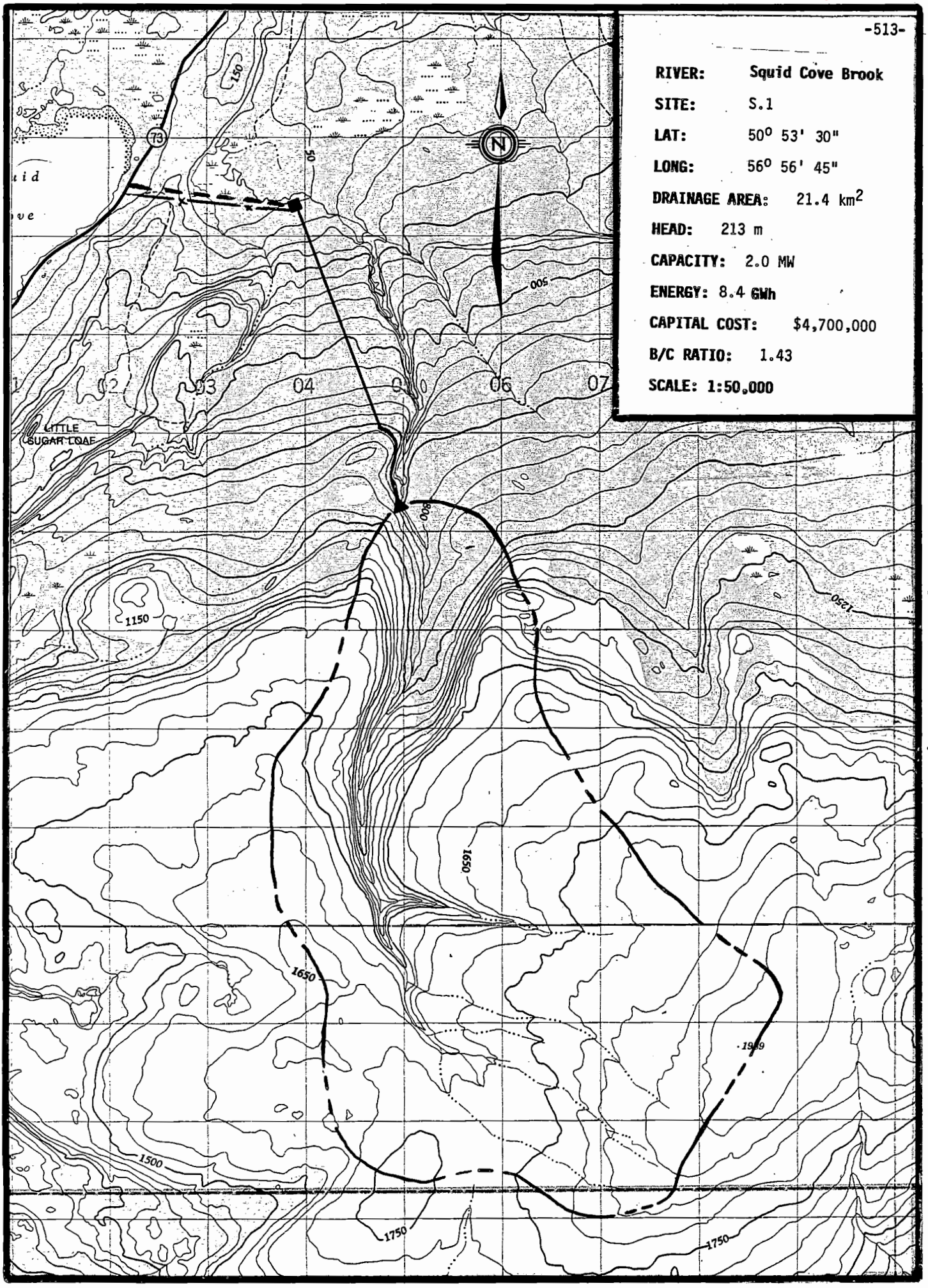
Q1000 = 260 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 2550 m
Access Road Length = 5.0 km
Dam Height = 5.7 m
Distance to Town = 7 km
Installed Capacity = 2.5 MW

Plant Design Flow = 6.73 m^3/s
T.L. Line Length = 3.0 km
Dam Length = 107 m
Distance to Concrete Plant = 100 km

5. Remarks:


-513-
RIVER: Squid Cove Brook
SITE: S.1
LAT: 50° 53' 30"
LONG: 56° 56' 45"
DRAINAGE AREA: 21.4 km²
HEAD: 213 m
CAPACITY: 2.0 MW
ENERGY: 8.4 GWh
CAPITAL COST: $4,700,000
B/C RATIO: 1.43
SCALE: 1:50,000
N
73
150
50
500
02
03
04
06
07
LITTLE
SUGAR LOAF
800
1150
1250
1650
1650
1500
1750
1750

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WATER SHED : Squid Cove Brook

SITE NAME : SITE - 1 FILE : 4027

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	:	1.950548 MW
PENSTOCK LENGTH	:	3236 M.
DESIGN FLOW	:	1.125 M^3/S
PENSTOCK DIAMETER	:	.6257386 M.
RATED HEAD	:	213 M.
HEIGHT OF DAM	:	3 M.
TRANSMISSION LINE LENGTH	:	1 KM.
LENGTH OF DAM	:	40 M.
ACCESS ROAD LENGTH	:	7 KM.
FLOOD FLOW	:	61 M^3/S
DISTANCE TO TOWN	:	10 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 3839061

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
65353.47	SEE DAM	25683.2	2002220	45750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
229776	547551.2	164265.4	663952.5	176621.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	180712.7	448464.1	151746.9

PROJECT COST: $ 4702096 COST PER KW: $ 2410.655

Total Project Cost = $ 4,702,096

MAP NUMBER 12 I/15 DATA SHEET FILE NUMBER 4027

1. Site Identification:

River Basin: Squid Cove Brook Site: S.1

2. Location:

Lat. 50° 53' 30" Long. 56° 56' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 22.5 km^2, MAR = 1100 mm, ACLS = 0 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = ____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 0.78 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 61 m^3/s Qz = 30

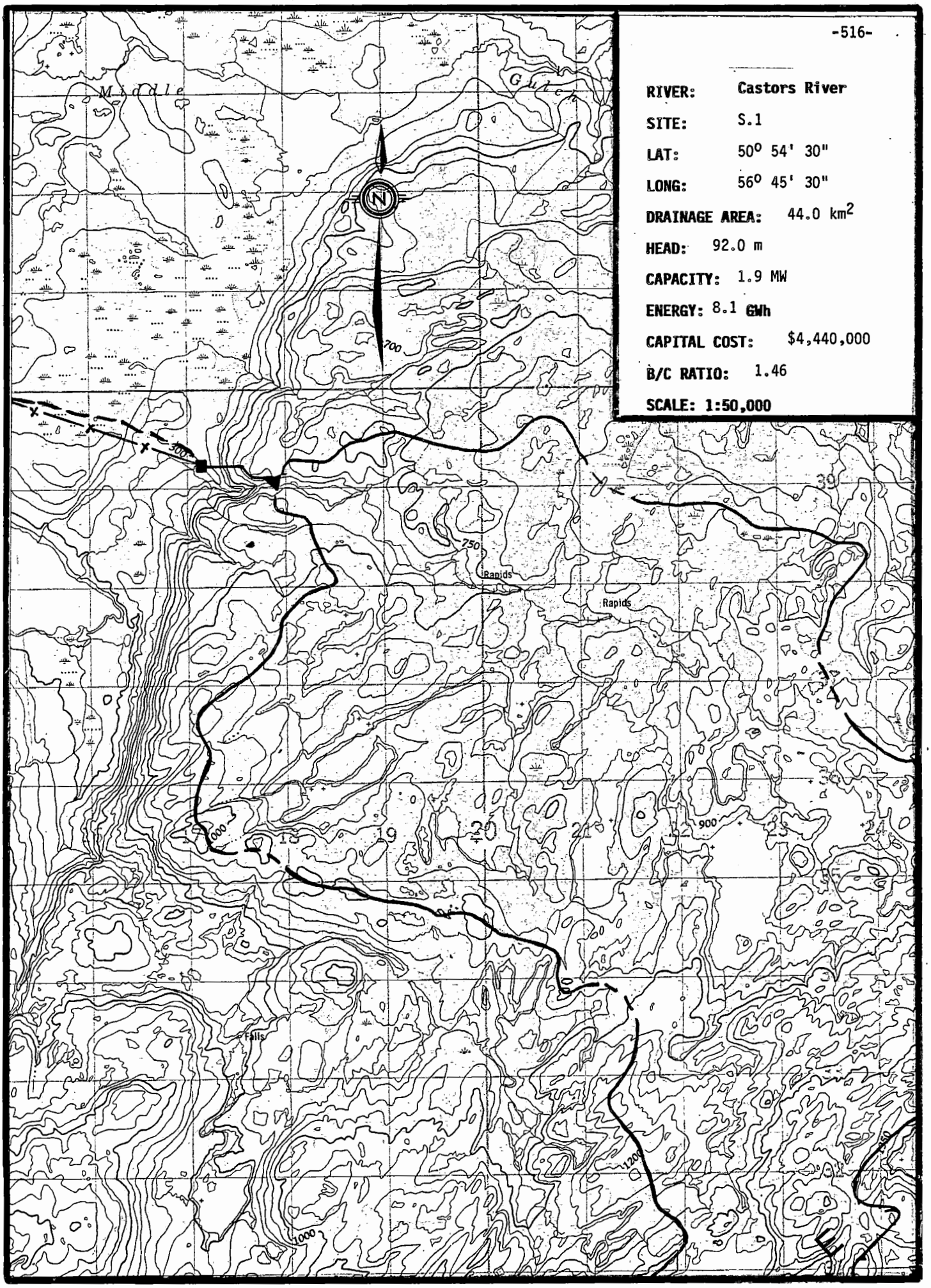
Q1000 = 82 m^3/s

4. Site Data:

Rated Head = 229 m
Penstock Length = 3236 m
Access Road Length = 7 km
Dam Height = 3 m
Distance to Town = 10 km
Installed Capacity = 2.2 MW

Plant Design Flow = 1.18 m^3/s
T.L. Line Length = 1.0 km
Dam Length = 40 m
Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Castors River

SITE: S.1

LAT: 50° 54' 30"

LONG: 56° 45' 30"

DRAINAGE AREA: 44.0 km^2

HEAD: 92.0 m

CAPACITY: 1.9 MW

ENERGY: 8.1 GWh

CAPITAL COST: $4,440,000

B/C RATIO: 1.46

SCALE: 1:50,000

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WATER SHED : Castors River

SITE NAME : SITE - 1 FILE : 4028

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.875944 MW
PENSTOCK LENGTH	: 775 M.
DESIGN FLOW	: 2.505 M^3/S
PENSTOCK DIAMETER	: .9929504 M.
RATED HEAD	: 92 M.
HEIGHT OF DAM	: 4.7 M.
TRANSMISSION LINE LENGTH	: 14 KM.
LENGTH OF DAM	: 68 M.
ACCESS ROAD LENGTH	: 7 KM.
FLOOD FLOW	: 32 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4571162

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
209283.3	SEE DAM	52788.45	798106.1	24000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
299955	714786.4	214435.9	663952.5	649835.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	249827.1	425993.4	141932.6

PROJECT COST: $ 4444896 COST PER KW: $ 2369.418

Total Project Cost = $ 4,444,896

MAP NUMBER 12 I/15 DATA SHEET FILE NUMBER 4028

1. Site Identification:

River Basin: Castors River Site: S.1

2. Location:

Lat. 50° 54' 30" Long. 56° 45' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 44 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 1.67 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 32 m^3/s

Q1000 = 43 m^3/s

Q_2 = 17

4. Site Data:

Rated Head = 92 m

Penstock Length = 775 m

Access Road Length = 7 km

Dam Height = 4.7 m

Distance to Town = 18 km

Installed Capacity = 1.9 MW

Plant Design Flow = 2.51 m^3/s

T.L. Line Length = 14 km

Dam Length = 68 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Castors River

SITE: S.2

LAT: 50° 52' 15"

LONG: 56° 46' 30"

DRAINAGE AREA: 82.0 km^2

HEAD: 114.0 m

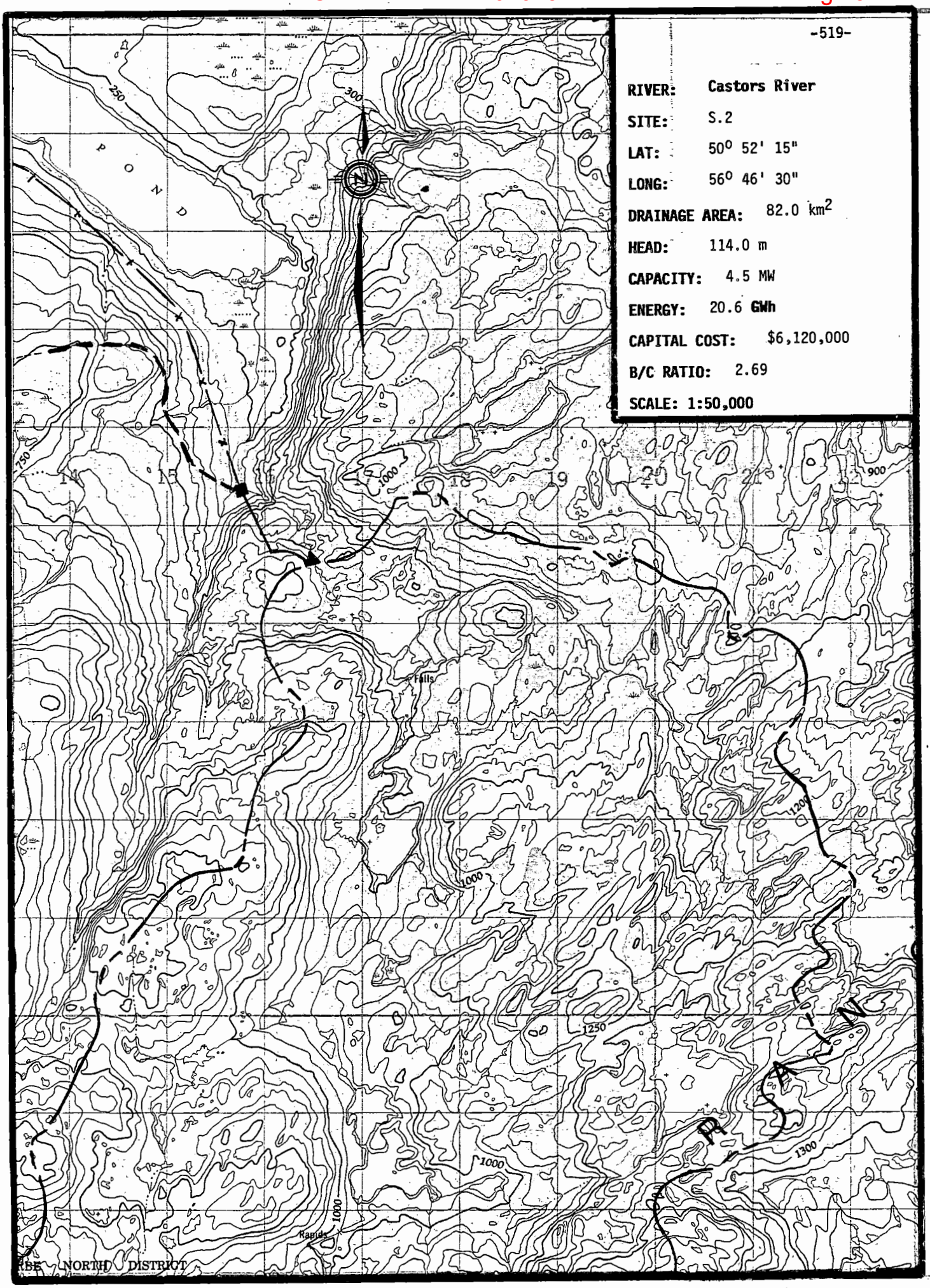
CAPACITY: 4.5 MW

ENERGY: 20.6 GWh

CAPITAL COST: $6,120,000

B/C RATIO: 2.69

SCALE: 1:50,000



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WATER SHED : Castors River

SITE NAME : SITE - 2 FILE : 4029

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 4.523805 MW
PENSTOCK LENGTH	: 1100 M.
DESIGN FLOW	: 4.875 M^3/S
PENSTOCK DIAMETER	: 1.283019 M.
RATED HEAD	: 114 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 13 KM.
LENGTH OF DAM	: 56 M.
ACCESS ROAD LENGTH	: 3.5 KM.
FLOOD FLOW	: 57 M^3/S
DISTANCE TO TOWN	: 19 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .78
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8924679

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
89968.48	SEE DAM	96114.55	1523283	42750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
515304.4	1227959	368387.8	368350.7	844503.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	240883.9	560429.7	239892.2

PROJECT COST: $ 6117827 COST PER KW: $ 1352.363

Total Project Cost = $ 6,117,827

MAP NUMBER 12 I/15 DATA SHEET FILE NUMBER 4029

1. Site Identification:

River Basin: Castors River Site: S.2

2. Location:

Lat. 50° 52' 15" Long. 56° 46' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 82 km^2, MAR = 1250 mm, ACLS = 98 %

Storage Reservoir Area = 1.2 km^2

Storage Reservoir Vol, V = 2.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.02$$

Mean Flow, QAV = 3.25 m^3/s

Usable Flow Ratio = 0.78

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 57 m^3/s

Q1000 = 78 m^3/s

Q_2 = 28

4. Site Data:

Rated Head = 114 m

Penstock Length = 1110 m

Access Road Length = 3.5 km

Dam Height = 3 m

Distance to Town = 19 km

Installed Capacity = 4.5 MW

Plant Design Flow = 4.87 m^3/s

T.L. Line Length = 13 km

Dam Length = 56 m

Distance to Concrete Plant = 100 km

5. Remarks:

(1) Access road from end of existing woods road. Condition of woods road is unknown.

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WATER SHED : Castors River

SITE NAME : SITE - 3 FILE : 4030

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.415139 MW
PENSTOCK LENGTH	: 1150 M.
DESIGN FLOW	: 2.85 M^3/S
PENSTOCK DIAMETER	: 1.111751 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 13 KM.
LENGTH OF DAM	: 72 M.
ACCESS ROAD LENGTH	: 13 KM.
FLOOD FLOW	: 41 M^3/S
DISTANCE TO TOWN	: 20 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4013675

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
227287.4	SEE DAM	59288.76	1347770	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
284329.4	677550.8	203265.3	1123713	556200.7

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	366857.9	527610.2	167769.8

PROJECT COST: $ 5572393 COST PER KW: $ 3937.701

Total Project Cost = $ 5,572,393

MAP NUMBER 12 I/15 , DATA SHEET FILE NUMBER 4030

1. Site Identification:

River Basin: Castors River Site: S.3

2. Location:

Lat. 50° 56' 45" Long. 56° 42' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 50 km^2, MAR = 1200 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.90 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 41 m^3/s

Q1000 = 55 m^3/s

Q_2 = 22

4. Site Data:

Rated Head = 61 m

Penstock Length = 1150 m

Access Road Length = 13 km

Dam Height = 4.8 m

Distance to Town = 20 km

Installed Capacity = 1.4 MW

Plant Design Flow = 2.85 m^3/s

T.L. Line Length = 13 km

Dam Length = 72 m

Distance to Concrete Plant = 100 km

5. Remarks:

RIVER: Castors River

SITE: S.4X

LAT: 50° 54' 45"

LONG: 56° 52' 30"

DRAINAGE AREA: 483.0 km²

HEAD: 37.0 m

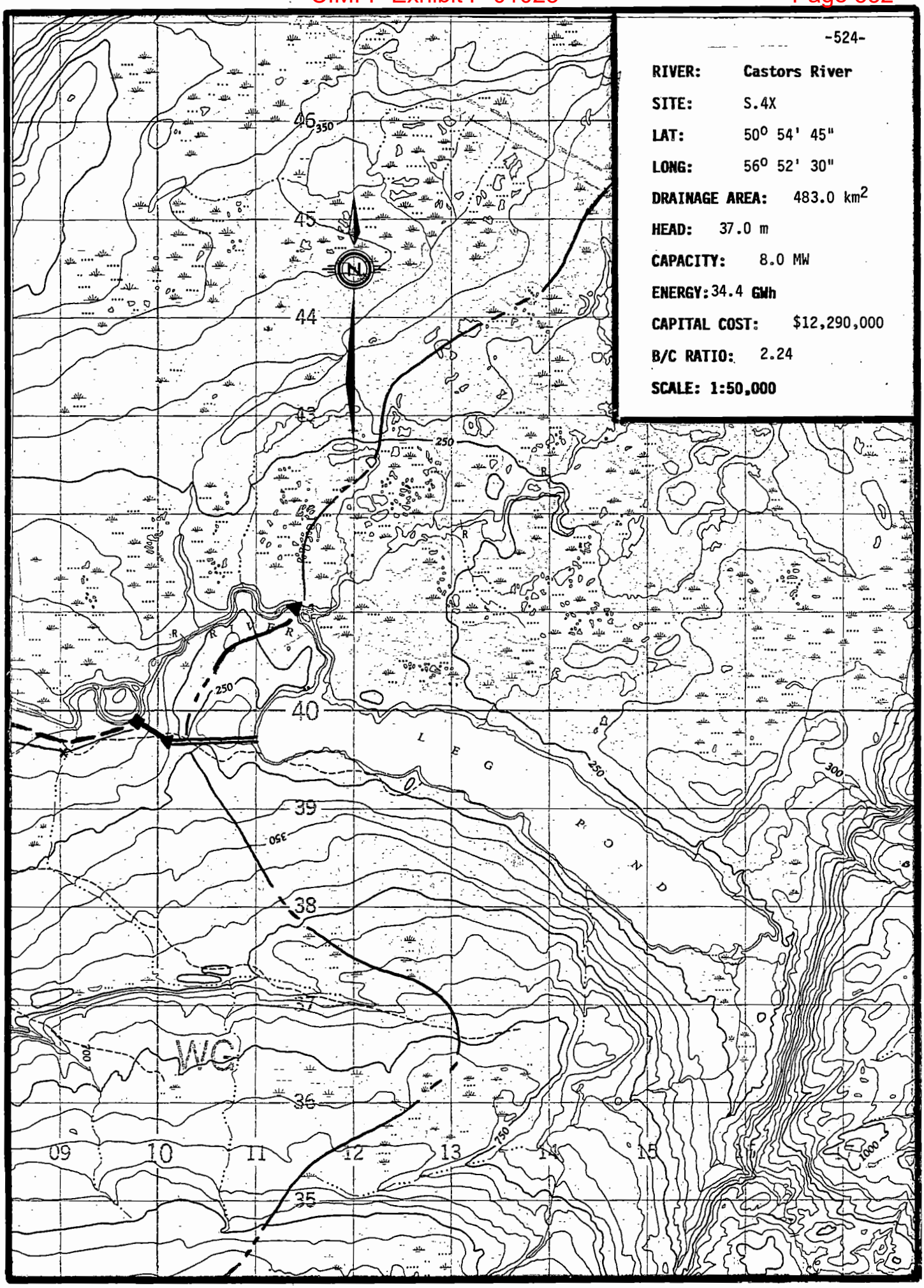
CAPACITY: 8.0 MW

ENERGY: 34.4 GWh

CAPITAL COST: $12,290,000

B/C RATIO: 2.24

SCALE: 1:50,000



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WATER SHED : Castors River

SITE NAME : SITE - 4X FILE : 4031

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 7.951152 MW
PENSTOCK LENGTH	: 350 M.
DESIGN FLOW	: 26.4 M^3/S
PENSTOCK DIAMETER	: 3.10536 M.
RATED HEAD	: 37 M.
HEIGHT OF DAM	: 7.5 M.
TRANSMISSION LINE LENGTH	: 7 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 7 KM.
FLOOD FLOW	: 211 M^3/S
DISTANCE TO TOWN	: 7 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.869188E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
602643.8	SEE DAM	439597.8	1479141	158250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1226089	2746438	819832.5	663952.5	431519.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	434874.1	928091.4	557821.7

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.228825E+07 COST PER KW: $ 1545.468

Total Project Cost = $ 12,288,250

WATER SHED : Castors River SITE - 4X

COST DATA

(ADDITIONAL COST of $ 1,800,000 for Intake Canal INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 921618.8

ANNUAL BENEFIT : $ 2061702

BENEFIT/COST RATIO: 2.237044

Total Project Cost = $ 12,288,250.00

Benefit / Cost Ratio = 2.24

MAP NUMBER 12 I/15 DATA SHEET FILE NUMBER 4031

1. Site Identification:

River Basin: Castors River Site: S.4X

2. Location:

Lat. 50° 54' 50" Long. 56° 52' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 483 km^2, MAR = 1150 mm, ACLS = 95 %

Storage Reservoir Area = 3.2 km^2

Storage Reservoir Vol, V = 6.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.01$$

Mean Flow, QAV = 17.6 m^3/s

Usable Flow Ratio = 0.77

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 211 m^3/s

Q1000 = 278 m^3/s

4. Site Data:

Rated Head = 37 m
Penstock Length = 350 m
Access Road Length = 7.0 km
Dam Height = 7.5 m
Distance to Town = 7.0 km
Installed Capacity = 8.0 MW

Plant Design Flow = 26.4 m^3/s
T.L. Line Length = 7.0 km
Dam Length = 100 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Add cost of Intake Canal = $1,800,000

(ii) Salmon River

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WATER SHED : Salmon River (Main Brook)

SITE NAME : SITE - 1 FILE : 4032

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 2.278386 MW
PENSTOCK LENGTH	: 75 M.
DESIGN FLOW	: 18.66 M^3/S
PENSTOCK DIAMETER	: 3.035357 M.
RATED HEAD	: 15 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 62 KM.
LENGTH OF DAM	: 240 M.
ACCESS ROAD LENGTH	: .1 KM.
FLOOD FLOW	: 260 M^3/S
DISTANCE TO TOWN	: 13 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .77
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8375563

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1795138	895841.9	321686.3	307312.2	195000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
648388.1	1379549	413864.8	17939.23	2261132

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	643673.6	903869.4	343809.5

PROJECT COST: $ 1.012721E+07 COST PER KW: $ 4444.904

Total Project Cost = $ 10,127,210

MAP NUMBER 12 P/01 DATA SHEET FILE NUMBER 4032

1. Site Identification:

River Basin: Salmon River (Main Brook, W.B.) Site: S.1

2. Location:

Lat. 51° 06' 45" Long. 56° 09' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 413 km^2, MAR = 950 mm, ACLS = 90 %

Storage Reservoir Area = 2.6 km^2

Storage Reservoir Vol, V = 5.2 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.01$$

