At least 60 days prior to construction of road sections, a map of a scale of not less than 20 chains to the inch, showing the location as laid out on the ground and a statement of road specifications and cost estimate will be submitted for consideration. Also specifications and estimates for all installation and facilities to be charged to the Forest Service through ledger cost allowance will be submitted to the District Forester for approval.

The same will apply for major bridges, though under this plan it is not expected any will be required in this first five year period.

2.2 PROVISION FOR REGENERATION

Under the clear cutting silvicultural system, sites will be prepared by logging in accordance with Cutting Permit conditions. Procedures will include the planning of cut priority, layout, marking of cutting boundaries, and submission of applications for Cutting Permits six months in advance listing volumes in proposed openings cruised in accordance with the Forest Service cruising manual. Openings will be assessed immediately following logging to determine what additional work is required to ensure that logged areas will be restocked. Plans and estimates for this additional work will be submitted for approval. The cost of the approved work, subsequent to logging and hazard abatement required by Part XI of the Forest Act will be submitted as a forestry cost. When artificial restocking is required, planting will be carried out by the licensee as directed by the District Forester either under separate Forest Service contract or through co-operative planning under forestry cost allowance.

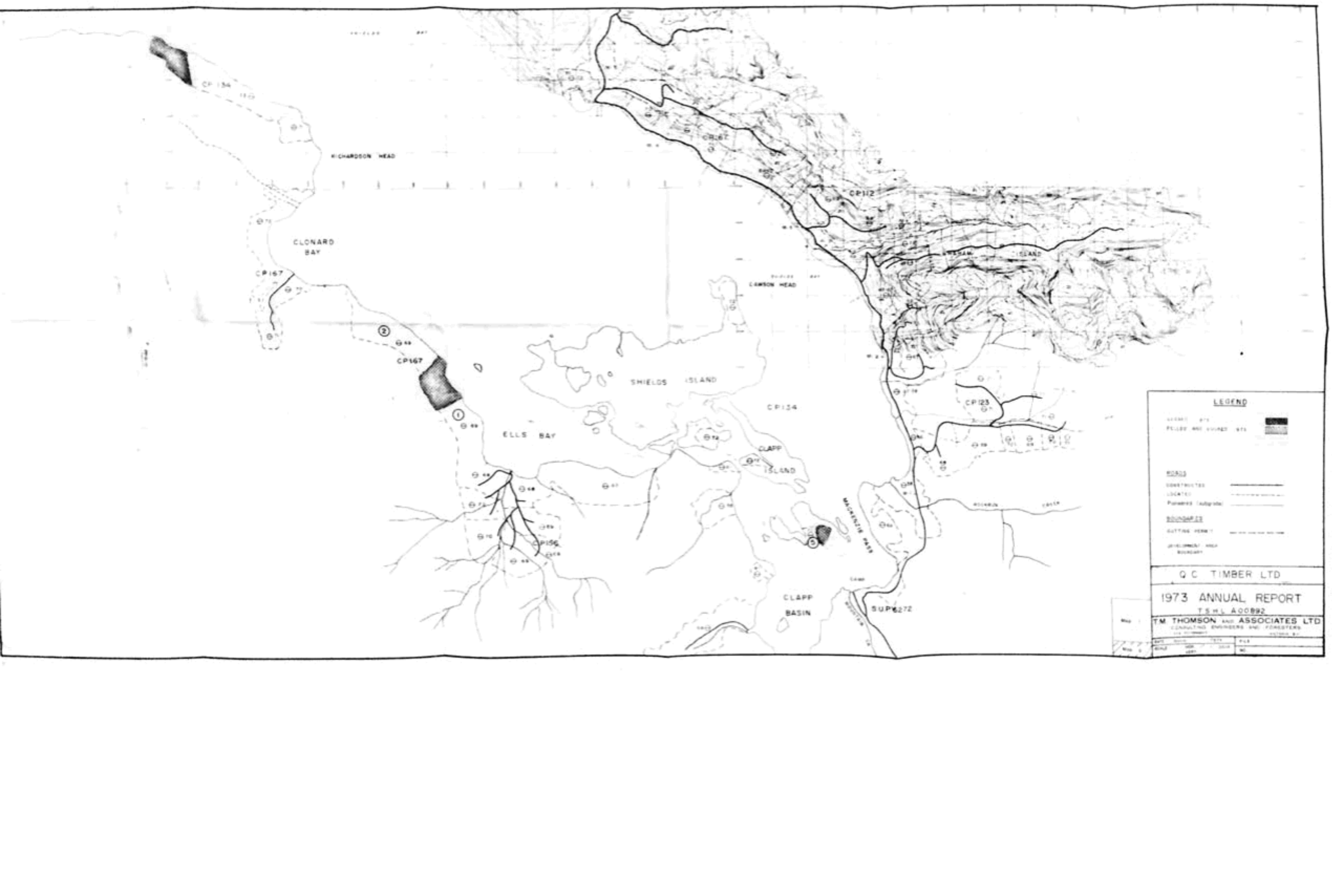
2.3 HARVESTING

High lead yarding by "A-frame" and portable steel spar along with lesser amounts of "cat" yarding shall be the logging method employed. Until 1972, skidders will be used to move the logs to water. After that time they will be replaced by loaders and trucks.

2.31 Cutting Budget

Present Annual Allowable Cut granted under Timber Sale Harvesting Licence A00892 document is 2,136 M cf. The allowable rate for the last three years of the five year cut control period ending in December 1971 is 2,728 M cf per year. On this basis the following cutting budget is established:

Year	Cutting Permit No.	Volume - M cf
1969	112	445
	123	449
	156	200
	167	1,639
Total for 1969		2,732


CP 134
RICHARDSON HEAD
CLONARD
BAY
CP167
CP167
SHIELDS ISLAND
CP134
ELLS BAY
CLAPP
ISLAND
MACKENZIE PASS
CLAPP
BASIN
S.U.P. 6272
DAWSON HEAD
CP112
CP123
LEGEND
ROADS
CONSTRUCTED
LOCATED
BOUNDARIES
CUTTING PERMIT
DEVELOPMENT AREA
BOUNDARY
Q.C. TIMBER LTD
1973 ANNUAL REPORT
T.S.H.L. A00892
T.M. THOMSON AND ASSOCIATES LTD
CONSULTING ENGINEERS AND FORESTERS

T. M. THOMSON and associates ltd.
CONSULTING ENGINEERS AND FORESTERS
1006 Government Street
Victoria, British Columbia
Telephone (604) 385-4468

March 15, 1974.

District Forester,
B.C. Forest Service,
Prince Rupert, B.C.

Dear Sir,

Re: Annual Report,
T.S.H.L. A00892.

We herewith submit our 1973 Annual Report for T.S.H.L. A00892.

We trust you will find this in order.

Yours very truly,

T.M. THOMSON AND ASSOCIATES LTD.,

Per:

G. Collins, R.P.F.

Q.C. TIMBER LTD.,

Per:

S. Suzuki, Vice President.

Encl.

ANNUAL REPORT FOR 1973

T.S.H.L. A00892

Q.C. TIMBER LTD.

1. LOGGING OPERATIONS

C.P. 134

Some 38 acres of felled and bucked on Blocks 1 and 5 were harvested in the early part of 1973 by A-frame.

C.P. 145

On Block 1 some 134 acres were harvested by high leading and grapple yarding. 39 acres of felled and bucked remain for early spring logging in 1974. A small volume of R/W wood was removed from Branch road 8 and 81 on Block 2.

Some 84 acres were harvested from Block 3, thus completing the logging on this area.

C.P. 167

39 acres of fire break timber between Areas 1 and 2 were harvested by A-frame. On the north side of Rennell Sound 82 acres of timber on Areas 7 and 8 were logged by high leading, leaving approximately 20 acres of felled and bucked to be harvested in 1974.

C.P. 168

Falling on C.P. 168 was curtailed after A-framing on this

area proved unsuccessful. At year end there was approximately 85 acres of felled and bucked.

It is now proposed to harvest this area with conventional high lead yarding equipment and truck haul the logs to the dump.

A road through the centre of the setting was located in 1973 and the falling boundaries have been extended to permit efficient high leading.

2. Road Construction

Mainline

Some 4 miles of mainline were completed extending from Riley Creek to Gregory Creek. This includes approximately 40 stations of road pioneered in 1972.

From Gregory Creek the mainline subgrade has been pioneered 1.3 miles up into Bonanza Creek.

C.P. 145

35 stations of subgrade on Branch 7 in Block 3 of C.P. 145 were surfaced.

On Branch 8, Block 2, 74 stations of road were completed. This includes some 19 stations of subgrade pioneered in 1972.

22 stations of road were completed on Branch 81, 18 of which were pioneered in 1972.

1974 ESTIMATED FORESTRY COST EXPENDITURES

T.S.H.L. A00892.

ITEM	COST
Reforestation	$ 2,000
Seed collection	500
Regeneration Surveys	3,000
Slash Burning (Landings only)	300
Development Plan and Reports	600
Development of Roads - Bonanza Mainline 1½	77,500
Estimated Expenditures	$83,900

52 stations of spur roads on Block 1 were completed during the year, 5 stations of which were pioneered in 1972.

3. Site Treatment

No site treatment programs were carried out on the area in 1973.

4. Forestry Costs

Forestry costs for 1973 for preparation of the Annual Report are: $450.00.

Forestry costs for 1973 for preparation of the second five year development plan are $2,500.

Forestry costs for preparation of the 1973 fire protection pre-organization report are $350.00.

TABLE 1

TIMBER SALE HARVESTING LICENCE .A00892.....

Annual Report Year ending 19.73.....

Cutting Permit No.	Map Reference No.	Total Acres Logged	Volume Billed Jan. 1-Dec. 31 (M c.f.)	Volume F & B at Dec. 31 (M c.f.)	Total Volume Cut (M c.f.)	Remarks
134	103 F 8 d	38	477.1	-	425.1	A-Frame
145	103 F 8 d	218	2431.3	444.6	2344.3	
167	103 F 8 d	39				A-Frame
		82				High Lead
			898.8	330.2	731.7	
168	103 F 8 d			591.9	-	
TOTALS		377	3807.2	1366.7	3501.1	

Approved by .....Licencee

.....Forester

March 14 .....19 74.....

TIMBER SALE HARVESTING LICENCE

Annual Report

A00892

Year ending 19..73.....

Road Construction Cost Summary

Description	Machine Type	Hrs.	Rate	Cost	Labour Cost	Material Cost	Transport Cost	Overhead Cost	Total Cost	Cost per Mile
Mainline	Napco Drill	1092	$27.06	$ 29,9550						
Constr. completed on 4 miles to Gregory Cr.	750 Amer.	Contract 210/Station		$ 50,360						
	Pacific Gravel Truck	1124	$19.95	$ 22,424		Powder $ 14,641				
	988 Loader	1381	$27.22	$ 37,591		Miscell. $ 5,209				
Subgrade Construction 1.3 miles	D-8Cat	457	$53.75	$ 24,564						
	D-9Cat	231	$34.45	$ 7,958						
	13-ACat Drill	303	$21.44	$ 6,496						
	Cat Grader	44	$24.69	$ 1,086						
	Contr. Truck			$ 22,130						
	Contr. Spread Cat			$ 25,229						
				$227,388	$ 4,320	$ 19,850		$ 12,095	$	

RANGER, R.D. #[redacted]

DISTRICT FORESTER
Prince Rupert, B.C.
V8J 1B8

August 15, 1978

Our File: TSHL A-00632

Q. C. Timber Ltd.
Suite 2100 - 1066 W. Hastings
Vancouver, B.C.
V6E 3X1

Dear Sirs,

This will acknowledge receipt of your 1977 Annual Report for TSHL A-00632 submitted under covering letter dated July 31, 1978.

We are reviewing your submission and you will be further advised in due course.

Yours truly,

J.D. Gooding

J.D. Gooding, R.P.F.
AREA FORESTER
for: A. C. MacPherson
DISTRICT FORESTER

JDG:dg
c.c. R.D., [redacted]2, Q.C.C. ATTN: Ranger Hansen - Attached is copy of report. May we please have your comments on Sec. 5.0 Forestry costs. Thanks.

T. M. Thomson & Associates Ltd.

THOMSON

1006 Government Street, Victoria, British Columbia V8W 1X7 Phone: (604) 385-4468 Telex: 049-7345

July 31, 1978

The District Forester,
B.C. Forest Service,
Market Place,
Prince Rupert, B.C.
V8J 1B9

Dear Sir,

Re: Annual Report
T.S.H.L. A00892 -
Rennell Sound

Enclosed for your approval and information are two copies of the 1977 Annual Report for T.S.H.L. A00892.

Please excuse our delay in submitting this report and do not hesitate to call us if you have any questions or comments.

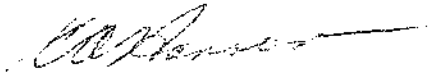
Yours very truly,

T.M. THOMSON & ASSOCIATES LTD.,

Per: 

W.A. Hopwood, R.P.F.

Q.C. TIMBER LTD.,

Per: 

C. Hanson,
General Superintendent.

WAH/mf

Encls.

1977 ANNUAL REPORT

T.S.H.L. A00892

Q.C. TIMBER LTD.

RENNELL SOUND

W.A. Hopwood, R.P.F.

1977 ANNUAL REPORT
T.S.H.L. A00892
Q.C. TIMBER LTD.

1.0 IMPROVEMENTS

1.1 Roads

No ledger roads were constructed in 1977.

The following non-ledger roads were built in 1977:-

Br. 8	(C.P. 151)	0.94 miles
Sp. 4	(C.P. 150)	0.09
Sp. 5	(C.P. 150)	0.10
Sp. 4-A	(C.P. 150)	0.06
Sp. 6-1	(C.P. 150)	0.11
Br. 13-1	(C.P. 150)	0.87
Br. 13-2	(C.P. 150)	0.21
Br. 13-3	(C.P. 150)	0.09
Br. 14-1	(C.P. 150)	0.06
Br. 14	(C.P. 150)	0.04
Br. 16	(C.P. 150)	0.21
Br. 16-2	(C.P. 150)	0.09
Br. 17	(C.P. 150)	0.09
Br. 18	(C.P. 150)	1.12
Br. 18-1	(C.P. 150)	0.08
Br. 18-2	(C.P. 150)	0.35
Br. 18-3	(C.P. 150)	0.08
Bonanza Mn.	(C.P. 150)	0.71
Br. 140	(C.P. 152)	0.26
Sp. 1	(C.P. 152)	0.14
Sp. 2	(C.P. 152)	0.12
Sp. 3	(C.P. 152)	0.02
Sp. 4	(C.P. 152)	0.09
Total		5.93 miles

These roads are all shown in red on the enclosed maps.

1.2 Bridges and Culverts

No major bridges or culverts were constructed in 1977.

2.0 Site Preparation

No site preparation work was undertaken in 1977.

3.0 Reforestation

No tree planting or regeneration survey projects were carried out in 1977. Most of the denuded areas in T.S.H.L. A00892 will be checked for natural regeneration in 1978. Brush threatened areas found to be Not Sufficiently Restocked will have a planting prescription done in 1978.

4.0 Denudation and Restocking Summary

See Table V.

5.0 Forestry Costs

Annual Report	$ 395
5-Year Development Plan*	3,848
Protection Pre-Organization Plan	212
Total Claimed	$4,455

*This cost includes planning, governmental liaison, drafting, stenography, supplies, telephone, etc.

SUMMARY OF DENUDATION AND RESTOCKING RECLASSIFIED TO DECEMBER 31, 1977

YEAR ENDING..1977...

DENUDED AREA BY YEAR OF DENUDATION - ACRES

ITEM		To 19.69	19.70	19.71	19.72	1973.	19.74	19...	19...	19...	Sub Total 19...
Acres denuded by C.P. (a)	112	96	-	-	-	-	-				
	123	58	24	140	-	-	-				
	134	-	-	25	117	38	-				
	145	-	-	-	-	218	126				
	146	-	-	-	-	-	16				
	147	-	-	-	-	-	124				
	156	38	-	-	-	-	-				
	167	126	159	94	74	121	-				
	168	-	-	-	-	-	16				
Total for T.S.H.L.		318	183	259	191	377	282				1,610
Adjustment (I) (b)											
Adjusted Total											
AREA RECLASSIFIED											
1. Non-Productive (c)		12	6	-	-	13	7				38
2. Natural stocked		268	153	39		98	124 (76)				682
3. Planted areas		-	-	-		-					
4. Seeded areas		-	-	-		-					
5. N.C.C.		-	-	-		-					
TOTAL RECLASSIFIED		280	159	39	-	111	131				720
DENUDED BALANCE		38	24	220	191	266	151				890

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.

(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).

(c) Rock, swamp, road surfaces, other non-forest areas.

SUMMARY OF DENUDATION AND RESTOCKING RECLASSIFIED TO DECEMBER 31, 19 77

TABLE V Page 2 of 2

YEAR ENDING..19..77.

DENUDED AREA BY YEAR OF DENUDATION - ACRES

ITEM	Page 1	1975.	19.76	19.77	19...	19...	19...	19...	19...	19...
Acres denuded by C.P. (a) 167		23	11	-						
168		164	-	-						
145		12	12	-						
146		113	76	-						
148		33	34	-						
149		110	54	60						
150		-	80	192						
151		-	-	53						
152		-	-	101						
Total for T.S.H.L.	1,610	443	267	406						2,776
Adjustment (I) (b)										
Adjusted Total										
AREA RECLASSIFIED										
1. Non-Productive (c)	38	19	10 (rd)	16 (rd)						83
2. Natural stocked	682	33	5	-						720
3. Planted areas	-	65	54	-						119
4. Seeded areas	-	-	-	-						-
5. N.C.C.	-	-	-	-						-
TOTAL RECLASSIFIED	720	117	69	16						922
DENUDED BALANCE	890	326	198	390						1,804

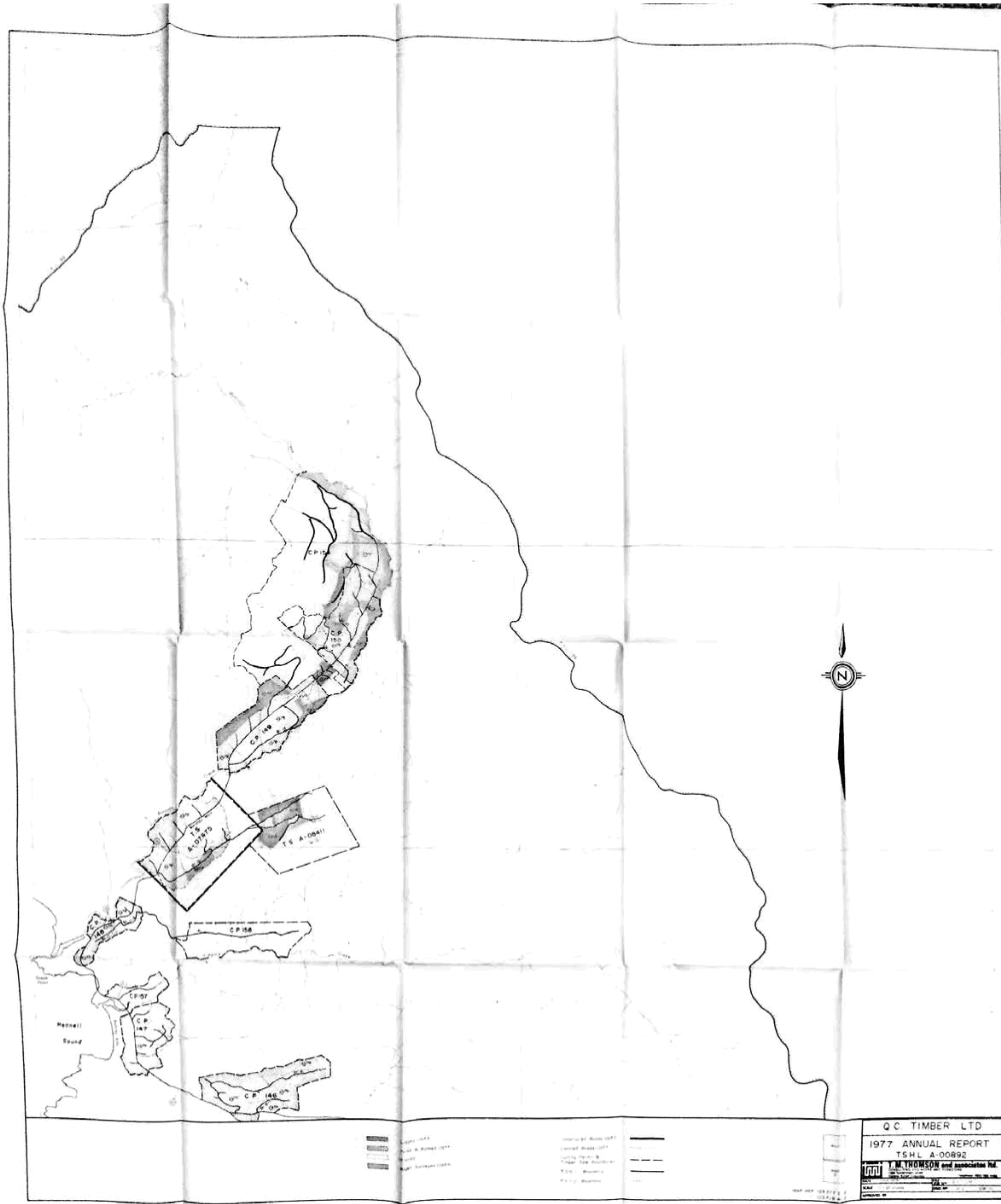
(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.

