PROVINCE OF BRITISH COLUMBIA
MINISTRY OF LANDS, PARKS AND HOUSING

TSITIKA WATERSHED
PROPOSED TIMBER EXCHANGE
BETWEEN
THE PROVINCE OF BRITISH COLUMBIA
AND
MACMILLAN BLOEDEL LTD.

APPRAISAL REPORT

AUGUST 1985

HOLMSEN FORESTRY LTD.

M10-822

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AUGUST 1985

PREPARED BY: _____

KARSTEN HOLMSEN, R.P.F.

HOLMSEN FORESTRY LTD.

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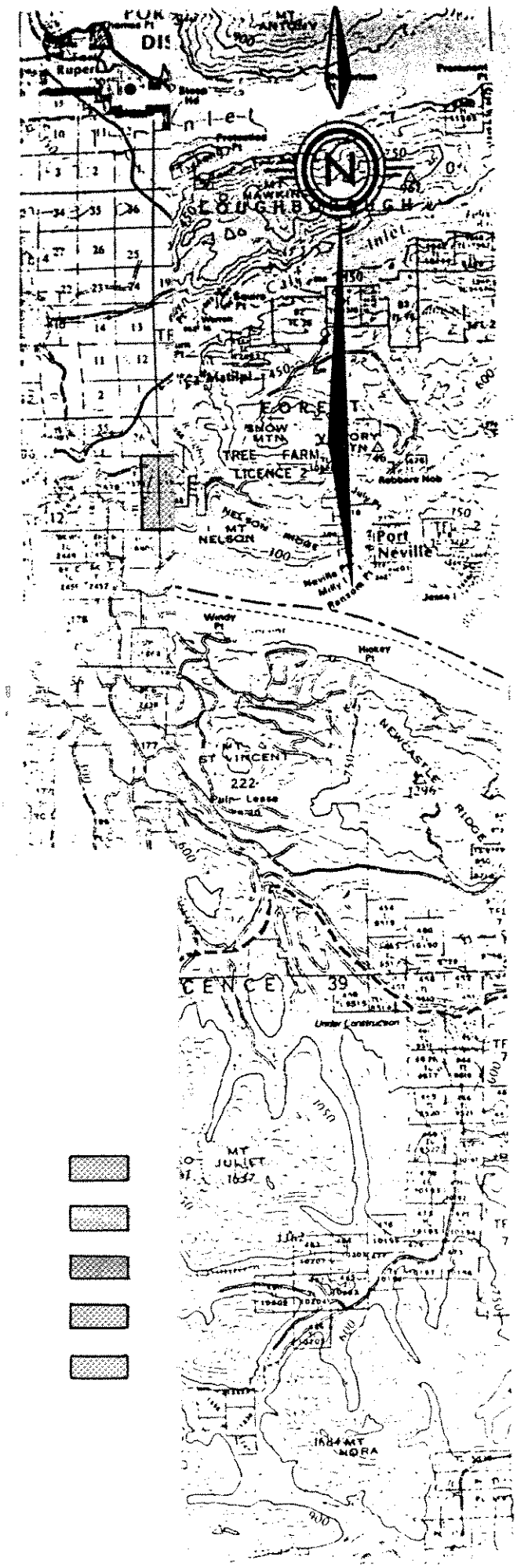
ACKNOWLEDGEMENTS

The appraiser would like to extend his appreciation for the cooperation received from the **Ministry of Forests** and **Macmillan, Bloedel** during the preparation of this appraisal. Staff from the Ministry of Forests at District, Regional, and Provincial levels have been very helpful in providing information requested. MacMillan, Bloedel camp and headquarter personnel have contributed valuable operational, yield projection and log marketing information and advice.

The interaction with all the individuals contacted in this project has been very fruitful and enjoyable.