Mean Flow, QAV = 12.44 m^3/s

Usable Flow Ratio = 0.77

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 200 m^3/s

Q1000 = 260 m^3/s

Q_2 = 95

4. Site Data:

Rated Head = 15 m

Penstock Length = 75 m

Access Road Length = 0 km

Dam Height = 15 m

Distance to Town = 13 km

Installed Capacity = 2.3 MW

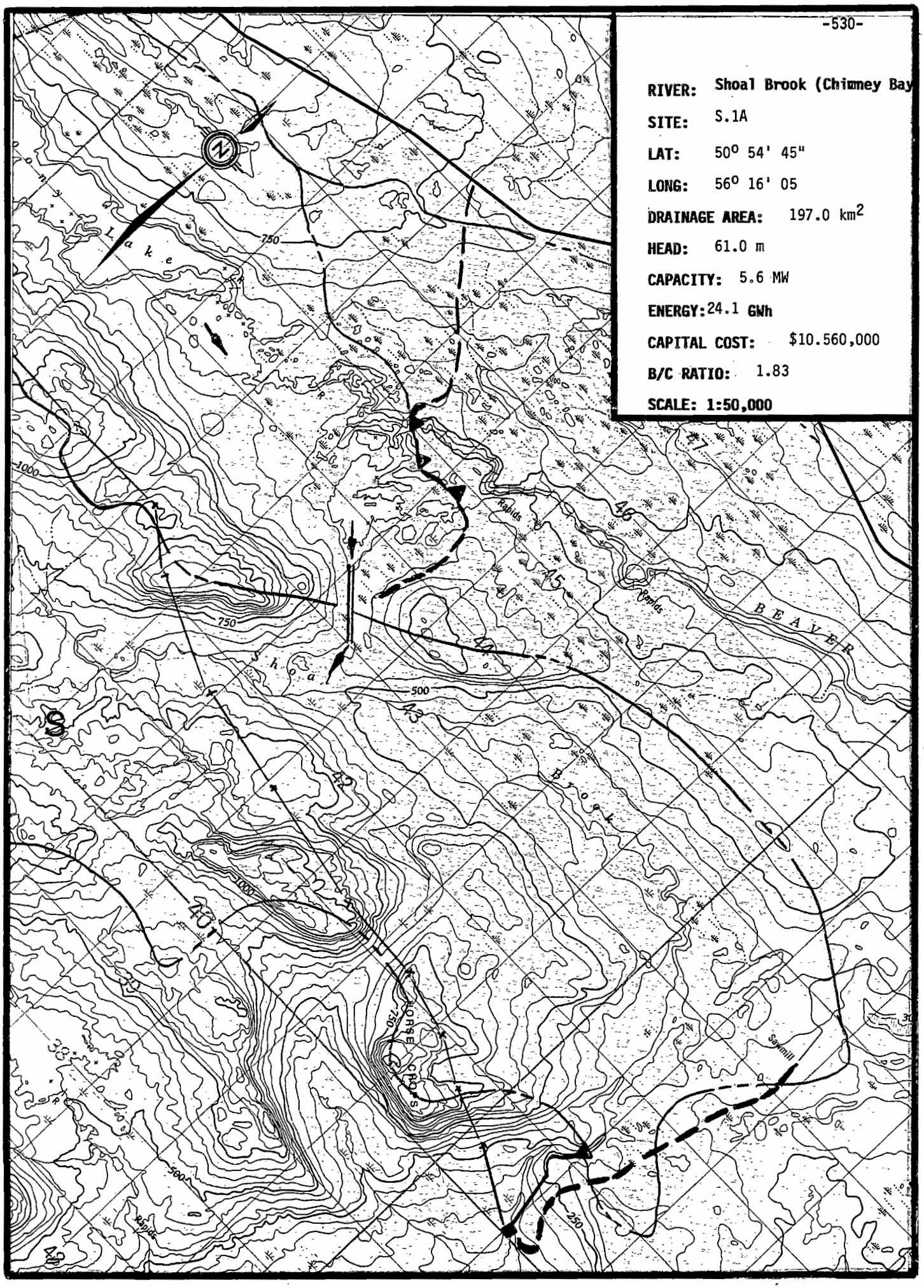
Plant Design Flow = 18.66 m^3/s

T.L. Line Length = 62 km

Dam Length = 240 m

Distance to Concrete Plant = 100 km

5. Remarks:



RIVER: Shoal Brook (Chimney Bay

SITE: S.1A

LAT: 50° 54' 45"

LONG: 56° 16' 05

DRAINAGE AREA: 197.0 km²

HEAD: 61.0 m

CAPACITY: 5.6 MW

ENERGY: 24.1 GWh

CAPITAL COST: $10.560,000

B/C RATIO: 1.83

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Shoal Brook (Chimney Bay)

SITE NAME : SITE - 1A FILE : 4035

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 5.578627 MW
PENSTOCK LENGTH	: 11.5 M.
DESIGN FLOW	: 11.235 M^3/S
PENSTOCK DIAMETER	: 2.00526 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: 70 KM.
LENGTH OF DAM	: 115 M.
ACCESS ROAD LENGTH	: 3.5 KM.
FLOOD FLOW	: 110 M^3/S
DISTANCE TO TOWN	: 25 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.236059E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
424462.5	SEE DAM	203764.2	27424.7	82500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
761517.3	1523035	454637.2	368350.7	3070741

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	414645.1	772950.4	374557.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.055899E+07 COST PER KW: $ 1892.757

Total Project Cost = $ 10,558,990

WATER SHED : Shoal Brook (Chimney Bay) SITE - 1A

COST DATA

(ADDITIONAL COST of $ 2,080,400 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 791923.8

ANNUAL BENEFIT : $ 1446516

BENEFIT/COST RATIO: 1.826584

Total Project Cost = $ 10,558,990.00

Benefit / Cost Ratio = 1.83

MAP NUMBER 12 I/16 DATA SHEET FILE NUMBER 4035

1. Site Identification:

River Basin: Shoal Brook (Chimney Bay) Site: S.1A

2. Location:

Lat. 50° 54' 45" Long. 56° 16' 05" Hydrologic Region 4

3. Hydrologic Data:

155 + 42

A = 197 km^2, MAR = 1200 mm, ACLS = _____ %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 7.49 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = _____ m^3/s

Q1000 = _____ m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 11.5 m
Access Road Length = 3.5 km
Dam Height = 5.5 m
Distance to Town = 25 km
Installed Capacity = 5.6 MW

Plant Design Flow = 11.2 m^3/s
T.L. Line Length = 70 km
Dam Length = 115 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Add cost of Diversion from Beaver Brook = $2,080,400.

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Shoal Brook (Chimney Bay) Region: 4

Total Developed Head, H = 61 m Map: 12 I/16

Diverted Area = 155 km^2, MAR = 1200 mm, from Beaver Brook

Location: Lat. = 50° 57' 15" Long. = 56° 23' 00"

Mean Diverted Flow = 5.90 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= 0.74x5.90 = 4.36 m^3/s

Additional Energy = H x Q* x 0.0716

= 61 x 4.36 x 0.0716 = 19.1 GWh p.a.

Dam: Height = 3.0 m, Length = 700 m, Q150 = 100 m^3/s

Canal: Height of Land = 1.0 m, Length = 700 m

Design Flow Ratio = 1.5 Design Flow = 8.85 m^3/s

Access Road: Length = 5.0 km

Costs:

Dam + Spillway	= 976,300
Diversion Canal	= 165,900
Access Road	= 200,000
Sub-total Direct Costs	= 1,342,200
Total Cost Diversion	= 2,080,400
Additional Plant Costs	=
Total Project Cost	=

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =

RIVER: Northern Arm River

SITE: S.1

LAT: 50° 32' 13"

LONG: 56° 22' 30"

DRAINAGE AREA: 160.0 km^2

HEAD: 168.0 m

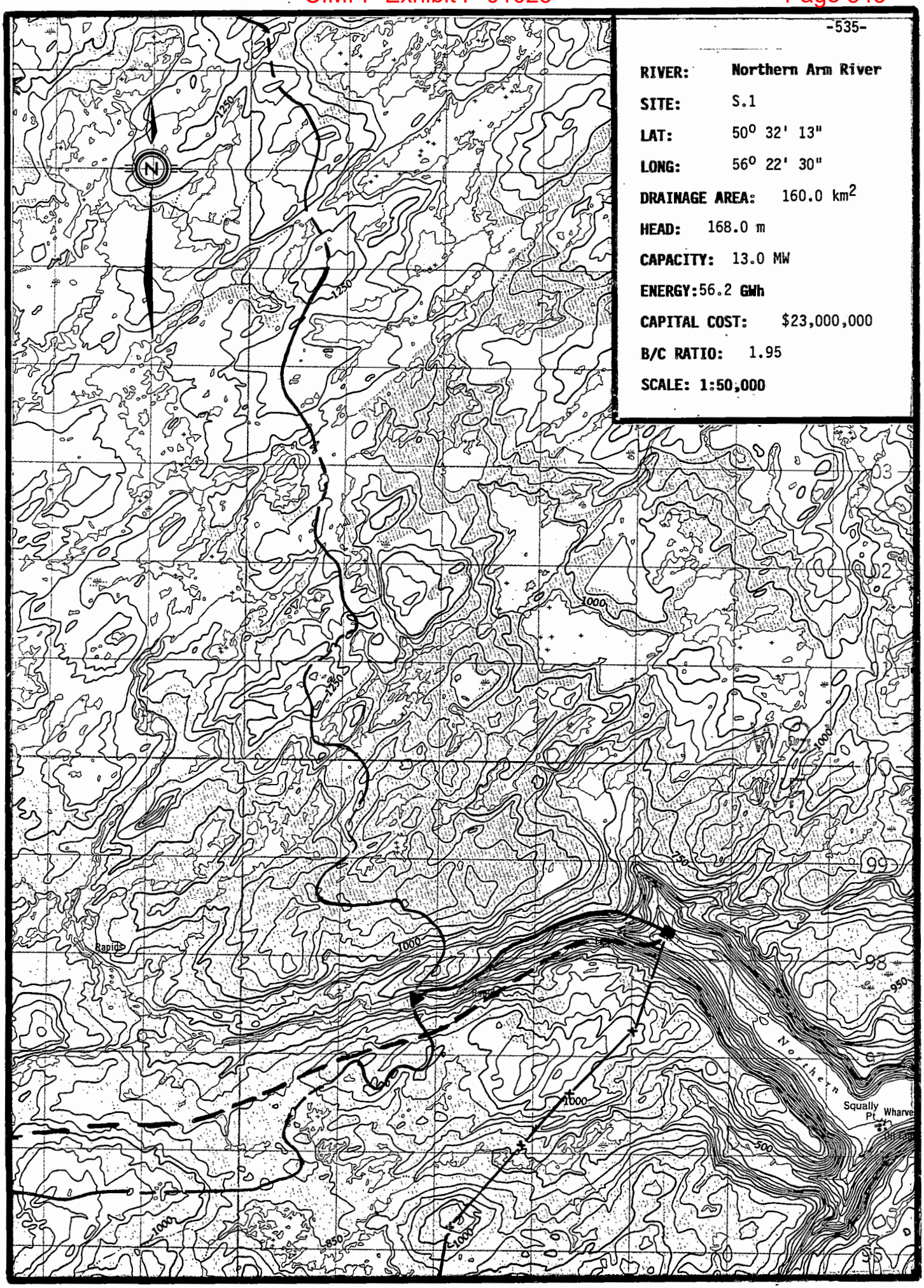
CAPACITY: 13.0 MW

ENERGY: 56.2 GWh

CAPITAL COST: $23,000,000

B/C RATIO: 1.95

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northern Arm River

SITE NAME : SITE - 1 FILE : 4038

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 13.00511 MW
PENSTOCK LENGTH	: 2850 M.
DESIGN FLOW	: 9.509999 M^3/S
PENSTOCK DIAMETER	: 1.619738 M.
RATED HEAD	: 168 M.
HEIGHT OF DAM	: 6.2 M.
TRANSMISSION LINE LENGTH	: 65 KM.
LENGTH OF DAM	: 102 M.
ACCESS ROAD LENGTH	: 48 KM.
FLOOD FLOW	: 135 M^3/S
DISTANCE TO TOWN	: 65 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.928526E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
457005.3	SEE DAM	175377.7	5267698	101250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1058570	2371196	707819.8	3410818	3771624

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2250832	1852743	1577669

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.300261E+07 COST PER KW: $ 1768.735

Total Project Cost = $ 23,002,610

MAP NUMBER 12 I/09 DATA SHEET FILE NUMBER 4038

1. Site Identification:

River Basin: Northern Arm River (Fourche Harbour) Site: S.1

2. Location:

Lat. 50° 32' 13" Long. 56° 22' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 160 km^2, MAR = 1250 mm, ACLS = 75 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 6.34 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 135 m^3/s

Q1000 = 170 m^3/s

Q_2 = 65

4. Site Data:

Rated Head = 168 m

Penstock Length = 2850 m

Access Road Length = 48 km

Dam Height = 6.2 m

Distance to Town = 65 km

Installed Capacity = 13 MW

Plant Design Flow = 9.51 m^3/s

T.L. Line Length = 65 km

Dam Length = 102 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) This plant could be grouped with Torrent River sites.

(ii) May be more feasible to develop using tunnel for delivery of water.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Northern Arm River

SITE NAME : SITE - 2 FILE : 4039

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 2.44725 MW
PENSTOCK LENGTH	: 950 M.
DESIGN FLOW	: 1.965 M^3/S
PENSTOCK DIAMETER	: .8330281 M.
RATED HEAD	: 153 M.
HEIGHT OF DAM	: 4.6 M.
TRANSMISSION LINE LENGTH	: 65 KM.
LENGTH OF DAM	: 68 M.
ACCESS ROAD LENGTH	: 48 KM.
FLOOD FLOW	: 39 M^3/S
DISTANCE TO TOWN	: 65 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 5016032

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
202761.9	SEE DAM	42426.61	803247.8	29250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
302385.3	643373	193011.9	3410818	2405122

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1621647	974307.6	380472.1

PROJECT COST: $ 1.100882E+07 COST PER KW: $ 4498.446

Total Project Cost = $ 11,008,820

MAP NUMBER 12 I/09 DATA SHEET FILE NUMBER 4039

1. Site Identification:

River Basin: Northern Arm River (Fourche Harbour) Site: S.2

2. Location:

Lat. 50° 32' 13" Long. 56° 22' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 36 km^2, MAR = 1150 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 1.31 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 39 m^3/s

Q1000 = 47 m^3/s

Q_2 = 19

4. Site Data:

Rated Head = 153 m

Penstock Length = 950 m

Access Road Length = 48 km

Dam Height = 4.6 m

Distance to Town = 65 km

Installed Capacity = 2.5 MW

Plant Design Flow = 1.97 m^3/s

T.L. Line Length = 65 km

Dam Length = 68 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) If site one is devellped this site can be added to it.

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Portland Creek

SITE NAME : SITE - 8 FILE : 4042

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 4.31538 MW
PENSTOCK LENGTH	: 850 M.
DESIGN FLOW	: 5.355 M^3/S
PENSTOCK DIAMETER	: 1.362537 M.
RATED HEAD	: 99 M.
HEIGHT OF DAM	: 7 M.
TRANSMISSION LINE LENGTH	: 30 KM.
LENGTH OF DAM	: 50 M.
ACCESS ROAD LENGTH	: 35 KM.
FLOOD FLOW	: 101 M^3/S
DISTANCE TO TOWN	: 39 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .82
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8889298

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
290038.1	SEE DAM	104591.3	1263766	75750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
523804.3	1248214	374464.4	2607723	1531535

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1092643	919387.7	411042.5

PROJECT COST: $ 1.131536E+07 COST PER KW: $ 2622.1

Total Project Cost = $ 11,315,360

WATER SHED : Portland Creek SITE - 8

COST DATA

(ADDITIONAL COST of $ 872,400 for Diversion INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .5466667

ANNUAL COST : $ 848651.8

ANNUAL BENEFIT : $ 1239930

BENEFIT/COST RATIO: 1.461058

Total Project Cost = $ 11,315,360.00

Benefit / Cost Ratio = 1.46

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4042

1. Site Identification:

River Basin: Portland Creek Site: S.8

2. Location:

Lat. 50° 06' 43" Long. 57° 18' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 98 km^2, MAR = 1150 mm, ACLS = 90 %

Storage Reservoir Area = 2.2 km^2

Storage Reservoir Vol, V = 4.4 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.04$$

Mean Flow, QAV = 3.57 m^3/s

Usable Flow Ratio = 0.82

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 80 m^3/s

Q1000 = 101 m^3/s

4. Site Data:

Rated Head = 99 m
Penstock Length = 850 m
Access Road Length = 35 km
Dam Height = 7 m
Distance to Town = 39 km
Installed Capacity = 4.3 MW

Plant Design Flow = 5.36 m^3/s
T.L. Line Length = 30 km
Dam Length = 50 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Includes flow from diversion at: Lat. 50° 04' 15"
Long. 57° 17' 20"

(ii) Diversion cost = $3,216,300 x $\frac{99}{365}$ = $872,400

SUMMARY SHEET DIVERSION SCHEMES

Plant/s: Portland Creek S.8 = 99 m
Portland Creek S.4 = 266 m
365 m

Region: 4

Total Developed Head, H = 400.8 m

Map: 12 I/03

Diverted Area = 37 km^2, MAR = 1150 mm, from S.3

Location: Lat. = 50° 04' 15" Long. = 57° 17' 20"

Mean Diverted Flow = 1.35 m^3/s,

Additional Usable FLow, Q* = F'(QAV + QDV) - F.QAV

= = m^3/s

Additional Energy = H x Q* x 0.0716

= x 0.0716 = _____ GWh p.a.

Dam: Height = 15 m, Length = 150 m, Q150 = 32 m^3/s

Canal: Height of Land = 75 m, Length = 300 m

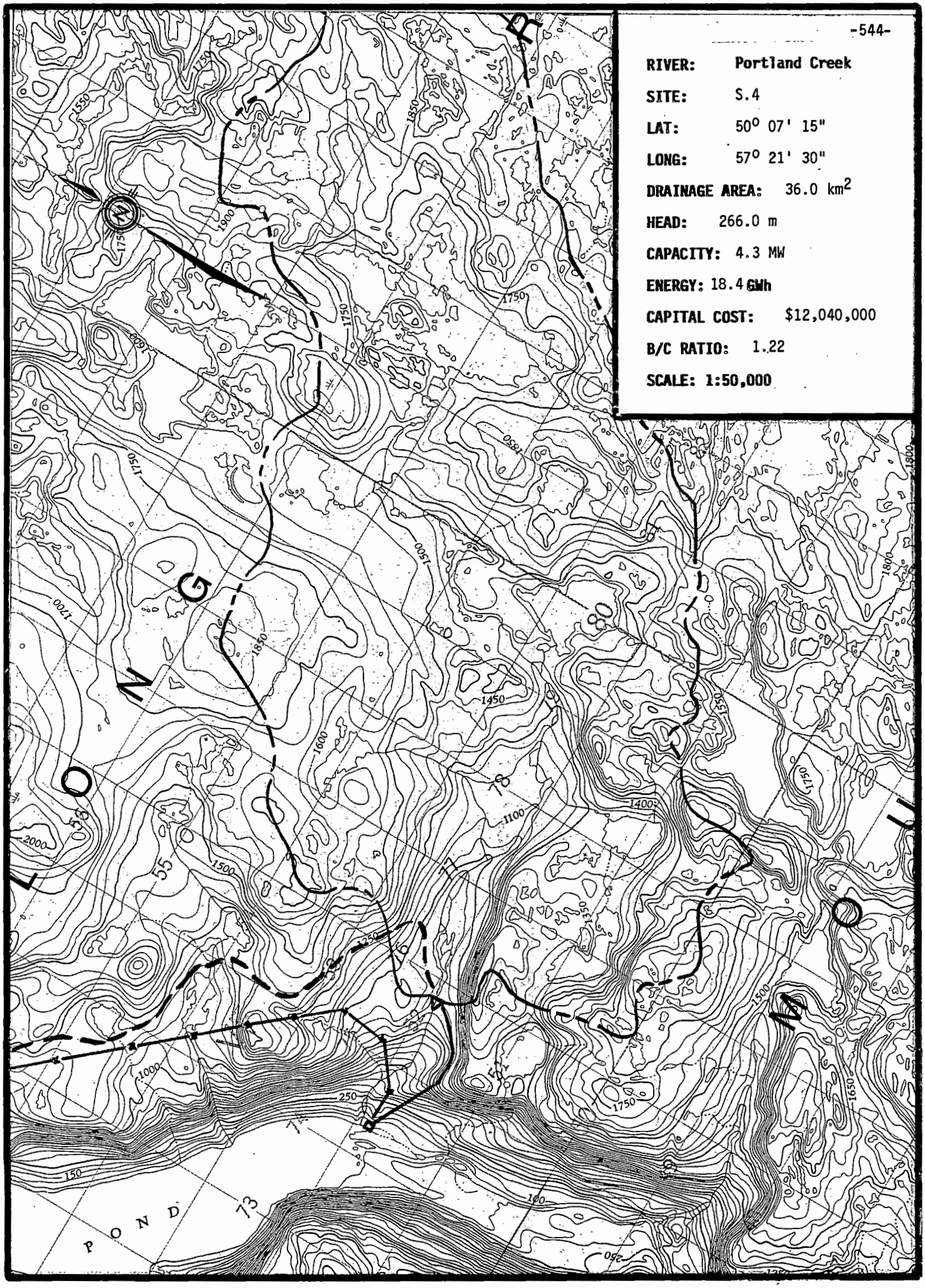
Design Flow Ratio = 1.50 Design Flow = 2.03 m^3/s

Access Road: Length = 3 km

Costs:

Dam + Spillway	= 1,413,000	
Diversion Canal	= 542,100	
Access Road	= 120,000	
Sub-total Direct Costs	= 2,075,000	
Total Cost Diversion	= 3,216,300	[$ 872,400 to S.8] $2,343,900 to S.4]
Additional Plant Costs	= N/A	
Total Project Cost	= N/A	

Benefit/Cost Ratio = $\frac{\text{Additional Energy} \times 10^6}{\text{Total Cost} \times 1.25}$ =


-544-
RIVER: Portland Creek
SITE: S.4
LAT: 50° 07' 15"
LONG: 57° 21' 30"
DRAINAGE AREA: 36.0 km²
HEAD: 266.0 m
CAPACITY: 4.3 MW
ENERGY: 18.4 GWh
CAPITAL COST: $12,040,000
B/C RATIO: 1.22
SCALE: 1:50,000
LONG POND
POND

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Portland Creek

SITE NAME : SITE - 4 FILE : 4043

SITE DATA

INSTALLED CAPACITY	: 4.254696 MW
PENSTOCK LENGTH	: 1785 M.
DESIGN FLOW	: 1.965 M^3/S
PENSTOCK DIAMETER	: .7709621 M.
RATED HEAD	: 266 M.
HEIGHT OF DAM	: 4.3 M.
TRANSMISSION LINE LENGTH	: 28 KM.
LENGTH OF DAM	: 72 M.
ACCESS ROAD LENGTH	: 31 KM.
FLOOD FLOW	: 68 M^3/S
DISTANCE TO TOWN	: 28 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6890161

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
193414	SEE DAM	42426.61	1385496	51000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
366967.2	780781.3	234234.4	4704255	1444745

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1313756	1047498	473539.1

PROJECT COST: $ 1.203811E+07 COST PER KW: $ 2829.371

Total Project Cost = $ 12,038,110

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4043

1. Site Identification:

River Basin: Portland Creek Site: S.4

2. Location:

Lat. 50° 07' 15" Long. 57° 21' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 36 km^2, MAR = 1150 mm, ACLS = 50 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.31 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 68 m^3/s

Q1000 = 84 m^3/s

Q_2 = 33

4. Site Data:

Rated Head = 266 m

Penstock Length = 1785 m

Access Road Length = 31 km

Dam Height = 4.3 m

Distance to Town = 28 km

Installed Capacity = 4.3 MW

Plant Design Flow = 1.97 m^3/s

T.L. Line Length = 28 km

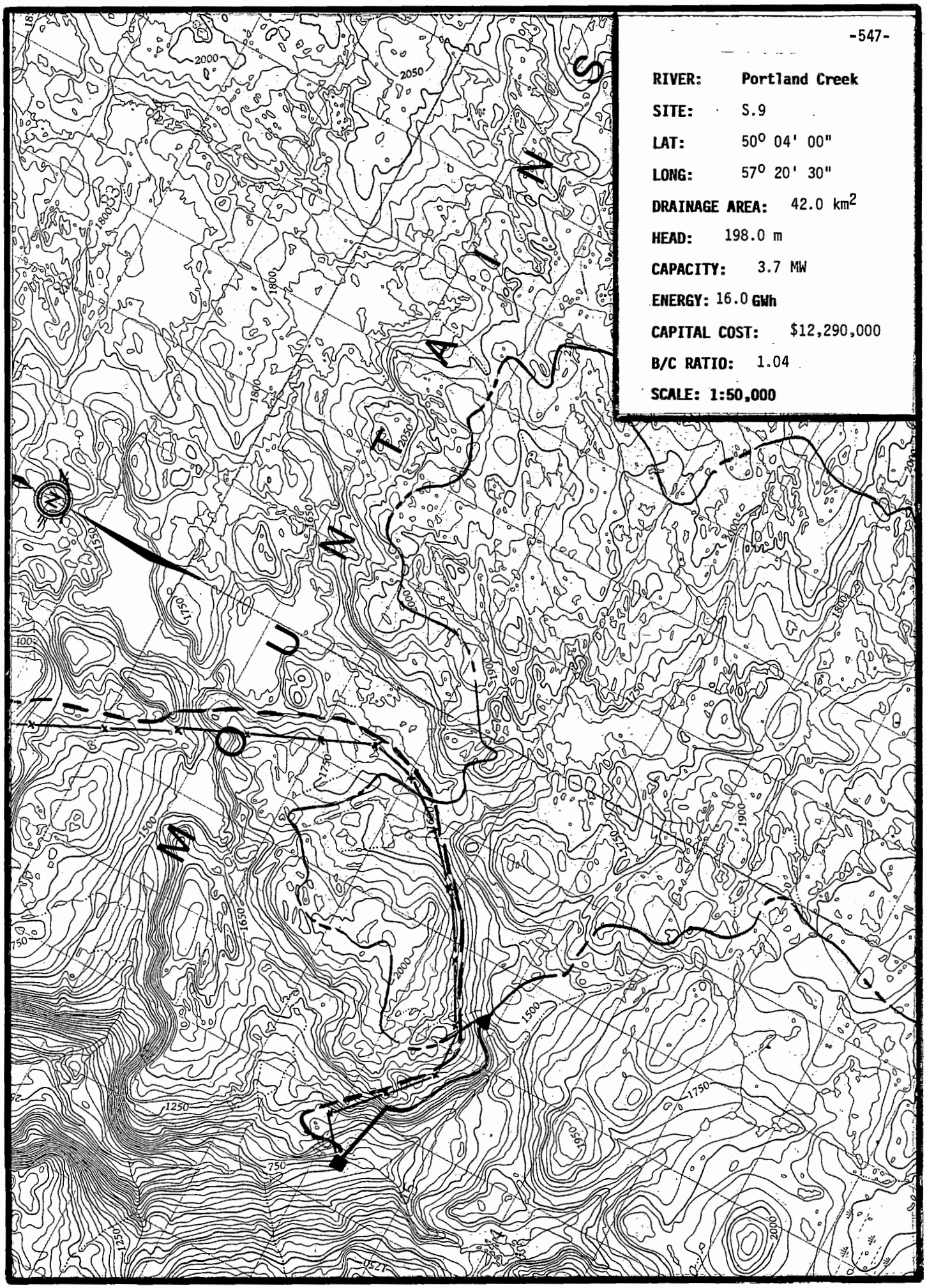
Dam Length = 72 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) No diversions accounted for.

(ii) Access route involves upgrading woods road and building a new road (partly on good ground and partly on difficult ground). Use $200,000 per km in SHYDRO analysis.