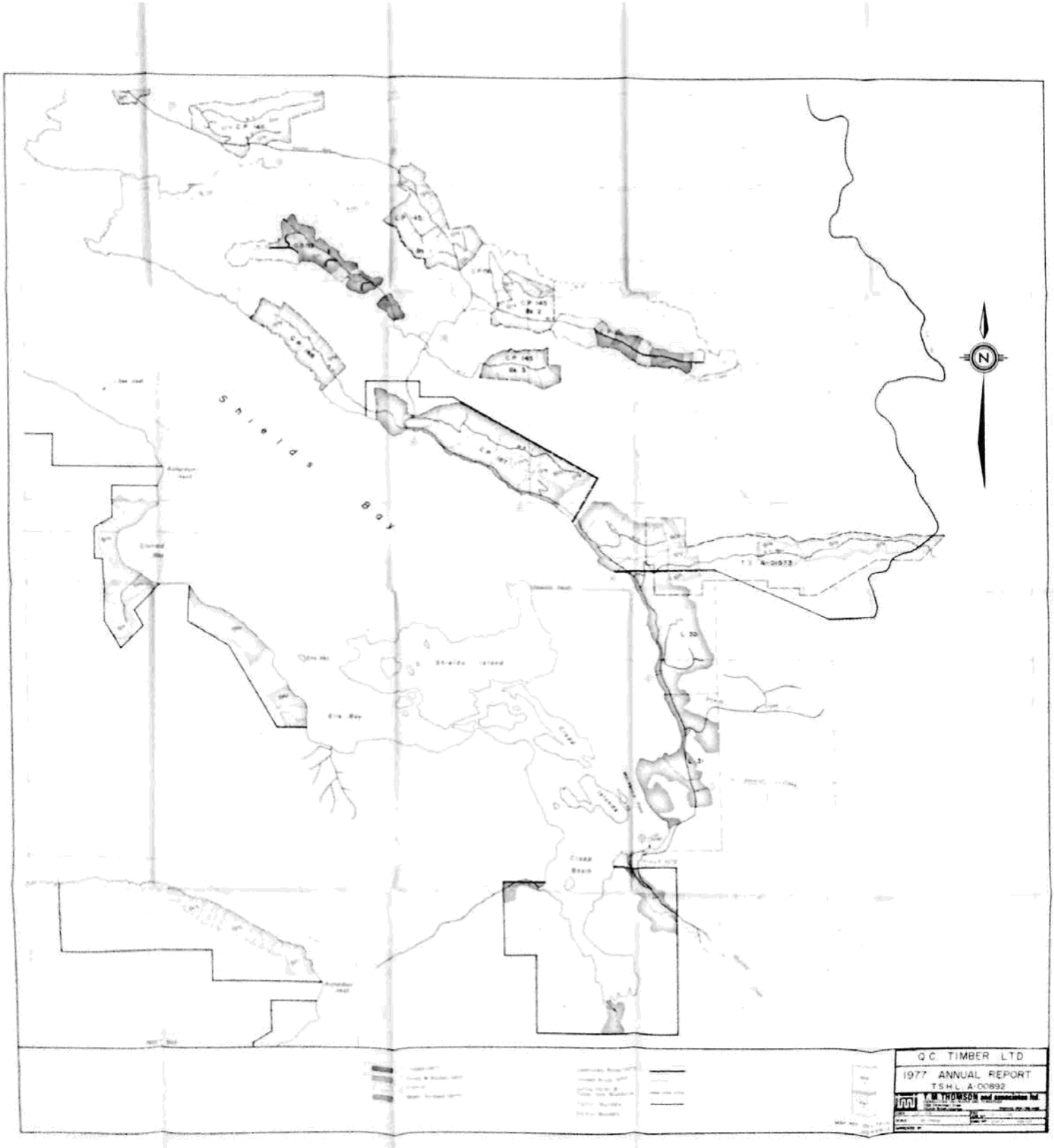
(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).

(c) Rock, swamp, road surfaces, other non-forest areas.

APPENDIX I

MAPS


C.P. 151
C.P. 150
C.P. 149
T.S. A-07875
T.S. A-08411
C.P. 148
C.P. 156
C.P. 157
C.P. 147
Rennell
Sound
C.P. 146
Q.C. TIMBER LTD
1977 ANNUAL REPORT
TSHL A-00892
T.M. THOMSON and associates ltd.
DATE
SCALE
APPROVED BY


Shields Bay
N
Q.C. TIMBER LTD
1977 ANNUAL REPORT
T.S.H.L. A-00892
Y.M. THOMSON and associates ltd.

THOMSON

T. M. Thomson & Associates Ltd.
Consulting Engineers and Foresters

1006 Government Street, Victoria, British Columbia V8W 1X7 Phone: (604) 385-4468 Telex: 049-7345

March 28, 1979

Our File No: 408

Regional Manager
B.C. Forest Service
Market Place
Prince Rupert, B.C.
V8J 1B9

Dear Sir

Re: 1978 Annual Report and Road Ledger - T.S.H.L. A00892

Enclosed for your information and approval are two copies of the 1978 Annual Report for T.S.H.L. A00892 at Rennell Sound. We trust you will find this in order.

You will note that there are three separate claims for ledger and stumpage offset roads:

(1) Gregory Main (Br. 11) - Since this road was built with approval into a block now denied from logging, we request a direct stumpage write-off in 1979 for the $92,838 claimed.

(2) Bonanza Mainline Revision - Since this revised road section is part of a ledger road and since it will improve the overall logging costs for numerous cutting permits, we submit our cost of $48,726 for inclusion in our road ledger.

(3) Storm Damage - Further to the Regional Manager's letter of February 27, 1979, we submit a claim of $127,155 for 1978 storm damage.

We acknowledge receipt of three letters dated February 6, 1979, which approve our 1975, 1976, and 1977 Annual Reports and which outline Development Ledger approved costs for the years 1969 to 1977. We

....2

note several discrepancies between our incurred costs and those approved by the Forest Service. These discrepancies amount to a considerable sum of money. The amounts of understated costs in the ledger are as follows:

(a)	Bonanza Main - 1973	$103,478
(b)	Rennell Sd. (Phantom) Rd. - 1974 & 75	40,939
(c)	Bonanza Main Relocation - 1975	5,191
(d)	Bonanza Cr. Bridges - 1975	6,809
(e)	Bonanza Main Resurfacing - 1976	31,574
(f)	Bonanza Main - 1976	18,432
	Total Difference	$206,423

We have attached hereto explanations of these reclaimed costs, which we respectfully request that you reconsider for inclusion in our Development Ledger. Due to the magnitude of these claims, we suggest that a Q.C. Timber - Forest Service meeting be arranged soon to thoroughly review these cost claims. At that time, we would be most happy to provide additional cost data or back-up explanations for whichever of these claims may still be in doubt.

We look forward to your reply and thank you for any time spent on these matters.

Yours very truly

T.M. THOMSON & ASSOCIATES LTD.

Per:

WAH:di

W.A. Hopwood, R.P.F.

Q.C. TIMBER LTD.

Per:

P. Pfister

cc: Mr. G. Marshall
Q.C. Timber Ltd.
Rennell Sound, B.C.

DEVELOPMENT LEDGER COST

DISCREPANCIES FOR 1969 - 1977

T.S.H.L. A00892

(a) Bonanza Main (1972 - 1974)

Your letter of February 6, 1979 (regarding approval of the 1975 Annual Report) approves road ledger costs for the Bonanza Main of $501,000 for the years 1972, 1973 and 1974. We wish to point out that our subgrade cost submission for miles 10.75 - 12.05 that was included in the 1973 Annual Report ($103,478) was not resubmitted in the 1974 Annual Report. We did not understand at that time that all road construction cost phases should be submitted altogether in the year of completion, not in the year incurred. This cost of $103,478 does not appear to have been considered anywhere in your ledger approvals to date. We request inclusion of this cost in our ledger. Detailed breakdown of cost components is presented in our 1973 Annual Report.

(b) Rennell Sound Road (Phantom) (1974 and 1975)

We note (again in your letter of February 6, 1979 outlining approved ledger costs for 1969 - 1975) that the approved costs for this road total $284,500 for 1974 and 1975; whereas our submitted actual costs total $325,439. We reiterate our claim for this difference of $40,939 and reproduce below our cost breakdown of June, 1975 for this road to back-up this claim. Attached is a letter and table from Q.C. Timber's Mr. Peter Pfister (dated September 29, 1975) that reaffirms the critical claim for the amount of ballast used in this road's construction.

Q.C. TIMBER LTD.

ACCESS ROAD TO QUEEN CHARLOTTE CITY

JUNE 30/75

1. R/W Clearing:

100' width felled for 3.4 miles or 180 stations. Merchantable logs are the property of McMillan Bloedel Ltd.,

Costs: Contract cost @ $75.00/station $ 13,500.00

2. Sub-Grade

Equipment: American 750 Grade Shovel
D 8 Cat
D 7 Cat
Napco Drill
Midi Drill
Skidder

Costs:	American Shovel - Contract	
	$200.00/station or $35.00/hr.	$ 42,821.00
	D 8 Cat - Sub-Grade	
	271 hours @ $53.03	14,363.00
	D 7 Cat - Sub-Grade	
	64 Hours @ $39.79	2,560.00
	Napco Drill - Slashing	
	172 Hours @ $39.79	6,775.00
	Midi-Drill - Slashing	
	155 hours @ $41.43	6,421.00
	Skidder - Grubbing - Cont.	
	44 hours @ $25.00	1,106.00
	Powder	3,636.00
		$ 77,682.00

3. Surfacing:

Equipment:
Scott Cont. - 1 Truck
Napco Drill
Co. Truck - Pacific
King Cont. - 2 Trucks
D 9 Cat
McKay Cont. - 1 Truck
Midi Drill
D 8 Cat
D 7 Cat
966 Loader
Skidder

Costs:	Rock Haul & Spreading:	Hrs.	Per Hr.	$
	Scott - 16 yd. rock box	877	24.00	21,048.00
	McKay - 16 yd. rock box	587	24.00	14,088.00
	King - 16 yd. rock box	62	24.00	1,488.00
	Co.Truck16 yd. rock box	573	28.61	16,392.00
	D 7 Cat - Scott	88	22.00	1,936.00
	D 7 Cat - Co.	660	39.79	26,261.00
	Rock Costs:			
	Napco Drill	763	38.44	29,328.00
	Midi Drill	527	37.76	19,901.00
	966 Loader	873	30.14	26,315.00
	Powder			23,978.00
				180,735.00

4. Culverts: 11 only 18" - 24" x 40' pipe culvert
18 only cedar culverts

Costs:	Labour 226 hours @ 7.84	$ 1,772.00
	D 8 Cat 66 hours @ 53.03	3,499.00
	D 7 Cat 160 hours @ 39.79	6,366.00
	American Shovel (contract incl. in sub-grade cost)	
	Materials: Pipe	2,878.00
	Other	2,283.00
		$ 16,798.00

Summary:	Falling R/W	$ 13,500.00	$ 3,971.00	Per Mile
	Sub-Grade	77,682.00	22,847.00	Per Mile
	Surfacing	180,735.00	53,157.00	Per Mile
	Culverts	16,798.00	4,940.00	Per Mile
	Phantom Cr. Bridge (See 1974 Annual Rep)	7,139.00	-	-
	Transportation, Supervision & O/H. @ 10%	29,585.00	-	-
		$325,439.00	$95,717.00	Per Mile

Q. C. Timber Ltd.

SUITE 1356-200 GRANVILLE ST., VANCOUVER, B.C., CANADA V6C 1S4 Telephone: (604) 689-1731 Telex 04-508

September 29, 1975

T.M. Thomson & Associates
1006 Government Street
Victoria, B.C.
V8W 1X7

ATTENTION: Mr. T. M. Thomson

Dear Sir:

RE: Q. C. Access Road

Enclosed is a copy of the schedule I have prepared, showing the number of loads of Ballast hauled to surface the Q. C. access road. We have hauled a total of 4,560 loads during 1974 and 1975. At 15 Cu. yards per load this works out to 68,400 Cu. yards of Ballast for the 3.4 miles of road constructed by Q. C. Timber Ltd.

Individual daily time tickets are made out by each driver and are approved by the Road Foreman or Superintendent. These tickets are filed at our Rennell Sound Camp and are available to Mr. Mirza at any time along with any other records he may wish to look at.

Would you kindly pass on the enclosed information to Mr. Mirza together with any comments you may wish to make.

I hope that this will help to resolve this matter in the near future.

Yours truly,

Q. C. TIMBER LTD.

P. Pfister

PP/mf
Enclosure

Timber Ltd.

Ballast Hauled - G.C. Access Road

Page 1 of 4

1974		Number of Loads Hauled - G.C. Access Road: Co. Truck Loads	Scott Trucking Loads	Total Loads
May	27	-	27	27
	28	-	19	19
	29	-	15	15
	30	-	25	25
	31	15	11	26
June	3	11	18	29
	4	2	-	2
	5	16	15	31
	6	20	20	40
	7	10	9	19
	8	16	16	32
	9	8	10	18
	10	1	17	18
July	15	-	13	13
	16	-	12	12
	17	-	20	20
	18	-	13	13
	19	-	18	18
	20	18	-	18
	21	-	-	-
	22	13	16	29
	23	13	15	28
	24	13	15	28
	25	10	9	19
	26	12	16	28
	27	20	14	34
	28	-	-	-
	29	17	15	32
	30	8	15	23
	31	-	9	9
August	5	14	15	29
	6	16	14	30
	7	14	-	14
	8	9	-	9
	9	14	13	27
	10	8	9	17
	11	-	-	-
	12	12	14	26
	13	14	14	28
	14	14	14	28
	15	12	14	26
	16	7	-	7
	17	-	-	-
	18	11	9	20
Totals		368	528	896

1974	Number of Loads Hauled: B.C. Access Road — Co. Truck Loads	Scott Trucking Loads	McHan Truck Loads			Total Loads
Forward	268	528	-			796
August 19	15	15	-			30
20	16	7	-			23
21	15	15	-			30
22	15	14	-			29
23	14	14	-			28
24	15	15	-			30
25	-	-	-			-
26	3	-	-			3
27	15	11	16			42
28	15	14	15			44
29	12	12	12			36
30	15	15	15			45
31	16	17	17			50
Sept. 2	13	19	19			51
3	16	14	12			42
4	14	17	17			48
5	12	14	17			41
6	28	-	-			28
7	17	-	-			17
24	-	15	19			34
25	-	32	30			62
Oct. 1	-	14	14			28
2	-	20	20			40
3	-	31	31			62
4	-	22	23			45
5	-	20	20			40
6	-	-	-			-
7	-	24	24			48
8	-	-	-			-
9	-	22	21			43
10	-	18	20			38
11	-	19	31			50
12	-	10	14			24
13	-	-	-			-
14	20	-	-			20
15	9	-	-			9
16	25	-	-			25
17	45	-	-			45
18	30	-	-			30
19	23	-	-			23
31	-	19	19			38
Nov. 1	-	14	12			26
2	-	-	5			5
TOTAL:	790	1021	943			2254

Number of Loads Hauled - G. C. Access Road

1975		Co. Truck Loads	Scott Truck'g Loads	McKay Truck'g	R. Ling & Sons Loads	Total Loads
Forward		852	1580	883	59	2374
Mar.	4	-	17	17		34
	12	-	29	31		70
	13 / 20	- / -	29 / 23?	31		60 / 37
April	1	-	25	25		50
	2	-	-	11		11
	21	-	16	-		16
	22	-	23	16		39
	23	-	20	17		37
	24	-	12	14		26
	25	14	15	15		44
	26	13	15	15		43
	28	3	14	14		31
	29	18	12	13		43
	30	12	19	16		47
May	1	12	19	16		47
	2	12	15	17		44
	3	10	-	13		23
	5	-	19	18		37
	6	-	9	11		20
	8	-	7	18		25
	13	-	18	21		39
	14	-	36	29		65
	15	-	31	25		56
	16	10	16	18		44
	17	12	18	15		45
June	23	17	17	23		57
	24	21	22	22		65
	25	17	5	19		41
July	-	-	-	-		-
August	-	-	-	-		-
Totals		1023	2095	1383	59	4560

Summary:
- All Trucks Are Equipped With 16 Yard Rock Boxes.
- Estimate An Average of 15 Yards Per Load.

4,560 Loads @ 15 Yards = 68,400 Yards of Ballast Hauled To Surface G.C. Access Road.

(c) Bonanza Main Relocation (1975)

We reiterate our claim of $34,191 incurred in the re-location work on Miles 5.70 - 5.88 of this road. Your approved cost of $29,000 (again in your letter of February 6, 1979) is substantially below our 1975 incurred cost which we restate below:

Bonanza M/L Re-location Near Mile 6		
R/W falling	$ 382	
R/W clearing	541	
Excavation (equipment)	2,615	
Helper (swamper)	583	
Borrow material in place (quarried rock hauled)		
7,356 yd^3 @ $3.62/$yd^3$	26,629	
Culvert	333	
Engineering & supervision	3,108	
Total		$ 34,191

(d) Bonanza Creek Bridges (1975)

We note that your approved cost of $54,740 for 1975 is well below our incurred cost of $61,549. We request that you reconsider our claim, which is detailed below along with notes explaining why the actual cost was somewhat higher than the original estimate.

C.P. #189 (System Road) Cost 1975.

1.	Bonanza Creek Bridges		
1.1	Labour		$ 6,837
1.2	Rock fill (approaches)		
	Quarried rock, hauled 1.2 miles to site cost in place.		
	8,712 yd^3 @ $4.10		35,719
1.3	Equipment		
	Grade shovel @ $41/hr	$ 6,538	
	D-8 grade cat @ $46/hr.	1,470	
	Skidder (yarding) @ $34.60/hr	3,794	11,802
1.4	Material Cost		1,596
1.5	Basic Cost		$55,954
1.6	Engineering & Supervision (10%)		5,595
1.7	Total cost		$61,549

NOTE 1: Reason for Cost Increases

- Haul distance increased by 0.7 mile due to poor quality of rock in original pit.
- Cost increases on equipment.

2: Decking and ties are cut at camp, cost is included in equipment and labour.

(e) Bonanza Main Resurfacing (1976)

Your letter of February 6, 1979 (approving our 1976 Annual Report) rejects our ledger claim of $31,574 for resurfacing 4.5 miles of the Bonanza Main in 1976. We hereby apply to have this claim reconsidered. Attached is a copy of the 1976 letter requesting permission for this project and outlining the expected costs. (N.B. Our claimed cost is about 10% higher than the original estimate because supervision costs were left out.) We point out that our actual cost for this project was $48,398, but we only claimed those costs which were extraordinary in nature; i.e., costs not associated with normal maintenance. We stress that this work went beyond normal maintenance practice and that it provided exceptional benefit to operating costs for numerous cutting permits. We are unable to see where a cost of this magnitude has been provided for in road maintenance phases in appraisals and/or reappraisals for 1976, nor in subsequent years.

Q.C. Timber Ltd.

SUITE 1356-200 GRANVILLE ST., VANCOUVER, B.C., CANADA V6C 1S4 Telephone: (604) 689-1731 Telex: 04-5

The District Forester
B.C. Forest Service
Prince Rupert Forest District
Prince Rupert, B.C.

June 11, 1976

Dear Sir:

Re: Capping of Bonanza Main Haulroad from Mi. 6.5 to Mi. 11.

The Bonanza Main haulroad between mile 6.5 and mile 11.0 was built in 1972 and 1973. Due to the nature of the available rock, the heavy loads and adverse weather conditions there is no material left for the grader to work with. Ground conditions also caused the road to "hydraulic" in some areas.

We propose to cap the road with shale rock and fill the dips caused by hydraulicing at the same time.

The volume of material required for filling and capping is 6" X 18' X 4.5 mi. = 7,920 cu.yards.

Estimated average haul distance is 4.0 miles.

Average turn - around time is:

Loading	3 min.
Hauling (8 mi. round-trip @ 20MPH)	24 min.
Unloading and turn-around	3 min.
Total	30 min.
Loads per day per truck	16

Rock Cost:

Quarried rock loaded on truck (7920cu.yd. X $2.04) $16,160.00

Hauling Cost:

Using 3 trucks production is (16X3X15) = 720cu.yd./day
Cost is ($33.00 X 8 X 3) = $720.00/day
Unit cost is (792 ÷ 720) = $1.10/cu.yd.
Hauling cost (7,920 X 1.10) = 8,710.00

Spreading Cost:

D7 cat ($43.00 X 8) = $344.00/day
Unit cost is (344÷720) = $.48/cu.yd.
Spreading cost is (7,920 X.48) = $ 3,800.00

Total cost $28,670.00

We propose that the cost of $ 28,670.00 for re-capping this road be included in the annual report for 1976 and added to the road ledger account.

Your favourable consideration of this application is appreciated.

Yours truly,
Q.C. Timber Ltd.

C.A. Hanson
Superintendent

(f) Bonanza Mainline (1976)

Your letter of February 6, 1979 (approving our 1976 Annual Report) approves a cost of $85,000, versus our claim of $103,432, for the Bonanza Main sections constructed in 1976. No reasons for this reduction are given, so we are unable to put forward any rebuttal herein. We are prepared to supply you with any additional information, if there is something you lack to clearly understand our claim for this road.

1978 ANNUAL REPORT

T.S.H.L. A00892

Q.C. TIMBER LTD.

RENNELL SOUND

MARCH 1979

W.A. HOPWOOD, R.P.F.

1978 ANNUAL REPORT
T.S.H.L. A00892
Q.C. TIMBER LTD.

1.0 IMPROVEMENTS

1.1 LEDGER ROADS

Table I (3 parts) outlines ledger (or stumpage off-set) road costs incurred in 1978 under the following three categories:

a) Gregory Main (Branch 11)- Q.C. Timber Ltd. has, with approval, constructed 68.70 stations of the Gregory Main with the understanding that logging would be allowed on proposed C.P. 158. Since logging on this block has been refused, and since recovery of construction costs through the normal stumpages appraisal system may not ever be possible, we feel that this cost should be recovered through direct stumpage write-off. Any future use of this section of road would not alter the validity of this present offset claim, since the road would then be in use as a development road. You will note that our claimed costs in Table I are somewhat higher than those estimated in the original cutting permit application for C.P. 158. This is mainly due to the unexpected need for an extra foot of surfacing material that brought ballasting depth to four feet.

b) Bonanza Mainline - Since this revision to the mainline provides for overall reduced hauling costs for numerous cutting permits and since it provides a better approach to the dryland sort for virtually every cutting permit, this section of mainline development road is hereby submitted as a ledger cost item.

c) 1978 Flood Damage - Further to your letter on this subject of February 27, 1979, we outline in Table I our repair costs for our stumpage offset roads resulting from storm damage in November - December 1978. Damage repairs are not yet completed. These costs were incurred by restoring these roads to pre-disaster condition and were not covered by insurance.