Inlet
FOREST
TREE FARM LICENCE 2
Port Neville
ST VINCENT
222
NEWCASTLE
1296
RIDGE
CENCE 39
Under Construction
MT JUNIET
1652
1884 MT NORA

1.0 INTRODUCTION

An exchange of timber rights is proposed between the Province of British Columbia and MacMillan Bloedel Ltd. to offset the effect of land withdrawals from Tree Farm Licence # 39 for the purposes of establishing Ecological Reserves # 1 and 5.

In a letter dated March 14, 1985, the Minister of Forests appointed HOLMSEN FORESTRY LTD. as the independent appraiser for the proposed exchange of timber rights between the Province and MacMillan Bloedel Ltd. in the Tsitika watershed. An agreement, dated June 5th, 1985, was signed between the Minister of Lands, Parks and Housing and HOLMSEN FORESTRY LTD.. Copies of the Terms of Reference and Appraisal Specifications, which were a part of the agreement, are found in **Appendix I** of this report. In accordance with the guidelines, the real estate evaluation of the Crown Grant, Lot 223, was subcontracted to John Miller, A.A.C.I., of D.R. Coell & Associates, Inc.

A walk-through field examination of all areas was completed during the month of June. The visit to Lot 223 at Robson Bight was coordinated with the real estate appraiser to allow in-the-field discussions between the land and timber appraisers and to make the most efficient use of helicopter time.

Timber cruise data, provided by Reid, Collins and Associates Ltd., provided basic information for the appraisal input. Although the procedures outlined by the Ministry of Forests' **Coastal Log Based Appraisal Manual**, dated January 1, 1985, were generally followed in this appraisal, minor modifications were applied to ensure consistency and improve accuracy. Average log market values were established from long term trend analysis. The values prepared and submitted in this report are the Appraiser's best estimates as of July 31, 1985, in terms of 1985 dollars.

2.0 SYNOPSIS

2.1 TFL # 39 Schedule "A" Exchange

The Take area totals **292,000 m3** on **396.4 ha** of merchantable area for a total estimated value of **$ 3,185,000.** To equal this value, the Schedule "A" ***Receive*** area is estimated to require **332,000 m3** and cover an area of **378.8 ha.**

2.2 TFL # 39 Productive Capacity Replacement

The ***Take*** areas are estimated to have a total annual productive yield capacity of **3,700 m3** on **396.4 ha** of merchantable area (**440.6 ha** total area). To equalize this productive capacity, **518.4 ha** of merchantable area, or a total of **602.2 ha**, is required from the ***Replacement*** area.

2.3 Crown Grant, Lot 223, Valuation

The estimated timber volume on Lot 223 totals **27,249 m3** on **34.8 ha** of merchantable area for a value of **$ 329,500.** The bare land real estate value is estimated at **$ 84,600.**

Total Property Value, Lot 223: $ 414,100

3.0 AREA DESCRIPTION

3.1 General

The geographic location, general topography, timber types and quality, have been desribed in the cruise report prepared by Reid, Collins. Therefore, additional area description in this report will relate primarily to location and topographic features affecting the operational chance. The location of each area is shown on the **Key Map**, page iv. A set of photographs giving general views of the areas is found in **Appendix II.** The productive capacity replacement area near O'Connor Lake is in the Port McNeill Forest District. All the other areas are located within the Campbell River Forest District.

3.2 TFL # 39 Schedule "A"

3.21 Take Area

3.211 ER 1 - Robson Bight

The alluvial plain in the centre of the area would offer few operational problems. If the area were to be logged, small temporary bridges would have to be installed in the river fan area to provide access to a number of small islands in the Tsitika River delta. If harvested during a period of relatively low river flow, little disturbance and cost would be incurred in the access construction and harvesting of these areas. The appraisal assumes that harvesting methods would have been portable high lead steel spars and grapple yarders. It is also assumed that a log dump would have been established at the mouth of Tsitika River.

The area to the west of the river delta consists of a timbered, rocky shoreline. Although the terrain is rocky and somewhat broken, benches running roughly parallel to the water would accommodate road and landing development within reasonable yarding distance from the water's edge. It is assumed that this area will be restricted to high lead spar yarding.