-547-
RIVER: Portland Creek
SITE: S.9
LAT: 50° 04' 00"
LONG: 57° 20' 30"
DRAINAGE AREA: 42.0 km2
HEAD: 198.0 m
CAPACITY: 3.7 MW
ENERGY: 16.0 GWh
CAPITAL COST: $12,290,000
B/C RATIO: 1.04
SCALE: 1:50,000
MOUNTAINS
2000
2050
1800
1750
1500
1250
750
1900
1950

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Portland Creek

SITE NAME : SITE - 9 FILE : 4044

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 3.698897 MW
PENSTOCK LENGTH	: 2390 M.
DESIGN FLOW	: 2.295 M^3/S
PENSTOCK DIAMETER	: .858962 M.
RATED HEAD	: 198 M.
HEIGHT OF DAM	: 4.4 M.
TRANSMISSION LINE LENGTH	: 27 KM.
LENGTH OF DAM	: 67 M.
ACCESS ROAD LENGTH	: 28 KM.
FLOOD FLOW	: 38 M^3/S
DISTANCE TO TOWN	: 28 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6605683

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
187461.6	SEE DAM	48788.38	2090911	28500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
368931.5	879155.8	263746.8	4314375	1340291

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1228907	1070158	468268.2

PROJECT COST: $ 1.228949E+07 COST PER KW: $ 3322.475

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4044

1. Site Identification:

River Basin: Portland Creek Site: S.9

2. Location:

Lat. 50° 04' 00" Long. 57° 20' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 42 km^2, MAR = 1150 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.53 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 38 m^3/s

Q1000 = 44 m^3/s

Q_2 = 21

4. Site Data:

Rated Head = 198 m

Penstock Length = 2390 m

Access Road Length = 28 km

Dam Height = 4.4 m

Distance to Town = 28 km

Installed Capacity = 3.7 MW

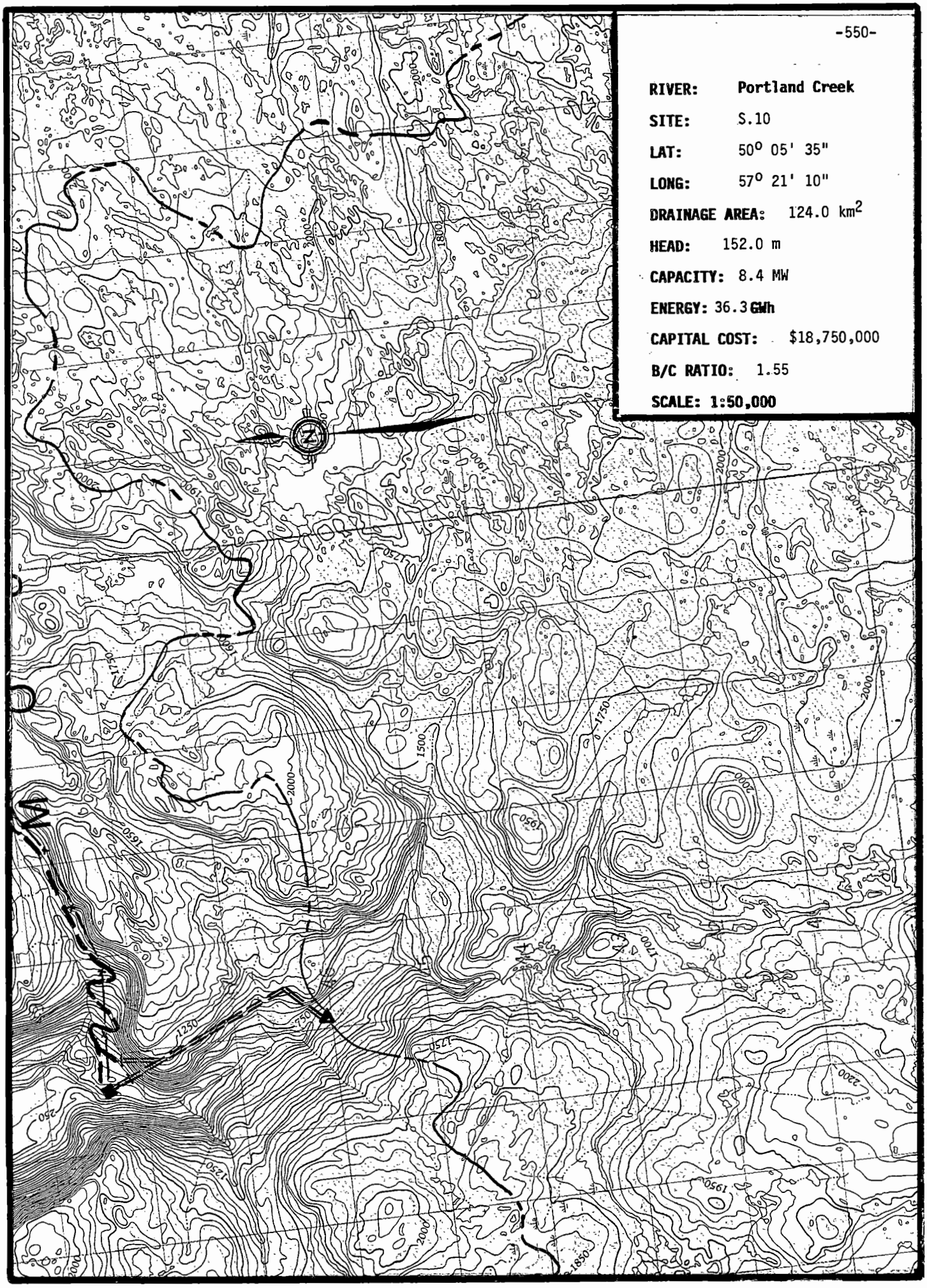
Plant Design Flow = 2.30 m^3/s

T.L. Line Length = 27 km

Dam Length = 67 m

Distance to Concrete Plant = 100 km

5. Remarks:


-550-
RIVER: Portland Creek
SITE: S.10
LAT: 50° 05' 35"
LONG: 57° 21' 10"
DRAINAGE AREA: 124.0 km²
HEAD: 152.0 m
CAPACITY: 8.4 MW
ENERGY: 36.3 GWh
CAPITAL COST: $18,750,000
B/C RATIO: 1.55
SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Portland Creek

SITE NAME : SITE - 10 FILE : 4046

SITE DATA

INSTALLED CAPACITY	: 8.388758 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 6.78 M^3/S
PENSTOCK DIAMETER	: 1.420173 M.
RATED HEAD	: 152 M.
HEIGHT OF DAM	: 11.4 M.
TRANSMISSION LINE LENGTH	: 27.5 KM.
LENGTH OF DAM	: 130 M.
ACCESS ROAD LENGTH	: 29 KM.
FLOOD FLOW	: 240 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.379674E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
728006	714423	129335.8	468586.7	180000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
769166.3	1538333	459203.8	4445002	1503973

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1750946	1259373	806741.6

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.875309E+07 COST PER KW: $ 2235.503

WATER SHED : Portland Creek SITE - 10

COST DATA

(ADDITIONAL COST of $ 4,000,000 for Tunnel INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 1406482

ANNUAL BENEFIT : $ 2175171

BENEFIT/COST RATIO: 1.546534

Total Project Cost = $ 18,753,090.00

Benefit / Cost Ratio = 1.55

MAP NUMBER 12 I/03 DATA SHEET FILE NUMBER 4046

1. Site Identification:

River Basin: Portland Creek Site: S.10

2. Location:

Lat. 50° 05' 35" Long. 57° 21' 10" Hydrologic Region 4

3. Hydrologic Data:

A = 124 km^2, MAR = 1150 mm, ACLS = 20 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.52 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 240 m^3/s

Q1000 = 305 m^3/s

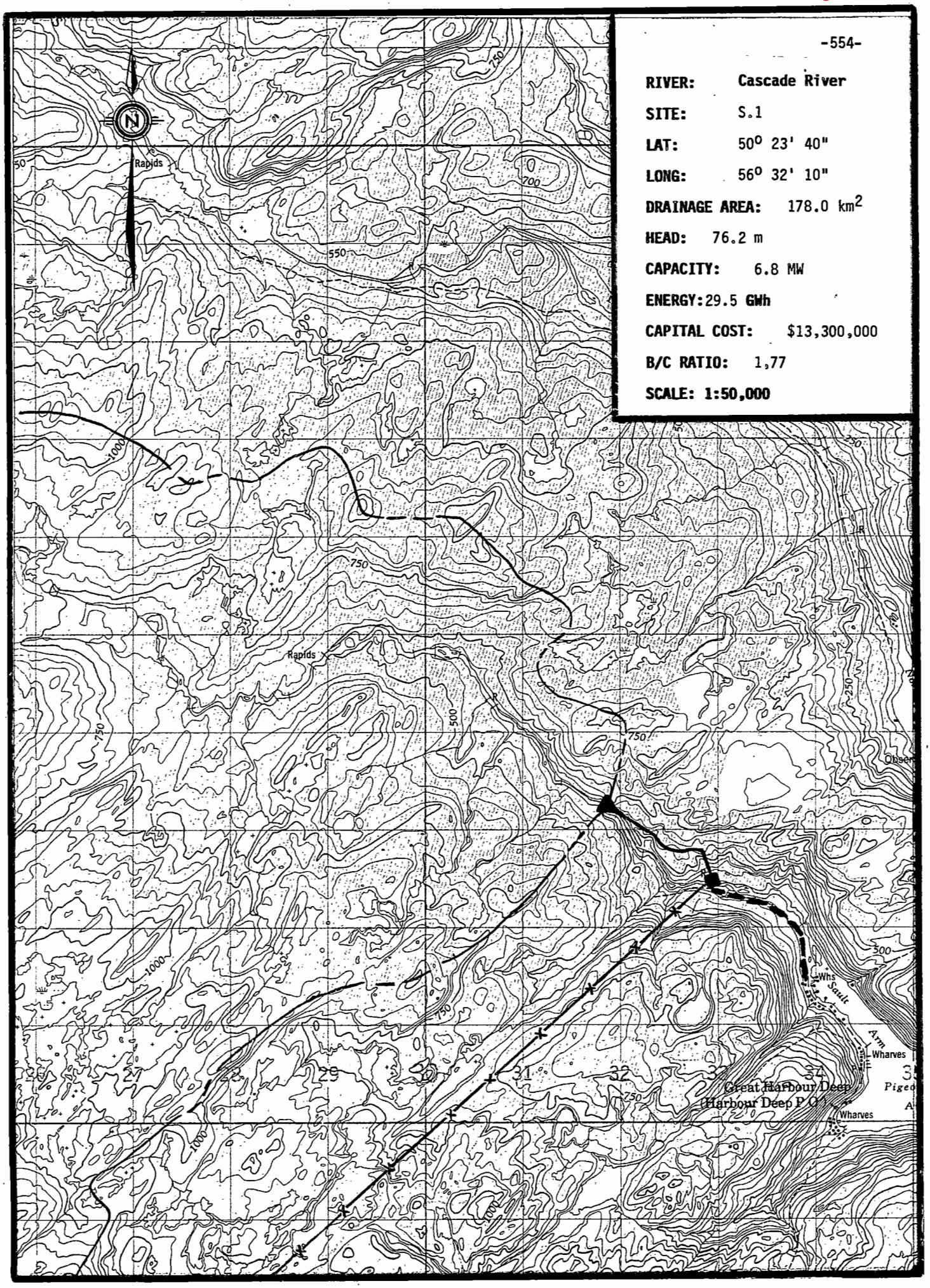
4. Site Data:

Rated Head = 152 m
Penstock Length = 300 m
Access Road Length = 29 km
Dam Height = 11.4 m
Distance to Town = 26 km
Installed Capacity = 8.4 MW

Plant Design Flow = 6.78 m^3/s
T.L. Line Length = 27.5 km
Dam Length = 130 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Capital cost of Tunnel [L = 2200m, Adit L = 400m, size 2.4 x 2.4m horse-shoe] = $4,000,000.


-554-
RIVER: Cascade River
SITE: S.1
LAT: 50° 23' 40"
LONG: 56° 32' 10"
DRAINAGE AREA: 178.0 km²
HEAD: 76.2 m
CAPACITY: 6.8 MW
ENERGY: 29.5 GWh
CAPITAL COST: $13,300,000
B/C RATIO: 1,77
SCALE: 1:50,000
N
Rapids
Rapids
Great Harbour Deep
(Harbour Deep P.O.)
Wharves
Wharves
Whs
Sault
Arm
Piged
Obser
550
700
750
500
250
1000
27
29
30
31
32
33
34

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Cascade River

SITE NAME : SITE - 1 FILE : 4047

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 6.829149 MW
PENSTOCK LENGTH	: 1450 M.
DESIGN FLOW	: 11.01 M^3/S
PENSTOCK DIAMETER	: 1.926928 M.
RATED HEAD	: 76.2 M.
HEIGHT OF DAM	: 5.3 M.
TRANSMISSION LINE LENGTH	: 62 KM.
LENGTH OF DAM	: 103 M.
ACCESS ROAD LENGTH	: 4 KM.
FLOOD FLOW	: 205 M^3/S
DISTANCE TO TOWN	: 60 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 200 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.381331E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
363576	SEE DAM	200087.8	3289030	153750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
832681.5	1865206	556778.1	412624.1	2929416

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	893623.4	1153919	653665.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.330436E+07 COST PER KW: $ 1948.172

Total Project Cost = $ 13,304,360

MAP NUMBER 12 I/07 DATA SHEET FILE NUMBER 4047

1. Site Identification:

River Basin: Cascade River Site: S.1

2. Location:

Lat. 50° 23' 40" Long. 56° 32' 10" Hydrologic Region 4

3. Hydrologic Data:

A = 178 km^2, MAR = 1300 mm, ACLS = 40 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 7.34 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 205 m^3/s Q_2 = 100

Q1000 = 255 m^3/s

4. Site Data:

Rated Head = 76.2 m
Penstock Length = 1450 m
Access Road Length = 4.0 km
Dam Height = 5.3 m
Distance to Town = 60 km
Installed Capacity = 6.9 MW

Plant Design Flow = 11.00 m^3/s
T.L. Line Length = 62 km
Dam Length = 103 m
Distance to Concrete Plant = 200 km

5. Remarks:

(i) Access to plant by sea.

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WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 1 FILE : 4048

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.56764 MW
PENSTOCK LENGTH	: 2325 M.
DESIGN FLOW	: 7.185 M^3/S
PENSTOCK DIAMETER	: 1.65458 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.4 M.
TRANSMISSION LINE LENGTH	: 42 KM.
LENGTH OF DAM	: 93 M.
ACCESS ROAD LENGTH	: 21 KM.
FLOOD FLOW	: 125 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8567208

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
341081.5	SEE DAM	136268.7	4367630	93750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
543161.6	1294342	388302.8	5405551	1881731

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2406380	1606583	729248

PROJECT COST: $ 1.919403E+07 COST PER KW: $ 5380.035

Total Project Cost = $ 19,194,030

MAP NUMBER 12 I/07 DATA SHEET FILE NUMBER 4048

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.1

2. Location:

Lat. 50° 17' 10" Long. 56° 43" 40" Hydrologic Region 4

3. Hydrologic Data:

A = 112 km^2, MAR = 1350 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 4.79 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 125 m^3/s

Q1000 = 160 m^3/s

Q_2 = 62

4. Site Data:

Rated Head = 61 m

Penstock Length = 2325 m

Access Road Length = 21 km

Dam Height = 5.4 m

Distance to Town = 50 km

Installed Capacity = 3.4 MW

Plant Design Flow = 7.19 m^3/s

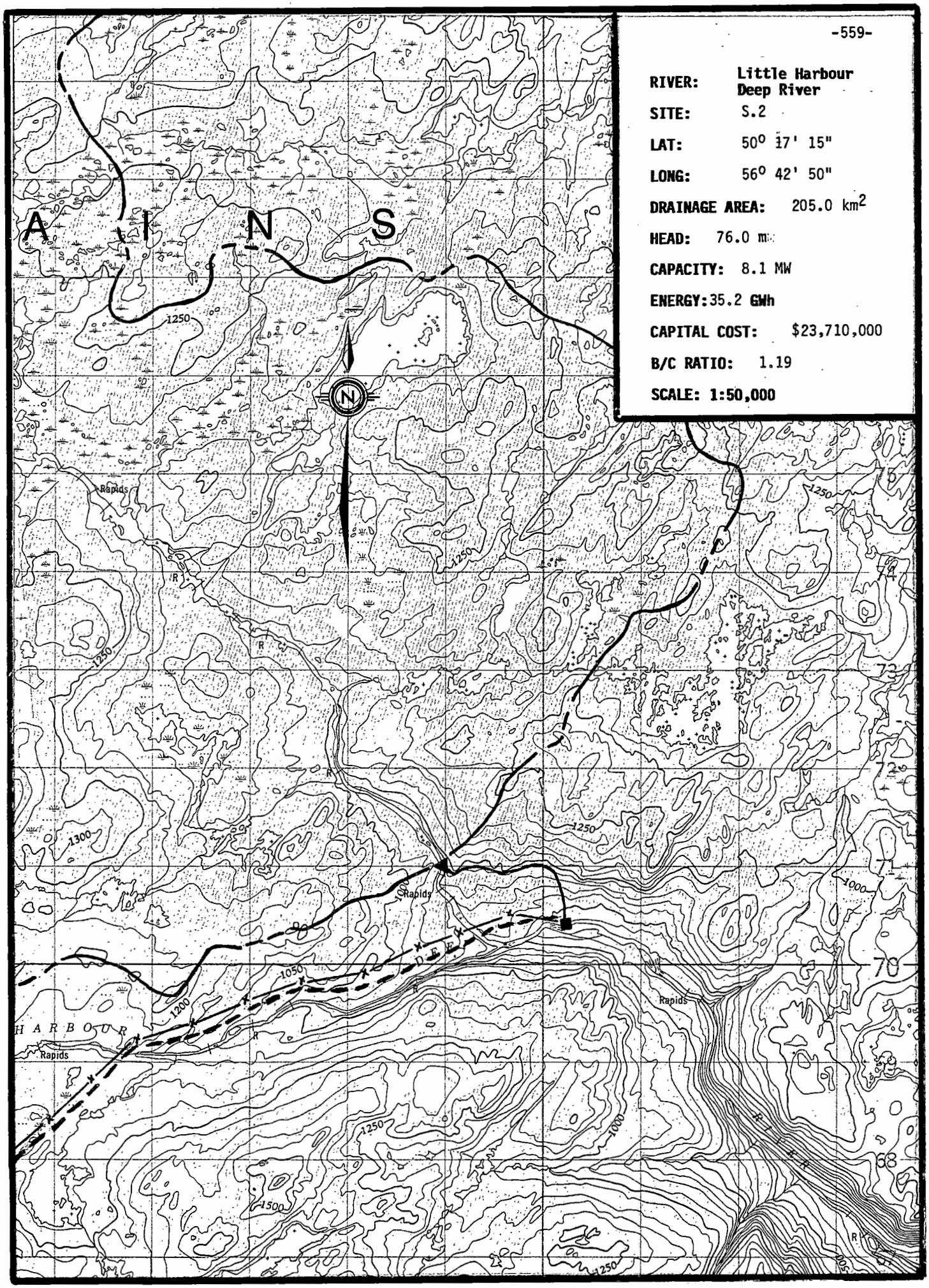
T.L. Line Length = 42 km

Dam Length = 93 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) Use access road cost of $320,000 per km.



RIVER:	Little Harbour Deep River
SITE:	S.2
LAT:	50° 17' 15"
LONG:	56° 42' 50"
DRAINAGE AREA:	205.0 km²
HEAD:	76.0 m
CAPACITY:	8.1 MW
ENERGY:	35.2 GWh
CAPITAL COST:	$23,710,000
B/C RATIO:	1.19
SCALE:	1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
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WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 2 FILE : 4049

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 8.138208 MW
PENSTOCK LENGTH	: 1775 M.
DESIGN FLOW	: 13.155 M^3/S
PENSTOCK DIAMETER	: 2.080969 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 11.5 M.
TRANSMISSION LINE LENGTH	: 42 KM.
LENGTH OF DAM	: 110 M.
ACCESS ROAD LENGTH	: 21 KM.
FLOOD FLOW	: 280 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.595995E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1300370	SEE DAM	234851.7	4436022	210000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
964002.4	2159366	644586.8	5405551	2180487

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2969363	1931002	1276560

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.371216E+07 COST PER KW: $ 2913.683

Total Project Cost = $ 23,712,160

MAP NUMBER 12 I/7 DATA SHEET FILE NUMBER 4049

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.2

2. Location:

Lat. 50° 17' 15" Long. 56° 42' 50" Hydrologic Region 4

3. Hydrologic Data:

A = 205 km^2, MAR = 1350 mm, ACLS = 75 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 8.77 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 205 m^3/s

Q1000 = 280 m^3/s

4. Site Data:

Rated Head = 76 m
Penstock Length = 1775 m
Access Road Length = 21 km
Dam Height = 11.5 m
Distance to Town = 50 km
Installed Capacity = 8.1 MW

Plant Design Flow = 13.16 m^3/s
T.L. Line Length = 42 km
Dam Length = 110 m
Distance to Concrete Plant = 100 km

5. Remarks:

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WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 3 FILE : 4050

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	:	1.415139 MW
PENSTOCK LENGTH	:	1100 M.
DESIGN FLOW	:	1.425 M^3/S
PENSTOCK DIAMETER	:	.7488945 M.
RATED HEAD	:	122 M.
HEIGHT OF DAM	:	4.1 M.
TRANSMISSION LINE LENGTH	:	42 KM.
LENGTH OF DAM	:	76 M.
ACCESS ROAD LENGTH	:	21 KM.
FLOOD FLOW	:	93 M^3/S
DISTANCE TO TOWN	:	50 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 3366523

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
189504.4	SEE DAM	31772.06	827013.3	69750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
223080.4	531595.8	159478.7	5405551	1401588

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2096210	1094013	377420.5

PROJECT COST: $ 1.240698E+07 COST PER KW: $ 8767.321

Total Project Cost = $ 12,406,980

MAP NUMBER 12 I/17 DATA SHEET FILE NUMBER 4050

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.3

2. Location:

Lat. 50° 16' 40" Long. 56° 41' 40" Hydrologic Region 4

3. Hydrologic Data:

A = 25 km^2, MAR = 1200 mm, ACLS = 20 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 0.95 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 93 m^3/s

Q1000 = 122 m^3/s

Q_2 = 49

4. Site Data:

Rated Head = 122 m

Penstock Length = 1100 m

Access Road Length = 21 km

Dam Height = 4.1 m

Distance to Town = 50 km

Installed Capacity = 1.4 MW

Plant Design Flow = 1.43 m^3/s

T.L. Line Length = 42 km

Dam Length = 76 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) MW<< Access distance

(ii) Cost of access roads will be high in this area use $320,000 per km.

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WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 4 FILE : 4051

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 3.674721 MW
PENSTOCK LENGTH	: 1990 M.
DESIGN FLOW	: 2.28 M^3/S
PENSTOCK DIAMETER	: .8565434 M.
RATED HEAD	: 198 M.
HEIGHT OF DAM	: 4.4 M.
TRANSMISSION LINE LENGTH	: 42 KM.
LENGTH OF DAM	: 66 M.
ACCESS ROAD LENGTH	: 21 KM.
FLOOD FLOW	: 38 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6570259

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
184941.6	SEE DAM	48501.29	1735506	28500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
367241.8	875129.4	262538.9	5405551	1899614

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2162255	1268036	564602.6

PROJECT COST: $ 1.480242E+07 COST PER KW: $ 4028.174

Total Project Cost = $ 14,802,420

MAP NUMBER 12 I/07 DATA SHEET FILE NUMBER 4051

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.4

2. Location:

Lat. 50° 15' 50" Long. 56° 41' 05" Hydrologic Region 4

3. Hydrologic Data:

A = 40 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.52 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 38 m^3/s

Q1000 = 49 m^3/s

Q_2 = 20

4. Site Data:

Rated Head = 198 m

Penstock Length = 1990 m

Access Road Length = 21 km

Dam Height = 4.4 m

Distance to Town = 50 km

Installed Capacity = 3.7 MW

Plant Design Flow = 2.28 m^3/s

T.L. Line Length = 42 km

Dam Length = 66 m

Distance to Concrete Plant = 100 km

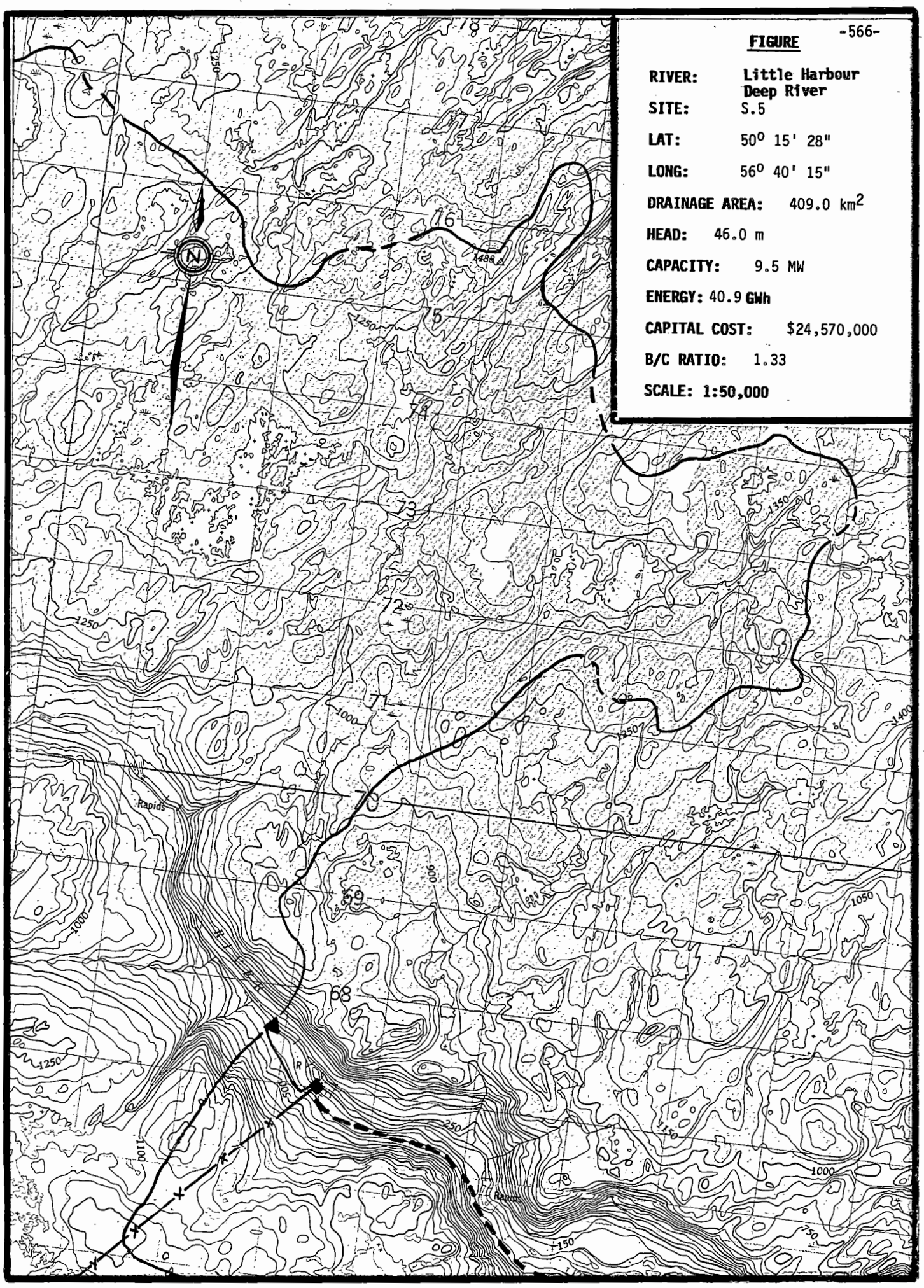
5. Remarks:

(i) Capacity << Access Distance/7

(ii) Cost of access roads would be high in this area, use $320,000/km

FIGURE

RIVER:	Little Harbour Deep River
SITE:	S.5
LAT:	50° 15' 28"
LONG:	56° 40' 15"
DRAINAGE AREA:	409.0 km^2
HEAD:	46.0 m
CAPACITY:	9.5 MW
ENERGY:	40.9 GWh
CAPITAL COST:	$24,570,000
B/C RATIO:	1.33
SCALE:	1:50,000



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WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 5 FILE : 4052

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	:	9.46397 MW
PENSTOCK LENGTH	:	875 M.
DESIGN FLOW	:	25.275 M^3/S
PENSTOCK DIAMETER	:	2.956253 M.
RATED HEAD	:	46 M.
HEIGHT OF DAM	:	15 M.
TRANSMISSION LINE LENGTH	:	42 KM.
LENGTH OF DAM	:	155 M.
ACCESS ROAD LENGTH	:	10 KM.
FLOOD FLOW	:	580 M^3/S
DISTANCE TO TOWN	:	50 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	100 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 2.043713E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
2743245	SEE DAM	422701.7	3459775	435000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1311888	2938628	877202.5	3596364	2289287

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	3084349	1985614	1430773

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.457483E+07 COST PER KW: $ 2596.672

Total Project Cost = $ 24,574,830

MAP NUMBER 12 I/07 DATA SHEET FILE NUMBER 4052

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.5

2. Location:

Lat. 50° 15' 28" Long. 56° 40' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 409 km^2, MAR = 1300 mm, ACLS = 60 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 16.85 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 425 m^3/s

Q1000 = 580 m^3/s

4. Site Data:

Rated Head = 46 m
Penstock Length = 875 m
Access Road Length = 10 km
Dam Height = 15 m
Distance to Town = 50 km
Installed Capacity = 9.5 MW

Plant Design Flow = 25.28 m^3/s
T.L. Line Length = 42 km
Dam Length = 155 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Cost of access road $400,000/km.