1.2 NON-LEDGER ROADS

The following non-ledger roads were built in 1978:

C.P. 149	Spurs	0.32 miles
C.P. 157	Gregory Main Lower	0.05
C.P. 150	Br. 18-3	0.14
	Br. 18-4	0.31
	Br. 18-5	0.49
	Br. 18-7	0.17
	Br. 18	0.62

C.P. 152	Br. 140	0.27
C.P. 151	Br. 8	0.22
	Br. 8-5	0.11
	Br. 8-4	0.31
	Br. 8-3	0.16
	Br. 8-2	0.12
	Br. 8-1	0.09
	Total	3.38 miles

All roads (ledger, non-ledger) constructed in 1978 are shown in red on the enclosed maps.

1.3 BRIDGES AND CULVERTS

No major bridges or culverts were constructed in 1978.

2.0 SITE PREPARATION

No site preparation work was undertaken in 1978.

3.0 REFORESTATION

The tree planting planned for C.P.'s 150 and 151 in 1978 was postponed until the Spring of 1979 due to the lack of a suitable contractor at a reasonable cost.

C.P.'s 149, 150 and 151 were assessed for planta-

bility in 1978, but other planned regeneration surveys were postponed until the Spring of 1979 to be done in conjunction with the planting.

Cone crop assessment was carried out in 1978, but no species had a pickable crop.

4.0 DENUDATION AND RESTOCKING SUMMARY

See Table V.

5.0 FORESTRY COSTS

Annual Report	$ 415
5-Year Development Plan	2,951*
Protection Pre-organization Plan	220
Reforestation - Assessing plantability; regen. survey and planting plan proposals	581
- Assessing cone crop	250
- Sowing request and 5-year seedling needs report as requested by B.C.F.S.	150
Total Forestry Costs Claimed	$4,567

*This relatively high cost is the result of the numerous revisions and meetings requested by the various governmental agencies.

TABLE I (a) - Complete either part (a) or (b)

TIMBER SALE HARVESTING LICENCE..A00892........ ANNUAL REPORT

YEAR ENDING....19.79...

ROAD NAME OR NUMBER .Gregory Main (Br. 11)........

ROAD CLASS ....4................(If different from standard F.S. Clauses, append table of specifications).

SECTION: STATION..20+00......to STATION..88+70 (68+70 sta.)

or MILE..0.38.......to MILE..1.68 (1.30 mile)

PHASE OF CONSTRUCTION	UNIT	QUANTITY	UNIT PRICE	SUBTOTAL	TOTAL
Clearing & grubbing	included in subgrade				
Roadway and drainage * excavation: Solid Rock — Subgrade Other Material (Specify type)	Cu. bank yds. " " "	per 100 ft.	$501.	34,415	$ 34,415
Surfacing: Loading — Haul & spread Spreading Hauling First mile — Quarrying Second mile — Total	Cu. bank yds. " " " Cu. bank yds. " " "	21,690 yd. 21,690 yd.	$1.32 $2.09 $3.41	$28,630 $45,332	$ 73,962
Metal or Wood Stave or wood Culverts (Materials and installation) 12" 18" 24" etc.	Lineal ft. " " " "	included in subgrade			
Transportion: Equipment	miles				$ 243
Overhead & Supervision	Lump Sum				$ 12,069
TOTAL ALL COSTS					$120,689
COST PER MILE					$ 92,838

* Total subgrade cost includes clearing and grubbing, roadway and drainage excavation, materials and installation of culverts.

TABLE I (b)-Complete either part (a) or (b)

TIMBER SALE HARVESTING LICENCE A02892 ANNUAL REPORT YEAR ENDING.....1978...

ROAD NAME OR NUMBER..Bonanza Main...........

Section: Station............to Station............ or Mile...4.8......to Mile...5.4......

ROAD CONSTRUCTION COST SUMMARY

ROAD CLASS....4............(If different from standard F.S. classes, append table of specifications)

PHASE OF CONSTRUCTION	MACHINE COST				LABOUR COST			MATERIAL		TRANSPORTATION COST			Overhead & Supervision	TOTAL COST	COST PER MILE
	Machine Used	No. of Hours	Rate / Hour	Total Machine Cost	Man Hrs.	Rate / Hour	Total Labour Cost	Materials used	Total Cost	No. of Miles	Rate / Mile	Total Cost			
Clearing & grubbing *	245 Cat backhoe	89	$96.20	$8,562		included		included			included		$ 856	$ 9,418	$18,836
Grade Construction: Rock Other Material	Mid.-drill	11.2	$97.50	$1,092		included		included			included		$ 109	$ 1,201	$ 2,402
Surfacing: Loading) Spreading) Hauling) 1 mile 2 mile 3 mile	D8 Cat 16 Yd.DT.	37 215	$94.25 $37.00	$3,487 $7,955		included		5,370 yd.	$23,203		included		$3,462	$38,107	$76,214
Metal or Wood Stave or Wood Culverts by Diameter	included above					N/A		N/A			N/A		N/A	–	–

* To be exclusive of cost of logging merchantable timber on R/W.
* Gravel & rock quarry pits to be included separately.

Totals: $48,726 $97,452

TIMBER SALE HARVESTING LICENCE A00892 ANNUAL REPORT

TABLE I (b)-Complete either part (a) or (b)
YEAR ENDING.....19..78...

Section: Station............to Station............
or Mile............to Mile............
VARIOUS SECTIONS - STORM DAMAGE REPAIRS

ROAD CONSTRUCTION COST SUMMARY

ROAD NAME OR NUMBER...Bonanza Main.........
ROAD CLASS.....4...........(If different from standard F.S. classes, append table of specifications)

PHASE OF CONSTRUCTION	MACHINE COST				LABOUR COST			MATERIAL		TRANSPORTATION COST			Overhead & Supervision	TOTAL COST	COST PER MILE
	Machine Used	No. of Hours	Rate / Hour	Total Machine Cost	Man Hrs.	Rate / Hour	Total Labour Cost	Materials used	Total Cost	No. of Miles	Rate / Mile	Total Cost			
Clearing & grubbing *	RT skidder	5.4	$31.50	$ 170	928	[illegible]	[illegible]			helicopter +		$2,381	$1,291	$ 13,122	N/A
Grade Construction: Rock Other Material	175 Clarke FEL 245 Cat backhoe MF 80 backhoe	128 292 210	$83.50 $96.20 $33.00	$10,686 $28,091 $ 6,930				2,930 cu. yd.	$12,656	lowbed		$ 162	$6,387	$ 64,913	N/A
Surfacing: Loading Spreading D65 Hauling D155 1 mile 2 mile 3 mile	Cat 14G Grader Komatsu Komatsu 16 yd.DT	149 217 133 249	$64.00 $45.00 $94.25 $37.00	$ 9,536 $ 9,765 $12,535 $ 9,213					$3,238				$4,833	$ 49,120	N/A
Metal or Wood Stave or Wood Culverts by Diameter		included	above			included above		included	above		N/A		included above	-	-

* To be exclusive of cost of logging merchantable timber on R/W.
* Gravel & rock quarry pits to be included separately.
+ To evaluate damage and reach isolated equipment.

Total: $127,155 N/A

THOMSON

I.M. Thomson & Associates Ltd.

SUMMARY OF DENUDATION AND RESTOCKING RECLASSIFIED TO DECEMBER 31, 1978

TABLE V Page 1 of 2

YEAR ENDING..19.78..

DENUDED AREA BY YEAR OF DENUDATION - ACRES

ITEM.		To 1969..	19.70	1971.	19.72	19.73	19.74	19...	19...	19...	Sub-total 19...
Acres denuded by C.P. (a)	112	96	-	-	-	-	-				
	123	58	24	140	-	-	-				
	134	-	-	25	117	38	-				
	145	-	-	-	-	218	126				
	146	-	-	-	-	-	16				
	147	-	-	-	-	-	124				
	156	38	-	-	-	-	-				
	167	126	159	94	74	121	-				
	16[illegible]	-	-	-	-	-	16				
Total for T.S.H.L.		318	183	259	191	377	282				1,610
Adjustment (I) (b)											-
Adjusted Total											
AREA RECLASSIFIED											
1. Non-Productive (c)		12	6	-	-	13	7				38
2. Natural stocked		268	153	39		98	124 (76)				683
3. Planted areas		-	-	-		-					
4. Seeded areas		-	-	-		-					
5. N.C.C.		-	-	-		-					
TOTAL RECLASSIFIED		280	159	39	-	111	131				720
DENUDED BALANCE		38	24	220	191	266	151				890

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.
(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).
(c) Rock, swamp, road surfaces, other non-forest areas.

SUMMARY OF [illegible] RECLASSIFIED TO DECEMBER 31, 1978

TABLE V Page 2 of 2

[illegible] AREA BY YEAR OF DENUDATION - ACRES

YEAR ENDING..19.78..

ITEM	Page 1 to 19...	19..	19..	1977.	1978.	19...	19...	19...	19...	TOTALS 19...
Acres denuded by C.P. (a) [illegible] 15		[illegible] - - - - -	[illegible] - - - -	- - - - - 60 192 53 101 -	- - - - - 20 399 46 10 30					
Total for T.S.H.L.	1,61[illegible]	443	267	406	505					3,231
Adjustment (I) (b)										-
Adjusted Total										
AREA RECLASSIFIED										
1. Non-Productive (c)	38	19	10 (rd)	16 (rd)	24 (rd)					107
2. Natural stocked	661	33	6	-	-					72[illegible]
3. Planted areas	-	65	54	-	-					119
4. Seeded areas	-	-	-	-	-					-
5. N.C.C.	-	-	-	-	-					-
TOTAL RECLASSIFIED	72[illegible]	117	69	16	24					946
DENUDED BALANCE	89[illegible]	3[illegible]	198	390	481					2,295

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.
(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).
(c) Rock, swamp, road surfaces, other non-forest areas.

ATTACHMENT NO. 5

ENGINEERING DEVELOPMENT DATA

Road Construction

Description and Cost Estimates

1. Summary

Br. No.	Sta.	Mile	Cost/Sta.	Cost/Mi.	Totals
11	82.7	1.56	$ 1,281	$ 67,653	$105,964
11-7	21.5	0.40	$ 1,436	$ 75,830	$ 30,878
11-9	5.2	0.10	$ 1,295	$ 68,376	$ 6,734
11-9A	6.9	0.13	$ 1,241	$ 65,525	$ 8,563
11-10	1.5	0.03	$ 1,241	$ 65,525	$ 1,861.5
11-11	5.6	0.11	$ 1,291	$ 68,159	$ 7,229
Total	123.4	2.33	$ 1,307	$ 69,197	$161,229.5

Therefore Development Cost is:

18,888 Ccf for $161,229.5 = $8.54/Ccf

Road Construction Specifications

- R/W costs included in logging costs
- Stumpage costs included in subgrade costs
- Subgrade - clearing width 60'
  - road width 16'
  - ditch depth 1'
  - turnout every 700' or within sight distance
  - grades - max. favourable 20%
    - max. adverse 10%
  - switchbacks - min. radius 60'
  - equipment - 3 - 12 yd^3 trucks
    - D7 Spread Cat
    - 600 cfm tank drill
    - Cat 245 backhoe
  - road equipment and crew work 8 hr. day
- culverts - metal where practical, otherwise local material
- ballast - yardage/sta. will vary with soil conditions

Calculation for Cost of Ballast

Quarry

- 600 cfm tank drill + 2 men @ $97.50/hr.	=	$ 780/day
- 600 lb. explosives @ $1/lb. (incl. caps, B-line, fuse, etc.)	=	600/day
Total Cost		$ 1,380/day
- Estimated production is 650 yd^3/day		
Therefore cost/yd^3 = $1,380/650	=	$ 2.12/yd^3

Load, Haul and Spread

- 966 F.E.L. @ $58.50/hr.	=	$ 468/day
- 3 trucks (12 cu.yd.) @ $302/day/truck	=	$ 906/day
- Spread Cat D7 @ $72.50/hr.	=	$ 580/day
Total Daily Costs		$ 1,954/day

Daily Production

Average Haul = 2.25 mile (round trip)

- Average haul speed		10 m.p.h.
- Travel time		13.5 min/trip
- Loading time		3 min/trip
- Turn and dump		3 min/trip
- Turn in pit		1 min/trip
- Wait in turnout		2 min/trip
Total		22.5 min/trip
	=	2.6 trips/hr/truck

Therefore production/day for 3 trucks (12 cu.yd. each) @ 2.6 trips/hr/truck = 7.8 trips/hr x 12 yd^3 = 93.6 yd^3 x 8 hr. = 749 yd^3/day

Cost/yd^3 = 1,650/749 = $2.2

Total Cost of ballast/yd^3 = Quarry $ 2.12
Load, Haul, Spread $ 2.20
Total $ 4.32

Br. 11 sta.6+00 - 88+70 (82.7 sta)

(a) sta 6+00 - 80+00 (74.0 sta)

- subgrade - sideslopes ± 30% average terrain	
- material sand and silt	
- estimated production 2 sta/day	
- Cat 245 @ $754/day @ 2 sta/day =	$ 377/sta
- culverts - 8 @ $280 each	$ 30.2/sta
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	$ 864.0/sta
- total cost/sta 6+00 - 80+00 (74.0 sta)	$1,271.2/sta
- total cost $ 6+00 - 80+00 (74.0 sta)	$94,069
- total cost/mi 6+00 - 80+00 (74.0 sta)	$67,119

(b) sta 80+00 - 88+70 (8.7 sta)

- subgrade - sideslopes - 50% average terrain	
- material sand and silt	
- estimated production 1.7 sta/day	
- Cat 245 @ $754/day @ 1.7 sta/day	$ 443.5/sta
- culverts - 2 @ $280 each	$ 59.7/sta
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	$ 864/sta
- total cost/sta 80+00 - 88+70 (8.7 sta)	$1,367.2/sta
- total cost $ 80+00 - 88+70 (8.7 sta)	$11,895
- total cost/mi 80+00 - 88+70 (8.7 sta)	$72,188

Therefore weighted average Br. 11 (82.7 sta)

- total cost/sta	$ 1,281
- total cost $	$105,964
- total cost/mile	$ 67,653

Br. 11-7 sta. 0+00 - 21+55 (21.5 sta)

(a) sta 0+00 - 12+50 (12.5 sta)

- subgrade - sideslopes ± 5% average terrain
  - material sand and silt
  - estimated production 2 sta/day
  - Cat 245 @ $754/day @ 2 sta/day = $ 377/sta
- culverts - 1 @ $280 22.5/sta
- ballast - 200 yd^3/sta @ $4.32/$yd^3$ 864/sta
- total cost/sta 0+00 - 12+50 (12.5 sta) $ 1,263.5/sta
- total cost $ 0+00 - 12+50 (12.5 sta) $15,794
- total cost/mi 0+00 - 12+50 (12.5 sta) $66,713

(b) sta 12+50 - 21+55 (9.0 sta)

- subgrade - sideslopes ± 10% average terrain
  - material swampy
  - estimated production 1.5 sta/day
  - Cat 245 @ $784/day @ 1.5 sta/day $ 503/sta
- culverts - 3 @ $280 93/sta
- ballast - 250 yd^3/sta @ $4.32/$yd^3$ 1,080/sta
- total cost/sta 12+50 - 21+55 (9.0 sta) $ 1,676/sta
- total cost $ 12+50 - 21+55 (9.0 sta) $ 15,084
- total cost/mi 12+50 - 21+55 (9.0 sta) $ 88,493

Therefore weighted average Br. 11-7 (21.5 sta)

- total cost/sta $ 1,436
- total cost $ $ 30,878
- total cost/mile $ 75,830

Br. 11-9 sta 0+00 - 5+20 (5.2 sta)

- subgrade - sideslopes ± 10% average terrain	
- material sand and silt	
- estimated production 2.0 sta/day	
- Cat 245 @ $754/day @ 2.0 sta/day	$ 377/sta
- culverts - 1 @ $280	54/sta
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	864/sta
- total cost/sta 0+00 - 5+20 (5.2 sta)	$ 1,295
- total cost $ 0+00 - 5+20 (5.2 sta)	$ 6,734
- total cost/mi 0+00 - 5+20 (5.2 sta)	$68,376

Br. 11-9A sta 0+00 - 6+88 (6.9 sta)

- subgrade - sideslopes ± 10% average terrain	
- material sand and silt	
- estimated production 2.0 sta/day	
- Cat 245 @ $754/day @ 2.0 sta/day	$ 377/sta
- culverts - none necessary	
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	$ 864/sta
- total cost/sta 0+00 - 6+88 (6.9 sta)	$ 1,241
- total cost $ 0+00 - 6+88 (6.9 sta)	$ 8,563
- total cost/mi 0+00 - 6+88 (6.9 sta)	$65,525

Br. 11-10 sta 0+00 - 1+50 (1.5 sta)

- subgrade - sideslopes ± 10% average terrain	
- material sand and silt	
- estimated production 2.0 sta/day	
- Cat 245 @ $754/day @ 7.0 sta/day	$ 377/sta
- culverts - none necessary	
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	864/sta
- total cost/sta 0+00 - 1+50 (1.5 sta)	$ 1,241/sta
- total cost $ 0+00 - 1+50 (1.5 sta)	$ 1,861.5
- total cost/mi 0+00 - 1+50 (1.5 sta)	$65,525

Br. 11-11 sta 0+00 - 5+56 (5.6 sta)

- subgrade - sideslopes ± 20% average terrain	
- material sand and silt	
- estimated production 2.0 sta/day	
- Cat 245 @ $754/day @ 2.0 sta/day	$ 377/sta
- culverts - 1 @ $280	$ 50/sta
- ballast - 200 yd^3/sta @ $4.32/$yd^3$	$ 864/sta
- total cost/sta 0+00 - 5+56 (5.6 sta)	$ 1,291/sta
- total cost $ 0+00 - 5+56 (5.6 sta)	$ 7,229
- total cost/mi. 0+00 - 5+56 (5.6 sta)	$68,159

ATTACHMENT NO. 6

APPRAISAL DATA

Appraisal Data

1. Falling and Bucking

- cull % (I.U. basis)	20%
- tree diameters range	7.1" - 120.0"
- snags/ac.	3.6

2. Yarding and Loading

- 1 loader per 2 yarders	
- 14 landings are required	
- D8K @ $94.25/hr for 9 hours	$ 848.25
- ballast @ $4.32/$yd^3$ for 150 yd^3	648.00
- cost/landing	1,496.25
therefore cost for 14 landings	20,947.50
therefore cost/Ccf = 20,947.5/18,888=	$ 1.1

- small settings due to short yarding distances necessitated by large spruce on Gregory flats

i.e. 18,888 Ccf/14 landings	=	1,349 Ccf/setting
production/day	=	75 Ccf
therefore frequency	=	1,349/75 = 18 days

3. Hauling

- round trip 16 miles

loading time	30 min.
travel time (15 mph)	64 min.
unload	10 min.
wait at turn outs	3 min.
Total	107 min.

Loads/9hr. day = 540/107 = 5.0 loads/day/truck

Production/day = 5.0 x 21 Ccf = 105 Ccf/day/truck

Truck costs $515.25/day for 9 hours

Therefore cost/Ccf = $515.25/123.9 = $4.91/Ccf

4. Road Maintenance

- total of 14 miles of which 11.5 are M/L

5. Preparation for Towing

- logs are dumped and sorted four ways into 6 Ccf bundles at the new dryland sort at 5 Mile Bonanza M/L.

6. Towing and Barging and Vancouver Sort

- bundles are towed to Shields Bay for storage: logs are then loaded on barge in bundle form and towed to Vancouver where the bundles are sorted four ways.

7. Stand Treatment

- normal

8. Administrative Expense

   - normal

9. Administration Expense

   - normal

10. Crew Transportation

    - normal

11. Engineering

    - extra work involved for soils study and resulting soils map.

12. Cruising

    - normal

1979 ANNUAL REPORT

T.S.H.L. A00892

Q.C. TIMBER LTD.

RENNELL SOUND

MARCH 1980

W.A. Hopwood, R.P.F.

1979 ANNUAL REPORT

T.S.H.L. A00892

Q.C. TIMBER LTD.

1.0 IMPROVEMENTS

1.1 Ledger Roads

No ledger roads were constructed in 1979.

1.2 Non-Ledger Roads

The following non-ledger roads were built in 1979:

Upper Gregory Creek Mainline		1.44 km
C.P. 159	Spur 2	0.04 km
	Spur 3	0.12 km
	Spur 4	0.40 km
C.P. 144	Spur	0.05 km
C.P. 150	Spur 18-6	0.68 km
Total		2.73 km

All roads constructed in 1979 are shown in red on the enclosed map.

1.3 Bridges and Culverts

No major bridges or culverts were constructed in 1979

1.4 Other Improvements

A dryland sort of approximately 0.5 ha. was constructed within waterlot 133.

2.0 SITE PREPARATION

No site preparation work was undertaken in 1979.

3.0 REFORESTATION

Detailed reforestation reports were submitted in April 1979 for spring planting and February 1980 for fall planting.

Summary

a) Spring 1979 planting:

CP Number	Hectares Planted
149	4.0
150	54.0

b) Fall 1979 planting:

CP Number	Hectares Planted
144	44.7
145	18.6
151	13.0
152	6.9
Total 1979 planting	141.2

Regeneration surveys were carried out in C.P.'s 145, 168, 167, 148, 146 and 145 for a total of 286 hectares. Reports were submitted in April 1979.

4.0 DENUDATION AND RESTOCKING SUMMARY

See Table V

5.0 FORESTRY COSTS

Forestry costs have been applied for under Section 88.

SUMMARY OF DENUDATION AND RESTOCKING RECLASSIFIED TO DECEMBER 31, 1979 — TABLE V

DENUDED AREA BY YEAR OF DENUDATION - HECTARES — YEAR ENDING..19.79..