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WATER SHED : Little Cat Arm River

SITE NAME : SITE - 1 FILE : 4053

NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 2.461536 MW
PENSTOCK LENGTH	: 1140 M.
DESIGN FLOW	: 1.8 M^3/S
PENSTOCK DIAMETER	: .7917616 M.
RATED HEAD	: 168 M.
HEIGHT OF DAM	: 4.2 M.
TRANSMISSION LINE LENGTH	: 38 KM.
LENGTH OF DAM	: 61 M.
ACCESS ROAD LENGTH	: 17 KM.
FLOOD FLOW	: 26 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4925395

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
161004.2	SEE DAM	39206.43	911187.9	19500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
293842.1	625196	187558.8	4516844	1542275

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1787216	1013367	398052.1

PROJECT COST: $ 1.149525E+07 COST PER KW: $ 4669.95

Total Project Cost = $ 11,495,250

MAP NUMBER 12 I/2 DATA SHEET FILE NUMBER 4053

1. Site Identification:

River Basin: Little Cat Arm River Site: S.1

2. Location:

Lat. 50° 09' 32" Long. 56° 37' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 38 km^2, MAR = 1000 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.20 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 26 m^3/s

Q1000 = 34 m^3/s $Q_2 = 14$

4. Site Data:

Rated Head = 168 m
Penstock Length = 1140 m
Access Road Length = 17 km
Dam Height = 4.2 m
Distance to Town = 50 km
Installed Capacity = 2.5 MW

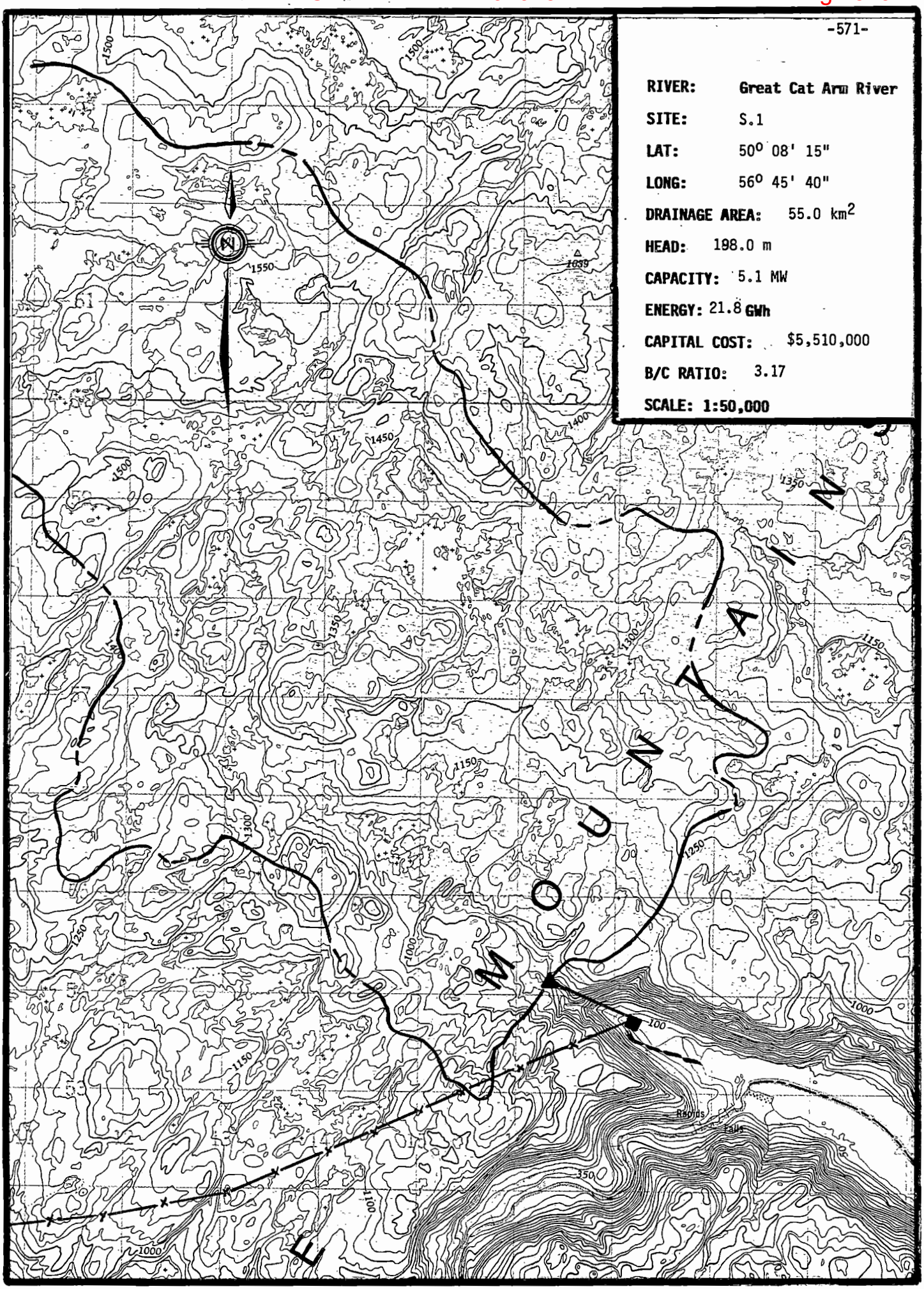
Plant Design Flow = 1.81 m^3/s
T.L. Line Length = 38 km to C.A.D.
Dam Length = 61 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Capacity < Access Distance ÷ 7

(ii) Access road costs will be high, use $320,000 per km.

(iii) T.L. into Cat Arm Development.


RIVER: Great Cat Arm River
SITE: S.1
LAT: 50° 08' 15"
LONG: 56° 45' 40"
DRAINAGE AREA: 55.0 km²
HEAD: 198.0 m
CAPACITY: 5.1 MW
ENERGY: 21.8 GWh
CAPITAL COST: $5,510,000
B/C RATIO: 3.17
SCALE: 1:50,000
MOUNTAIN
1500
1550
1039
1450
1400
1350
1300
1250
1150
1000
350
100
Rapids
Falls

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WATER SHED : Great Cat Arm River

SITE NAME : SITE - 1 FILE : 4054

SITE DATA

INSTALLED CAPACITY	: 5.052741 MW
PENSTOCK LENGTH	: 925 M.
DESIGN FLOW	: 3.135 M^3/S
PENSTOCK DIAMETER	: .9822444 M.
RATED HEAD	: 198 M.
HEIGHT OF DAM	: 4.6 M.
TRANSMISSION LINE LENGTH	: 28.5 KM.
LENGTH OF DAM	: 70 M.
ACCESS ROAD LENGTH	: 1 KM.
FLOOD FLOW	: 42 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 200 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 8530817

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
208121.4	SEE DAM	64599	940931.7	31500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
463433.6	926867.1	276676.8	127000	1327588

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	388491.7	525907.5	231190.4

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 5512307 COST PER KW: $ 1090.954

Total Project Cost = $ 5,512,307

MAP NUMBER 12 I/02 DATA SHEET FILE NUMBER 4054

1. Site Identification:

River Basin: Great Cat Arm River Site: S.1

2. Location:

Lat. 50° 08' 15" Long. 56° 45' 40" Hydrologic Region 4

3. Hydrologic Data:

A = 55 km^2, MAR = 1200 mm, ACLS = 90 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 2.09 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 42 m^3/s Q_2 = 24

Q1000 = 55 m^3/s

4. Site Data:

Rated Head = 198 m
Penstock Length = 925 m
Access Road Length = 1.0 km
Dam Height = 4.6 m
Distance to Town = 100 km
Installed Capacity = 5.1 MW

Plant Design Flow = 3.12 m^3/s
T.L. Line Length = 28.5 km
Dam Length = 70 m
Distance to Concrete Plant = 200 km

5. Remarks:

(1) Access by sea.

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WATER SHED : Great Cat Arm River

SITE NAME : SITE - 2 FILE : 4056

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 1.540414 MW
PENSTOCK LENGTH	: 1100 M.
DESIGN FLOW	: 2.49 M^3/S
PENSTOCK DIAMETER	: 1.017237 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 4.4 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 65 M.
ACCESS ROAD LENGTH	: 5.5 KM.
FLOOD FLOW	: 32 M^3/S
DISTANCE TO TOWN	: 42 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4076247

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
182417.8	SEE DAM	52503.88	1164363	24000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
279376.1	665747.3	199724.2	1081787	793441.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	531529.6	536672.1	174639.3

PROJECT COST: $ 5686202 COST PER KW: $ 3691.348

Total Project Cost = $ 5,686,202

MAP NUMBER 12 I/02 DATA SHEET FILE NUMBER 4056

1. Site Identification:

River Basin: Great Cat Arm River Site: S.2

2. Location:

Lat. 50° 07' 00" Long. 56° 51' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 42 km^2, MAR = 1250 mm, ACLS = 100 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.66 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 32 m^3/s

Q1000 = 44 m^3/s Q_2 = 17

4. Site Data:

Rated Head = 76 m
Penstock Length = 1100 m
Access Road Length = 5.5 km
Dam Height = 4.4 m
Distance to Town = 42 km
Installed Capacity = 1.5 MW

Plant Design Flow = 2.50 m^3/s
T.L. Line Length = 20 km
Dam Length = 65 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Use $200,000 per km for access road.

(iii) Access from end of construction road to Borrow Pit T.1 of Cat Arm Development.

RIVER: Little Coney Arm River

SITE: S.1

LAT: 49° 57' 42"

LONG: 56° 47' 30"

DRAINAGE AREA: 21.0 km^2

HEAD: 198.0 m

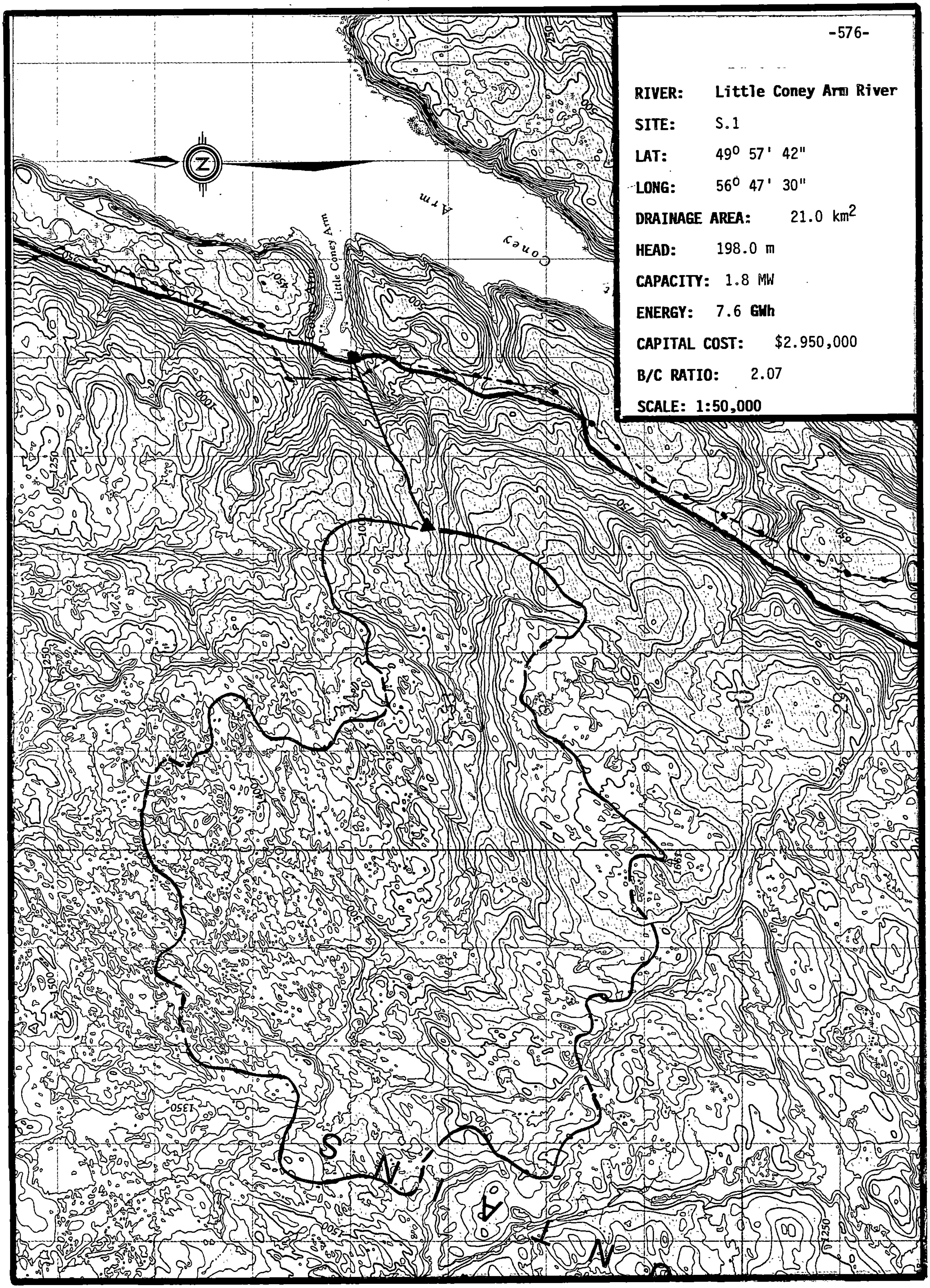
CAPACITY: 1.8 MW

ENERGY: 7.6 GWh

CAPITAL COST: $2.950,000

B/C RATIO: 2.07

SCALE: 1:50,000



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WATER SHED : Little Coney Arm River

SITE NAME : SITE - 1 FILE : 4057

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.764833 MW
PENSTOCK LENGTH	: 1960 M.
DESIGN FLOW	: 1.095 M^3/S
PENSTOCK DIAMETER	: .624864 M.
RATED HEAD	: 198 M.
HEIGHT OF DAM	: 3.9 M.
TRANSMISSION LINE LENGTH	: .3 KM.
LENGTH OF DAM	: 64 M.
ACCESS ROAD LENGTH	: .1 KM.
FLOOD FLOW	: 58 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3600771

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
151068.9	SEE DAM	25065.98	1210898	43500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
219779.7	523730.5	157119.1	17939.23	136018.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	84414.13	291516.3	91721.55

PROJECT COST: $ 2952772 COST PER KW: $ 1673.117

Total Project Cost = $ 2,952,772

MAP NUMBER 12 H/15 DATA SHEET FILE NUMBER 4057

1. Site Identification:

River Basin: Little Coney Arm Site: S.1

2. Location:

Lat. 49° 57' 42" Long. 56° 47' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 21 km^2, MAR = 1100 mm, ACLS = 20 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 0.73 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 58 m^3/s

Q1000 = 74 m^3/s

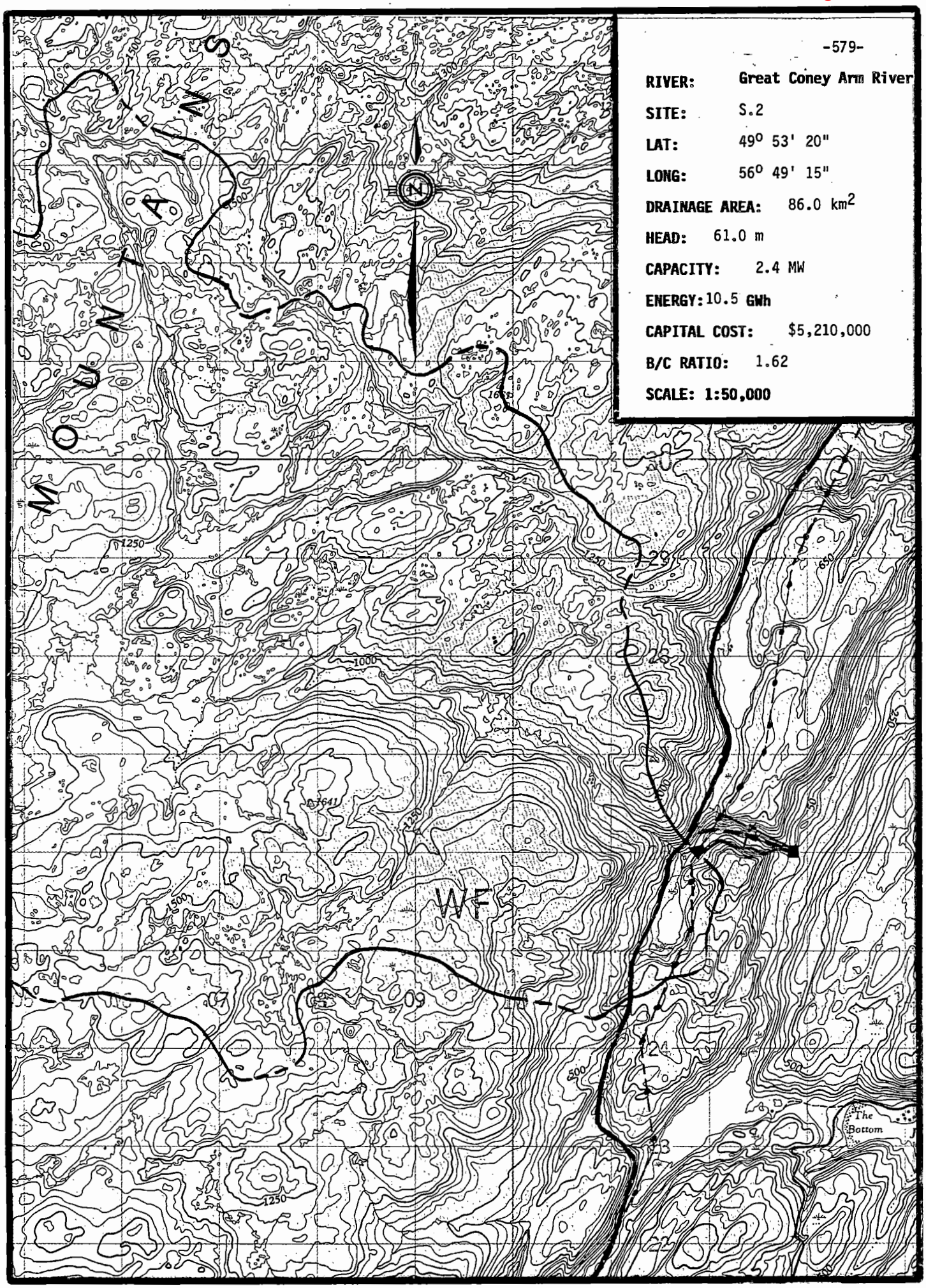
Qz = 26

4. Site Data:

Rated Head = 198 m
Penstock Length = 1960 m
Access Road Length = 0.1 km
Dam Height = 3.9 m
Distance to Town = 10 km
Installed Capacity = 1.8 MW

Plant Design Flow = 1.10 m^3/s
T.L. Line Length = 0.3 km
Dam Length = 64 m
Distance to Concrete Plant = 100 km

5. Remarks:


-579-
RIVER: Great Coney Arm River
SITE: S.2
LAT: 49° 53' 20"
LONG: 56° 49' 15"
DRAINAGE AREA: 86.0 km²
HEAD: 61.0 m
CAPACITY: 2.4 MW
ENERGY: 10.5 GWh
CAPITAL COST: $5,210,000
B/C RATIO: 1.62
SCALE: 1:50,000
MOUNTAINS
N
1250
1000
1641
500
WF
The Bottom

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WATER SHED : Great Coney Arm River

SITE NAME : SITE - 2 FILE : 4058

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.435529 MW
PENSTOCK LENGTH	: 1150 M.
DESIGN FLOW	: 4.905 M^3/S
PENSTOCK DIAMETER	: 1.404103 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 7 M.
TRANSMISSION LINE LENGTH	: .1 KM.
LENGTH OF DAM	: 105 M.
ACCESS ROAD LENGTH	: .1 KM.
FLOOD FLOW	: 102 M^3/S
DISTANCE TO TOWN	: 4 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6264600

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
565525.3	SEE DAM	96646.7	1772024	76500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
415793.4	990826.8	297248	17939.23	151942

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	157858.3	490588.4	177235.9

PROJECT COST: $ 5210129 COST PER KW: $ 2139.219

Total Project Cost = $ 5,210,129

MAP NUMBER 12 H/15 DATA SHEET FILE NUMBER 4058

1. Site Identification:

River Basin: Great Coney Arm Site: S.2

2. Location:

Lat. 49° 53' 20" Long. 56° 49' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 86 km^2, MAR = 1200 mm, ACLS = 60 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 3.27 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 102 m^3/s

Q1000 = 145 m^3/s

Q_2 = 52

4. Site Data:

Rated Head = 61 m

Penstock Length = 1150 m

Access Road Length = 0.1 km

Dam Height = 7 m

Distance to Town = 4 km

Installed Capacity = 2.4 MW

Plant Design Flow = 4.91 m^3/s

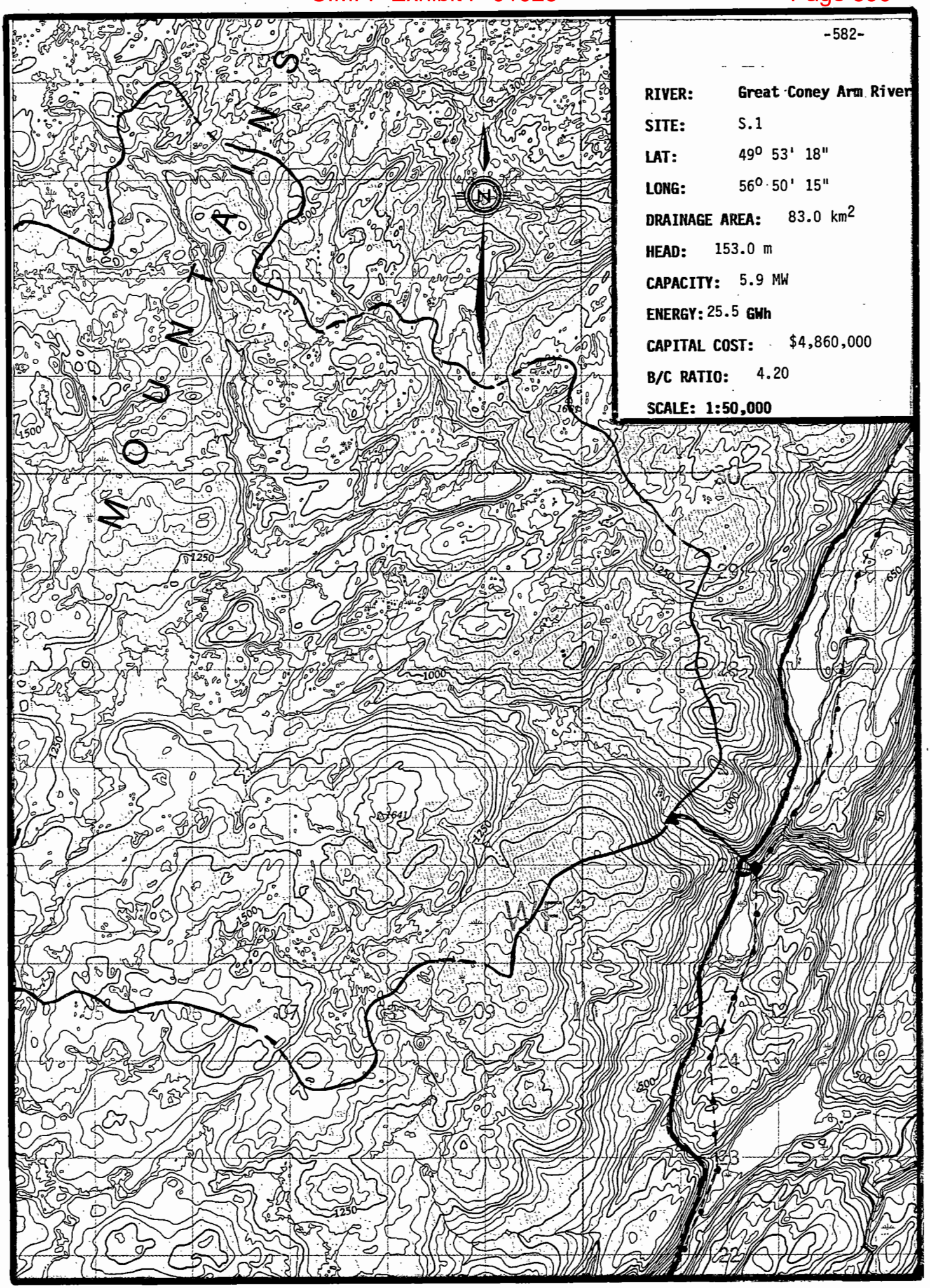
T.L. Line Length = 0.1 km

Dam Length = 105 m

Distance to Concrete Plant = 100 km

5. Remarks:

(i) It may be preferable to develop the entire head of Great Coney Arm S.1 and S.2 via a tunnel and shaft layout.



RIVER: Great Coney Arm River

SITE: S.1

LAT: 49° 53' 18"

LONG: 56° 50' 15"

DRAINAGE AREA: 83.0 km^2

HEAD: 153.0 m

CAPACITY: 5.9 MW

ENERGY: 25.5 GWh

CAPITAL COST: $4,860,000

B/C RATIO: 4.20

SCALE: 1:50,000

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WATER SHED : Great Coney Arm River

SITE NAME : SITE - 1 FILE : 4059

SITE DATA

INSTALLED CAPACITY	: 5.90329 MW
PENSTOCK LENGTH	: 950 M.
DESIGN FLOW	: 4.74 M^3/S
PENSTOCK DIAMETER	: 1.216462 M.
RATED HEAD	: 153 M.
HEIGHT OF DAM	: 5.3 M.
TRANSMISSION LINE LENGTH	: .5 KM.
LENGTH OF DAM	: 89 M.
ACCESS ROAD LENGTH	: 1.5 KM.
FLOOD FLOW	: 102 M^3/S
DISTANCE TO TOWN	: 4 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.032622E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
318781.1	SEE DAM	93715.71	1235938	76500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
576168.4	1152337	343981.2	179259.1	36576.31

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	161290.8	468391.1	221430.7

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 4864369 COST PER KW: $ 824.0098

Total Project Cost = $ 4,864,369

MAP NUMBER 12 H/15 DATA SHEET FILE NUMBER 4059

1. Site Identification:

River Basin: Great Coney Arm Site: S.1

2. Location:

Lat. 49° 53' 18" Long. 56° 50' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 83 km^2, MAR = 1150 mm, ACLS = 70 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = 0

Mean Flow, QAV = 3.03 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 102 m^3/s

Q1000 = 145 m^3/s

4. Site Data:

Rated Head = 153 m
Penstock Length = 950 m
Access Road Length = 1.5 km
Dam Height = 5.3 m
Distance to Town = 4 km
Installed Capacity = 5.7 MW

Plant Design Flow = 4.54 m^3/s
T.L. Line Length = 0.5 km
Dam Length = 89 m
Distance to Concrete Plant = 100 km

5. Remarks:

(1) It may be preferable to develop the head of Great Coney Arm sites S.1 and S.2 in a single plant using a tunnel and shaft layout.

-585-

RIVER: Great Coney Arm River

SITE: S.3

LAT: 49° 50' 40"

LONG: 56° 51' 42"

DRAINAGE AREA: 18.0 km²

HEAD: 153.0 m

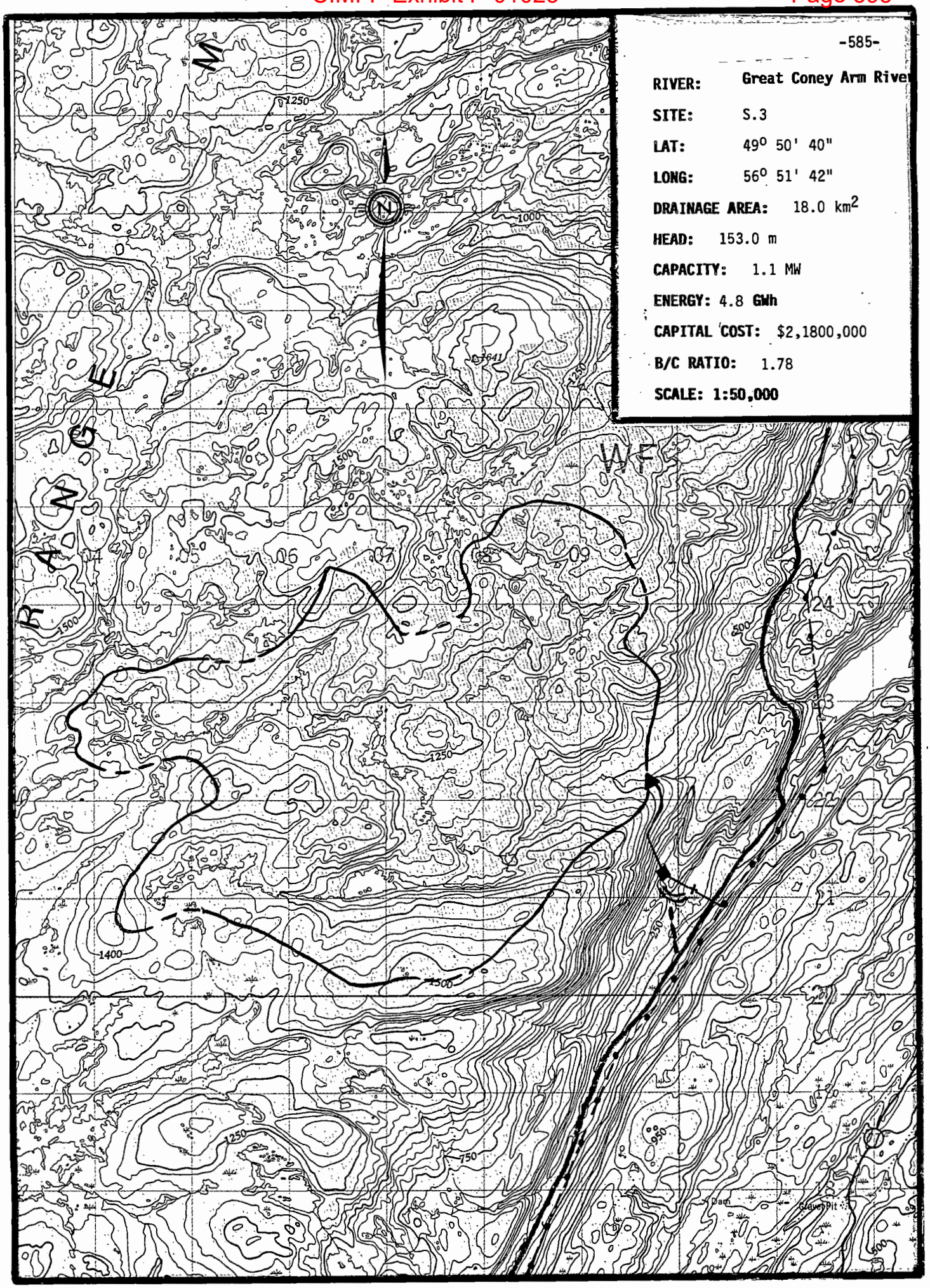
CAPACITY: 1.1 MW

ENERGY: 4.8 GWh

CAPITAL COST: $2,1800,000

B/C RATIO: 1.78

SCALE: 1:50,000



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WATER SHED : Great Coney Arm River

SITE NAME : SITE - 3 FILE : 4060

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.120878 MW
PENSTOCK LENGTH	: 1375 M.
DESIGN FLOW	: .9 M^3/S
PENSTOCK DIAMETER	: .5954401 M.
RATED HEAD	: 153 M.
HEIGHT OF DAM	: 4 M.
TRANSMISSION LINE LENGTH	: .1 KM.
LENGTH OF DAM	: 60 M.
ACCESS ROAD LENGTH	: .2 KM.
FLOOD FLOW	: 31 M^3/S
DISTANCE TO TOWN	: 3 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2310770

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
147826.6	SEE DAM	21010.21	806749.2	23250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
175055.9	417154.4	125146.3	32335.48	96401.15

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	54106.69	222429.5	60640.38

PROJECT COST: $ 2182106 COST PER KW: $ 1946.783

Total Project Cost = $ 2,182,106

MAP NUMBER 12 H/15 DATA SHEET FILE NUMBER 4060

1. Site Identification:

River Basin: Great Coney Arm Site: S.3

2. Location:

Lat. 49° 50' 40" Long. 56° 51' 42" Hydrologic Region 4

3. Hydrologic Data:

A = 18 km^2, MAR = 1050 mm, ACLS = 40 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 0.06 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 31 m^3/s

Q1000 = 38 m^3/s

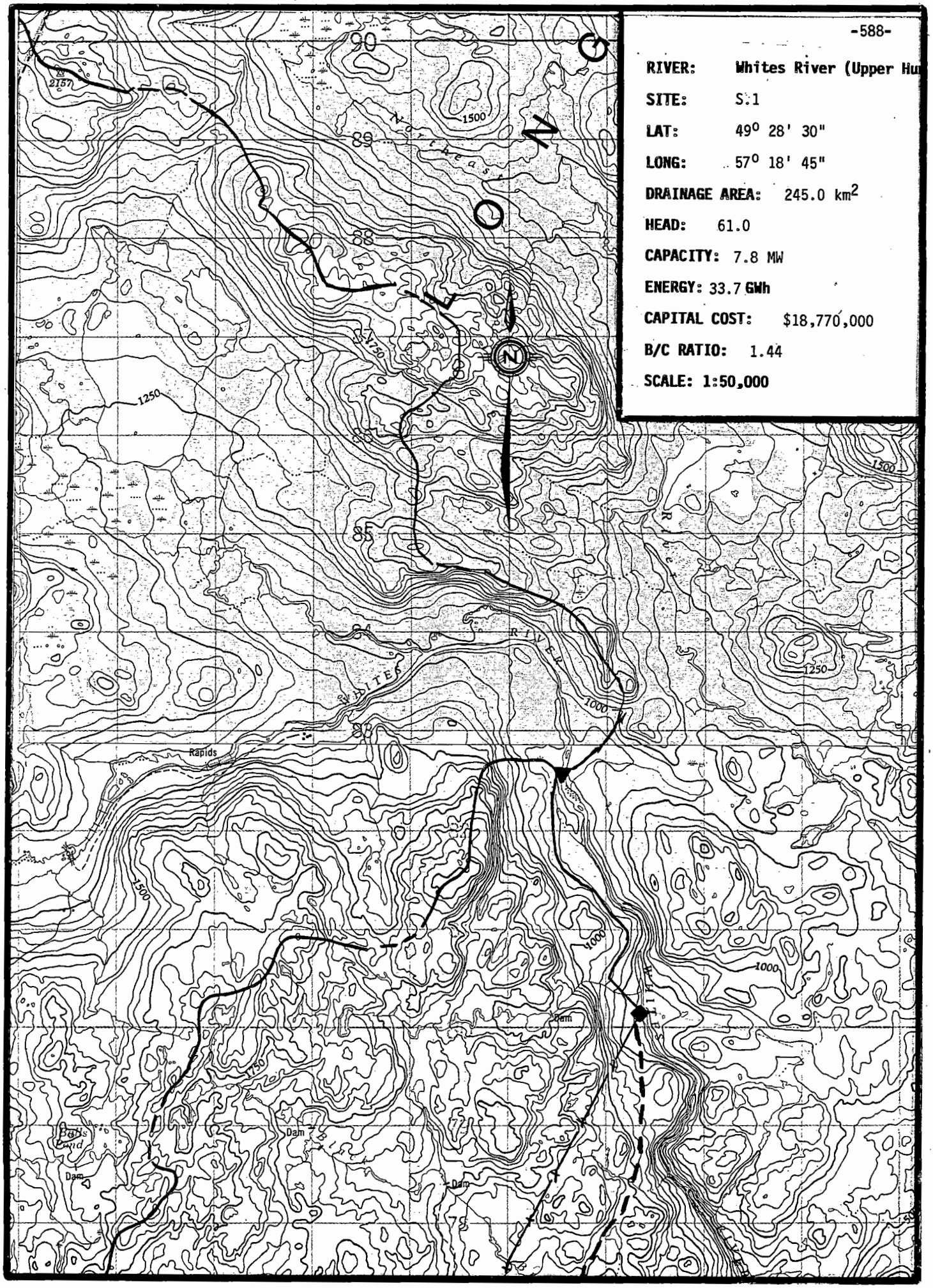
Qz = 16

4. Site Data:

Rated Head = 153 m
Penstock Length = 1357 m
Access Road Length = 0.2 km
Dam Height = 4 m
Distance to Town = 3 km
Installed Capacity = 1.1 MW

Plant Design Flow = 0.09 m^3/s
T.L. Line Length = 0.1 km
Dam Length = 60 m
Distance to Concrete Plant = 100 km

5. Remarks:


-588-
RIVER: Whites River (Upper Hu
SITE: S.1
LAT: 49° 28' 30"
LONG: 57° 18' 45"
DRAINAGE AREA: 245.0 km²
HEAD: 61.0
CAPACITY: 7.8 MW
ENERGY: 33.7 GWh
CAPITAL COST: $18,770,000
B/C RATIO: 1.44
SCALE: 1:50,000
N
Northeast
WHITES RIVER
Rapids
Dam
Bell's Pond
1500
1250
1000
1750
2157

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WATER SHED : Whites River (Upper Humber)

SITE NAME : SITE - 1 FILE : 4065

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 7.805608 MW
PENSTOCK LENGTH	: 2875 M.
DESIGN FLOW	: 15.72 M^3/S
PENSTOCK DIAMETER	: 2.316855 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 7 M.
TRANSMISSION LINE LENGTH	: 25 KM.
LENGTH OF DAM	: 133 M.
ACCESS ROAD LENGTH	: 7.5 KM.
FLOOD FLOW	: 325 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.628023E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
699597.9	SEE DAM	275688.9	8243498	243750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1008024	2257975	674022.3	704053.7	1348994

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	761587	1567570	989236.9

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.8774E+07 COST PER KW: $ 2405.193

Total Project Cost = $ 18,774,000

MAP NUMBER 12 H/06 DATA SHEET FILE NUMBER 4065

1. Site Identification:

River Basin: Whites River (Upper Humber) Site: S.1

2. Location:

Lat. 49° 28' 30" Long. 57° 18' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 245 km^2, MAR = 1350 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 10.48 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 325 m^3/s Q_2 = 160

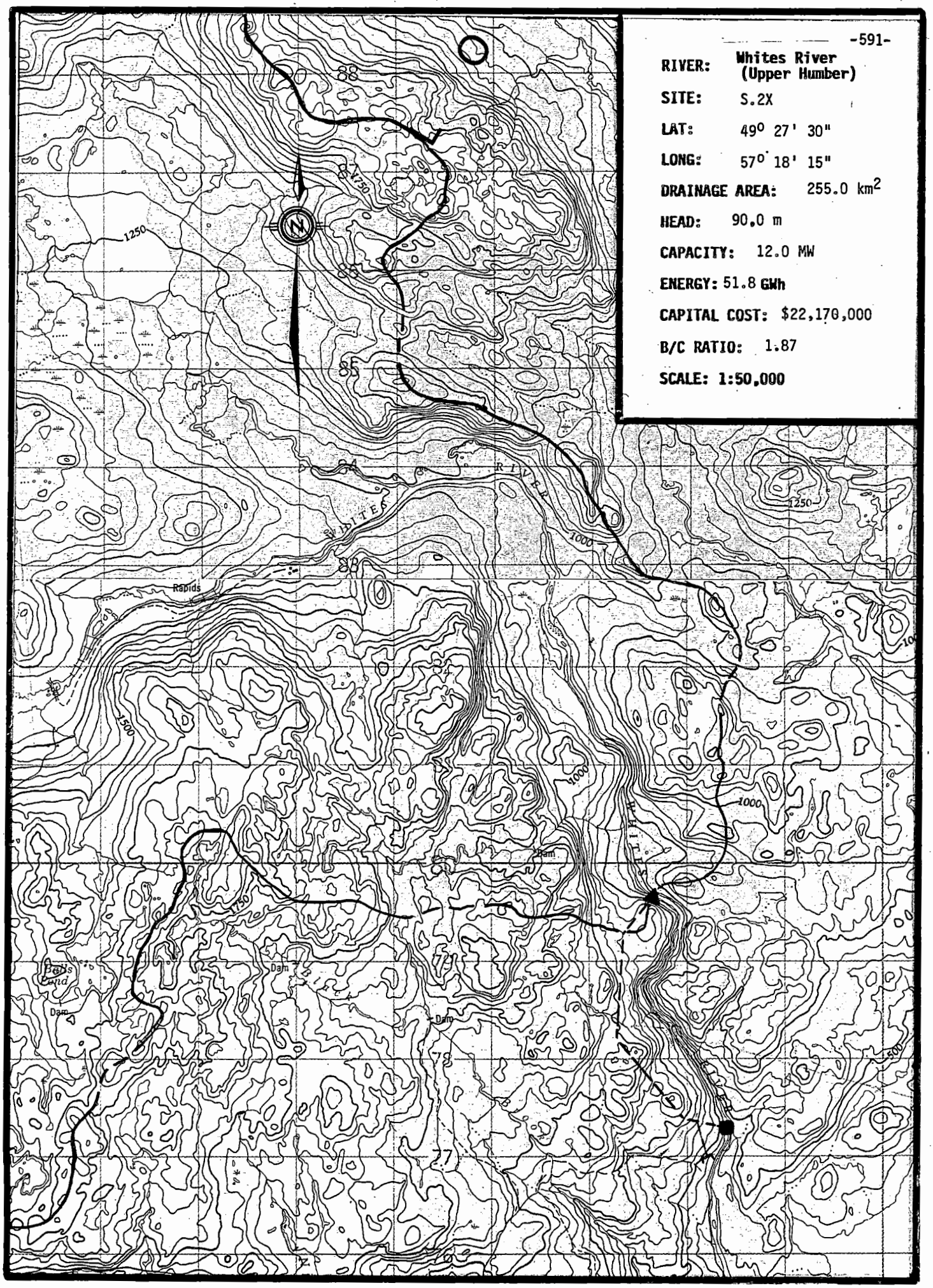
Q1000 = 415 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 2875 m
Access Road Length = 7.5 km
Dam Height = 7 m
Distance to Town = 30 km
Installed Capacity = 7.8 MW

Plant Design Flow = 15.73 m^3/s
T.L. Line Length = 25 km
Dam Length = 133 m
Distance to Concrete Plant = 60 km

5. Remarks:


-591-
RIVER: Whites River (Upper Humber)
SITE: S.2X
LAT: 49° 27' 30"
LONG: 57° 18' 15"
DRAINAGE AREA: 255.0 km²
HEAD: 90.0 m
CAPACITY: 12.0 MW
ENERGY: 51.8 GWh
CAPITAL COST: $22,170,000
B/C RATIO: 1.87
SCALE: 1:50,000
N
WHITES RIVER
Rapids
Dam
1250
1000
1500
1750
500

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ShawMont Newfoundland Limited
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WATER SHED : Whites River (Upper Humber)

SITE NAME : SITE - 2X FILE : 4066

SITE DATA

INSTALLED CAPACITY	: 11.97801 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 16.35 M^3/S
PENSTOCK DIAMETER	: 2.231461 M.
RATED HEAD	: 90 M.
HEIGHT OF DAM	: 12 M.
TRANSMISSION LINE LENGTH	: 20 KM.
LENGTH OF DAM	: 100 M.
ACCESS ROAD LENGTH	: 7.5 KM.
FLOOD FLOW	: 325 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 60 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.10189E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1279399	SEE DAM	285613	819597.6	243750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1247268	2494537	744638	704053.7	1269636

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	804065.3	1009273	767131.1

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.216896E+07 COST PER KW: $ 1850.805

Total Project Cost = $ 22,168,960

WATER SHED : Whites River (Upper Humber) SITE - 2X

COST DATA

(ADDITIONAL COST of $10,500,000 for Tunnel INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 1662672

ANNUAL BENEFIT : $ 3105850

BENEFIT/COST RATIO: 1.867987

Total Project Cost = $ 22,168,960.00

Benefit / Cost Ratio = 1.87

MAP NUMBER 12 H/06 DATA SHEET FILE NUMBER 4066

1. Site Identification:

River Basin: Whites River (Upper Humber) Site: S.2X

2. Location:

Lat. 49° 27' 30" Long. 57° 18' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 255 km^2, MAR = 1350 mm, ACLS = 58 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 10.90 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 355 m^3/s

Q1000 = 428 m^3/s

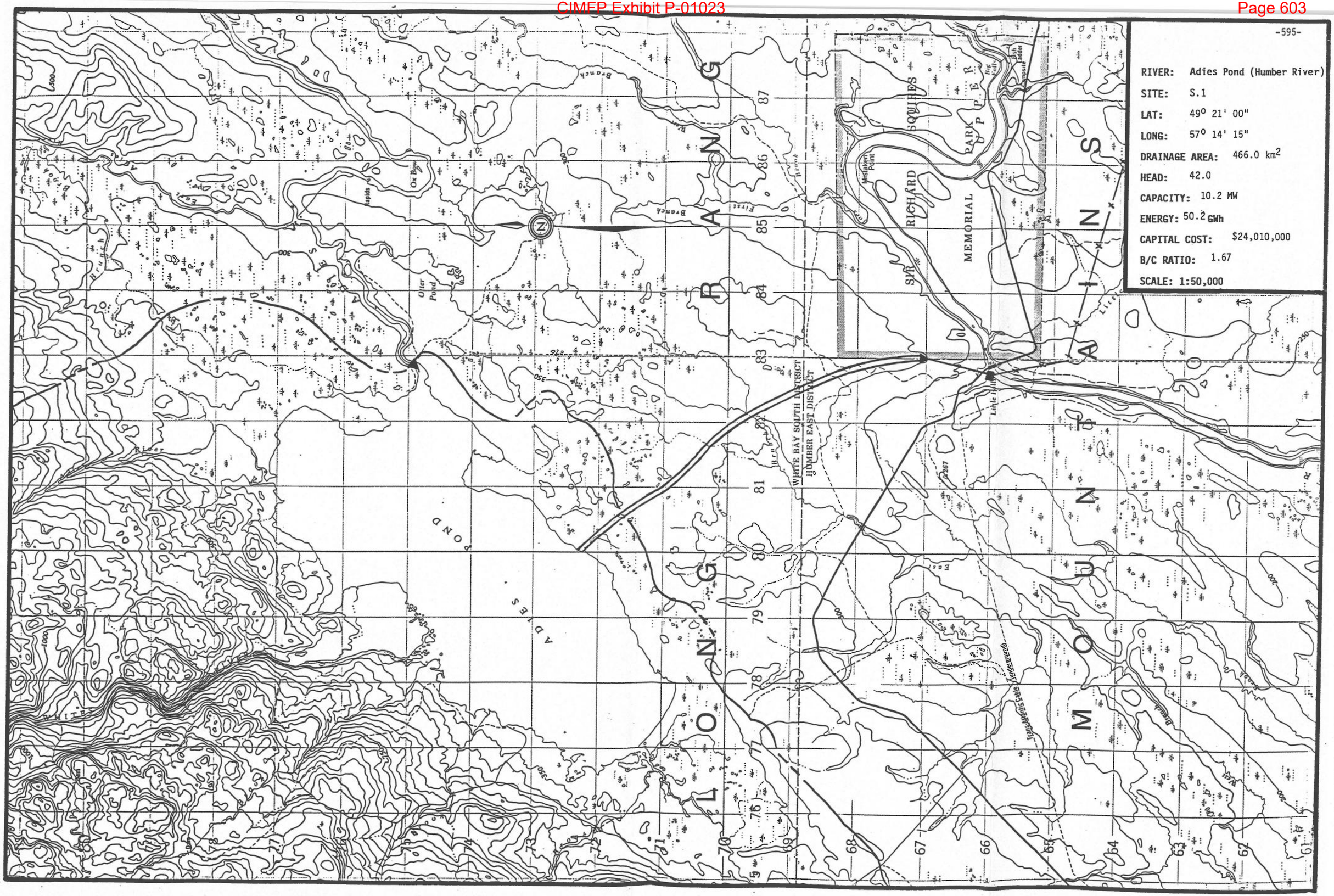
4. Site Data:

Rated Head = 90 m
Penstock Length = 300 m
Access Road Length = 7.5 km
Dam Height = 12 m
Distance to Town = 30 km
Installed Capacity = 12.0 MW

Plant Design Flow = 16.3 m^3/s
T.L. Line Length = 20 km
Dam Length = 100 m
Distance to Concrete Plant = 60 km

5. Remarks:

(i) Add cost for 3900 m of adit and power tunnel (3.5m x 3.5m horseshoe, unlined) = $10,500,000.


-595-
RIVER: Adies Pond (Humber River)
SITE: S.1
LAT: 49° 21' 00"
LONG: 57° 14' 15"
DRAINAGE AREA: 466.0 km²
HEAD: 42.0
CAPACITY: 10.2 MW
ENERGY: 50.2 GWh
CAPITAL COST: $24,010,000
B/C RATIO: 1.67
SCALE: 1:50,000
LONGRANGE MOUNTAINS
ADIES POND
WHITE BAY SOUTH DISTRICT
HUMBER EAST DISTRICT
SQUIRES RICHARD MEMORIAL PARK
Mistaken Point
Otter Pond
Ox Bow
Rapids
Branch
First
Little River
Fish Composite Pader
Pine Point
Trans-Labrador Highway (Goose Bay to Cartwright)
Z

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WATER SHED : Adies Pond (Upper Humber)

SITE NAME : SITE - 1 FILE : 4067

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 10.22563 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 29.91 M^3/S
PENSTOCK DIAMETER	: 3.218968 M.
RATED HEAD	: 42 M.
HEIGHT OF DAM	: 8.3 M.
TRANSMISSION LINE LENGTH	: 11 KM.
LENGTH OF DAM	: 177 M.
ACCESS ROAD LENGTH	: 6 KM.
FLOOD FLOW	: 690 M^3/S
DISTANCE TO TOWN	: 15 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 45 KM.
USEFUL TURBINE FLOW RATIO	: .84
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2.22692E+07

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
1181566	SEE DAM	491866	4438164	517500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1447319	3241996	967759.9	582414.5	703169.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	553864.1	1386052	1000780

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.401245E+07 COST PER KW: $ 2348.262

Total Project Cost = $ 24,012,450

WATER SHED : Adies Pond (Upper Humber) SITE - 1

COST DATA

(ADDITIONAL COST of $ 7,500,000 for Power Canal INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .56

ANNUAL COST : $ 1800934

ANNUAL BENEFIT : $ 3009771

BENEFIT/COST RATIO: 1.671228

Total Project Cost = $ 24,012,450.00

Benefit / Cost Ratio = 1.67

MAP NUMBER 12 H/06 DATA SHEET FILE NUMBER 4067

1. Site Identification:

River Basin: Adies Pond (Upper Humber) Site: S.1

2. Location:

Lat. 49° 21' 00" Long. 57° 14' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 466 km^2, MAR = 1350 mm, ACLS = 40 %

Storage Reservoir Area = 18.5 km^2

Storage Reservoir Vol, V = 37 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.06$$

Mean Flow, QAV = 19.94 m^3/s

Usable Flow Ratio = 0.84

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 690 m^3/s Q_2 = 350

Q1000 = 900 m^3/s

4. Site Data:

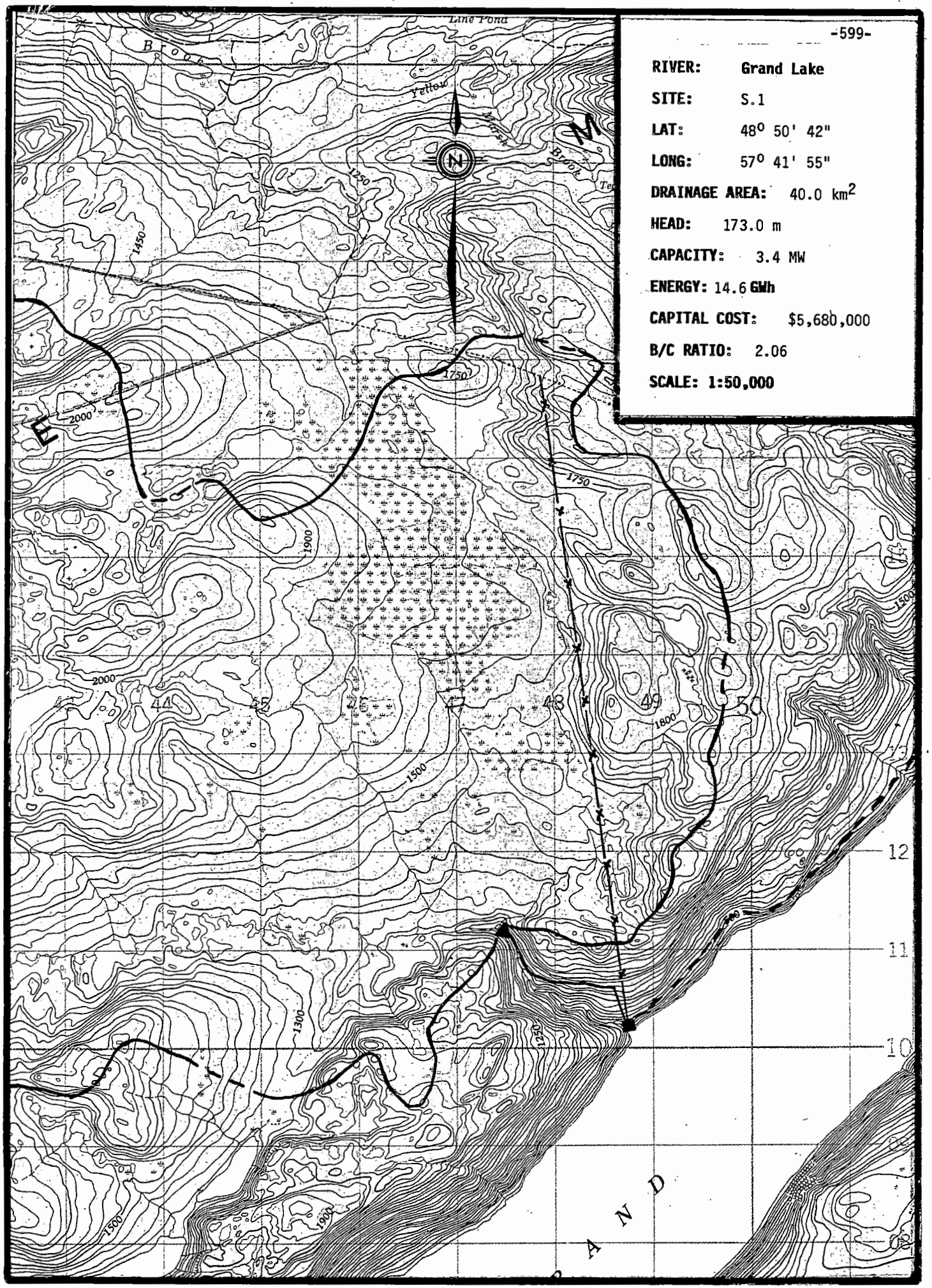
Rated Head = 42 m
Penstock Length = 1000 m
Access Road Length = 6 km
Dam Height = 8.3 m
Distance to Town = 15 km
Installed Capacity = 10.2 MW

Plant Design Flow = 29.91 m^3/s
T.L. Line Length = 11 km
Dam Length = 177 m
Distance to Concrete Plant = 45 km

5. Remarks:

(i) Add cost of dug power canal at $7.5 x 10^6.

(ii) Some of the Humber River salmon may spawn in Adies River.