ITEM	To 19...	19.75	19.76	19.77	19.78	19.79	19...	19...	19...	19...
Acres denuded by C.P. (a) 167 168 145 146 148 149 150 151 152 157 144		9.3 66.1 4.8 45.7 13.3 44.5 - - - -	4.4 - 4.8 30.7 13.7 21.8 32.3 - - -	- - - - - 24.2 77.7 21.4 40.8 -	- - - - - 8.1 161.5 18.6 4.0 12.1	 5.8 23.9 - 14.7 9.8 44.7				
Total for T.S.H.L.	651.3	183.9	107.7	164.1	204.3	98.9				1,410.2
Adjustment (I) (b)										
Adjusted Total										
AREA RECLASSIFIED										
1. Non-Productive (c)	22.1	7.7	4.0 (rd)	6.5 (rd)	9.7 (rd)					50.0
2. Natural stocked	403.9	13.3 * 132.6('79)	2.0 46.0('79)							597.8
3. Planted areas	18.6	26.3 4.0('79)	21.8 27.0('79)	33.9('79)	13.0('79)	44.7('79)				189.3
4. Seeded areas	-	-	-	-	-					-
5. N.C.C.	-	-	-	-	-					-
TOTAL RECLASSIFIED	444.6	183.9	100.8	40.4	22.7	44.7				
DENUDED BALANCE	206.7	0	6.9	123.7	181.6	54.2				573.1

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.
(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).
(c) Rock, swamp, road surfaces, other non-forest areas.

* C.P.'s 167, 168, 145, 146 & 148 were all regen. surveyed in 1977 & 1979 and found to be stocked; therefore "natural stocked" areas have been adjusted to reflect this.

SUMMARY OF DENUDATION AND RESTOCKING RECLASSIFIED TO DECEMBER 31, 1979

TABLE V

DENUDED AREA BY YEAR OF DENUDATION - HECTARES

YEAR ENDING..1979...

ITEM		To 1969.	1970.	1971.	1972.	1973.	1974.	19...	19...	19...	19...
Acres denuded by C.P. (a)	112	38.8	-	-	-	-	-				
	123	23.5	9.7	56.6	-	-	-				
	134	-	-	10.1	47.3	15.4	-				
	145	-	-	-	-	88.2	51.0				
	146	-	-	-	-	-	6.5				
	147	-	-	-	-	-	50.2				
	156	15.4	-	-	-	-	-				
	167	51.0	64.3	38.0	29.9	48.9	-				
	168	-	-	-	-	-	6.5				
Total for T.S.H.L.		128.7	74.0	104.7	77.2	152.5	114.2				651.3
Adjustment (I) (b)											
Adjusted Total											
AREA RECLASSIFIED											
1. Non-Productive (c)		4.8	2.4	-	-	6.1-'79 5.3	0.7-'79 2.8				22.1
2. Natural stocked		108.4	61.9	15.8		39.6 86.1('79)	50.2('76) 41.9('79)				403.9
3. Planted areas		-	-	-		-	18.6('79)				18.6
4. Seeded areas		-	-	-		-					
5. N.C.C.		-	-	-		-					
TOTAL RECLASSIFIED		113.2	64.3	15.8	-	137.1	113.5				444.6
DENUDED BALANCE		15.5	9.7	88.9	77.2	15.4	0				206.7

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning etc. should be classed as logged.

(b) Adjustments due to acreage re-measurements, denudation date corrections, up-dating information (e.g. plantation failures).

(c) Rock, swamp, road surfaces, other non-forest areas.


LEGEND
LEGEND
QC TIMBER LTD

APPRAISAL INFORMATION

6.0 ROAD CONSTRUCTION

1) Area Description (expressed as % of total area)

a)	Topography	Flat (0 -15%)	15%
		Medium (15-30%)	20%
		Steep (30-50%)	30%
		Excessive (50%+)	35%
b)	Terrain	Uniform	35%
		Broken	35%
		Rolling	30%
c)	Windfall	Light	3%
		Heavy	3%
d)	Obstacles	Rock	0%
		Swampy	10%
		Windfall	9%
e)	Logging Chance	Easy	40%
		Normal	40%
		Difficult	20%

2) Road Construction Program

Calculations of road construction costs for 0.9 km of the Upper Gregory Mainline, two Branch Roads and six spur roads follow. The logs from this cutting permit will be hauled 2.0 km on the Upper Gregory Mainline to 12.8 km on the Bonanza Mainline then to the dryland sort which is located at 8 km of the Bonanza Mainline. Average haul distance is 8 km.

3) Description and Cost Estimates

Road No.	Sta	Km	$/sta	$km	Total	
Upper Gregory M/L	15+29-24+37	0.908	$6,224	$62,240	$ 56,513	39280
Br 160	24+37-30+14	0.577	7,902	79,020	45,595	28144
Br 160	30+14-31+11	0.097	9,381	93,810	9,100	6035
Br 160	31+11-36+50	0.539	3,227	32,270	17,393	11261
Br 160	36+50-37+03	0.053	5,146	51,460	2,727	1757
Spur 160-A	0+00-2+96	0.296	3,162	31,620	9,359	5672
Spur 160-A1	0+00-4+57	0.457	5,166	51,660	23,609	15013
Br 160-B	0+00-2+26	0.226	5,710	57,100	12,905	8740
Br 160-B	2+26-6+32	0.406	3,859	38,590	15,668	11173
Br 160-B	6+32-8+02	0.170	4,416	44,160	7,507	6341
Br 160-B	8+02-9+20	0.118	5,881	58,810	6,939	3484
Spur 160-B1	0+00-1+41	0.141	4,562	45,620	6,432	4873
Spur 160-C	0+00-2+31	0.231	7,255	72,550	16,759	10393
Spur 160-D	0+00-1+79	0.179	5,472	54,720	9,794	6209
Total	43.98	4.398	$5,463	$54,638	$240,300	

Therefore development cost is
38,805 m^3 for $240,300 = $6.19/$m^3$

158375
38805

6.11

4.08

4) Road Construction Specifications

General

- R/W costs included in logging cost
- stumpage costs included in subgrade cost
- culverts - local materials where possible; otherwise, metal
- ballast - m^3/sta - will vary with soil conditions
- equipment - 2-12.2 m^3 trucks
  - Komatsu D65E Spread Cat
  - 600 cfm tank drill
  - Hitachi Backhoe
  - Komatsu D155
  - Clark F.E.L.
  - Road equipment and crew work 8 hr/day

Mainline Construction

- Clearing width - 20 m
- Road width - 6 m
- Ditch Depth - 1 m
- Turnouts every 200 m or within sight distance
- Grades - max. favourable - 15%
  - max. adverse - 5%

Branch and Spur Road Construction

- Clearing width - 20 m
- Road width - 6 m
- Ditch depth - 0.5 m
- Turnout every 200 m or within sight distance.
  Short spurs do not require turnouts.
- Grades - max. favourable - 25%
  - max. adverse - 10%
  - min. switchback radius- 18 m

A. MACHINE RATES

Hitachi Backhoe:	- owning costs, operation, and repair parts and labour	$15.09/m
	- *fuel 39.4 l/h at $.175/l	55.00/day
Komatsu D155:	- equivalent to CAT D8K	
	- daily rate	891.00/day
Komatsu D65E:	- equivalent to CAT D7G	
	- daily rate	700.00/day
600 cfm Tank drill + 2 men		932.00/day
Clark F.E.L.:	- equivalent to CAT 966C	554.00/day
12.2 m^3 Gravel Truck (Hayes HD)	- owning costs, operator, and repair parts and labour at $40.45/hr	324.00/day
	- *fuel 27.4 l/hr at $.175/l	38.00/day
	- total daily cost	$362.00/day
HDX off-highway trucks with 14' bunks		
	- owning costs, operator and repair parts and labour at $55.00/hr.	495.00/day
	- *fuel 82.2 l/hr at $.175/l (for 9 hr shift)	129.00/day
	- total daily cost	$624.00/day

*The contract rates for the backhoe, gravel trucks, and log trucks do not include fuel.

B. CALCULATION OF BALLAST COSTS

i) Quarry:

- 600 c.f.m. tank drill + 2 men @ $116.50/hr = $ 932/day
- 273 kg explosives @ $2.42/kg (incl. caps, B-Line, fuse, etc.) $ 661/day
- Total Cost $1,593/day
- Estimated production is 497 m^3/day

Total Quarry Costs/m^3 = $ 3.21/m^3

ii) Load, Haul and Spread

a) Daily Cost:

- Clark F.E.L. @ $69.25/hr = $ 554/day
- 2 trucks (12.2 m^3) @ $362/day/truck = $ 724/day
- 1 D65E Spread Cat @ $87.50/hr. = $ 700/day
- Total Daily Cost $1978/day

(iii) Daily Production

- Travel time is dependent on average haul distance (round trip)
- Avg. haul speed 15 km/hr
- Loading time 3 min
- Turn and dump 3 min
- Turn in pit time 1 min
- Wait in turnouts 2 min

  Total fixed time/trip 9 min
- Travel time = (average haul distance / 15 km/hr) x 60 min/hr
- Total time/trip = total fixed time + travel time
- Number of trips/day/truck = (8 hr x 60 min/hr) / (total time/trip.)
- Total daily production = number of trips/day/truck x 12.2 m^3/trip x 2 trucks.
- Total load haul and spread costs/m^3=total daily costs/total daily production.

Location of existing and proposed rock pits

Pit #1 (existing) at sta 12+70 on Upper Gregory Mainline

Pit #2 (proposed) at sta 23+60 on Branch 160

Pit #3 (proposed) at sta 31+11 on Branch 160

BALLASTING COST SUMMARY

Spur	Sta	Pit #	Av.Haul Distance Round Trip (km)	Travel Time (min)	Total Travel Time (min)	Load[x], Haul & Spread Cost($/m^3)	Quarry[+] Cost ($/m^3)	Total Ballast Cost ($/m^3)	
Upper Gregory	15+29-24+37	1	1.426	5.70	14.70	1.41 2.48	3.21	5.69	4.65
Br 160	24+37-30+14	2	0.731	2.90	11.90	1.59 2.01	3.21	5.22	4.31
Br 160	30+14-31+11	2	1.405	5.60	14.60	1.90 2.47	3.21	5.68	4.67
Br 160	31+11-36+50	3	0.270	1.10	10.10	1.31 1.71	3.21	4.92	4.00
Br 160	36+50-37+03	3	1.131	4.50	13.50	1.85 2.28	3.21	5.49	4.62
Sp 160A	0+00-2+96	2	0.450	1.80	10.80	1.40 1.82	3.21	5.03	4.17
Sp 160A1	0+00-4+57	2	0.611	2.40	11.40	1.49 1.93	3.21	5.14	4.26
Br 160B	0+00-2+26	2	1.192	4.80	13.80	1.89 2.33	3.21	5.54	4.66
Br 160B	2+26-6+32	2	1.824	7.30	16.30	2.12 2.75	3.21	5.96	4.89
Br 160B	6+32-8+02	2	2.400	9.60	18.60	2.42 3.14	3.21	6.35	5.19
Br 160B	8+02-9+20	2	2.682	10.70	19.70	2.57 3.33	3.21	6.54	5.34
Sp 160B1	0+00-1+41	2	2.371	9.50	18.50	2.36 3.12	3.21	6.33	5.33
Sp 160C	0+00-2+31	3	0.230	0.90	9.90	1.28 1.67	3.21	4.88	4.05
Sp 160D	0+00-1+79	3	1.363	5.50	14.50	1.89 2.45	3.21	5.66	4.65

155375.79

FS COST

C. CALCULATION OF ROAD CONSTRUCTION COSTS

1) Upper Gregory Main 15+29-24+37 (908 m)

- terrain: rolling-uniform	
- average: sideslopes 5% - 50%	
- material: gravelly-clay type	
- construction: Hitachi Backhoe @ $15.09/m	$1,509/sta
- production: 100 m/day	
- fuel: @ $55/day	55/sta
- ballast: 750 m^3/sta @ $5.69	4,268/sta
- culverts: wooden 4-1 m @ $400 = $1600	519/sta 176/sta
- 1-4 m @ $1165	128/sta
- culverts c.m.p. 2 @ $400	88/sta
Total cost/sta	$6,224/sta
Total cost/km	62,240/sta
Total cost (9.08 sta)	56,513

FS COST

2a) Br 160 24+37-30+14 (577 m)

- terrain: uniform-rolling	
- average sideslope: 8-44%	
- material: moist "clay" type	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 100 m/day	
- fuel: @ $55/day	55/sta
- ballast: 1088 m^3/sta @ $5.22/$m^3$	5,679
- culverts: wooden 5-1 m @ $400 = $2000	347/sta
- 3-2 m @ $600 = $1800	312/sta
Total cost/sta	$ 7,902
Total cost/km	$79,020
Total cost (5.77 sta)	$45,595

2b) 30+14-31+11 (97 m)

- terrain: uniform	
- average: 15-20%	
- material: sandy-clay, loam	
- construction: Hitachi Backhoe	
@ $15.09/m	$ 1,509/sta
- production: 70 m/day	
- fuel: $55/day	$ 79/sta
- ballast: 1088m^3/sta @ $5.68/$m^3$	$ 6,180/sta
- culverts: wooden 1-1 m @ $400	$ 412/sta
1-5 m @ $1165	$ 1,201/sta
Total cost/sta	$ 9,381
Total cost/km	$93,810
Total cost (0.97 sta)	$ 9,100

2c) Br 160 31+11-36+50 (539 m)

- terrain: uniform	
- average: 30-50%	
- material: sandy-clay gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 70 m/day	
- fuel: @ $55/day	$ 79/sta
- ballast: 288 m^3/sta @ $4.92/$m^3$	$ 1,417/sta
- culverts: wooden 1-1 m @ $400	$ 74/sta
- culverts: c.m.p. 2 @ $400 = $800	$ 148/sta
Total cost/sta	$ 3,227
Total cost/km	$32,270
Total cost (5.39 sta)	$17,393

2d) Br 160 36+50-37+03 (53 m)

- terrain: broken	
- average: 5-60%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe	
@ $15.09/m	$ 1,509/sta
- production: 80 m/day	
- fuel: @ $55/day	$ 69/sta
- ballast: 650 m^3/sta @ $5.49/$m^3$	$ 3,568/sta
Total cost/sta	$ 5,146
Total cost/km	$51,460
Total cost (0.53 sta)	$ 2,727

3) Spur 160-A 0+00-2+96 (296 m)

- terrain: uniform	
- average: 4-25%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 80 m/day	
- fuel: @ $55/day	$ 69/sta
- ballast: 288 m^3/sta @ $503	$ 1,449/sta
- culverts: wooden 1-1 m @ $400	$ 135/sta
Total cost/sta	$ 3,162
Total cost/km	$31,620
Total cost (2.96 sta)	$ 9,359

4) Spur 160-A1 0+00-4+57 (457 m)

- terrain: uniform	
- average: 2-26%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 90 m/day	
- fuel: @ $55/day	$ 61/sta
- ballast: 650 m^3/sta @ $5.14	$ 3,341/sta
- culverts: wooden 1-4 m @ $1165	$ 255/sta
Total cost/sta	$ 5,166
Total cost/km	$51,660
Total cost (4.57 sta)	$23,609

5a) BR 160-B 0+00-2+26 (226m)

- terrain: uniform-gullied @ creeks	
- average: 6-42%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 80m/day	
- fuel: $55/day	69/sta
- ballast: 650m^3/sta @ $5.54	3,601/sta
- culverts: wooden 3-1 m @ $400 = $1200	531/sta
Total cost/sta	$ 5,710
Total cost/km	$57,100
Total cost (2.26 sta)	$12,905

5b) BR 160-B 2+26-6+32 (406 m)

- terrain: rolling	
- average: 10-60%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 60 m/day	
- fuel: @ $55/day	92/sta
- ballast: 288 m^3/sta @ $5.96	$ 1,716/sta
- culverts: wooden 1-1m @ $400 3-2 m @ $600 $1800	$ 443/sta
Total cost/sta	$ 3,859
Total cost/km	$38,590
Total cost (4.06 sta)	$15,668

5c) BR 160-B 6+32-8+02 (170m)

- terrain: Broken-gullied	
- average: 26-50%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 40 m/day	
- fuel: @ $55/day	137/sta
- ballast: 288 m^3/sta @ $6.35	$ 1,829/sta
- culverts; wooden: 1-1 m @ $400	235/sta
1-2 m @ $600	353/sta
1-3 m @ $600	353/sta
Total cost/sta	$ 4,416
Total cost/km	$44,160
Total cost (1.70 sta)	$ 7,507

5d) BR 160-B 8+02-9+20 (118m)

- terrain: broken	
- average: 9-75%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 80 m/day	
- fuel: @ $55/day	$ 69/sta
- ballast: 650 m^3/sta @ $6.62	$ 4,303/sta
- culverts; none required	
Total cost/sta	$ 5,881
Total cost/km	$58,810
Total cost (1.18 sta)	$ 6,939

6) Spur 160-B1 0+00-1+41 (141 m)

- terrain: rolling	
- average: 33-47%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 60 m/day	
- fuel: @ $55/day	92/sta
- ballast: 288 m^3/sta @ $6.33	$ 1,823/sta
- culverts; wooden: 1-1 m @ $400	286/sta
1-2 m @ $600	426/sta
1-3 m @ $600	426/sta
Total cost/sta	$ 4,562
Total cost/km	$45,620
Total cost (1.41 sta)	$ 6,432

7a) Spur 160-C 0+00-2+31 (231 m)

- terrain: rolling	
- average: 13-42%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe @ $15.09/m	$ 1,509/sta
- production: 80 m/day	
- fuel: @ $55/day	$ 69/sta
- ballast: 1088 m^3/sta @ $4.90	$ 5,331/sta
- culverts; wooden: 2-1 m @ $800 = $800	346/sta
Total cost/sta	$ 7,255
Total cost/km	$72,550
Total cost (2.31 sta)	$16,759

8) Spur 160-D 0+00-1+79 (179 m)

- terrain: uniform	
- average: 0-35%	
- material: sandy-clay, gravel	
- construction: Hitachi Backhoe	613
@ $15.09/m	$ 1,509/sta
- production: 90 m/day	61
- fuel: @ $55/day 553 465	$ 61/sta
- ballast: 650 m^3/sta @ $5.66	$ 3,679/sta 2572
- culverts; c.m.p. 1 A $400	$ 223/sta 223
	3469
Total cost/sta	$ 5,472
Total cost/km	$54,720
Total cost (1.79)	$ 9,794
	6209

7.0 SKID ROADS

N/A.

8.0 ROAD MAINTENANCE

- 4.8 km on Bonanza Mainline & 1.5 km on Upper Gregory Mainline
- costs as per manual

9.0 BRIDGES & CULVERTS

- see road costs for culvert costs
- no major bridges required

10.0 LANDINGS

- total 19, highlead, remainder of area to be grapple yarded
- size - 14 m x 14 m
- location - see cutting plan map
- season of year - fall
- costs/landing Komatsu D155 1 day @ $891/day = $ 891
- ballast 165 m^3 @ $6.05/$m^3$ 998
- Total cost/landing 1,889

- Total landing costs $35,891

11.0 FALLING

- 100% chainsaw falling
- 65% of the area is normal
- 15% of the area is difficult due to steep gullies and windfall
- costs/m^3 as per manual

12.0 BUCKING

- 100% chainsaw bucking
- 65% of the area is normal
- 15% of the area is difficult due to windfall and steep gullies

13.0 LOADING

- 100% grapple loading
- normal
- costs as per manual

14.0 YARDING

- 27.4 m mobile steel tower (high lead) with grapple yarding as appropriate
- normal
- costs per manual

15.0 HAULING

- off highway trucks with 4.6 m bunks
- 16.0 km round trip

- travel time (@ 24 km/hr)	40 min.
- loading time	30 min.
- unloading time	10 min.
- wait at turnout	3 min.
- Total time	83 min.
- number of loads/9 hr day	6.5 loads/truck
- production @ 59 m^3/trip	383 m^3/truck/day
- total cost/truck @ $68/hr	$612/truck/day
- total hauling cost	$1.60/$m^3$

16.0 UNLOADING & DUMP

- 175B Clarke F.E. Loader
- costs as per manual

17.0 SORTING

- dryland sort (at 8 km (5 mi) Bonanza Mainline) 8 km
- 4 sorts bundled into 17 m^3 bundles
- cost/sort as per manual
- cost of facility - estimated final cost $200,000

18.0 BOOMING, TOWING & BARGING

- bag booms towed 8 km from the dryland sort to Shields Bay
- booming and towing costs as per manual
- 4 million FBM barge to Vancouver Sort
- barging costs as per manual

19.0 SLASH DISPOSAL

- slash burning is inappropriate

20.0 COOKHOUSE & CAMP

- 21 - 100 men
- 300 days/year
- location: Shields Bay
- 15.9 km to operating area
- costs as per manual

21.0 CRUMMY TRANSPORTATION

- as per manual

22.0 POINT OF MANUFACTURE

- location Pitt Meadows
- sawmill
- dimensional lumber and chips

23.0 OVERHEAD

- costs as per manual

6.0 APPRAISAL INFORMATION

6.1 Appraisal Analysis Sheet

Tenure No: A00892
Licensee: Q.C. Timber Ltd.
Location: Rennell Sound

Cubic Metres

Volume Removed	Estimated Volume Remaining	Total C.U. Volume
N/A		26,348 m^3

Hectares 48.8

Operating Season of 300 shifts

	Length in km	Cost/km	Total Cost	Amortization per m^3	Remarks
Branch Roads					
Branch 165	0.480	$60,691	$ 34,153	$1.30	0+00 to 0+48
	0.150	52,609	8,986	0.34	0+48 to 0+63
	1.432	64,615	103,546	3.93	0+63 to 20+62
Spur A	0.217	37,733	8,463	0.32	
B	0.040	37,733	1,784	0.08	
1	0.092	40,866	3,760	0.14	
2	0.159	53,001	8,702	0.33	0+00 to 1+59
	0.363	54,585	36,295	1.38	0+59 to 5+22
3	0.173	40,866	8,165	0.31	
4	0.048	40,866	2,326	0.09	
Culverts	costs included in above appraisal of Roads				
Road Main.	3.154	1,360	4,289	0.16	
Snow Removal	3.154		1,844	0.07	
Putting Roads to bed			3,800	0.14	
Seeding			4,500	0.17	Based on CP144 costs
TOTAL			$230,613	$8.76	