-599-
RIVER: Grand Lake
SITE: S.1
LAT: 48° 50' 42"
LONG: 57° 41' 55"
DRAINAGE AREA: 40.0 km²
HEAD: 173.0 m
CAPACITY: 3.4 MW
ENERGY: 14.6 GWh
CAPITAL COST: $5,680,000
B/C RATIO: 2.06
SCALE: 1:50,000
Line Pond
Yellow
Brook
N
E
M
1250
1450
1750
2000
1900
1500
1800
1300
44
45
46
47
48
49
50
12
11
10
A N D

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WATER SHED : Grand Lake

SITE NAME : SITE - 1 FILE : 4070

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	:	3.379728 MW
PENSTOCK LENGTH	:	1775 M.
DESIGN FLOW	:	2.4 M^3/S
PENSTOCK DIAMETER	:	.8923494 M.
RATED HEAD	:	173 M.
HEIGHT OF DAM	:	4.7 M.
TRANSMISSION LINE LENGTH	:	6.5 KM.
LENGTH OF DAM	:	70 M.
ACCESS ROAD LENGTH	:	9.5 KM.
FLOOD FLOW	:	41 M^3/S
DISTANCE TO TOWN	:	19 KM.
NO.OF UNITS	:	1
DISTANCE TO CONCRETE PLANT	:	19 KM.
USEFUL TURBINE FLOW RATIO	:	.74
MAXIMUM TURBINE FLOW RATIO	:	1.5
LEAST COST	:	$ 6341642

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
214815.2	SEE DAM	50792.79	1620463	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
363102.2	865264.8	259579.5	860733.5	488843.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	188467.7	527030.2	208306.9

PROJECT COST: $ 5678149 COST PER KW: $ 1680.061

Total Project Cost = $ 5,678,149

MAP NUMBER 12 A/13 DATA SHEET FILE NUMBER 4070

1. Site Identification:

River Basin: Grand Lake Site: S.1

2. Location:

Lat. 48° 50' 42" Long. 57° 41' 55" Hydrologic Region 4

3. Hydrologic Data:

A = 40 km^2, MAR = 1250 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.6 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 41 m^3/s Q_2 = 22

Q1000 = 53 m^3/s

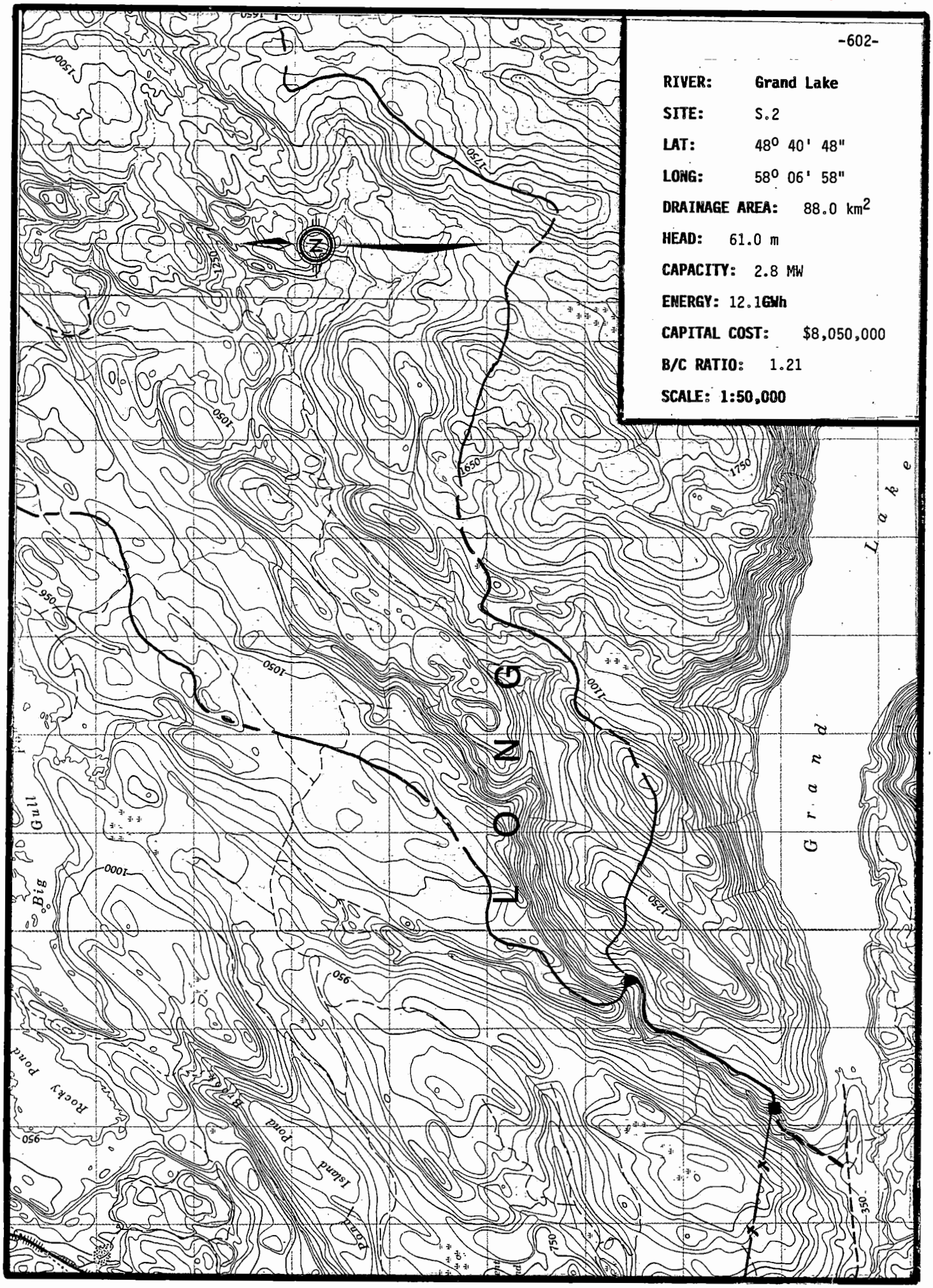
4. Site Data:

Rated Head = 173 m
Penstock Length = 1775 m
Access Road Length = 9.5 km
Dam Height = 4.7 m
Distance to Town = 19 km
Installed Capacity = 3.3 MW

Plant Design Flow = 2.38 m^3/s
T.L. Line Length = 6.5 km
Dam Length = 70 m
Distance to Concrete Plant = 19 km

5. Remarks:

(i) Access to powerhouse site will be difficult due to steepness of terrain. Access by barge for construction may be more economic.


-602-
RIVER: Grand Lake
SITE: S.2
LAT: 48° 40' 48"
LONG: 58° 06' 58"
DRAINAGE AREA: 88.0 km²
HEAD: 61.0 m
CAPACITY: 2.8 MW
ENERGY: 12.1GWh
CAPITAL COST: $8,050,000
B/C RATIO: 1.21
SCALE: 1:50,000
Grand Lake
Big Gull
Rocky Pond
Island Pond
Pond
1500
1750
1250
1050
1650
950
1100
1000
750
350

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WATER SHED : Grand Lake

SITE NAME : SITE - 2 FILE : 4071

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.807933 MW
PENSTOCK LENGTH	: 2150 M.
DESIGN FLOW	: 5.655 M^3/S
PENSTOCK DIAMETER	: 1.492693 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 5.5 M.
TRANSMISSION LINE LENGTH	: 4 KM.
LENGTH OF DAM	: 110 M.
ACCESS ROAD LENGTH	: 3 KM.
FLOOD FLOW	: 250 M^3/S
DISTANCE TO TOWN	: 15 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 45 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 7039861

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
407816.6	SEE DAM	109850.3	3564783	187500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
459338.8	1094595	328378.3	323114.7	349360.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	213132.7	730777.3	285995.3

PROJECT COST: $ 8054642 COST PER KW: $ 2868.53

Total Project Cost = $ 8,054,642

MAP NUMBER 12 B/09 DATA SHEET FILE NUMBER 4071

1. Site Identification:

River Basin: Grand Lake Site: S.2

2. Location:

Lat. 48° 40' 48" Long. 58° 06' 58" Hydrologic Region 4

3. Hydrologic Data:

A = 88 km^2, MAR = 1350 mm, ACLS = 10 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 3.77 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 250 m^3/s

Q1000 = 310 m^3/s

Q_2 = 120

4. Site Data:

Rated Head = 61 m

Penstock Length = 2150 m

Access Road Length = 3 km

Dam Height = 5.5 m

Distance to Town = 15 km

Installed Capacity = 2.8 MW

Plant Design Flow = 5.65 m^3/s

T.L. Line Length = 4 km

Dam Length = 110 m

Distance to Concrete Plant = 45 km

5. Remarks:

RIVER: Middle Arm Brook

SITE: S.1

LAT: 49° 50' 40"

LONG: 56° 25' 20"

DRAINAGE AREA: 343.0 km²

HEAD: 45.0 m

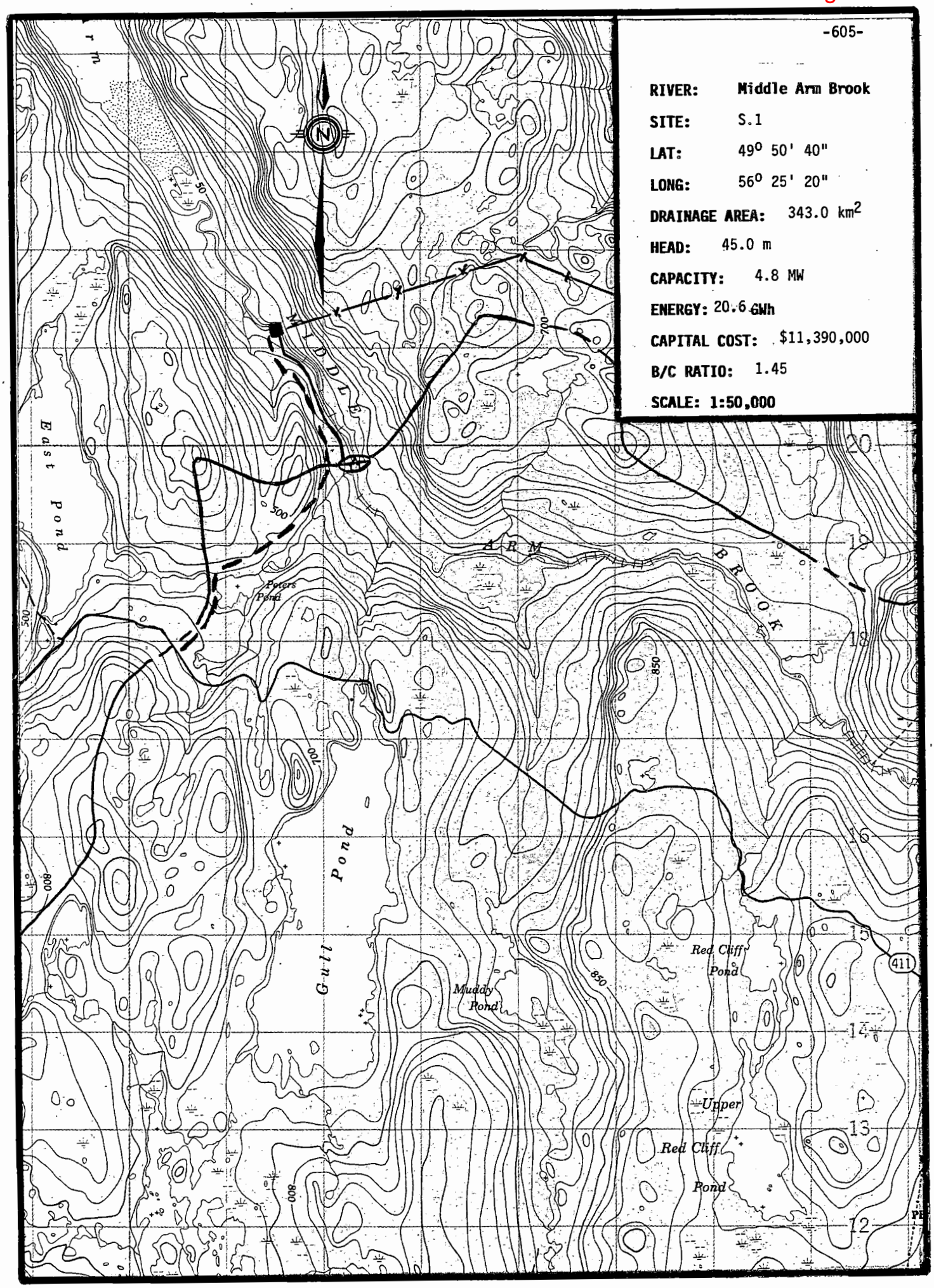
CAPACITY: 4.8 MW

ENERGY: 20.6 GWh

CAPITAL COST: $11,390,000

B/C RATIO: 1.45

SCALE: 1:50,000



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WATER SHED : Middle Arm Brook

SITE NAME : SITE 1 FILE : 4072

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 4.77472 MW
PENSTOCK LENGTH	: 1600 M.
DESIGN FLOW	: 13.035 M^3/S
PENSTOCK DIAMETER	: 2.230583 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 10 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 4 KM.
FLOOD FLOW	: 170 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.172533E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
1523473	643135.8	232922.7	1703678	127500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
740912.7	1765579	529673.8	412624.1	726211.8

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1214187	1204853	569483.8

PROJECT COST: $ 1.139423E+07 COST PER KW: $ 2386.367

Total Project Cost = $ 11,394,230

MAP NUMBER 12 H/16 DATA SHEET FILE NUMBER 4072

1. Site Identification:

River Basin: Middle Arm Brook (White Bay) Site: S.1

2. Location:

Lat. 49° 50' 40" Long. 56° 25' 20" Hydrologic Region 4

3. Hydrologic Data:

A = 343 km^2, MAR = 800 mm, ACLS = 90 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 8.69 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 130 m^3/s

Q1000 = 170 m^3/s

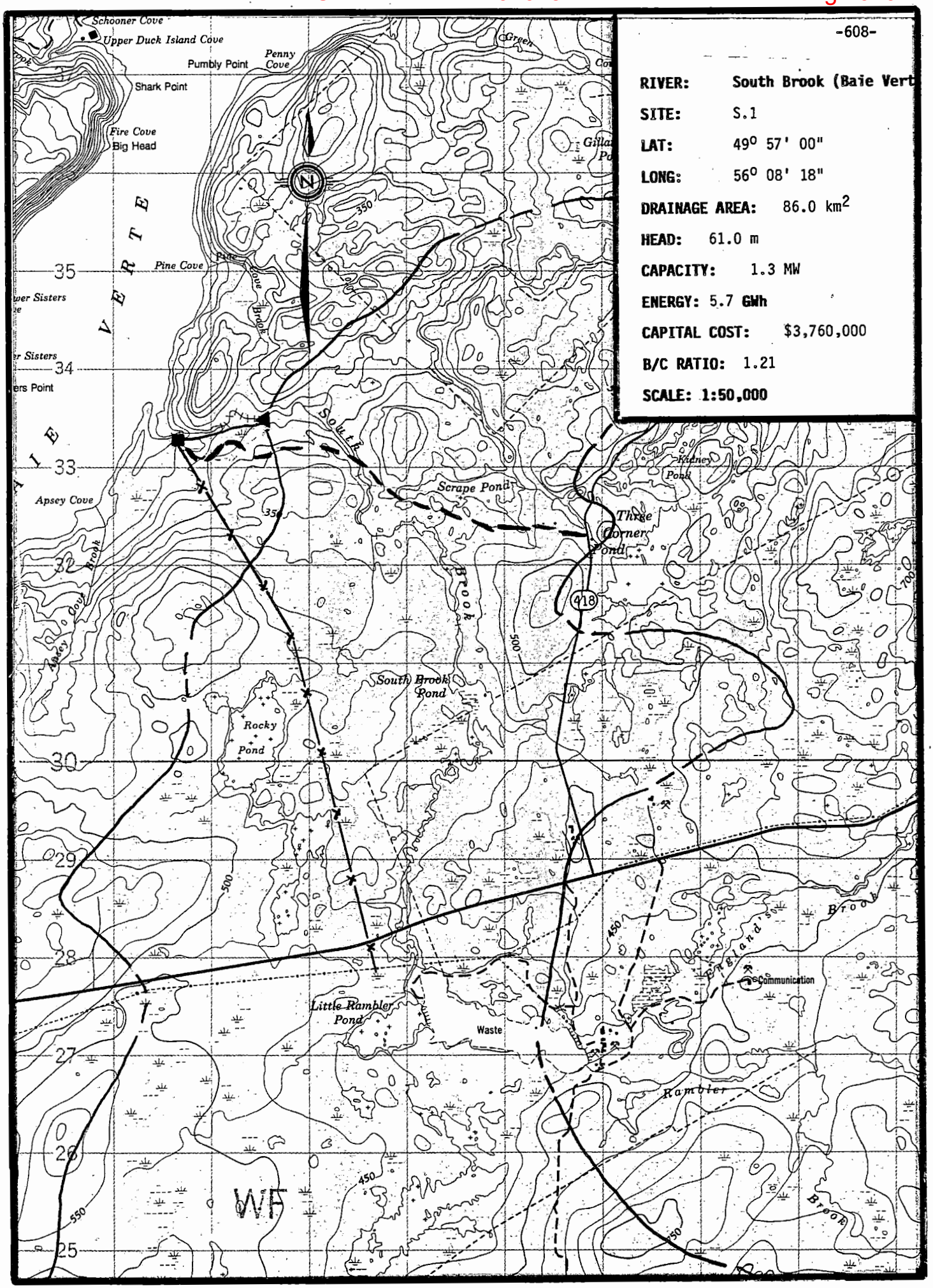
4. Site Data:

Rated Head = 45 m
Penstock Length = 1600 m
Access Road Length = 4 km
Dam Height = 15 m
Distance to Town = 50 km
Installed Capacity = 5.0 MW

Plant Design Flow = 13 m^3/s
T.L. Line Length = 10 km
Dam Length = 200 m
Distance to Concrete Plant = 50 km

5. Remarks:

(i) Considered poor salmon river by locals.


-608-
RIVER: South Brook (Baie Vert
SITE: S.1
LAT: 49° 57' 00"
LONG: 56° 08' 18"
DRAINAGE AREA: 86.0 km²
HEAD: 61.0 m
CAPACITY: 1.3 MW
ENERGY: 5.7 GWh
CAPITAL COST: $3,760,000
B/C RATIO: 1.21
SCALE: 1:50,000
Schooner Cove
Upper Duck Island Cove
Pumbly Point
Penny Cove
Shark Point
Fire Cove
Big Head
Pine Cove
Apsey Cove
Scrape Pond
Three Corner Pond
Kidney Pond
South Brook Pond
Rocky Pond
Little Rambler Pond
Waste
Communication
Rambler
Brook
South
418
350
500
450
550
700
35
34
33
32
30
29
28
27
26
25

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WATER SHED : South Brook (Baie Verte)

SITE NAME : SITE 1 FILE : 4073

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.318314 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 2.655 M^3/S
PENSTOCK DIAMETER	: 1.078381 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 5.5 KM.
LENGTH OF DAM	: 71 M.
ACCESS ROAD LENGTH	: 3.5 KM.
FLOOD FLOW	: 42 M^3/S
DISTANCE TO TOWN	: 6.5 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 20 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3787061

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
224444.1	SEE DAM	55625.01	1131590	31500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
270567.4	644756.4	193426.9	368350.7	303792.3

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	54707.88	367480.5	110279.9

PROJECT COST: $ 3756521 COST PER KW: $ 2849.49

Total Project Cost = $ 3,756,521

MAP NUMBER 12 H/16 DATA SHEET FILE NUMBER 4073

1. Site Identification:

River Basin: South Brook (Baie Verte) Site: S.1

2. Location:

Lat. 49° 57' 00" Long. 56° 08' 18" Hydrologic Region 4

3. Hydrologic Data:

A = 86 km^2, MAR = 650 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.77 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 42 m^3/s

Q1000 = 55 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 1000 m
Access Road Length = 3.5 km
Dam Height = 4.8 m
Distance to Town = 6.5 km
Installed Capacity = 6.4 MW

Plant Design Flow = 2.65 m^3/s
T.L. Line Length = 5.5 km
Dam Length = 71 m
Distance to Concrete Plant = 20 km

5. Remarks:

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RIVER: Pacquet Brook

SITE: S.1

LAT: 49° 56' 10"

LONG: 55° 54' 00"

DRAINAGE AREA: 102.0 km²

HEAD: 67.0 m

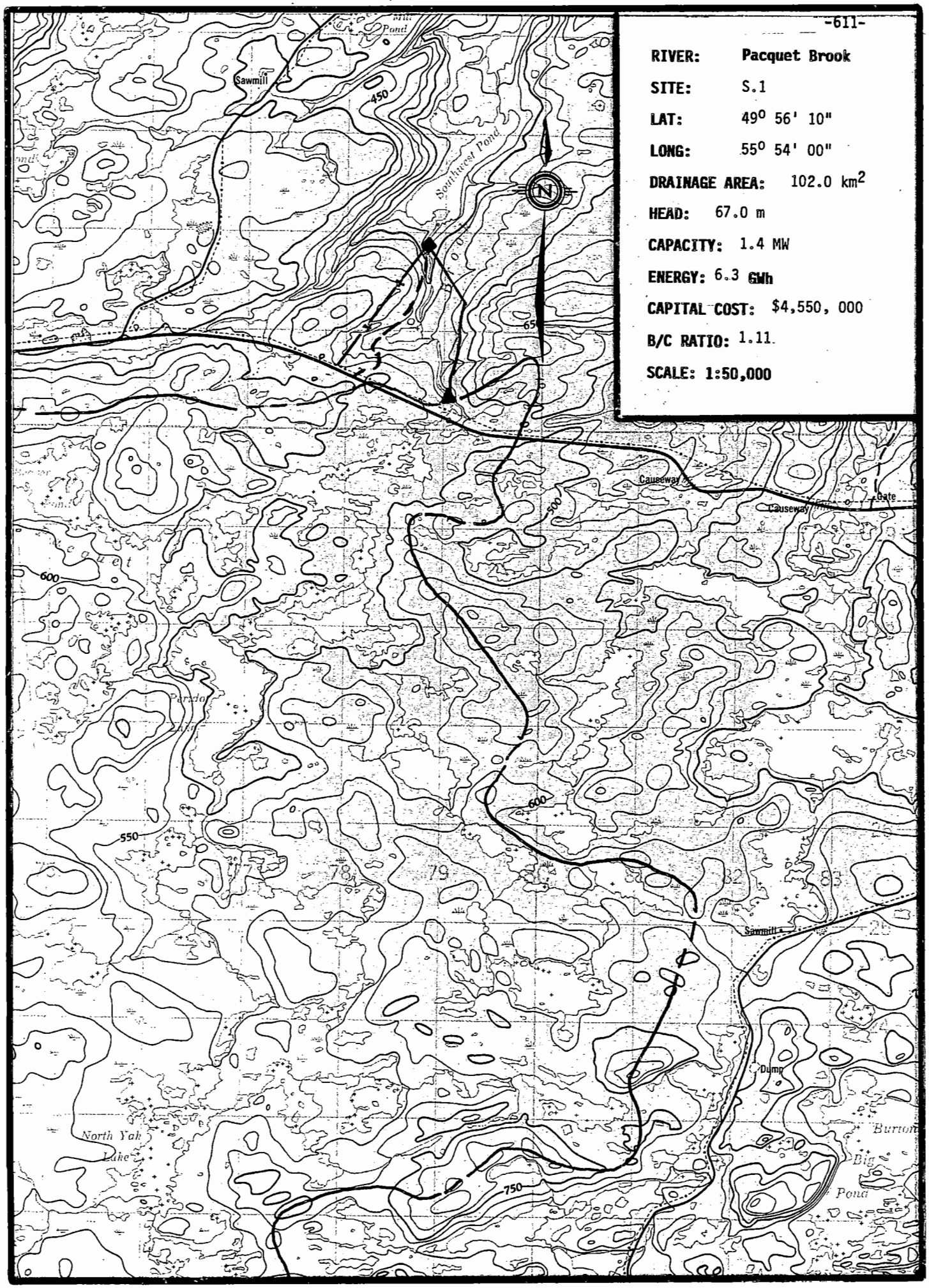
CAPACITY: 1.4 MW

ENERGY: 6.3 GWh

CAPITAL COST: $4,550, 000

B/C RATIO: 1.11

SCALE: 1:50,000



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WATER SHED : Pacquet Brook

SITE NAME : SITE 1 FILE : 4074

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.447984 MW
PENSTOCK LENGTH	: 1800 M.
DESIGN FLOW	: 2.655 M^3/S
PENSTOCK DIAMETER	: 1.064309 M.
RATED HEAD	: 67 M.
HEIGHT OF DAM	: 4.8 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 70 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 41 M^3/S
DISTANCE TO TOWN	: 10 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .75
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3996593

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
221597	SEE DAM	55625.01	2006399	30750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
279599.4	666279.5	199883.9	228917.6	190702.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	97894.97	438071.4	137232.8

PROJECT COST: $ 4552954 COST PER KW: $ 3144.34

Total Project Cost = $ 4,552,954

MAP NUMBER 2 E/13 DATA SHEET FILE NUMBER 4074

1. Site Identification:

River Basin: Pacquet Brook Site: S 1

2. Location:

Lat. 49° 56' 10" Long. 55° 54' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 102 km^2, MAR = 550 mm, ACLS = 60 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.77 m^3/s

Usable Flow Ratio = 0.75

Max. Turbinable Flow Ratio = 1.40

Flood Flow: Q150 = 41 m^3/s

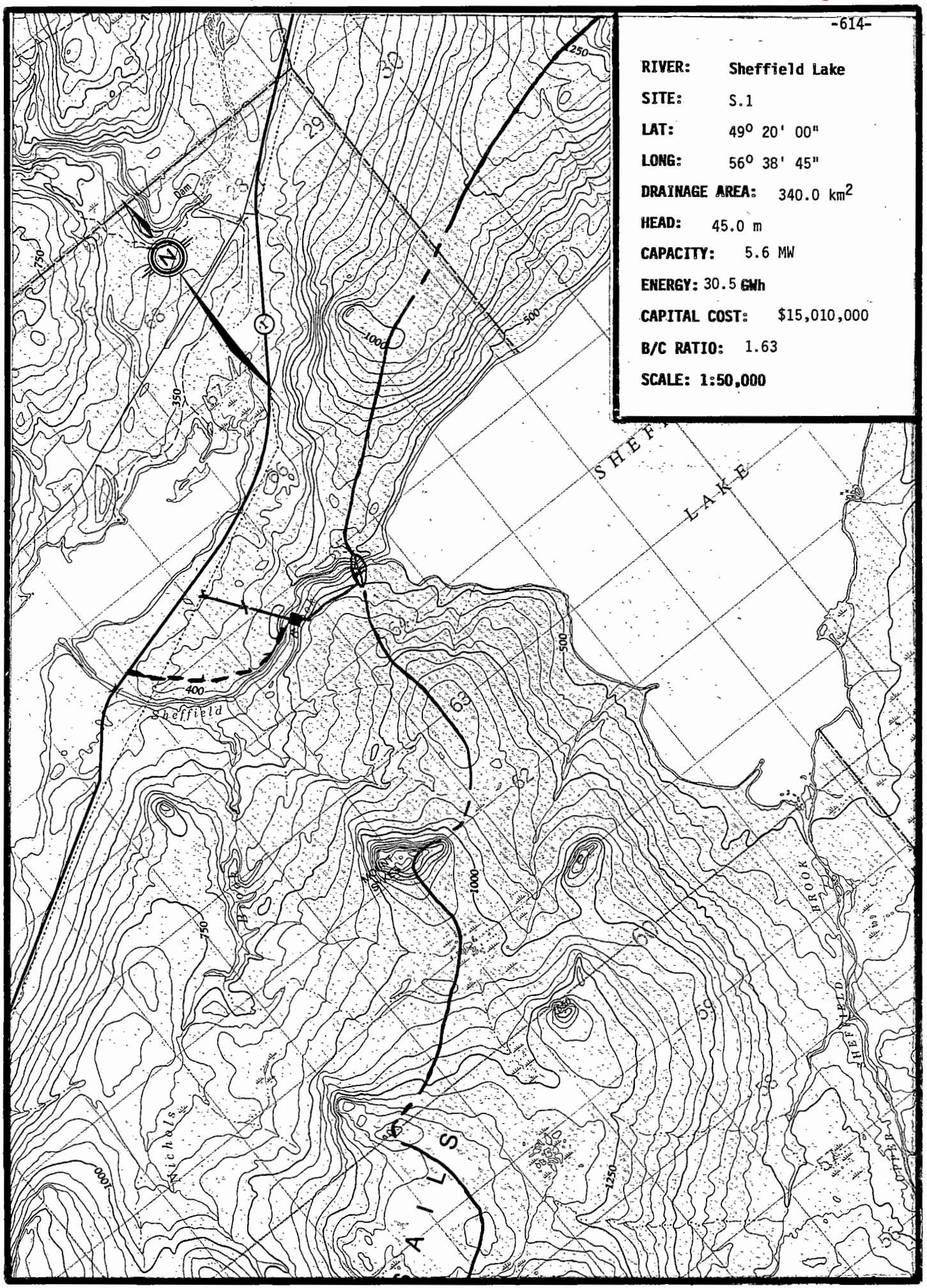
Q1000 = 55 m^3/s

4. Site Data:

Rated Head = 67 m
Penstock Length = 1800 m
Access Road Length = 2 km
Dam Height = 4.8 m
Distance to Town = 10 km
Installed Capacity = 1.5 MW

Plant Design Flow = 2.66 m^3/s
T.L. Line Length = 2 km
Dam Length = 70 m
Distance to Concrete Plant = 50 km

5. Remarks:



RIVER: Sheffield Lake

SITE: S.1

LAT: 49° 20' 00"

LONG: 56° 38' 45"

DRAINAGE AREA: 340.0 km²

HEAD: 45.0 m

CAPACITY: 5.6 MW

ENERGY: 30.5 GWh

CAPITAL COST: $15,010,000

B/C RATIO: 1.63

SCALE: 1:50,000

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WATER SHED : Sheffield Lake

SITE NAME : SITE 1 FILE : 4075

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 5.620873 MW
PENSTOCK LENGTH	: 1000 M.
DESIGN FLOW	: 15.345 M^3/S
PENSTOCK DIAMETER	: 2.392691 M.
RATED HEAD	: 45 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 1 KM.
LENGTH OF DAM	: 220 M.
ACCESS ROAD LENGTH	: 1.7 KM.
FLOOD FLOW	: 175 M^3/S
DISTANCE TO TOWN	: 50 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 50 KM.
USEFUL TURBINE FLOW RATIO	: .9299999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.340377E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
4482318	1035732	269762.9	1142437	131250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
853391.1	1911596	570625.8	199381.7	67243.21

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2167559	1434071	747924.2

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 1.501329E+07 COST PER KW: $ 2670.989

MAP NUMBER 12 H/07 DATA SHEET FILE NUMBER 4075

1. Site Identification:

River Basin: Sheffield Lake Site: S.1

2. Location:

Lat. 49° 20' 00" Long. 56° 38' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 340 km^2, MAR = 950 mm, ACLS = 100 %

Storage Reservoir Area = 25 km^2

Storage Reservoir Vol, V = 50 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.15$$

Mean Flow, QAV = 10.23 m^3/s

Usable Flow Ratio = 93

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 135 m^3/s

Q1000 = 175 m^3/s

4. Site Data:

Rated Head = 45 m

Penstock Length = 1000 m

Access Road Length = 1.7 km

Dam Height = 30 m

Distance to Town = 50 km

Installed Capacity = 5.8 MW

Plant Design Flow = 15.35 m^3/s

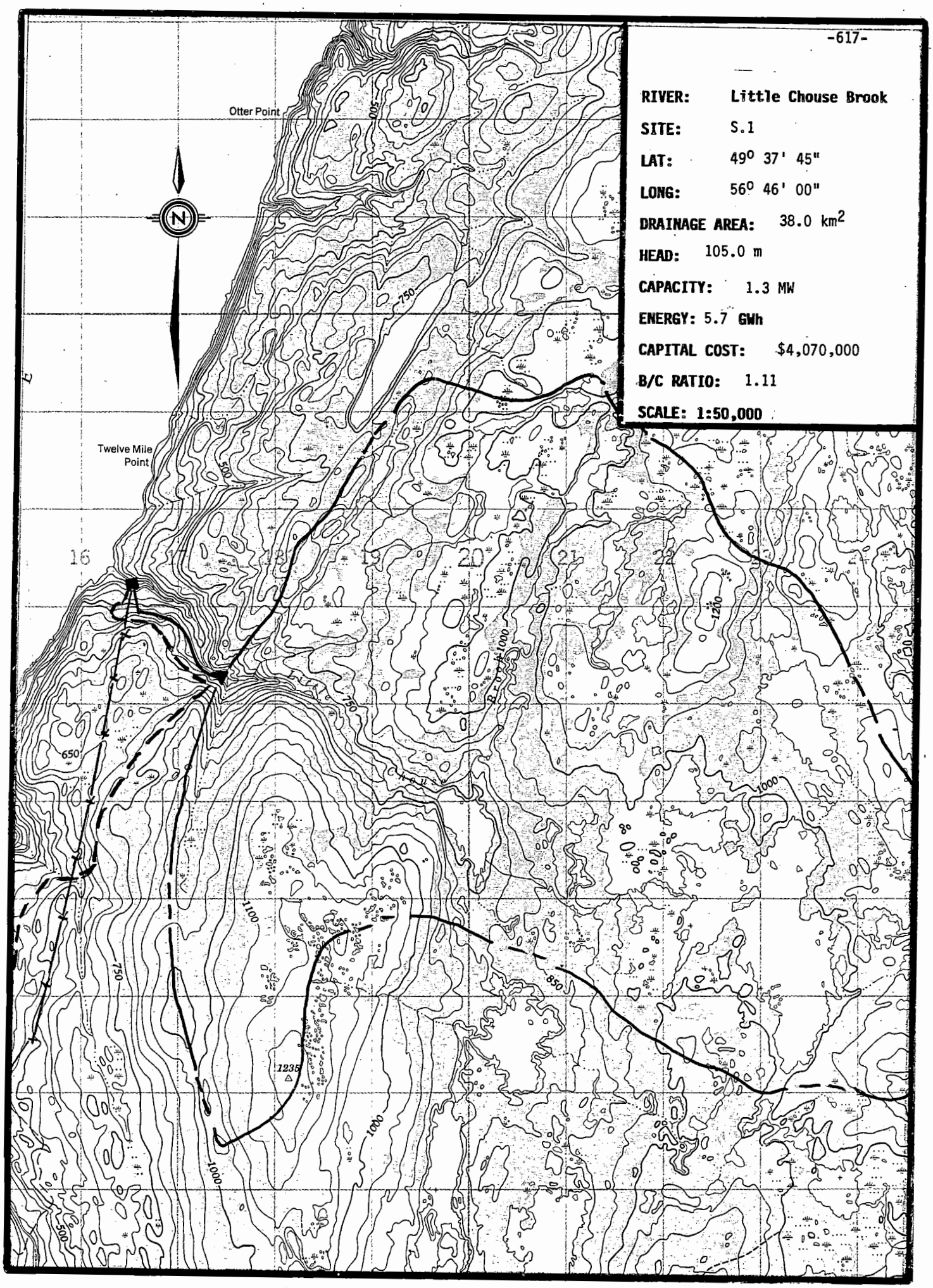
T.L. Line Length = 1 km

Dam Length = 220 m

Distance to Concrete Plant = 50 km

5. Remarks:

(i) Upper Sheffield area may be diverted to Kitty's Brook Development.



RIVER: Little Chouse Brook

SITE: S.1

LAT: 49° 37' 45"

LONG: 56° 46' 00"

DRAINAGE AREA: 38.0 km²

HEAD: 105.0 m

CAPACITY: 1.3 MW

ENERGY: 5.7 GWh

CAPITAL COST: $4,070,000

B/C RATIO: 1.11

SCALE: 1:50,000

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Little Chouse Brook

SITE NAME : SITE 1 FILE : 4076

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 1.307691 MW
PENSTOCK LENGTH	: 1400 M.
DESIGN FLOW	: 1.53 M^3/S
PENSTOCK DIAMETER	: .7885356 M.
RATED HEAD	: 105 M.
HEIGHT OF DAM	: 4.4 M.
TRANSMISSION LINE LENGTH	: 8 KM.
LENGTH OF DAM	: 61 M.
ACCESS ROAD LENGTH	: 8 KM.
FLOOD FLOW	: 25 M^3/S
DISTANCE TO TOWN	: 8 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3226656

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
172282.8	SEE DAM	33871.49	1113974	18750

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
222466.8	530133.6	159040.1	743755.4	384031.9

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	179762.2	396125	119627.2

PROJECT COST: $ 4073821 COST PER KW: $ 3115.278

Total Project Cost = $ 4,073,821

MAP NUMBER 12 H/10 DATA SHEET FILE NUMBER 4076

1. Site Identification:

River Basin: Little Chouse Brook Site: S.1

2. Location:

Lat. 49° 37' 45" Long. 56° 46' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 38 km^2, MAR = 850 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 1.02 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 25 m^3/s

Q1000 = 33 m^3/s

4. Site Data:

Rated Head = 105 m
Penstock Length = 1400 m
Access Road Length = 8 km
Dam Height = 4.4 m
Distance to Town = 8 km
Installed Capacity = 1.3 MW

Plant Design Flow = 1.53 m^3/s
T.L. Line Length = 8 km
Dam Length = 61 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Equipment could be barged to site from Hampden.

(ii) Possible diversion of 20 km^2 from Big Chouse Brook.

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WATER SHED : Otter Point Brook

SITE NAME : SITE 1 FILE : 4078

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - TRANSMISSION LINE LENGTH EXCEEDS 10*MW

SITE DATA

INSTALLED CAPACITY	: 1.120756 MW
PENSTOCK LENGTH	: 1200 M.
DESIGN FLOW	: 1.005 M^3/S
PENSTOCK DIAMETER	: .6341048 M.
RATED HEAD	: 137 M.
HEIGHT OF DAM	: 4.3 M.
TRANSMISSION LINE LENGTH	: 15 KM.
LENGTH OF DAM	: 58 M.
ACCESS ROAD LENGTH	: 15 KM.
FLOOD FLOW	: 18 M^3/S
DISTANCE TO TOWN	: 15 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 2408165

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
159211.3	SEE DAM	23203.92	753146.4	13500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
181942.2	433564.3	130069.3	1269057	562471.4

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	299646	424157.4	124185.3

PROJECT COST: $ 4374155 COST PER KW: $ 3902.863

Total Project Cost = $ 4,374,155

MAP NUMBER 12 H/10 DATA SHEET FILE NUMBER 4078

1. Site Identification:

River Basin: Otter Point Brook Site: S.1

2. Location:

Lat. 49° 41' 45" Long. 56° 44' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 25 km^2, MAR = 850 mm, ACLS = 80 %

Storage Reservoir Area = 0 km^2

Storage Reservoir Vol, V = 0 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0$$

Mean Flow, QAV = 0.67 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 18 m^3/s

Q1000 = 25 m^3/s

4. Site Data:

Rated Head = 137 m
Penstock Length = 1200 m
Access Road Length = 15 km
Dam Height = 4.3 m
Distance to Town = 15 km
Installed Capacity = 1.17 MW

Plant Design Flow = 1.01 m^3/s
T.L. Line Length = 15 km
Dam Length = 58 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Equipment could be barged to site from Hampden.

RIVER: Middle Arm Brook (Whi

SITE: S.2

LAT: 49° 49' 20"

LONG: 56° 23' 00"

DRAINAGE AREA: 240.0 km²

HEAD: 53.0 m

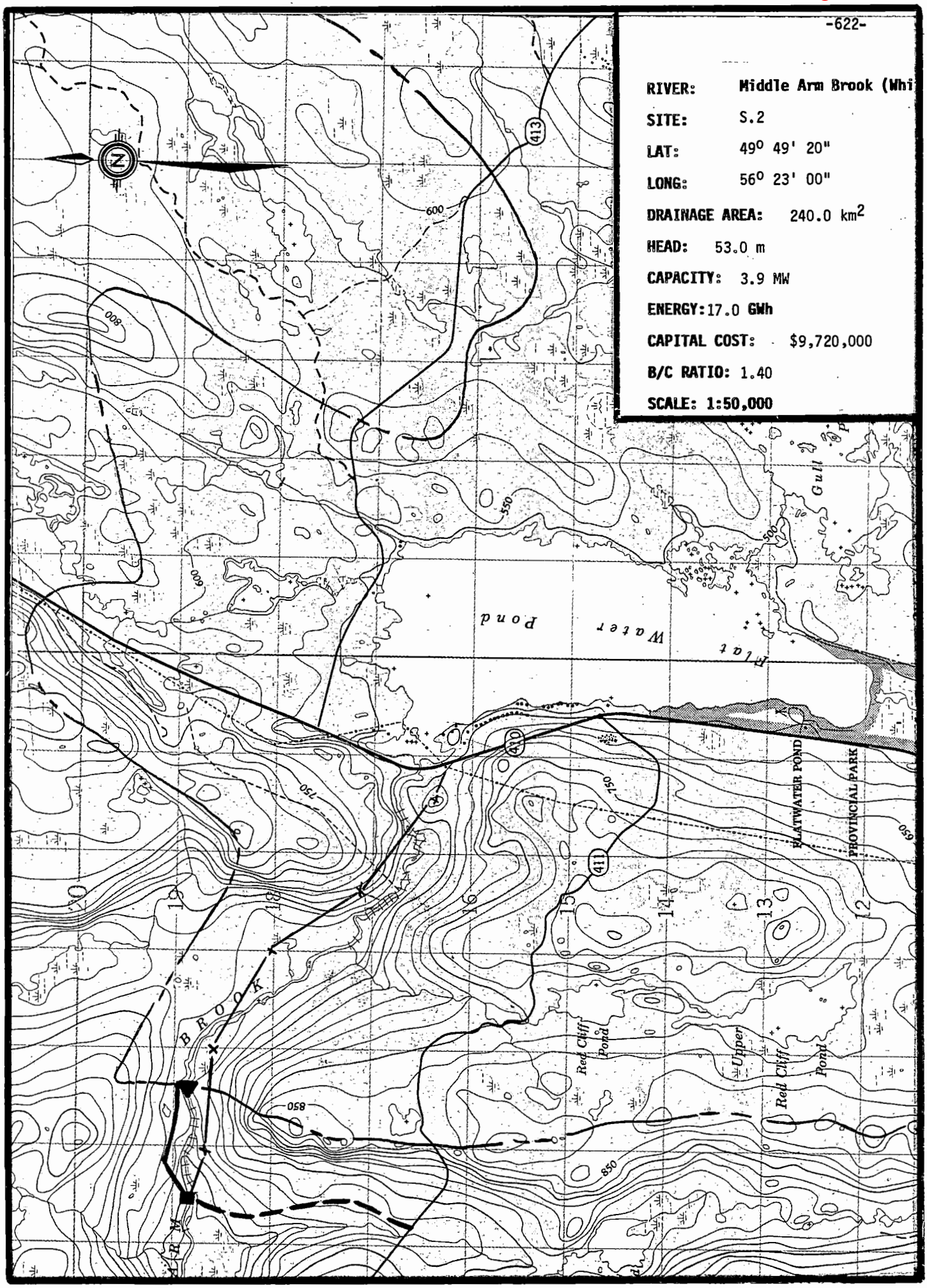
CAPACITY: 3.9 MW

ENERGY: 17.0 GWh

CAPITAL COST: $9,720,000

B/C RATIO: 1.40

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
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WATER SHED : Middle Brook (White Bay)

SITE NAME : SITE - 2 FILE : 4079

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 3.941021 MW
PENSTOCK LENGTH	: 1200 M.
DESIGN FLOW	: 9.134999 M^3/S
PENSTOCK DIAMETER	: 1.871012 M.
RATED HEAD	: 53 M.
HEIGHT OF DAM	: 15 M.
TRANSMISSION LINE LENGTH	: 5.5 KM.
LENGTH OF DAM	: 300 M.
ACCESS ROAD LENGTH	: 2.4 KM.
FLOOD FLOW	: 120 M^3/S
DISTANCE TO TOWN	: 31 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 9622885

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
2194403	490132.5	169141.3	1071442	90000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
611726.7	1457732	437319.5	267290.3	474597.5

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	1029817	987552.2	435087.4

PROJECT COST: $ 9716241 COST PER KW: $ 2465.412

Total Project Cost = $ 9,716,241

MAP NUMBER 12 H/16 DATA SHEET FILE NUMBER 4079

1. Site Identification:

River Basin: Middle Brook(White Bay) Site: S.2

2. Location:

Lat. 49° 49' 20" Long. 56° 23' 00" Hydrologic Region 4

3. Hydrologic Data:

A = 240 km^2, MAR = 800 mm, ACLS = 90 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 6.09 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 82 m^3/s

Q1000 = 100 m^3/s

4. Site Data:

Rated Head = 53 m
Penstock Length = 1200 m
Access Road Length = 2.4 km
Dam Height = 15 m
Distance to Town = 31 km
Installed Capacity = 4.0 MW

Plant Design Flow = 9.13 m^3/s
T.L. Line Length = 5.5 km
Dam Length = 300 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Locals consider this to be a poor salmon river.

-625-

RIVER: Middle Arm Brook

SITE: S.3

LAT: 49° 48' 05"

LONG: 56° 20' 50"

DRAINAGE AREA: 220.0 km^2

HEAD: 33.0 m

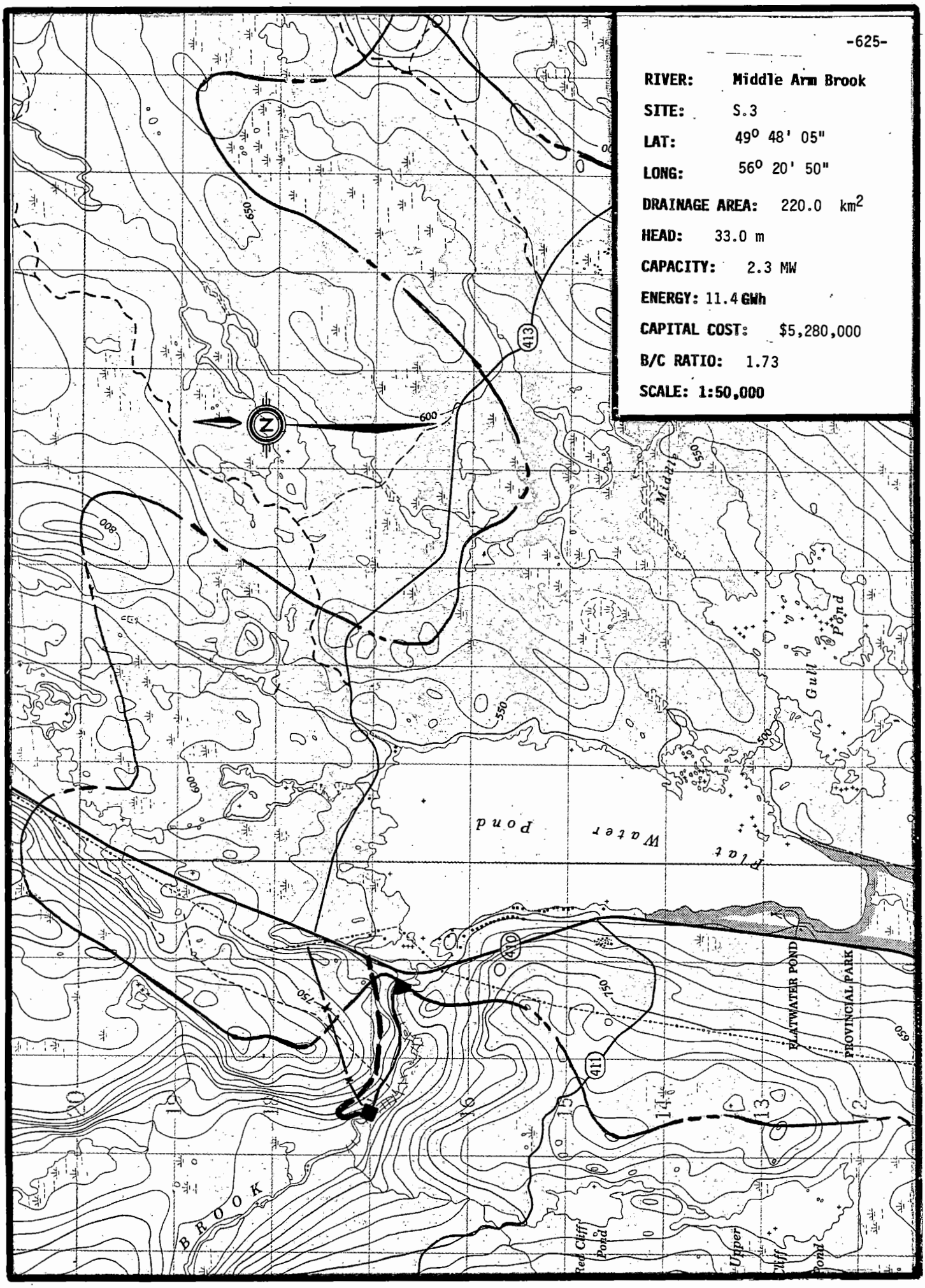
CAPACITY: 2.3 MW

ENERGY: 11.4 GWh

CAPITAL COST: $5,280,000

B/C RATIO: 1.73

SCALE: 1:50,000



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WATER SHED : Middle Brook (White Bay)

SITE NAME : SITE - 3 FILE : 4080

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 2.268496 MW
PENSTOCK LENGTH	: 1300 M.
DESIGN FLOW	: 8.445 M^3/S
PENSTOCK DIAMETER	: 1.932931 M.
RATED HEAD	: 33 M.
HEIGHT OF DAM	: 3 M.
TRANSMISSION LINE LENGTH	: 2 KM.
LENGTH OF DAM	: 110 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 70 M^3/S
DISTANCE TO TOWN	: 30 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .8599999
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6874305

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (FIBERGLASS)	UNWATERING
170099.1	SEE DAM	157598.4	1199182	52500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
490528.9	1168920	350676	228917.6	235600.6

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	335985.7	648129.7	237276.2

PROJECT COST: $ 5275414 COST PER KW: $ 2325.512

Total Project Cost = $ 5,275,414

MAP NUMBER 12 H/16 DATA SHEET FILE NUMBER 4080

1. Site Identification:

River Basin: Middle Arm Brook Site: S.3

2. Location:

Lat. _____ Long. _____ Hydrologic Region ____

3. Hydrologic Data:

A = 222 km^2, MAR = 800 mm, ACLS = 100 %

Storage Reservoir Area = 7.10 km^2

Storage Reservoir Vol, V = 14.2 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.08$$

Mean Flow, QAV = 5.63 m^3/s

Usable Flow Ratio = 0.86

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 70 m^3/s

Q1000 = 90 m^3/s

4. Site Data:

Rated Head = 33 m
Penstock Length = 1300 m
Access Road Length = 2.0 km
Dam Height = 3.0 m
Distance to Town = 30 km
Installed Capacity = 2.3 MW

Plant Design Flow = 8.45 m^3/s
T.L. Line Length = 2.0 km
Dam Length = 110 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Risk of flooding cottages should be checked.

(ii) Poor salmon river but Flat Water Lake reported good for trout.

-628-

RIVER: Gull Pond (White Bay)

SITE: S.1

LAT: 49° 49' 30"

LONG: 56° 24' 30"

DRAINAGE AREA: 76.0 km²

HEAD: 122.0 m

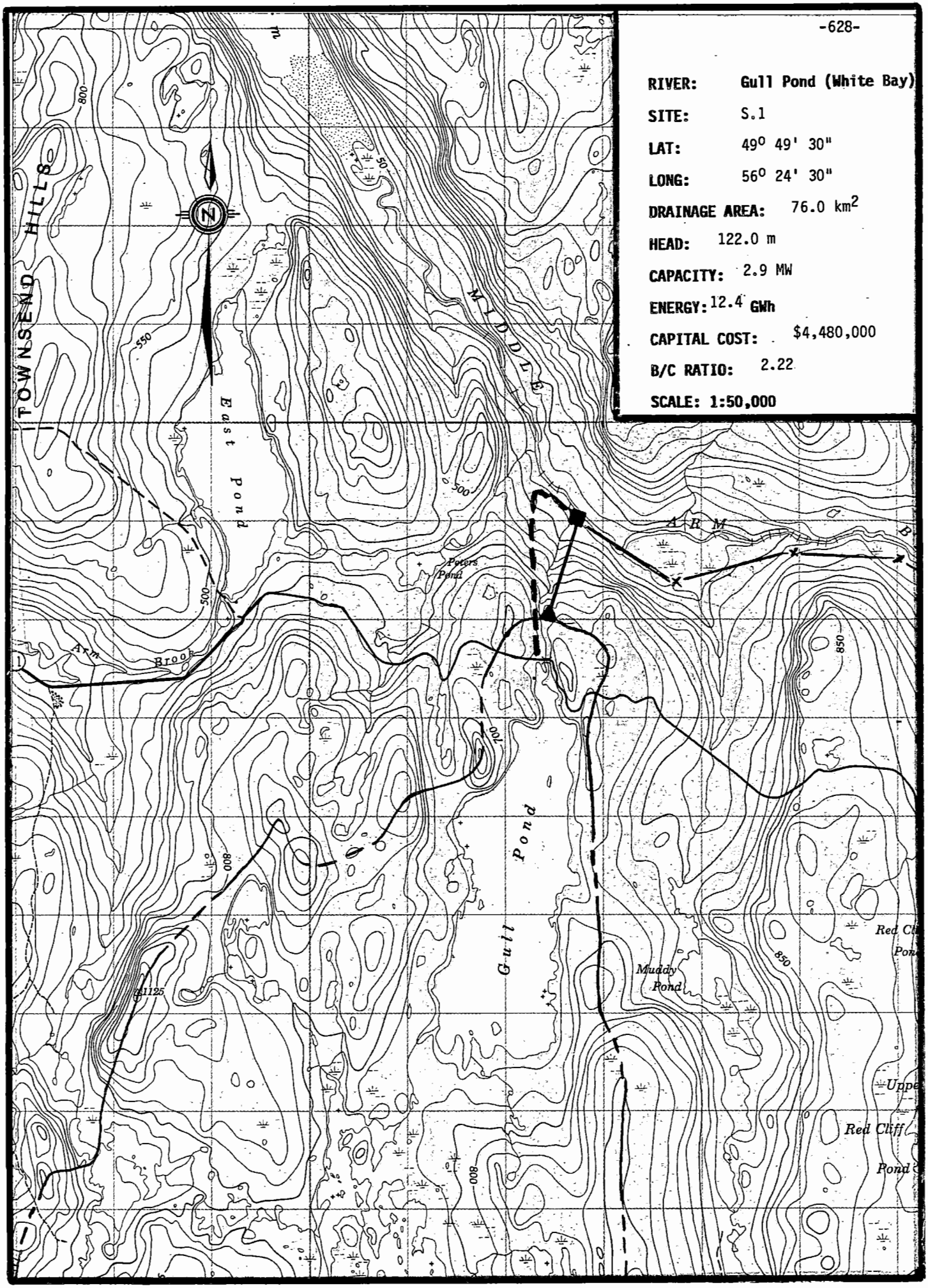
CAPACITY: 2.9 MW

ENERGY: 12.4 GWh

CAPITAL COST: $4,480,000

B/C RATIO: 2.22

SCALE: 1:50,000



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WATER SHED : Gull Pond (White Bay)

SITE NAME : SITE - 1 FILE : 4081

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)

SITE DATA

INSTALLED CAPACITY	: 2.874967 MW
PENSTOCK LENGTH	: 1110 M.
DESIGN FLOW	: 2.895 M^3/S
PENSTOCK DIAMETER	: 1.015755 M.
RATED HEAD	: 122 M.
HEIGHT OF DAM	: 4 M.
TRANSMISSION LINE LENGTH	: 8 KM.
LENGTH OF DAM	: 60 M.
ACCESS ROAD LENGTH	: 2 KM.
FLOOD FLOW	: 31 M^3/S
DISTANCE TO TOWN	: 33 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 6052189

COST ESTIMATE SUMMARY ($)

DAM (CONCRETE)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
147826.6	SEE DAM	60130.63	1172999	23250

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
366391.1	873102.1	261930.7	228917.6	519536.2