Felling	100% Power Saw:	___	Easy	90% Normal	10%	Difficult
Yarding	70% Tower :	___	Easy	100% Normal	___	Difficult
	30% Grapple :	___	Easy	70% Normal	30%	Difficult
Loading	100% Hydraulic Loader:	___	Easy	100% Normal	___	Difficult

Hauling	Cycle Time	1.1 hrs.
	Load	30 min.
	Haul	14 min.
	Dump	10 min.
	Return	11 min.
	Delay	3 min.
	Total	68 min.
	Bunk Size	4.6 m
	Load Size	59 m^3
	Kilometres to Dump/Mill	5.5 km 1 way
Unloading at	5 mile dryland sort	
Road Use Charge	$ n/a	
Sorting	Dryland: x	Water Sort:
Booming	Bag	Flat Bundle x
Towing	Number of km (1 way) 8km	
	From: 5 mile dryland sort	
	To: Rennell Sound camp in Shields Bay	
Barging	Pulp	
	From: Rennell Sound	To: Vanguard Bay
	S/L	
	From: Rennell Sound	To: Vanguard Bay
Slash Disposal	Hectares Treated N/A	
	Cost/ha $ N/A	
3 m Falling	48.8	hectares
	$21.04	rate per ha
Full Tree Skidding	n/a	% area applicable

Crummy	Kilometers on off highway 30 km
	Round Trip
	Shifts per year 300
	Production per shift 377 m^3/shift
Travel Time	Number of Minutes 40 min.(past 9 hours)
	Average Speed 45 km/hr
Boat Travel Time Allowance	n/a
Camp Expense	Annual Production 113,100 m^3
Cookhouse Loss	Number of Men 21-40 Number of Shifts 300
Freight Allowance	$ 0.47
Risk Chance	a) 4
	b) 3
	c) 0
	d) 4
	e) 0
	f) 5
	Total 16

Risk of Chance Factor - 0.02

Log Grades (coast only)

	#1	#2	#3
B			
C	2.8	8.1	89.1
Cy	3.5	37.8	58.6
F			
H	4.4	11.8	83.8
S	7.6	64.6	27.8

A. ROAD CONSTRUCTION DATA SHEET

File 408 C.P.: 165

Road Dist.	Length (km)	Side % Slope	No. of Stumps per ha				Ballast Depth	Terrain Group			Type of Ballast				Haul Dist. from Pit	Exc. Subgrade	Comments
			90 (cm) +	120 (cm) +	150 (cm) +	180 (cm) +	(m)	J	TC	CC	J 1 rock road exc.	gravel loose	gravel cemented	rock quarried	km	m	
Br. 165																	
Sec. 1	0.480	30	34	4	1		1.0		3	1				x	0.4	7.5	0+00 to 4+80
Sec. 2	0.150	35	34	4	1		0.75		3	4				x	0.6	7.0	4+80 to 6+30
Sec. 3	1.432	35	34	4	1		1.0		3	2				x	0.7	7.5	6+30 to 20 +62
Spur A	0.217	10	76	24	4		0.75		2	1				x	0.6	7.0	0+00 to 2+17
Spur B	0.040	10	76	24	4		0.75		2	1				x	0.6	7.0	0+00 to 0+40
Spur 1	0.092	35	34	4	1		0.75		2	1				x	0.5	7.0	0+00 to 0+92
Spur 2																	
Sec. 1	0.159	60	34	4	1		0.75		2	1				x	0.2	7.0	0+00 to 1+59
Sec. 2	0.363	55%	76	24	4		0.50		4	4				x	0.2	6.4	1+59 to 5+22
Spur 3	0.173	35%	34	4	1		0.75		2	1				x	0.5	7.0	0+00 to 1+73
Spur 4	0.048	35%	34	4	1		0.75		2	1				x	0.5	7.0	0+00 to 0+48

SURVEY COST ESTIMATE

Operator: Q.C. TIMBER LTD. Road(s) RENNELL SOUND

Special Sections - Terrain Group (on form)	
Br. 165: End haul 0+00 to 0+50	2,486
18+20 to 18+60	4,532
Spur 2: Rock drilling 1+60 to 2+20	5,337
End haul for 2 large culverts @ 2+00 and 3+90	9,064
Put roads to bed (total of 3.154 km)	
5 days for backhoe @ $760/day	3,800
Grass Seeding based on C.P. 144 costs	4,500
TOTAL	29,719
a) Removal of overburden	
Total roads = 3.154 km with 0.6 m of overburden @ $2240/km for every 0.3 m of overburden above basic 0.3 m	7,065
b) Moving Costs	
4% of basic cost	6,233
c) Freight and Haulage	
2% of basic cost	3,365
d) Isolation	
5% of basic cost	7,790
Total	24,453
e) Culverts and Special Structures	
Large: 2 @ $435/culvert = $ 870	
Medium: 29 @ $365/culvert = $10,585	
Small: 11 @ $275/culvert = $ 3,025 Total	14,480
GRAND TOTAL	68,652

ESTIMATOR: _____ DATE: _____

6.2 Road Construction Specifications

- R/W costs included in logging costs
- Stumping costs included in subgrade costs
- Branch road and spurs
  - clearing width 30 m
  - road width (subgrade) 6.4 m to 7.5 m
  - ditch depth 0.5 m
  - turnout every 200 m or within sight distance
  - grades - max. favourable 20%
    - max. adverse 10%
    - switchbacks min. radius 20 m
- Equipment - 1 Hitachi Backhoe
  - 1 Komatsu D155
  - 1 Komatsu D65E
  - 1 600 cfm Tank Drill
  - 1 Clark F.E.L.
  - 2 12.2 m^3 gravel trucks
  - road equipment and crew work a 9 hr. day
- Culverts - wooden made form right-of-way logs plus split cedar punching.

6.3 Calculation of Road Costs

i) Branch 165 (0 km to 0.48 km)

Terrain group 3, construction category 1, overburden 0.6 m, stumps 90 cm + 34, 120 cm + 4, 150 cm + 1, full ballasting 1.0 m rock required, 7.5 m excavated subgrade, 0.4 km haul distance from pit location, 7 additional wooden culverts are required, rock average 6,500 m^3/km.

Basic cost (from graph)	$10,000
Additional stump removal cost	
34 - 90 cm	500
4 - 120 cm	50
1 - 150 cm	50
Ballasting cost (from graph)	$28,500/km
	$39,100/km

Subgrade width formula

$$f = 0.9 \frac{(7.5)^2}{41} + 0.1$$

Total Adjusted Basic Cost	$52,189/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) grade percent ballast haul	N/A
c) moving (4% of basic cost)	2,087
d) freight and haulage cost (3% of basic cost)	1,566
e) isolation (5% of basic cost)	2,609
Total Cost/km	$60,691

Other Costs

(i) culverts and special drainages

- 1 small size @ $275/culvert	$ 275
- 5 medium size @ $365/culvert	1,825
- 1 large size @ $435/culvert	435
Total	$ 2,535

(ii) End haul from 0+00m to 0+50m requires:

- 1 backhoe for 2 days @ $760/day	$ 1,520
- 1 truck for 2 days @ $483/day	966
Total	$ 2,486

material will be dumped on spur 2 C.P. 159

Total Cost of Road Section $34,153

ii) Branch 165 (0.48 km to 0.63 km)

Terrain group 3, construction category 4, overburden 0.6 m deep, stumps 90 cm + = 34, 120 cm + 4, 150 cm + = 1, full ballasting - 0.75 m of rock required, 7.0 m excavated subgrade, 0.6 km haul distance, 3 additional wooden culverts medium size are required, rock required 4590 m^3/km.

Basic cost (from graph)	$18,500
Additional stump removal cost	
34 - 90 cm	500
4 - 120 cm	50
1 - 150 cm	50
Ballasting cost (from graph)	$19,500/km
	$38,600/km

Subgrade width formula

$$f = 0.9 \frac{(7.0)^2}{} + 0.1$$

Total Adjusted Basic Cost	$45,378/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) N/A	
c) moving (4% of basic cost)	1,815
d) freight and haulage cost (2% of basic cost)	907
e) isolation cost (5% of basic cost)	2,269
Total Cost/km	$52,609
Other Costs	
(i) culverts and special drainages - 3 wooden culverts medium size @ $365/culvert	$ 1,095
Total Cost of Road Section	$ 8,986

iii) Branch 165 (0.63 km to 2.062 km)

Terrain group 3, construction category 2, overburden 0.6 m deep, stumps 90 cm + = 34, 120 cm + = 4, 150 cm + = 1, full ballasting - 1.0 m of rock required, 7.5 m excavated subgrade, 0.7 km haul distance from pit, 19 wooden culverts, medium size and small size are required, rock average 6,500 m^3/km.

Basic cost (from graph)	$13,000
Additional stump removal cost	
34 - 90 cm	500
4 - 120 cm	50
1 - 150 cm	50

Ballasting cost (from graph)	$28,500/km
	$42,100

Subgrade width formula

$$f = 0.9 \frac{(7.5)^2}{41} + 0.1$$

Total Adjusted Basic Cost	$56,193/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) N/A	
c) moving (4% of basic cost)	2,248
d) freight and haulage cost (2% of basic cost)	1,124
e) isolation cost (5% of basic cost)	2,810
Total Cost/km	$64,615

Other Costs

(i)	culverts and special drainages	
	- 5 small size @ $275/culvert	$ 1,375
	-14 medium size @ $365/culvert	5,110
	Total	$ 6,485
(ii)	end haul from 18+20 to 18+60 to sta. 0+63 on Br. 165 require:	
	1 backhoe for 2 days @ $760/day	$ 1,520
	2 trucks for 2 days @ $483/day/truck	1,932
	1 Cat - D65E for 2 days @ $540/day	1,080
	Total	$ 4,532
Total Cost of Road Section		$103,546

iv) Spur A (.217 km) and Spur B (.040 km)

Terrain group 2, construction category 1, overburden 0.6 m deep, stumps 90 cm + = 76, 120 cm + = 24, 150 cm + = 4, full ballasting - 0.75 m of rock, 7.0 m excavated subgrade, 0.6 km haul distance from pit, 2 additional wooden culverts required, rock average 4,590 m^3/km.

Basic cost (from graph)	$ 6,200/km
Additional stump removal cost	
76 - 90 cm	1,000
24 - 120 cm	1,000
4 - 150 cm	-
Ballasting costs (from graph)	19,000/km
	$27,200/km

Subgrade width formula

$$f = 0.9 \frac{(7.0)^2}{41} + 0.1$$

Total Adjusted Basic Cost	$31,976/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) grade percent ballast haul	N/A
c) moving (4% of basic costs)	1,279
d) freight and haulage cost (2% of basic cost)	639
e) isolation cost (5% of basic cost)	1,599
Total Cost/km	$37,733

Other Costs

(i) Culverts and special drainages	
- 2 small size @ $275/culvert (1 culvert for each spur)	$ 550
Total Cost of Spur A	$ 8,463
Spur B	$ 1,784

v) Spur 1 (0.092 km), Spur 3 (0.173 km), Spur 4 (0.048 km)

Terrain group 2, construction category 1, overburden 0.6 m deep, stumps 90 cm + = 34, 120 cm + = 4, 150 cm + = 1, full ballasting - 0.75 m of rock required, 7.0 m excavated subgrade, 0.50 km haul distance from pit, 4 wooden culverts are required, rock averages 4,590 m^3/km.

Basic cost (from graph)	$ 9,500
Additional stump removal cost	
34 - 90 cm	500
4 - 120 cm	50
1 - 150 cm	50
Ballasting cost (from graph)	$19,500/km
	$29,600/km

Subgrade width formula

$$f = 0.9 \frac{(7.0)^2}{41} + 0.1$$

Total Adjusted Basic Cost	$34,798/km
Additives:	
a) additional removal of overburden 0.3 m	$ 2,240/km
b) N/A	
c) moving (4% of basic cost)	1,392
d) freight and haulage cost (2% of basic cost)	696
e) isolation cost (5% of basic cost)	1,740
Total Cost/km	$40,866

Other Costs

(i) Culverts and special drainages

- spur 1: no culverts	
- Spur 3: 3 medium size @ $365/culvert	$ 1,095
- Spur 4: 1 medium size @ $365/culvert	$ 365
Total Cost of Spur 1	3,760
Spur 3	$ 8,165
Spur 4	$ 2,326

vi) Spur 2 (0 km to 0.159 km)

Terrain group 2, construction category 1, overburden 0.6 m deep, stumps 90 cm + = 34, 120 cm + = 4, 150 cm + = 1, full ballasting - 0.75 m of rock required, 7.0 m excavated subgrade, 0.2 km haul distance from pit, 1 wooden culvert is required, rock averages 4,590 m^3/km.

Basic cost (from graph)	$19,800
Additional stump removal cost	
34 - 90 cm	500
4 - 120 cm	50
1 - 150 cm	50
Ballasting cost (from graph)	$18,500/km
	$38,900/km

Subgrade width formula

$$f = 0.9 \frac{(7.0)^2}{41} + 0.1$$

Total Adjusted Basic Cost	$45,731/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) N/A	
c) moving (4% of basic cost)	1,829
d) freight and haulage cost (2% of basic cost)	915
e) isolation cost (5% of basic cost)	2,286
Total Cost/km	$53,001
Other Costs	
(i) culverts and special drainages	
1 small size @ $275/culvert	$ 275
Total Cost of Road Section	$ 8,702

vii) Spur 2 (0.159 to 0.522 km)

Terrain group 4, construction category 4, overburden 0.6 m deep, stumps 90 cm + = 76, 120 cm + = 24, 150 cm + = 4, full ballasting - 0.5 m of rock required, 6.4 m excavated subgrade, 0.2 km haul distance from pit, 6 wooden culverts are required, rock averages 2880 m^3/km

Basic cost (from graph)	$34,000

Additional stump removal cost	
76 - 90 cm	1,000
24 - 120 cm	1,000
4 - 150 cm	-
Ballasting cost (from graph)	$11,200/km
	$47,200/km
Subgrade width formula	
$f = 0.9 \frac{(6.4)^2}{41} + 0.1$	
Total Adjusted Basic Cost	$47,158/km
Additives:	
a) additional removal of overburden 0.3 m	2,240/km
b) N/A	
c) moving (4% of basic cost)	1,886
d) freight and haulage cost (2% of basic cost)	943
e) isolation cost (5% of basic cost)	2,358
Total Cost/km	$54,585

Other Costs

(i) culverts and special drainages	
1 large culvert @ $435/culvert	$ 435
2 small culverts @ $275/culvert	$ 550
3 medium culverts @ $365/culvert	$ 1,095
Total	$ 2,080

(ii) end haul for the culverts @ 2+00 m and 3+90 m	
Require:	
1 backhoe for 4 days @ $760/day	$3,040
2 trucks for 4 days @ $483/day/truck	3,864
1 Cat D65E for 4 days @ $540/day	2,160
Total	$9,064
(iii) extra drilling required from sta. 1+60 to 2+20	
600 c.f.m. drill for 3 days @ $1244/day incl. supplies	$ 3,732
1 D85E for 3 days @ $535/day	1,605
Total	$ 5,337
Total Cost of Road Section	$36,295

7.0 LOGGING POSSIBILITIES

7.1 Terrain Examination of Proposed C.P. 165

On February 26-29, field examination of the proposed cutting permit area was conducted by Ron Townshend of Peril Bay Geotechnic Services. Mr. Townshend's findings and recommendations are stated in Appendix II.

7.2 Biogeoclimatic Notes

(a) There is no Biogeoclimatic information available for the Queen Charlotte Islands. As a result, although indicator species were present, the significance of these indicator species is not known.

(b) The C.P. is divided by a central ridge area (dominant slopes of 20 - 50 percent) into a north half with a north-westerly aspect and slopes of 40 - 60 percent and a south half with a south-westerly aspect and slopes of 50 - 75 percent.

The central ridge area exhibits imperfect to very poor soil drainage. There is moderately well to imperfect drainage in the northerly aspect while in the southerly aspect, the soils are noticeably drier with well to imperfectly drained soils. The soil moisture is indicated as moist in the cruise notes.

7.3 Post Logging Treatment Prescriptions

7.31 Silvicultural Prescriptions

(a) Background

In keeping with the steep slope management concerns regarding the Rennell Sound area, particular attention will be paid to those areas steeper than 60%. In C.P. 165, about 20% of the area is in this category. This includes the area surrounding spur #2, adjacent to C.P. 145 Block 1 and surrounding the small gully adjacent to Spur #3.

In May of last year, our Mr. A. Hopwood wrote regarding a planting proposal for C.P. 144. In that letter he outlined the spacing (2.6m by 2.6 m) and stock type (Ss 1+2br) to be used. We propose a similar prescription.

(b) Planting

Planting with 1 + 2 stock on sites that are greater than 60% sidehill immediately after harvesting should minimize the soil erosion potential. Fill planting within two years with 1+0 Cy (20%) plugs, 2+0 Ss (80%) bareroot. Although there is potential for a large amount of slash due to decadence, burning should be confined to landings and slash accumulations only. Thus, there will be some planting problems due to slash.

No constraints to seedling survival other than browsing are apparent. Browsing by deer may be a potential deterrent to seedling survival. A regeneration survey will be undertaken after logging to determine the extent of the establishment of naturals on the area.

(c) The plant indicator species are as follows: Rhytidiopsis robusta, Blechnum spicant, Vaccinium parvifolium and Hylocomium splendens.

7.32 Reclamation Prescriptions

A total of 3.154 km of road will be "put to bed" within C.P. 165, which includes the removal of culverts, cleaning out ditches and creating a cross drainage pattern. Estimated cost for job is listed under Special Sections of Survey Cost Estimate on page 10. Grass seeding is also to be carried out in a manner similar to that of C.P. #144.

7.4 Conditions Affecting Appraisal

See Appendix III.

7.5 Special Yarding Techniques

Several areas are identified for special dangers.

Area No. 1 - Adjacent and below Spur 3, a steep-sided gulley enters the canyon tributary to Cash Creek. The road was specifically designed for full suspension of the wood over the gully. Yarding is short, with a maximum of around 125 m and excellent deflection. Directional falling at the gully edge is required to minimize disturbance within the gully itself.

Area No. 2 - Gullys above Spur No. 2 at 2 + 00 m and 3+90 m. Directional falling on the gully edge by the use of jacks and/or lining of trees is required to minimize disturbance within the gully. Scab lining is recommended to harvest the wood from the head walls of the gully at sta. ~~2+00~~ 3+90 EPR m.

Area No. 3 - Area above C.P. 145, Block 1, which is below Spur No. 2. Deflection is good for uphill yarding. Summer yarding is recommended. No additional yarding techniques are recommended for this area.

7.6 Special Falling Techniques

Directional falling is required for the northerly cutting boundary adjacent to a gully complex, draining into Cash Creek. In order to minimize the potential for windthrow, one, two or three step falling procedure will be followed.

Step No. 1 - Standard falling techniques.

Step No. 2 - Directional falling by the use of timber jacks and a packer to assist the faller. This is a distinct separate step that is carried out after standard falling is complete.

Step No. 3 - Lining of trees immediately before or during harvesting, by the use of yarding equipment, is often used for directional falling of trees which could not be jacked.

6.0 APPRAISAL INFORMATION

6.1 Appraisal Analysis Sheet

Tenure No: A00892
Licensee: CIPA Industries Ltd.
Location: Rennell Sound

Cubic Metres

Volume Removed	Estimated Volume Remaining	Total C.U. Volume
NEW	86,948 m^3	86,948 m^3

Hectares 160.3
Operating Season of 10 months

	LENGTH in km	COST/km	TOTAL COST	AMORTIZATION PER M^3
Main Roads	1.485			
Branch Roads	6.653			
Additional Culverts			12,695	
Total Roads	8.138	67,556	549,768	6.32
Hangover Bridge			78,110	.90
GRAND TOTAL	8.138		627,878	7.22

Camp Estab.