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	244264.4	424527.1	157315.5

PROJECT COST: $ 4480191 COST PER KW: $ 1558.346

Total Project Cost = $ 4,480,191

MAP NUMBER 12 H/16 DATA SHEET FILE NUMBER 4081

1. Site Identification:

River Basin: Gull Pond (White Bay) Site: S.1

2. Location:

Lat. 49° 49' 30" Long. 56° 24' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 76 km^2, MAR = 800 mm, ACLS = 100 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = \_\_\_\_\_$$

Mean Flow, QAV = 1.93 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 31 m^3/s

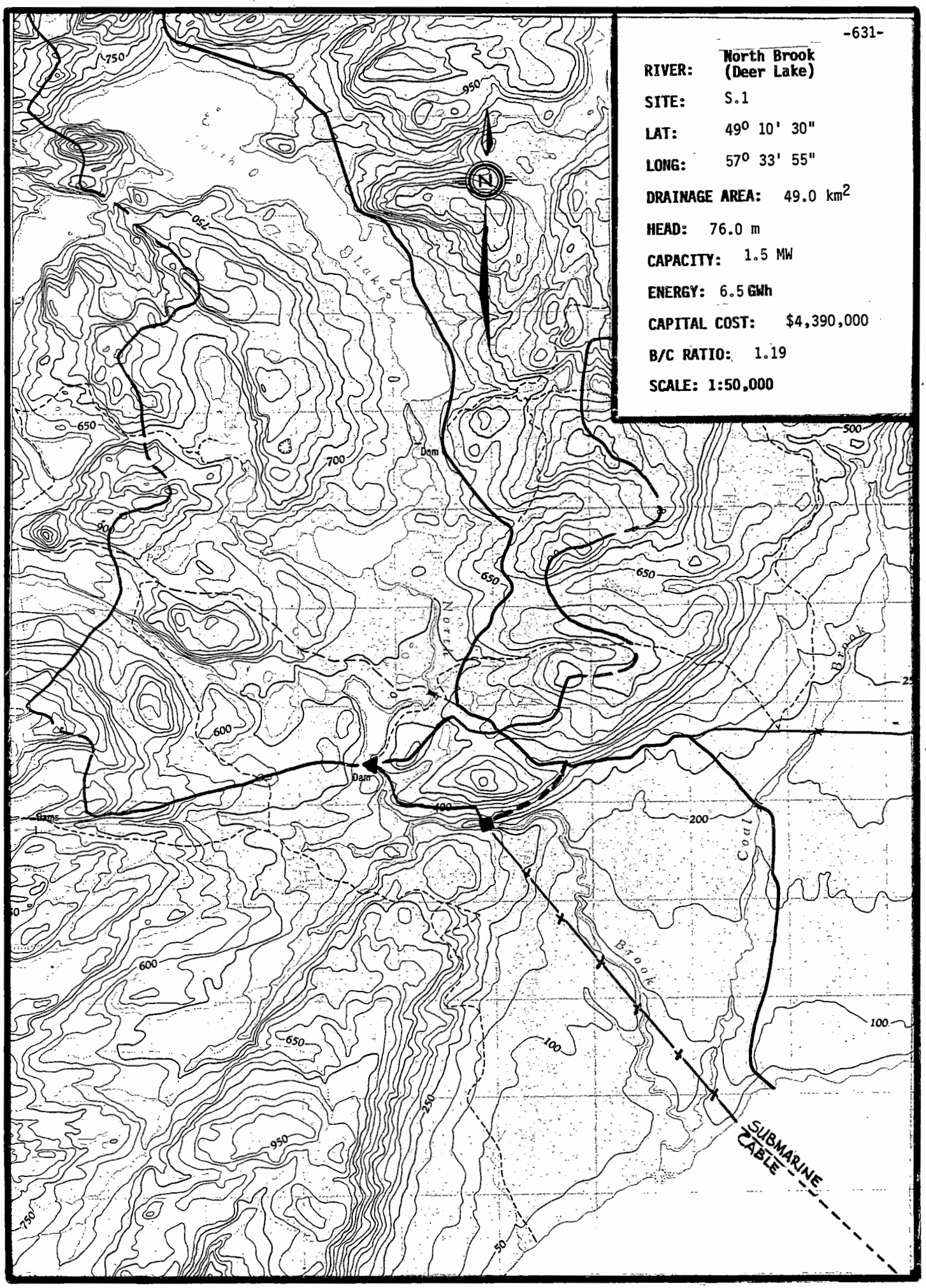
Q1000 = 42 m^3/s

4. Site Data:

Rated Head = 122 m
Penstock Length = 1110 m
Access Road Length = 2.0 km
Dam Height = 4.0 m
Distance to Town = 33 km
Installed Capacity = 2.9 MW

Plant Design Flow = 2.89 m^3/s
T.L. Line Length = 8.0 km
Dam Length = 60 m
Distance to Concrete Plant = 100 km

5. Remarks:


RIVER: North Brook (Deer Lake)
SITE: S.1
LAT: 49° 10' 30"
LONG: 57° 33' 55"
DRAINAGE AREA: 49.0 km²
HEAD: 76.0 m
CAPACITY: 1.5 MW
ENERGY: 6.5 GWh
CAPITAL COST: $4,390,000
B/C RATIO: 1.19
SCALE: 1:50,000
N
Dam
Dam
Dams
Coal Brook
SUBMARINE CABLE

SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : North Brook

SITE NAME : SITE - 1 FILE : 4082

NOTE - PENSTOCK LENGTH EXCEEDS 7*H (PRESSURE RELIEF VALVE ADDED TO POWERHOUSE EQUIPMENT COST)
NOTE - PENSTOCK LENGTH EXCEEDS 20*H

SITE DATA

INSTALLED CAPACITY	: 1.512575 MW
PENSTOCK LENGTH	: 1750 M.
DESIGN FLOW	: 2.445 M^3/S
PENSTOCK DIAMETER	: 1.009291 M.
RATED HEAD	: 76 M.
HEIGHT OF DAM	: 3.4 M.
TRANSMISSION LINE LENGTH	: 8 KM.
LENGTH OF DAM	: 56 M.
ACCESS ROAD LENGTH	: 1.2 KM.
FLOOD FLOW	: 40 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 68 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 4015741

COST ESTIMATE SUMMARY ($)

DAM (TIMBER CRIB)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
109138.9	SEE DAM	51649.12	1835929	30000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
275832.2	657302.2	197190.6	148288.6	406936

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	120717	423176.6	133507.2

PROJECT COST: $ 4389668 COST PER KW: $ 2902.116

Total Project Cost = $ 4,389,668

MAP NUMBER 12 H/04 DATA SHEET FILE NUMBER 4082

1. Site Identification:

River Basin: North Brook Site: S.1

2. Location:

Lat. 49° 10' 30" Long. 57° 33' 55" Hydrologic Region 4

3. Hydrologic Data:

A = 49 km^2, MAR = 1050 mm, ACLS = 85 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 1.63 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 40 m^3/s Q_2 = 20 m^3/s

Q1000 = 53 m^3/s

4. Site Data:

Rated Head = 76 m Plant Design Flow = 2.45 m^3/s

Penstock Length = 1750 m

Access Road Length = 1.2 km T.L. Line Length = 8.0 km

Dam Height = 3.4 m Dam Length = 56 m

Distance to Town = 18 km Distance to Concrete Plant = 68 km

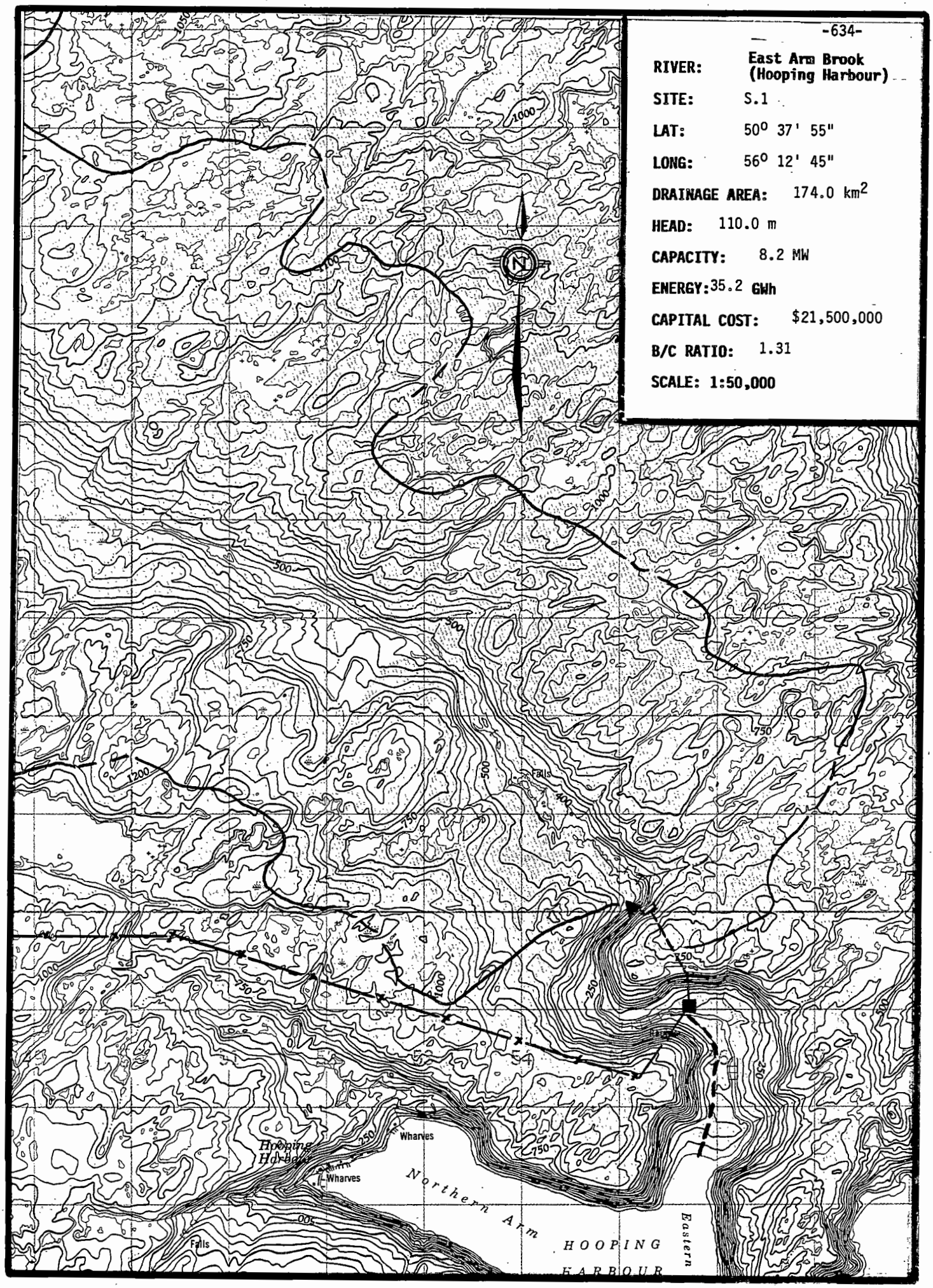
Installed Capacity = 1.5 MW

5. Remarks:

(i) Shortest distance to grid via underwater cable to south side of Deer Lake a distance of 8.0 km.

(ii) Access via Corner Brook Pulp and Paper woods road.

RIVER:	East Arm Brook (Hooping Harbour)
SITE:	S.1
LAT:	50° 37' 55"
LONG:	56° 12' 45"
DRAINAGE AREA:	174.0 km^2
HEAD:	110.0 m
CAPACITY:	8.2 MW
ENERGY:	35.2 GWh
CAPITAL COST:	$21,500,000
B/C RATIO:	1.31
SCALE:	1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : East Arm Brook (Hooping Harbour)

SITE NAME : SITE - 1 FILE : 4083

SITE DATA

INSTALLED CAPACITY	: 8.152616 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 9.104999 M^3/S
PENSTOCK DIAMETER	: 1.686809 M.
RATED HEAD	: 110 M.
HEIGHT OF DAM	: 30 M.
TRANSMISSION LINE LENGTH	: 72 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 1.5 KM.
FLOOD FLOW	: 290 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 200 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.459348E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4113860	1535848	168641.3	577032.9	217500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
844655.5	1689311	504272	179259.1	3543834

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2842722	1566885	1012694

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.149652E+07 COST PER KW: $ 2636.763

Total Project Cost = $ 21,496,520

WATER SHED : East Arm Brook (Hooping Harbour) SITE - 1

COST DATA

(ADDITIONAL COST of $ 2,700,000 for Tunnel INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .4933334

ANNUAL COST : $ 1612239

ANNUAL BENEFIT : $ 2113941

BENEFIT/COST RATIO: 1.311184

Total Project Cost = $ 21,496,520.00

Benefit / Cost Ratio = 1.31

MAP NUMBER 12 I/09 DATA SHEET FILE NUMBER 4083

1. Site Identification:

River Basin: East Arm Brook (Hooping Harbour) Site: S.1

2. Location:

Lat. 50° 37' 55" Long. 56° 12' 45" Hydrologic Region 4

3. Hydrologic Data:

A = 174 km^2, MAR = 1100 mm, ACLS = 50 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 6.07 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 210 m^3/s

Q1000 = 290 m^3/s

4. Site Data:

Rated Head = 110 m
Penstock Length = 300 m
Access Road Length = 1.5 km
Dam Height = 30 m
Distance to Town = 100 km
Installed Capacity = 8.2 MW

Plant Design Flow = 9.10 m^3/s
T.L. Line Length = 72 km
Dam Length = 200 m
Distance to Concrete Plant = 200 km

5. Remarks:

(i) Access to site by sea.

(ii) Could be combined with plants on Northern Arm River (Fourche Harbour).

(iii) Add cost of tunnel at $2,700,000.

RIVER: Little Harbour Deep R

SITE: S.6

LAT: 50° 14' 30"

LONG: 56° 34' 30"

DRAINAGE AREA: 462.0 km²

HEAD: 30.3 m

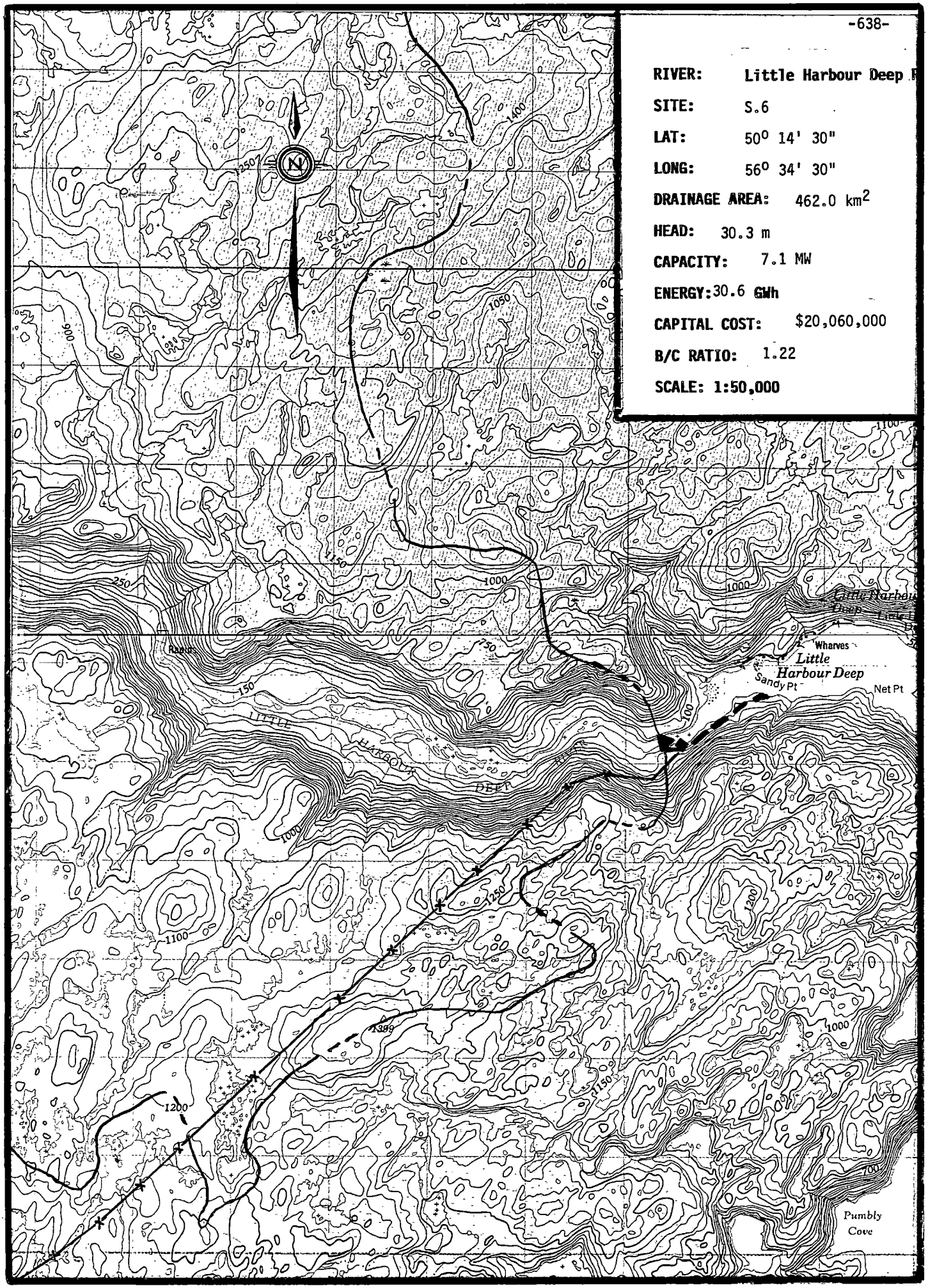
CAPACITY: 7.1 MW

ENERGY: 30.6 GWh

CAPITAL COST: $20,060,000

B/C RATIO: 1.22

SCALE: 1:50,000



SHYDRO-PC VERSION 2.0 MARCH 1986
ShawMont Newfoundland Limited
Updated Sept. '86 by H.J.Keats

WATER SHED : Little Harbour Deep River

SITE NAME : SITE - 6 FILE : 4084

SITE DATA

INSTALLED CAPACITY	: 7.075695 MW
PENSTOCK LENGTH	: 129 M.
DESIGN FLOW	: 28.5 M^3/S
PENSTOCK DIAMETER	: 3.29725 M.
RATED HEAD	: 30.5 M.
HEIGHT OF DAM	: 30.5 M.
TRANSMISSION LINE LENGTH	: 30 KM.
LENGTH OF DAM	: 200 M.
ACCESS ROAD LENGTH	: 1.5 KM.
FLOOD FLOW	: 470 M^3/S
DISTANCE TO TOWN	: 100 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 200 KM.
USEFUL TURBINE FLOW RATIO	: .74
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 1.781357E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
4219075	2263912	470947.5	591679.1	352500

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
1190708	2381415	710870.3	179259.1	1541146

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	3491710	1667640	1004049

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 2.006491E+07 COST PER KW: $ 2835.751

Total Project Cost = $ 20,064,910

MAP NUMBER 12 I/02 DATA SHEET FILE NUMBER 4084

1. Site Identification:

River Basin: Little Harbour Deep River Site: S.6

2. Location:

Lat. 50° 14' 30" Long. 56° 34' 30" Hydrologic Region 4

3. Hydrologic Data:

A = 462 km^2, MAR = 1300 mm, ACLS = 50 %

Storage Reservoir Area = _____ km^2

Storage Reservoir Vol, V = _____ $x10^6 m^3$

Storage Factor = $\frac{V\ m^3}{MAR \times A\ km^2 \times 1000}$ = _____

Mean Flow, QAV = 19.0 m^3/s

Usable Flow Ratio = 0.74

Max. Turbinable Flow Ratio = 1.50

Flood Flow: Q150 = 350 m^3/s

Q1000 = 470 m^3/s

4. Site Data:

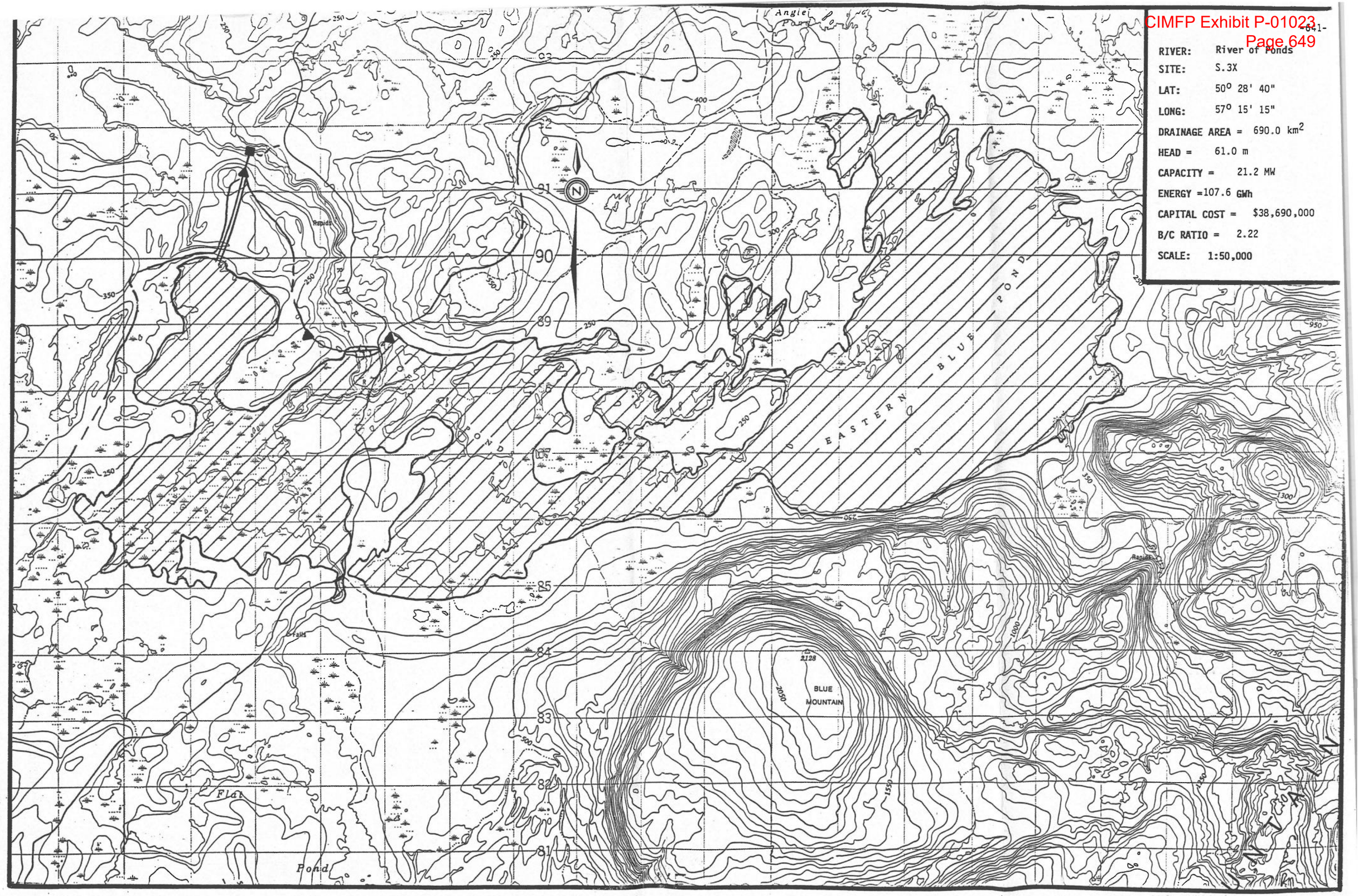
Rated Head = 30.5 m
Penstock Length = 129 m
Access Road Length = 1.5 km
Dam Height = 30.5 m
Distance to Town = 100 km
Installed Capacity = 7.1 MW

Plant Design Flow = 28.6 m^3/s
T.L. Line Length = 30 km
Dam Length = 200 m
Distance to Concrete Plant = 200 km

5. Remarks:

(i) Power delivered to Cat Arm Development.

(ii) Access to site by sea.


RIVER: River of Ponds
SITE: S.3X
LAT: 50° 28' 40"
LONG: 57° 15' 15"
DRAINAGE AREA = 690.0 km²
HEAD = 61.0 m
CAPACITY = 21.2 MW
ENERGY = 107.6 GWh
CAPITAL COST = $38,690,000
B/C RATIO = 2.22
SCALE: 1:50,000
EASTERN BLUE POND
BLUE MOUNTAIN
2128
Rapids
Falls
Flat
Pond
Angle
Pond
N

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WATER SHED : River of Ponds

SITE NAME : SITE - 3X FILE : 4086

SITE DATA

INSTALLED CAPACITY	: 21.17495 MW
PENSTOCK LENGTH	: 300 M.
DESIGN FLOW	: 42.645 M^3/S
PENSTOCK DIAMETER	: 3.558506 M.
RATED HEAD	: 61 M.
HEIGHT OF DAM	: 20 M.
TRANSMISSION LINE LENGTH	: 14 KM.
LENGTH OF DAM	: 850 M.
ACCESS ROAD LENGTH	: .5 KM.
FLOOD FLOW	: 560 M^3/S
DISTANCE TO TOWN	: 18 KM.
NO.OF UNITS	: 1
DISTANCE TO CONCRETE PLANT	: 100 KM.
USEFUL TURBINE FLOW RATIO	: .87
MAXIMUM TURBINE FLOW RATIO	: 1.5
LEAST COST	: $ 3.690296E+07

COST ESTIMATE SUMMARY ($)

DAM (EARTHFILL)	SPILLWAY	INTAKE	PENSTOCK (STEEL)	UNWATERING
8319391	1955582	676851.3	1528900	420000

P.HOUSE CIVIL	EQUIP SUPPLY	EQUIP ERECTION	ACCESS ROAD	TRANS. LINE &SUBSTATION
2311319	4622638	1379892	70457.66	1126320

FISHWAY	CONTRACT OVERHEAD	ENG & OWNER	INT.DURING CONSTRUCT
0	2639514	2307421	2633548

NOTE : SUBSTATION COST INCLUDED IN EQUIPMENT SUPPLY COST

PROJECT COST: $ 3.869183E+07 COST PER KW: $ 1827.246

Total Project Cost = $ 38,691,830

WATER SHED : River of Ponds SITE - 3X

COST DATA

(ADDITIONAL COST of $ 8,700,000 for Canals & Clearing INCLUDED)

INTEREST RATE : 6 REVENUE, $ PER MWH : 60
O & M PERCENTAGE : 1.5 CAPACITY FACTOR : .58

ANNUAL COST : $ 2901887

ANNUAL BENEFIT : $ 6455141

BENEFIT/COST RATIO: 2.224463.

Total Project Cost = $ 38,691,830.00

Benefit / Cost Ratio = 2.22

MAP NUMBER 12I/05 DATA SHEET FILE NUMBER 4086

1. Site Identification:

River Basin: River of Ponds Site: S.3X

2. Location:

Lat. 50° 28' 40" Long. 57° 15' 15" Hydrologic Region 4

3. Hydrologic Data:

A = 690 km^2, MAR = 1300 mm, ACLS = 90 %

Storage Reservoir Area = 37 km^2

Storage Reservoir Vol, V = 74 $x10^6 m^3$

$$\text{Storage Factor} = \frac{V\ m^3}{MAR \times A\ km^2 \times 1000} = 0.08$$

Mean Flow, QAV = 28.4 m^3/s

Usable Flow Ratio = 0.87

Max. Turbinable Flow Ratio = 1.5

Flood Flow: Q150 = 480 m^3/s

Q1000 = 560 m^3/s

4. Site Data:

Rated Head = 61 m
Penstock Length = 300 m
Access Road Length = 0.5 km
Dam Height = 20 m
Distance to Town = 18 km
Installed Capacity = 21.1 MW

Plant Design Flow = 42.7 m^3/s
T.L. Line Length = 14 km
Dam Length = 850 m
Distance to Concrete Plant = 100 km

5. Remarks:

(i) Add for reservoir cleaning	$2,500,000
(ii) Add for Power & Forebay Canal	$5,700,000
(iii) Add for Bridge	$ 500,000
Total	$8,700,000