Dumps (Dryland Sort)

Booming Ground

Felling	100% Power Saw:	__% Easy	57% Normal	43% Difficult	
Yarding	73% Tower :	__% Easy	57% Normal	43% Difficult	
	27% Grapple :	__% Easy	70% Normal	30% Difficult	
Loading	100% Heel Boom Loader:				
		25% Easy	65% Normal	10% Difficult	

Hauling

Cycle Time	2.05	hrs.
Load	30	min.
Haul	38	min.
Dump	15	min.
Return	25	min.
Delay	15	min.
Total	123	min.
Bunk Size	14	ft.
Load Size	59	m^3

Kilometres to Dump/Mill 13.0

Unloading at 5 - Mile Dryland Sort

Road Use Charge $ N/A

Sorting Dryland: x Water Sort:

Booming Bag Flat Bundle x

Towing
Number of km (1 way): 8 km
From: 5 - Mile Dryland Sort
To: Rennell Sound Camp - Shields Bay

Barging
Pulp
From: Rennell Sound To: Vanguard Bay
S/L
From: Rennell Sound To: Vanguard Bay

Slash Disposal
Hectares Treated: Landings only
Cost/ha: $11.75 (for 160.2 ha)

3 m Falling
160.3 hectares
$21.04 rate per ha

Full Tree Skidding N/A % area applicable

Crummy

Kilometers on/off highway: 41 km
Round Trip

Total days available: 303

Total working days: 260

Production per working day per spar: 200 m^3
At 92% machine availability = 239 working days @ 200 m^3/day

Travel Time

Number of Minutes 55 past 9 hours
Average Speed: 45 km/hr

Camp Expense

Annual Production: 114,891 m^3

Cookhouse Loss

Number of Men: 43
Number of Cookhouse Shifts: 303

Freight Allowance

$ 0.47

Risk Chance

a) 3 b) 3 c) 0 d) 4 e) 0 f) 5

Profit and Risk Factors

	Cedar	Hemlock	Spruce	Cypress
Market Risk	3	3	3	3
Defect & Breakage Risk	1	0	0	1
Risk of Chance	3	3	3	3
Pioneering Risk	0	0	0	0
Total Cost (Invest. Risk)	2	2	2	2
Northcoast Factor	0	0	0	0
Total Specific Allowance	9	8	8	9
Basic Allowance - logs	10	10	10	10
Total Allowance for Risk	19	18	18	19

6.11 APPRAISAL PAGE 4

TIMBER SALE NO. A00892 CUTTING PERMIT NO. 166

3. Appraisal of Stumpage Value

(1) Development amortization calculations: Cruise: 86,948 m^3

Development Item	Number of Units km	Cost per Unit $/km	Total Cost $	Amortization /Cunit	
Main roads	8.138	65,996	537,073	6.18	
Main access					
Main on area					
Branch roads					
Bridges	1		78,110	.90	
Culverts	45	282	12,695	.15	
Road maintenance					
Camp establishment					7.23
Booming grounds					
Reload or dump					

13. (2) Woods costs - stump to pond or manufacturing plant:

	Species				Comments and Calculations
	S/L	Pulp			Av. Decay: 12%
Average merchantable diameter	58.0 cm				
Average volume per tree	219 m^3				
ITEM OF COST			Felling & Bucking		
1. Log making:					
Felling &	1.90		57N x 1.80 = $1.90/$m^3$		
Bucking decay	0.06		43D x 2.02		
2. Stump to landing:					
Spur (skid) roads					
Yarding & skidding	5.41				
Decay	0.13				
3. Swinging - truck skid:					
Decking					
4. Log transportation			2/Yarding & Skidding		
Loading	1.45				
Decay	0.04		Grapple: 27%		
Hauling	1.58		70% N x 4.60 = $5.01/$m^3$		
Road maintenance	0.86		30% D x 5.97		
Sort D/L	2.33				
Booming:			Hi Lead: 73%		
2 strap bundle	0.95		57% N x 4.90 = $5.56/$m^3$		
Towing: 8 km	0.45		43% D x 6.44		
Reboom	0.62				
Barging (including			.27 x $5.01/$m^3$ + .73 x 5.56/m^3 = $5.41		
Howe Snd. loading)	5.54	3.65 P.R.	Grapple	High Lead	

5. Contractual costs		
Slash Disposal		
Stand Treatment		
Snag Falling	0.04	
6. Administrative expense		
(a)Office overhead - clerical, rental, utilities:	5.28	
Management - supervision		
Taxes, insurance		
Marketing		
(b)Operational overhead:		
Scaling		
Cookhouse loss	1.66	
Camp expense	1.03	
Crummy - transport	0.87	
7. Development amortization		
Roads and bridges	7.23	
Freight Allowance	0.47	
8. Forestry costs		
N/A		
Total Logging (Cunit)	37.90	36.01

4/Log Transport

Load
.25 + 1.33 + .65 x 1.46 x .10 x 1.66 = $1.45/m^3$

100% HB, 25% E, 65% N, 10% D

Haul - 14' Bunk
2.05 r Cycle Time x $45.50/hr = $158/m^3$
59 m^3/load (Historical Rennell)

Tow
$0.21 x (0.03)(8 km) = 0.45/m^3

Barge
$5.54 m^3

5/Contract Costs

10' Falling
160.3 ha @ $21.04/ha = 3,372.71/86,948 = $0.04/m^3$

6/Administrative Expense

C/H Loss
$\frac{(43 \text{ men})(303 \text{ shifts})(17.81 - 3.04)}{114,891 \text{ m}^3} = \$1.66$

Crummy
$0.61/$m^3$ + (41 km R.T.)(0.00644/m^3/hr) = $0.87/$m^3$

LOGGING COST

S/L	Pulp
September 1980 Trend Factor = 1.1380	
1.1380 (37.90) = $43.13 m^3	1.1380 (36.01) = $40.98/$m^3$

6.2 Road Construction Specifications

- R/W costs included in logging costs
- Stumping costs included in subgrade costs

- Hangover Main
  - clearing width 20 m
  - road width (subgrade) 7.9 m
  - ditch depth 0.5 m
  - turnout every 200 m or within sight distance
  - grades
    - max. favourable 5%
    - max adverse 5%
    - switchbacks min. radius 20 m

- Spurs
  - clearing width 20 m
  - road width (subgrade) 7.9 m
  - ditch depth 0.5 m
  - turnout every 200 m or within sight distance
  - grades
    - max. favourable 20%
    - max. adverse 10%
    - switchbacks min. radius 20 m

- Equipment
  - 1 235 Cat Backhoe
  - 1 Komatsu D65E
  - 1 600 Cfm Tank Drill
  - 1 Clarke F.E.L.
  - 2 12.2 m^3 gravel trucks
  - road equipment and crew work a 8 hour day

- Culverts - wooden where available.

6.3 ROAD CONSTRUCTION DATA SHEETS

A. ROAD CONSTRUCTION DATA SHEET

Page 15 C.P. 166

Road Distance	Length (km)	Side Slope	No. of Stumps per ha 90 (cm)+	120 (cm)+	150 (cm)+	180 (cm)+	Ballast Depth (m)	Terrain Group TG	CC	Type of Ballast Rock Road Depth	Haul	Grav. Depth	Cmt. Haul	Rock Qua. Depth	Haul	Exc. Subgr. Width (m)	Cost $/km	Cost $/Section
R-Main from sta 0+00 to:																		
1+00	0.100	10						2	2					1.0	0.15	7.5	49,275	4,927.50
2+00	0.100	10		See special costing for Bridge and Fills										1.0	0.60	7.5	-	-
14+85	1.285	20						2	3								52,515	67,481.78
	1.485				10 Culverts total .6 m x 1.2 m (wood)													
Br 210 from sta 0+00 to:																		
8+50	0.850	35						3	3					0.9	0.30	7.3	44,450	37,782.50
from sta to:																		
17+00	0.850	5						2	2					1.2	1.03	7.9	66,591	56,602.35
from sta to:																		
23+18	0.618							4	4					0.8	0.15	7.3	61,341	37,908.74
from sta to:																		
	2.318				15 Culverts .6 m x 1.2 m (wood)													
from sta to:					2 Culverts 1.2 m x 2.5 m "													

A. ROAD CONSTRUCTION DATA SHEET

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Road Distance	Length (km)	Side Slope	No. of Stumps per ha 90 (cm)+	120 (cm)+	150 (cm)+	180 (cm)+	Ballast Depth (m)	Terrain Group TG	CC	TYPE OF BALLAST Rock Road Depth	Rock Road Haul	Gravel Cm. Depth	Gravel Cm. Haul	Rock Quarry Depth	Rock Quarry Haul	Excavated Subgrade Width (m)	Cost $/km	Cost $/Section
Br. 211 from sta 0+00 to:																		
2+14	0.214	0						2	2					1.2	0.32	7.9	60,270	12,897.78
4+22	0.208													0.45	0.53	6.4	18,500	3,848.00
Br. 211A from sta 0+00 to																		
1+20	0.120	0						2	2					0.75	0.05	7.0	32,450	3,894.00
Br. 213 from sta 0+00 to:																		
3+40	0.340	45						3	3					0.10	0.70	7.5	67,230	22,858.20
from sta		to:																
10+00	0.660	70						3	4					0.90	0.60	7.3	87,249	57,584.34
from sta		to:																
19+80	0.980	40						4	4					0.90	0.20	7.3	60,325	59,118.50
from sta		to:																
	1.980																	

A. ROAD CONSTRUCTION DATA SHEET

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Road Distance	Length (km)	Side Slope	No. of Stumps per ha 90 (cm)+	120 (cm)+	150 (cm)+	180 (cm)+	Ballast Depth (m)	Terrain Group TG	CC	Type of Ballast Rock Road Depth	Haul	Grav. Depth	Cmt. Haul	Rock Qua. Depth	Haul	Exc. Subgr. Width (m)	Cost $/km	Cost $/Section
Br.213A from sta 0+00 to:																		
4+73 *	.463	20					1.20	3	3						0.550	7.3	62,230	28,812.49
							4 Culverts 60 cm x 120 cm Wood											
Br. from sta 0+00 to: 213B																		
1+68	.168	45					0.90	3	4						0.180	7.3	61,214	10,283.95
Br. from sta 0+00 to: 213C							2 Culverts 60 cm x 120 cm Wood											
0.46	.045	15					0.75	4	4						0.020	7.3	47,371	2,131.70
Br. from sta 0+00 to: 201							1 Culvert 60 cm x 120 cm Wood											
1+82	.182						1.00	2	2						0.800		47,371	8,621.52
Br. from sta 0+00 to: 202							2 Culverts 60 cm x 120 cm Wood											
3+39	.339	35					1.20	3	3						0.200		70,866	24,023.57
from sta to:							5 Culverts 60 cm x 120 cm Wood											

* Chainage equation on Map

A. ROAD CONSTRUCTION DATA SHEET

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Road Distance	Length (km)	Side Slope	No. of Stumps per ha 90 (cm)+	120 (cm)+	150 (cm)+	180 (cm)+	Ballast Depth (m)	Terrain Group TG	CC	TYPE OF BALLAST Rock Road Depth	Rock Road Haul	Gravel Cm. Depth	Gravel Cm. Haul	Rock Quarry Depth	Rock Quarry Haul	Excavated Subgrade Width (m)	Cost $/km	Cost $/Section
from sta		to:																
Br. 220	0.385	10					1.00	3	2						0.16	7.5	48,735	18,762.98
Br. 220A	0.064	10					0.90	3	2						0.24	7.3	41,148	2,633.47
Br. 221	0.167	10					0.90	3	3						0.30	7.3	43,434	7,253.48
from sta		to:	4 Culverts 60 cm x 120 cm - wood							Total Main								72,409.28
										Total Br.								395,017.57
										Total Basic								457,426.85
										Additional Overburden								18,229.00
										Moving Cost + 4%								18,697.00
										Freight and Haulage + 2%								9,349.00
										Isolation + 5%								23,371.00
										Additional Culverts								12,695.00
										Bridge								78,110.00
										TOTAL ROAD COST								$627,877.85

6.4 CALCULATION OF ROAD COSTS

Road No. Hangover Mainline (0+000 - 0+100)

Basic Cost (from graph)		$ 9,500
Additional stump removal cost		
- 90 cm +	43/ha	$ 500
- 120 cm +	19/ha	$ 250
- 150 cm +	12/ha	$ 250
Ballasting costs	(a) Road rock	$
	(b) Cemented gravel	$
	(c) Rock quarried	$26,000
		$36,500

Subgrade width formula

$$f = 0.9 \frac{(7.5)^2}{41} + 0.1 = 1.35$$

Therefore Total Adjusted Basic Cost $49,275

Road No. Hangover Mainline (0+200 - 1+485)

Basic Cost (from graph)		$ 9,900
Additional stump removal cost		
- 90 cm +	43/ha	$ 500
- 120 cm +	19/ha	$ 250
- 150 cm +	12/ha	$ 250
Ballasting costs	(a) Road rock	$
	(b) Cemented gravel	$
	(c) Rock quarried	$28,000
		$38,900

Subgrade width formula

$$g = 0.9 \frac{(7.5)^2}{41} + 0.1 = 1.35$$

Therefore Total Adjusted Basic Cost $52,515

Road No. Br 210 (0+000 - 0+850)

Basic Cost (from graph)		$ 11,500
Additional stump removal cost		
- 90 cm + 43/ha		$ 500
- 120 cm + 19/ha		$ 250
- 150 cm + 12/ha		$ 250
Ballasting costs	(a) Road rock	$
	(b) Cemented gravel	$
	(c) Rock quarried	$ 23,000
		$ 35,000

Subgrade width formula

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = (1.27)$$

Therefore Total Adjusted Basic Cost $ 44,450

Road No. Br 210 (0+850 - 1+700)

Basic Cost (from graph)		$ 7,300
Additional stump removal cost		
- 90 cm + 43/ha		$ 500
- 120 cm + 19/ha		$ 250
- 150 cm + 12/ha		$ 250
Ballasting costs	(a) Road rock	$
	(b) Cemented gravel	$
	(c) Rock quarried	$ 37,000
		$ 45,300

Subgrade width formula

$$g = 0.9 \frac{(7.9)^2}{41} + 0.1 = 1.47$$

Therefore Total Adjusted Basic Cost $ 66,591

Road No.: Br 210 (1+700 - 2+318)

Basic Cost (from graph)		$27,500	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$19,800	$48,300

Subgrade width formula:

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $61,341

Road No.: Br 211 (0+000 - 0+214)

Basic Cost (from graph)		$ 7,500	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$32,500	$41,000

Subgrade width formula:

$$g = 0.9 \frac{(7.9)^2}{41} + 0.1 = 1.47$$

Therefore, Total Adjusted Basic Cost $60,270

Road No.: Br 211 (0+214 - 0+422)

Basic Cost (from graph)		$ 7,500	
Additional stump removal cost			
- 90 cm + 43/ha		$	
- 120 cm + 19/ha		$	
- 150 cm + 12/ha		$	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$11,000	$18,500

Subgrade width formula:

$$g = 0.9 \frac{(6.4)^2}{41} + 0.1 = 1.0$$

Therefore, Total Adjusted Basic Cost $18,500

Road No.: Br 211A (0+000 - 0+120)

Basic Cost (from graph)		$ 7,500	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$19,000	$27,500

Subgrade width formula:

$$f = 0.9 \frac{(7.0)^2}{41} + 0.1 = 1.18$$

Therefore, Total Adjusted Basic Cost $32,450

Road No.: Br 213 (0+000 - 0+340)

Basic Cost (from graph)		$20,000	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$28,800	$49,800

Subgrade width formula:

$$g = 0.9 \frac{(7.5)^2}{41} + 0.1 = 1.35$$

Therefore, Total Adjusted Basic Cost $67,230

Road No.: Br 213 (1+430 - 1+000)

Basic Cost (from graph)		$44,200	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$23,500	$68,700

Subgrade width formula:

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $87,249

Road No.: Br 213 (0+000 - 1+980)

Basic Cost (from graph)		$24,200	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$22,300	$47,500

Subgrade width formula:

$$g = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $60,325

Road No.: Br 213A (1+000 - 1+473)

Basic Cost (from graph)		$12,200	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$35,800	$49,000

Subgrade width formula:

$$g = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $62,230

Road No.: Br 213B (0+000 - 0+168)

Basic Cost (from graph)		$24,200	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$23,000	$48,200

Subgrade width formula:

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $61,214

Road No.: Br 213C (0+000 - 0+045)

Basic Cost (from graph)		$17,500	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$18,800	$37,300

Subgrade width formula:

$$g = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $47,371

Road No.: Br 201 (0+000 - 0+182)

Basic Cost (from graph)		$ 7,300	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$29,000	$37,300

Subgrade width formula:

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $47,371

Road No.: Br 202 (0+00 - 0+339)

Basic Cost (from graph)		$16,800	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$38,000	$55,800

Subgrade width formula:

$$g = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $70,866

Road No.: Br 220 (0+000 - 0+385)

Basic Cost (from graph)		$ 9,300	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$25,800	$36,100

Subgrade width formula:

$$g = 0.9 \frac{(7.5)^2}{41} + 0.1 = 1.35$$

Therefore, Total Adjusted Basic Cost $48,735

Road No.: Br 220A (0+000 - 0+064)

Basic Cost (from graph)		$ 9,200	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$22,200	$32,400

Subgrade width formula:

$$f = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $41,148

Road No.: Br 221 (0+000 - 0+167)

Basic Cost (from graph)		$10,900	
Additional stump removal cost			
- 90 cm + 43/ha		$ 500	
- 120 cm + 19/ha		$ 250	
- 150 cm + 12/ha		$ 250	
Ballasting costs	(a) Road rock	$	
	(b) Cemented gravel	$	
	(c) Rock quarried	$22,300	$34,200

Subgrade width formula:

$$g = 0.9 \frac{(7.3)^2}{41} + 0.1 = 1.27$$

Therefore, Total Adjusted Basic Cost $43,434

6.41 SURVEY COST ESTIMATE

Operator: CIPA INDUSTRIES LTD. Road(s): Rennell Sound

Special Sections - Terrain Group (on form)	
Total	
Additives (+ column on form) a) Removal of overburden - Total roads 8.138 km with 0.6 m overburden @ 2240/km for every 0.3 m of overburden above basic 0.3 m.	18,229
b) Grade - % Ballast Haul N/A	
c) Moving Costs 4% of basic costs	18,697
d) Freight and Haulage 2% of basic costs	9,349
e) Isolation 5% of basic costs	23,371
Total	69,646
f) Culverts and Special Structures 43 wood .6 x 1.2	11,825
2 wood 1.2 x 2.5	870
Bridge & Approaches	78,110
Above those included in basic costs	
Total	90,805
GRAND TOTAL	160,451

ESTIMATOR: G. Runtz DATE: July, 1980

REVISED: G. Runtz DATE: August, 1980

6.5 Calculation of Bridge Costs

Hangover Mainline Bridge

over Bonanza Creek
22 m Clear Span

T.S.H.L. A00892
Rennell Sound
CIPA Industries Ltd.

Bridge Costs

1.	Approach Fills		$ 27,556
2.	Site Preparation and End Haul		2,713
3.	Substructure		
	a) Hauling	$ 566	
	b) Loading	595	
	c) Yarding	2,280	
	d) Unloading	508	
	e) Falling	715	
	f) Crib Construction	15,932	
	Sub. Total	$ 20,596	$ 20,596
4.	Structure		
	a) Stringer Transport	$ 1,990	
	b) Stringer Preparation	3,816	
	c) Stringer Falling & Yarding	1,353	
	d) Placement of Stringers	1,965	
	e) Decking Placement	3,274	
	f) Decking-Milling-Hauling	7,305	
	g) Guard Rails	640	
	Sub. Total	$ 20,343	$ 20,343
5.	Hardware & Shipping		$ 6,902
	TOTAL BRIDGE (0+100 - 0+200)		$ 78,110

6.5 CALCULATION OF BRIDGE COSTS (cont'd)

1. Approach Fills

$4{,}920\ m^3 \times \$5.52 = \$27{,}158$

Basic cost from graph of 1.2 m quarry rock at .32 km haul = $32,500/km

Subgrade Width Formula:

$$f = 0.9\ \frac{(7.9)^2}{41} + 0.1\ (32{,}500) = \$47{,}774$$ graph allowance for $8{,}640\ m^3$

$\$47{,}774 \div 8{,}640\ m^3 = \$5.52/m^3$

*4,920 m^3 of Fill @ $5.52/$m^3$	$27,158.00

**2. Lowbed

8 hours x $49.70 =	397.60
TOTAL APPROACH FILLS	$27,555.60

2. Site Preparation (3 days - Site Preparation)

MACHINE	FUNCTION	HOURS x RATE	TOTAL
Cat 235 Hoe	Excavation	24 x $63.55/hr	$1,525.50
11.5 m^3 Gr. Trucks	Hauling	32 x $37.10/hr	$1,187.20
TOTAL SITE PREPARATION			$2,712.70

* Rock Cost - BCFS Appraisal Manual

** Equipment costs based on BCFS equipment hourly cost schedule dated August 1, 1979.

3) Substructure (354 m^3 approximate)

a) Hauling - 30 km Round Trip (Appraisal Manual)

Travel Time @ 24/km/hr = 1.25 hr =	75 min.
Loading Time	30 min.
Unload	30 min.
Delay Time	15 min.
	150 min.

150 min/60 min/hr = 2.5 hr cycle time

2.50 hr cycle time x \$45.50/hr = \$1.60/m^3

71 m^3/load

Large cedar and light weight

1.60 m^3 x 354 m^3 = \$566 — Hauling \$ 566

b) Loading (Appraisal Manual)

HB - \$1.68/m^3 x 354 m^3 = — Loading 595

c) Yarding (Appraisal Manual)

Madill High Lead
\$6.44/m^3 x 354 m^3 = — Yarding 2,280

d) Unloading

235 Cat Hoe
8 hrs @ \$63.55/hr — Unloading 508

e) Falling (Appraisal Manual)

\$2.02/m^3 x 354 m^3 = \$637 — Falling 715

f) Crib Construction

(12 days)/8 hrs./day	= 96 hrs.	
4 Bridgemen and equipment @ \$23.00/hr x 384 hours	= 8,832	
1 Helper @ \$10.41/hr. x 96 hrs.	= 999	
Cat 235 Backhoe 96 hrs. x \$63.55/hr	= 6,101	
	15,932	15,932

TOTAL SUBSTRUCTURE \$20,596

4) Structure

a) Stringer Transport - 9 km one way

7 stringers + 1 needle beam = 8 logs = 160 m^3

requires 3 loads with each load requiring 2 trucks with 1 truck backing up.

2 - 14' Bunk Log Trucks for 1 day each

14' Bunk Log Trucks	16 hrs. @ $61/hr.	=	$ 976
1800 Chapman Loader	8 hrs. @ $95/hr.	=	760
235 Cat Hoe	4 hrs. @ $63.55/hr	=	254
			$1,990

b) Stringer Preparation - Peeling and Facing

7 stringers + 1 needle beam - 5 shift

Bridgeman and equipment	80 hrs. @ $23.00/hr.	= $ 1,840	
Helper	40 hrs. @ $10.40/hr.	= 416	
MF 80 Backhoe	40 hrs. @ $34.00/hr.	= 1,360	3,816

c) Stringer Falling and Yarding

Falling - 160 m^3 @ $2.02/$m^3$	= $ 323	
Yarding - Madill Tower 160 m @ $6.44/$m^3$ 1 shift @ $970/shift	= 1,030	1,353

d) Placement of Stringers and Needle Beam

235 Backhoe - 2 shifts @ $508.40/shift	= $ 1,017	
D155E Komatsu - 2 shifts @ $374.40/shift	= 749	
Lowbed (2 moves) - 4.0 hrs x 49.70/hr.	= 199	1,965

e) Decking - Placement (3 shifts)

Bridgeman and equipment	96 hrs. @ $23.00/hr. =	$ 2,208	
Helper	24 hrs. @ $10.41/hr. =	250	
MF 80 Backhoe	24 hrs. @ $34.00/hr. =	816	$ 3,274

f) Decking-Milling, Hauling, Yarding of Materials (38m^3)

Ties and Planking	$ 7,305

g) Guard Rails

Bridgeman and equipment	16 hrs. @ $23.00/hr. =	$ 368	
MF 80 Backhoe	8 hrs. @ $34.00/hr. =	$ 272	$ 640
TOTAL STRUCTURE			$20,343

5) Hardware

100 kg - Rail Road Spikes ($30.50 per 100 lbs.)	$ 67
100 kg - 5 x 5/8" staples	112
500 kg - 8" Ardox Galvanized Spikes ($75.61 per 100 lbs.)	832
7000 ft - 3/4" Wire Rope ($65 per 100 ft.)	4,550
100 - 7/8" x 16" Hot Rolled Steel Drifts ($2.80 each)	280
2 rods - 7/8" x 20' Rod for Drifts	40
25 gal. - Creosote @ $6.30/gal.	158
2 shts - 3/4" Fir Plywood @ $25/sheet	50
4 shts - 1/2" Fir Plywood @ $19/sheet	76
4 shts - 1/4" Fir Plywood @ $12.75/sheet	51
Shipping charges via Rivtow	686
TOTAL HARDWARE	$ 6,902

7.0 PRE-AND POST-LOGGING PRESCRIPTIONS

7.1 Biogeoclimatic Notes

a) Although biogeoclimatic subzone classification in the Queen Charlottes is continuing, no interpretive information is available for this area. As a result, although minor indicator species were noted, their significance is not certain.

b) This C.P. exhibits 3 regions, a flat area of some 70 ha bordering on Rennell Sound and Bonanza Creek, a steep area of 20 ha over 60% slope and a moderately sloping area of 80 ha. The eastern half of the C.P. is the steeper area having a rocky knoll which has aspects from west through south to easterly. The western half has the majority of the flat area and faces south.

Soil materials in the C.P. range from sandy gravels and sandy clays (on the flats and moderate slopes) to sandy clay morainal and organic over bedrock (on the very steep areas). Soil moisture is coded as moist on the plot cards throughout, however some areas of imperfect drainage occur in the organic materials and in the fine textured areas around plots 2, 3, 11,

12, 13, 15, 20, 23, 30, 41, 42, 44, 49, 51, 52 and 53.

c) Plant indicator species are Rhytidiadopsis loreas, Hyloconium splendens, Sphagnum moss, V. parvifolium, V ovalifolium, and Galtheria shallon.

7.2 Silvicultural Prescriptions

7.21 Background

In keeping with the steep slope management concerns regarding the Rennell Sound area, particular attention will be paid to those areas steeper than 60%. In C.P. 166, about 20 ha of the area is in this category. This includes the area surrounding Spurs #213 and # 213B.

7.22 Selective Cutting Area

This area of 3.5 ha will not require any post logging treatment.

7.23 Clearcut Area

i) Slashburning - Spot burning of landings and accumulations only is required

ii) Planting

. Flat area (66.5 ha) - plant immediately with 1+2 Ss at a spacing of 1500 trees/ha. Ss 1+0 plugs are an alternative if large stock is not available.

. Steep area (20 ha) - plant immediately with 1+2, 1+1, or 1p+1 Ss at a spacing of 1500 trees/ha. Ss 1+0 plugs are not as desirable, since large stock with a vigorous root system will be needed to help stabilize the slope as early as possible.

. Moderately sloped areas (80 ha) - may be planted immediately with 80% Ss 2+0 (BR) or 1+0 (plugs) and 20% Cwr (1+0), or, if stock is not available, fill plant after 2 years. Density should be average 1000 trees/ha.

7.24 Reclaimation Prescriptions

The cleaning of ditches and waterbarring of roads will be incorporated into maintenance as the harvesting is completed.

The Pulling of culverts will not be considered, as the roads will be constructed to high standards with numerous wood culverts.

The use of the road system for intensive Forestry will be given high priority. Grass seeding for the stabilization of road cut and fills will be handled separately under Section 88.

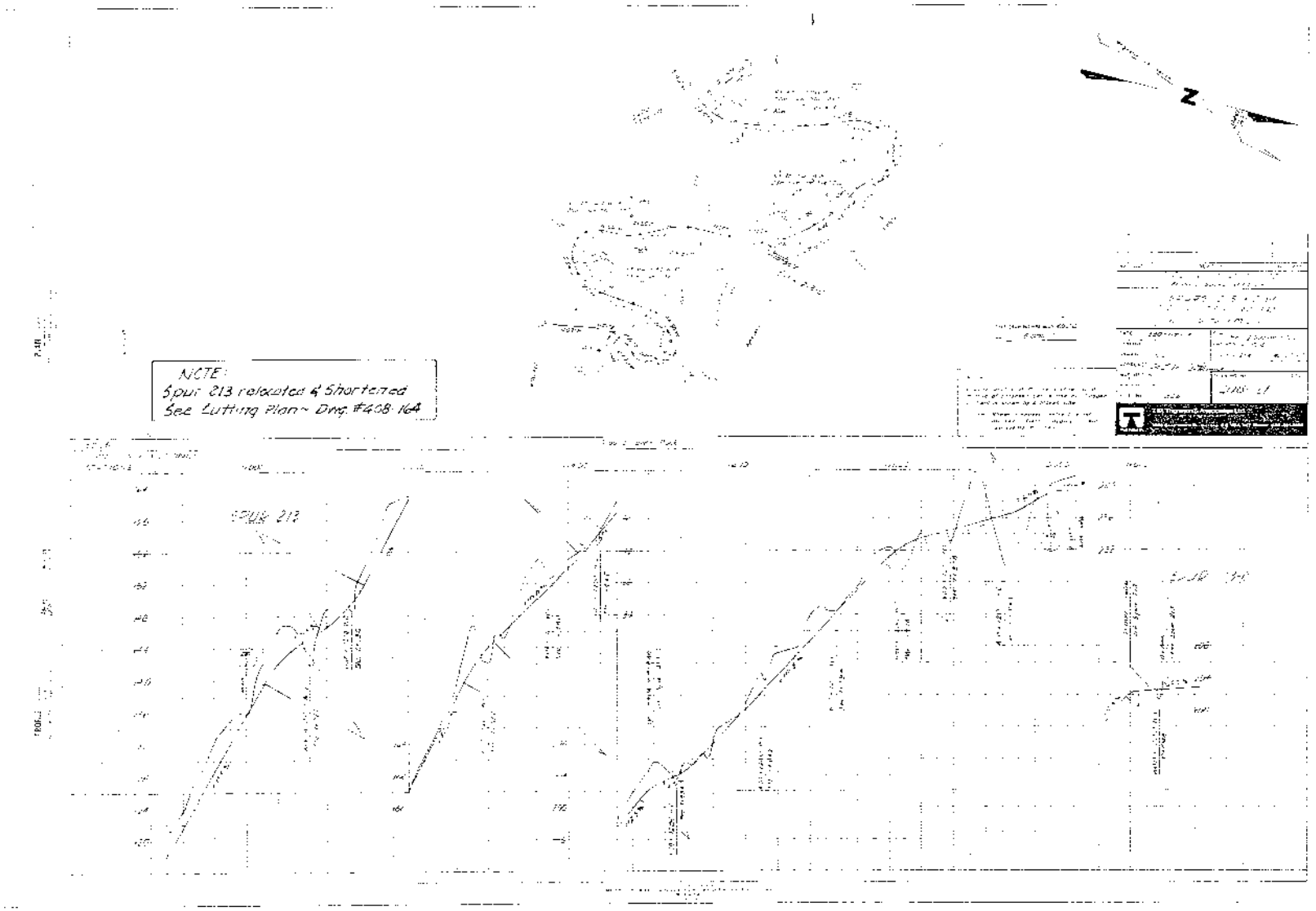
8.0 SPECIAL HARVESTING PRESCRIPTION

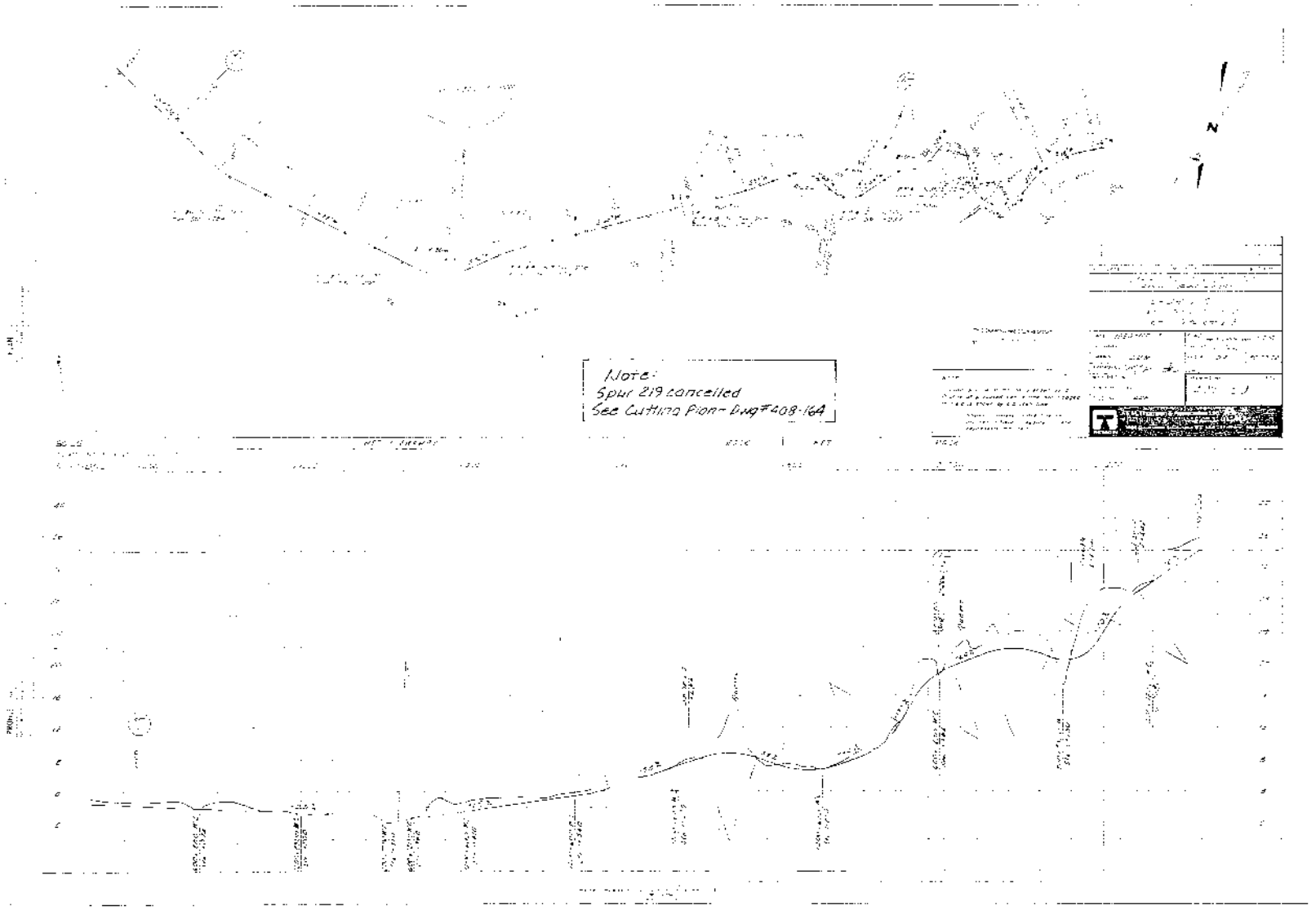
Scab-lining with Back Spars will be used extensively in order to minimize harvesting disturbance in steep or possible soil sensitive areas. All back spars within the Cutting Permit area will be topped in order to prevent blow-down. A back-spar location line has been marked in the field (xxx on Cutting Plan Map). The final selection of back spars will be by the harvesting personnel. The area shown in yellow on the cutting plan map will be scap lined with the use of back spars. Other areas within the cutting area may be scab-lined on a site specific basis.

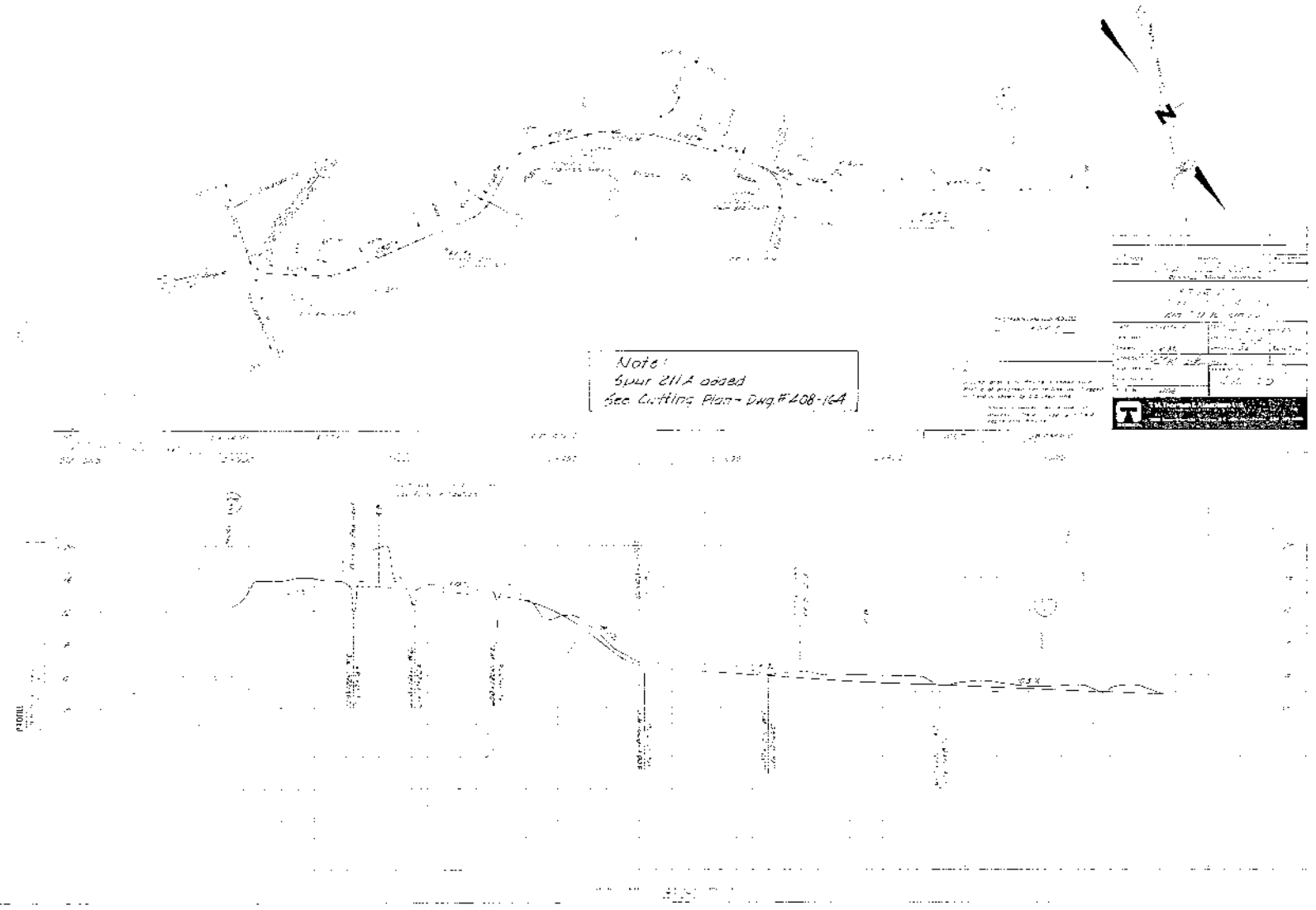
Please note that the area marked in yellow is not necessarily soil sensitive. However, in order to prevent any siltation of the Bensnza Drainage due to harvesting disturbance, strict enforcement of the Special Harvesting Prescription will take place. It is hoped that FERIC in conjunction with company and government personnel will monitor the harvesting in order that the effects of harvesting using special harvesting measures can be documented.

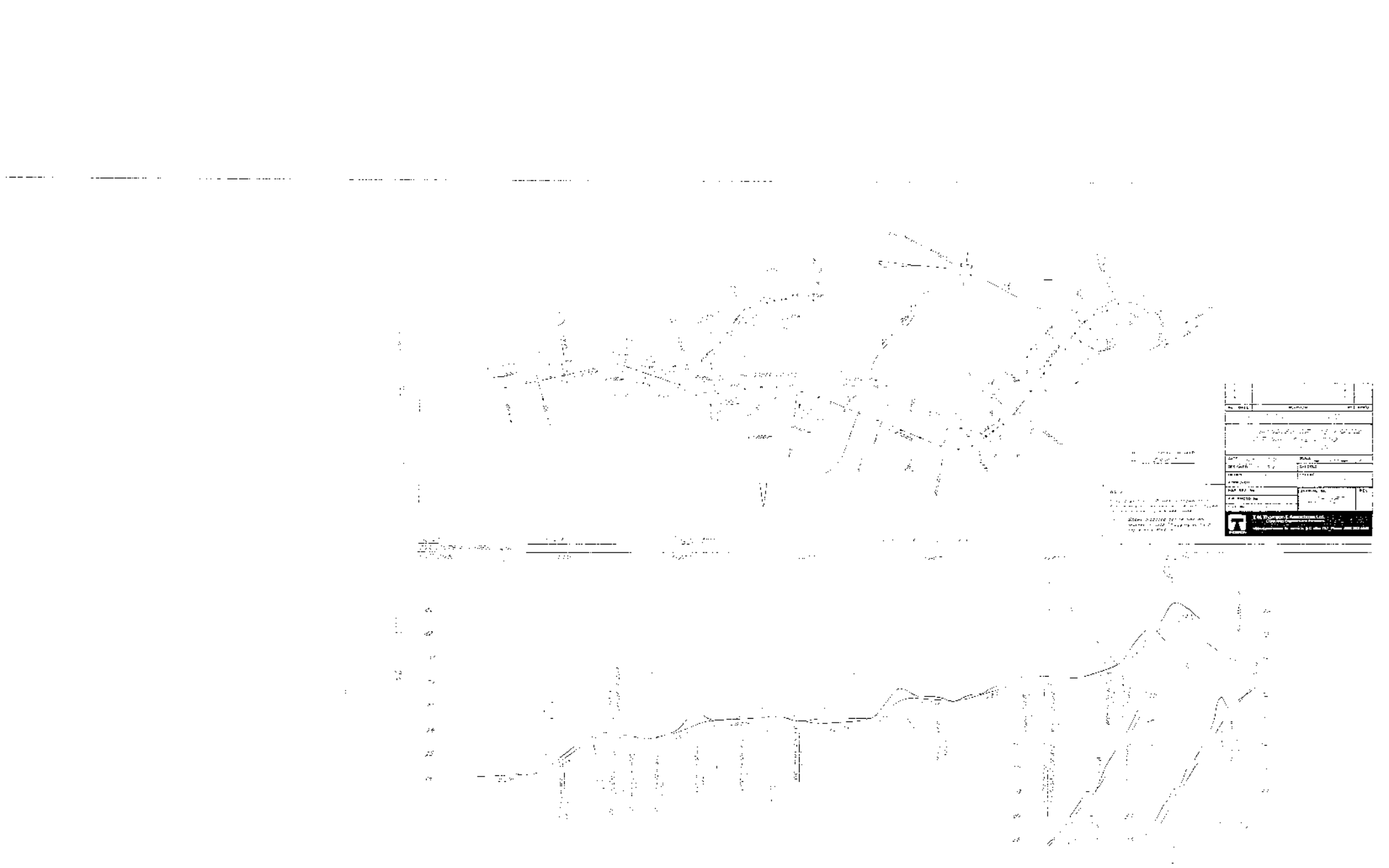
APPENDIX I

PLAN PROFILES


NOTE:
Spur 213 relocated & Shortened
See Cutting Plan ~ Dwg. #408-164
SPUR 213


Note:
Spur 219 cancelled
See Cutting Plan - Dwg #408-164


Note:
Spur 211A added
See Cutting Plan - Dwg #208-164
N
PROFILE



THOMSON

T. M. Thomson & Associates Ltd.
Consulting Engineers and Foresters

1006 Government Street, Victoria, British Columbia V8W 1X7 Phone: (604) 385-4468 Telex: 049-7345

February 5, 1980

File: 408

Regional Manager
B.C. Forest Service
Market Place
Prince Ruert, B.C.
V8J 1B9

Attention: Valuation Division

Dear Sir:

Re: Section 88 Cost Claim,
Fall Planting and Slope Stabilization
Follow-up Reports - T.S.H.L. A00892

Enclosed for your information and approval are our Section 88 Cost Claim, a report of our fall planting and a pictorial follow-up of the slope stabilization and sediment reduction project, for T.S.H.L. A00892 at Rennell Sound, Queen Charlotte Island P.S.Y.U. We include 4 copies of the cost claim form and 3 copies of the report on this project.

Please accept our apologies for the delay in submitting this report. Final cost calculation was delayed by the processing of insurance claims after the Rennell fire.

Please also pass this report on to G. Lloyd of your silviculture section. We trust you will find this in order.

Yours very truly

T.M. THOMSON & ASSOCIATES LTD.

Per: A. Hopwood

WAH:di

W.A. Hopwood, R.P.F.

encls.

Q.C. TIMBER LTD.

Per: Eugene P. Runtz

E. Runtz

cc: Ranger B.V. Hansen - B.C. Forest Service, Queen Charlotte City, B.C. V0T 1S0

Province of British Columbia

Ministry of Forests

Forest Service

COST CLAIM - SECTION 88 OF THE FOREST ACT

TO: REGIONAL MANAGER, Prince Rupert FOREST REGION

c/o DISTRICT MANAGER _____

FROM: Q.C. Timber Ltd.
Ste. 2100,
1066 West Hastings Str.
Vancouver, B.C.V6E 3X1

PROJECT DETAILS

SECTION 88 REFERENCE #MOF File #2068 *PRESCRIBED AREA Q.C.I. P.S.Y.U.

ACTUAL COMMENCEMENT DATE Nov. 2, 1979 †ACTUAL COMPLETION DATE Nov. 30, 1979

FOREST LICENSE & C.P.'S (IF APPLICABLE) T.S.H.L. A00892

PROJECT DESCRIPTION: 1979 Fall Tree Planting (see enclosed planting report)

**SUMMARY OF COSTS:

			F.S. USE ONLY CODE
SCHEDULE:	C.P.'s 144, 145, 151, 152	$ 35,527	$
"			
"			
"			
"			
"			
TOTAL AMOUNT REQUESTED FOR APPROVAL		$ 35,527	$

LICENSEE DECLARATION: WE CERTIFY THAT THE WORKS COMPLETED FOR WHICH THESE COSTS ARE CLAIMED HAVE BEEN CARRIED OUT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

SIGNATURE _____ TITLE Gen Mgr. DATE Feb. 6/80

COST CLAIM APPROVED: REGIONAL MANAGER _____ DATE _____

* SPECIFY P.S.U.U. OR T.F.L. BY NAME AND NUMBER.

+ IF THIS IS A PROGRESS PAYMENT CLAIM, INSERT DATE TO WHICH COSTS ARE INCLUDED.

** SUBSIDIARY COST CALCULATIONS, MAPS, INSPECTION REPORTS AND OTHER DATA RELATIVE TO PROJECT APPROVAL MUST BE ATTACHED AND SUBMITTED WITH THE ORIGINAL COST CLAIM.

1980 ANNUAL REPORT
T.S.H.L. A00892

CIPA INDUSTRIES LTD.
RENNELL SOUND

February, 24, 1981

David S. Clarke

THOMSON

T. M. Thomson & Associates Ltd.
Consulting Engineers and Foresters

1006 Government Street, Victoria, British Columbia V8W 1X7 Phone: (604) 385-4468 Telex: 049-7345

February 24, 1981

Our File: 408

T. A. Dyer, R.P.F.
District Manager
Ministry of Forests
Box 39
Queen Charlotte City, B.C.
V0T 1S0

Dear Sir:

Re: 1980 Annual Report, T.S.H.L. A00892
Rennell Sound

Enclosed please find two copies of the 1980 Annual Report.

We trust this will meet with your approval. Should you have any questions regarding this matter, please do not hesitate to contact us.

Yours very truly,

T. M. THOMSON & ASSOCIATES LTD.

Per: David C Bulger

David C. Bulger, R.P.F.

CIPA INDUSTRIES LTD.

Per: Eugene P Runtz

E. Runtz

DC:jl

Enc.

1980 ANNUAL REPORT
T.S.H.L. A00892
CIPA INDUSTRIES LTD.

1.0 IMPROVEMENTS

1.1 Ledger Roads

No ledger or Section 88 roads were constructed in 1980.

1.2 Non-Ledger Roads

The following non-ledger roads were built in 1980:

Upper Gregory Creek Mainline		1.033 km
CP. 160	Br.160	1.268
	Sp.160-A	0.296
	Sp.160-A1	0.457
	Br.160-B	0.920
	Sp.160-B1	0.141
	Sp.160-C	0.231
	Sp.160-D	0.179
CP. 166 Blk.1	Br.210	1.450
	Hangover Main	0.219
	Total	6.194 km

All roads constructed in 1980 are shown in red on the enclosed map.

1.3 Bridges and Culverts

A log stringer bridge, with a 22 m span, was constructed over Bonanza Creek for the Hangover Mainline.

Estimated bridge and approach costs = $78,110.

No other bridges or major culverts were constructed in in 1980.

1.0 IMPROVEMENTS (cont'd)

1.4 Other Improvements

During 1980 a new cookhouse, drying room and recreation hall were constructed. The new buildings were necessary because of a fire in November of 1979.

2.0 SITE PREPARATION

No site preparation work was undertaken in 1980.

3.0 REFORESTATION

In 1980 no planting was undertaken. However, regeneration surveys were carried out, covering a total of 611.7 ha.

Areas Surveyed: CP.149, CP.150, CP.152, CP.157 and CP.159.

Reports were submitted in August, 1980. These reports stated that of the 611.7 ha, 23.8 ha are non-productive, 206.6 ha are satisfactorily restocked, and 381.3 ha are plantable.

4.0 DENUDATION AND RESTOCKING SUMMARY

See Table IV

5.0 FORESTRY COSTS

Forestry costs have been applied for under Section 88.

DB/hjb:

TABLE I

Year Ending.....

TIMBER SALE HARVESTING LICENCE - ANNUAL REPORT

A00892 Rennell Sound

Cutting Permit No.	Total Area Logged Ha	Volume Billed Jan.1-Dec.31 m^3	Remarks
144	6.0	3,226	CP144, CP152 SCALED IN 1979 but not billed until 1980. EPR
149	-	-	
150	59.0	37,086	
151	28.0	17,777	
152	3.0	1,601	
159	28.0	21,081	
160	8.0	4,607	
Totals	132 ha	85,378 m^3	

TABLE II

1980 ROAD CONSTRUCTION SUMMARY

ROAD	AVG. HAUL ONE WAY	SUBGRADE				BALLAST				TOTAL	
		STATIONS	LENGTH	COST $	$/KM	STATIONS	LENGTH	COST $	$/KM	COST $	$/KM
Upper Gregory Creek ML & CP 159 Spurs			0.872	27,901	31,977		1.895	85,924	45,342	113,825	77,389
CP 160 Spurs			3.492	95,376	27,314		3.107	115,246	37,092	210,622	64,406
CP 166 Spurs			2.804	84,812	30,247		1.669	88,870	53,247	173,682	83,494
Total			7.168	208,089	29,030		7.056	290,040	41,105	498,129	70,135
Hangover Bridge		22m span								81,157	

TABLE III

TIMBER SALE HARVESTING LICENCE - ANNUAL REPORT

A00892 Rennell Sound

Project	C.P.No.	Areas Treated ha	Total Cost	Cost/ha or/Unit	Remarks
Scarification					None
Planting					None
Seeding					None
Other (Specify) Regeneration Surveys	149 150 152 157 159	89.6 260.7 65.6 20.6 44.3	$4,177.00	$7.07/ha	

SUMMARY OF DENUDATION AND RE-STOCKING RECLASSIFIED TO DECEMBER 31, 1980 TABLE IV

DENUDED AREA BY YEAR OF DENUDATION - HECTARES YEAR ENDING 1980

ITEM	To 1969	1970	1971	1972	1973	1974	19...	19...	TOTALS
Hectares denuded by C.P. (a) 112	38.8	-	-	-	-	-			
123	23.5	9.7	56.6	-	-	-			
134	-	-	10.1	47.3	15.4	-			
145	-	-	-	-	88.2	51.0			
146	-	-	-	-	-	6.5			
147	-	-	-	-	-	50.2			
156	15.4	-	-	-	-	-			
167	51.0	64.3	38.0	29.9	48.9	-			
168	-	-	-	-	-	6.5			
Total for T.S.H.L.	128.7	74.0	104.7	77.2	152.5	114.2			651.3
Adjustment (1) (b)									
Adjusted Total									
AREA RECLASSIFIED									
1. Non-productive (c)	4.8	2.4	-	-	6.1 ('79) 5.3	0.7 ('79) 2.8			22.1
2. Natural stocked	108.4	61.9	15.8	-	39.6 86.1 ('79)	50.2 ('76) 41.9 ('79)			403.9
3. Planted areas	-	-	-	-	-	18.6 ('79)			18.6
4. Seeded areas	-	-	-	-	-	-			-
5. N.C.C.	-	-	-	-	-	-			-
TOTAL RECLASSIFIED	113.2	64.3	15.8	-	137.1	113.5			444.6
DENUDED BALANCE	15.5	9.7	88.9	77.2	15.4	0			206.7

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning, etc. should be classed as logged.

(b) Adjustments due to acreage re-measurements, denudation data corrections, up-dating information (e.g. plantation failures).

(c) Rock, swamp, road surfaces, other non-forest areas.

TABLE IV

YEAR ENDING 1980

SUMMARY OF DENUDATION AND RE-STOCKING RECLASSIFIED TO DECEMBER 31, 1980

DENUDED AREA BY YEAR OF DENUDATION - HECTARES

ITEM	To 19...	1975	1976	1977	1978	1979	1980	19...	19...	TOTALS
Hectares denuded by C.P. (a) 167*		9.3	4.4	-	-	-	-			
168*		66.3	-	-	-	-	-			
145*		4.8	4.8	-	-	-	-			
146*		45.7	30.7	-	-	-	-			
148*		13.3	13.7	-	-	-	-			
149		44.5	21.8	24.2	8.1	5.8	-			
150		-	32.3	77.7	161.5	23.9	41.3			
151		-	-	21.4	18.6	-	15.9			
152		-	-	40.8	4.0	14.7	-			
157		-	-	-	12.1	9.8	-			
144		-	-	-	-	44.7	-			
159		-	-	-	-	-	31.6			
160		-	-	-	-	-	8.6			
Total for T.S.H.L.	651.3	183.9	107.7	164.1	204.3	98.9	97.4			1,507.6
Adjustment (1) (b)			5.6**	8.2†	3.3†	13.6†				
Adjusted Total	651.3	183.9	113.3	172.3	207.6	112.5	97.4			1,538.3
AREA RECLASSIFIED										
1. Non-productive (c)	22.1	7.7	4.0 (rd)	6.5 (rd)	9.7 (rd)	1.4 (rd)	3.0 (rd)			54.4
2. Natural stocked	403.9	13.3 132.6 ('79)	2.0 46.0 ('79)	62.4	9.0					669.2
3. Planted areas	18.6	14.3 4.0 ('79)	21.8 27.0 ('79)	29.9 ('79)	13.0 ('79)	44.7 ('79)	-			189.3
4. Seeded areas	-	-	-	-	-	-	-			-
5. N.C.C.	-	12.0	-	4.0	-	-	-			-
TOTAL RECLASSIFIED	444.6	183.9	100.8	102.8	31.7	46.1	3.0			-
DENUDED BALANCE	206.7	0	12.5	69.5	175.9	66.4	94.4			625.4

(a) Area on which yarding has been completed. Areas requiring chunking, 10-foot falling prescribed burning, etc. shouldbe classed as logged.
(b) Adjustments due to acreage re-measurements, denudation data corrections, up-dating information (e.g. plantation failures).
(c) Rock, swamp, road surfaces, other non-forest areas.

* C.P.s 167, 168, 145, 146 and 148 were all regeneration surveyed in 1977 and 1979, and found to be stocked; therefore "natural stocked" areas have been adjusted to reflect this.

**Area of plantation failure in C.P. 149. Results are from 1980 Regeneration Surveys.

† Denudation data corrections for C.P. 150 and 152.

CIPA INDUSTRIES LTD.

March 10, 1982

file: A-00892 DEVELOPMENT PLAN.

T.A. Dyer, R.P.F.
District Manager
Ministry of Forests
P.O. Box 39
QUEEN CHARLOTTE CITY, B.C.
V0T 1S0

Dear Sir:

Re: Development Plan for T.S.H.L. A00892
CIPA Industries Ltd. and MacMillan Bloedel Ltd.
Quota for T.S. A-08411 during 1982-1986

Enclosed please find four copies of the Development Plan including maps and pertinent appendices.

We trust this will meet with your approval. Should you have any questions regarding this matter, please do not hesitate to contact us.

Yours very truly,

CIPA INDUSTRIES LTD.

Per: *[signature]*

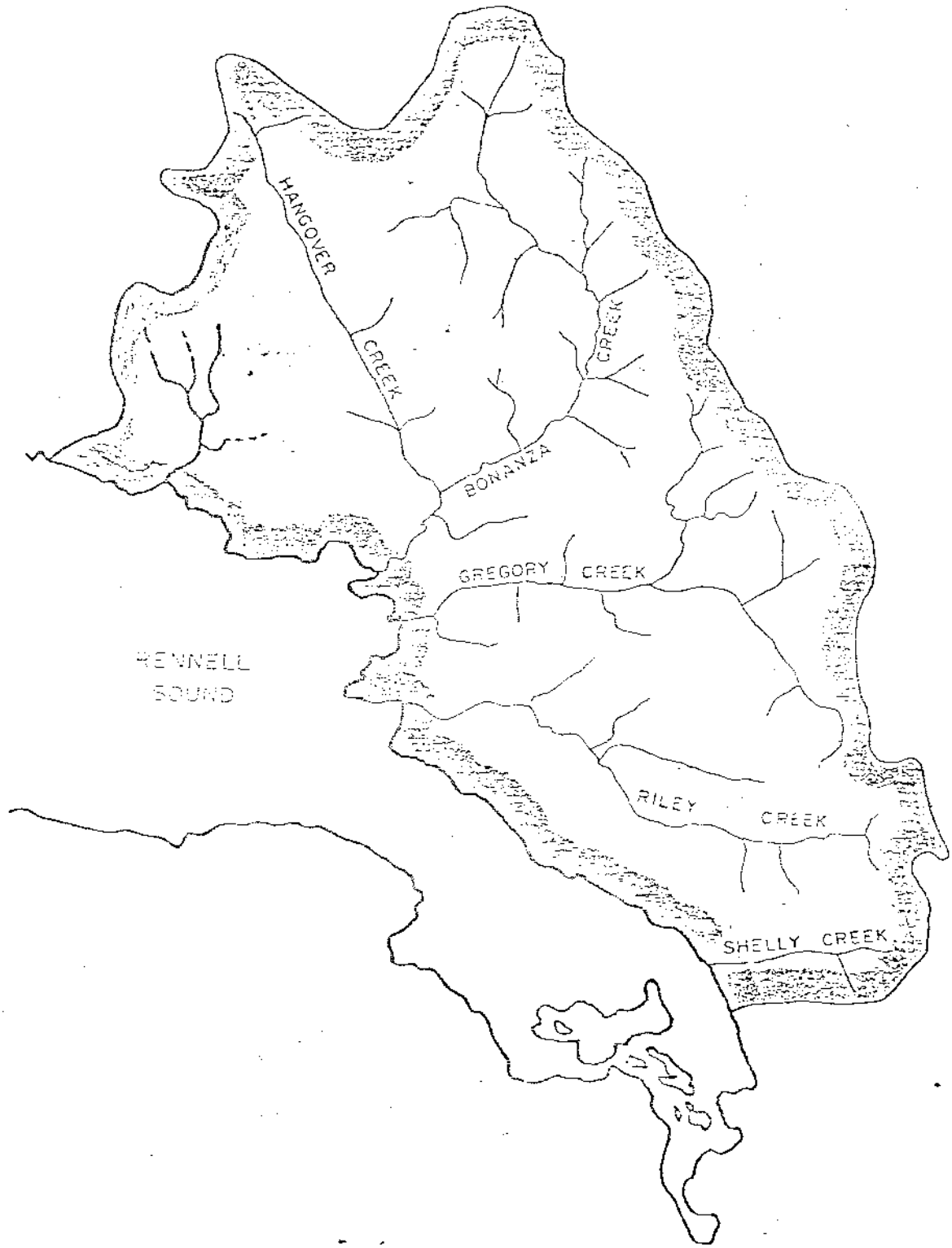
Alan R. Catto, R.P.F.

CIPA INDUSTRIES LTD.

Per: *[signature]*

R.V. Dick, General Manager

ER/rk
Encls.



T.S.H.L. – A00892

CHART AREA BOUNDARY

MAP REFERENCE 103 F/8

CIPA INDUSTRIES LTD.
RENNELL SOUND DIVISION

KEY MAP
RENNELL SOUND

DATE	1981-02-05	FILE NO.	408
SCALE	1:125 000	DWG. NO.	408-142
APPROVED			

1982 - 1986

DEVELOPMENT PLAN

TIMBER SALE HARVESTING LICENCE A00892 AND

MacMILLAN BLOEDEL LTD. QUOTA

FOR T.S. A-08411

1.0 DESCRIPTION OF AREA:

1.1 Location and Size:

The boundary of the development area within the Chart Area is outlined on the key map. It is situated at Rennell Sound on the west coast of Graham Island.

The development area encompasses approximately 951 ha over the 5-year term of the plan. It includes proposed cut blocks for both T.S.H.L. A00892, held by the licensee, and the quota for MacMillan Bloedel Ltd. for T.S. A-08411.

1.2 Forest and Integrated Use Resources:

1.2.1 Forest Resources:

The development area is shown on a standard Ministry of Forests Cover Map with timber types as shown. This map is at a scale of 1:20,000 and is incorporated with the map of proposed cutting areas and roads, shown as Exhibit B.

Area and volume summaries based on Forest Service Inventory Division classifications and local cruise data for each development area are presented in the Appendix Table.

1.2.2 Other Resources:

In addition to the forest resource, other important considerations such as soil stability and fisheries resources have been identified. Work has been undertaken by the licensee in order to quantify these resources and determine the impact of logging upon them.

Peril Bay Geotechnic Services has developed a terrain classification map and a terrain stability map for the Rennell Sound area of which your office has a copy. These maps and the accompanying report, as well as intensive field sampling, aerial photographic interpretation, and other relevent data* were used in the preparation of this report.

* See bibliography of the Rennell Sound Geotechnic Report.

cont'd . . /2

1.2 Forest and Integrated Use Resources: (cont'd)

The stability map is presented both as an overlay and a paper print at a scale of 1:20,000. This map was used in preparing the Development Plan Map to lessen conflicts between harvesting and slope stability.

Where logging is proposed on sensitive areas, a suitable harvesting system, careful road building and a slope stabilization program will be used to reduce or eliminate associated failures. This stabilization program will include such items as cross ditching of unnecessary roads, grass seeding of exposed soil on, or adjacent to, sensitive slopes, and planting tree seedlings at close spacing.

The extent and quality of the fisheries resources is still being evaluated. Interaction of natural failures with fish spawning and rearing areas is a major feature of Rennell Sound watersheds and is still not well documented. Nevertheless, we have made every attempt to minimize the impact of harvesting on fisheries. For example, watercourses having major fishery potential have been avoided, except for minor instances. These and other operational measures will be taken to ensure that fishery habitat is maintained.

2.0 OPERATIONS:

2.1 Engineering Development:

All road, bridge and other developments are shown on the Forest Cover Base Map, Exhibit "B". Road development will specifically adhere to constraints prescribed in the Geotechnic Report. Road development will primarily involve the use of backhoe equipment with limited tractor construction. Culverts and ditches will be built along with the subgrade. Wooden culverts will be installed wherever possible. Upon completion of harvesting and silvicultural activities, unmaintained roads will be cross ditched where necessary.

2.2 Provisions for Regeneration:

All regeneration requirements will be undertaken on a site specific basis in accordance with F.S.Y.U. silvicultural objectives, and any other specific directions of the Regional Manager.

A 5-year Silvicultural Plan, summarizing specific silvicultural prescriptions and projecting the regeneration requirements for the 5-Year Period, is an integral part of this Development Plan and will be similarly updated annually.

cont'd . . /3

2.2 Provisions for Regeneration: (cont'd)

Specific projects may include seed collection, site preparation, planting, survival studies, or regeneration surveys; or as the site requires.

Due to the relatively unstable nature of many of the T.S.H.L.'s terrain units, all of these sensitive units will be planted with Sitka spruce seedlings as soon as feasible after logging. Spacing will be approximately 2.2 m, with on-site inspections being made to determine variations to this proposal.

All of the high site, brush threat areas will be planted at 3.2 m spacing with large Sitka spruce seedlings as soon after logging as feasible.

The remainder of the logged areas is expected to reforest naturally. Where indicated, Sitka spruce will be spot planted to improve upon this natural restocking.

2.3 Harvesting:

2.3.1 Logging Operations:

2.3.1.1 Cutting Sequence:

Areas proposed for cutting are designated by cutting sequence for 5 years of operation. The cut blocks planned for the period 1982 to 1986 are coloured; future cut blocks are not. CP 310 in the extension of the Charter Area has not been included on the map, as mapping is not complete. Annually, tables will be updated to reflect operational revisions as well as to present an additional year's projected harvest.

The initial reconnaissance development plan at the first annual update, and in successive years, will include field location of the subsequent two years planned harvest.

2.3.1.2 Harvesting Method:

Harvesting Methods which reduce or eliminate yarding disturbance by full or partial suspension of logs will be employed in sensitive areas. Road development associated with smaller creeks and tributaries will be reduced.

2.3.2 Cutting Permit Applications:

Cutting Permit applications will give full consideration to the material available in accordance to Section 1.2 and to the current Forest Service Guide to the Submission of Cutting Permit Applications, in proposing the feasibility of cutting.

cont'd . . /4

2.3 Harvesting: (cont'd)

2.3.3 Scaling:

Scaling will be undertaken at a time and place in accordance with the directions of the Regional Manager.

2.4 Protection:

A pre-organization plan has been submitted for 1981. This plan will be updated and re-submitted to the Regional Manager by April 15.

3.0 ANNUAL REPORT:

An annual report, prepared in accordance with current guidelines, signed by the Licensee and a Registered Professional Forester, will be submitted to the Regional Manager by March 15 of the following year. Continuous history maps at the same scale as the Development Plan will be submitted with the annual report.


SHIELDS BAY
CP 134
RICHARDSON HEAD
CLONARD BAY
CP167
CP167
CP112
GRAHAM ISLAND
SHIELDS BAY
DAWSON HEAD
SHIELDS ISLAND
CP134
CP123
ELLS BAY
CLAPP ISLAND
CP156
MACKENZIE PASS
ROCKRUN CREEK
CAMP
CLAPP BASIN
MOUNTAIN CR
S.U.P. 6272
LEGEND
LOGGED 1973
FELLED AND BUCKED 1973
ROADS
CONSTRUCTED
LOCATED
Pioneered (subgrade)
BOUNDARIES
CUTTING PERMIT
DEVELOPMENT AREA BOUNDARY
Q C TIMBER LTD
1973 ANNUAL REPORT
T.S.H.L. A00892
T.M. THOMSON AND ASSOCIATES LTD.
CONSULTING ENGINEERS AND FORESTERS
VICTORIA B.C.
DATE March 1974
FILE
SCALE HOR. 1" = 20ch
VERT.
NO.
Map 1
Map 2