The area to the east of Tsitika River is steep and rocky with numerous bluffs. Natural benches in this area, that would facilitate road and landing development, are infrequent within reasonable yarding distance from the water's edge. A saddle and ridge running south of the area boundary would provide general access. Direct access onto the area to provide reasonable yarding distances will be difficult and very costly. Long yarding distances would be expected. Therefore, some skyline yarding is assumed for this section.

Overall for the area, 50 percent high lead spar, 20 percent skyline, and 30 percent grapple yarding has been assumed.

3.212 ER 5 - Muskeg Creek

Aside from a rocky ridge between Muskeg Creek and a large swamp, the area is relatively flat. Few problems would be encountered in road development, although some soft and wet sections would require substantial ballasting. Harvesting methods are assumed to be a combination of 60 percent spar and 40 percent grapple yarding.

3.22 Receive Area

The ***Receive*** area is gentle sloping with generally very good ground conditions. A steep and somewhat rocky area in the western section, initially included in the cruise compilation, was excluded when area reduction was required to equate timber value between ***Take*** and ***Receive*** areas. This improved the overall slope and terrain factors for the area. Excellent terrain deflection, and the opportunity for a relatively inexpensive parallel road system development, render this area very suitable for grapple yarding.

A combination of 70 percent grapple and 30 percent spar high lead yarding has been assumed. A map of the proposed ***Receive*** area is found in **Map Pocket # 1**, following the Appendices.

3.3 TFL # 39 Productive Capacity Replacement

The ***Productive Capacity Replacement*** area was selected on old, logged over timber licences to the south of O'Connor Lake. Except for a few small patches of old growth timber, growing on rocky knolls or ridge tops, the entire area has been roaded with fair to good standard roads. Logging technology and road requirements may drastically change over the next rotation. It would be expected that a substantial value in the road development would still exist when the present crop becomes mature. Under present logging system standards, the rolling to somewhat broken terrain would lend itself primarily to spar high lead yarding. A map showing the proposed ***Productive Capacity Replacement*** Area is found in **Map Pocket # 2**, following the Appendices.

3.4 Crown Grant, Lot 223

Lot 223, located at the mouth of Tsitika River, is transected by several river channels: old, over grown, intermittent and perennial. Except for the northeast corner, which is very steep and rocky, the area is generally flat. The alluvial plain would offer few operational problems. If the area were to be logged, small temporary bridges would have to be installed across the river channels to provide access to a number of small islands in the Tsitika River delta. If harvested during a period of relatively low river flow, little disturbance and cost would be incurred in the access construction and harvesting of these areas. Road development into the northeast section of the property would only be feasible in conjunction with development of the adjacent areas of TFL # 39. It has been assumed that harvesting methods would have consisted of 60 percent grapple yarding, 20 percent portable high lead spar yarding, and 20 percent skidding with rubber tired line skidder.

"TSITIKA WATERSHED PROPOSED TIMBER EXCHANGE BETWEEN THE PROVINCE OF BRITISH COLUMBIA AND MACMILLAN BLOEDEL LTD"

APPRAISAL REPORT

AMENDMENT NO. 1

VALUE OF CUTTING RIGHTS ON TAKE AREAS

Crown cutting rights, or "***quota***", are not officially recognized assets that can be sold as separate entities, although these rights often constitute the prime values of a forest company's assets. Transactions involving timber cutting rights therefore always include manufacturing facilities and/or equipment that often are old and obsolete and are considered liabilities rather than assets. Consequently, actual values paid for cutting rights are diffcult to isolate, particularly if the transactions involve manufacturing facilities and equipment that have value as a going concern and which will be operated by the new owner.

Size of the cutting rights, location, accessibility and stage of development, terrain, transport distance, timber quality, size and density, local demand as well as the suitability of integration with a purchaser's existing operation in the area, are all factors that could affect the potential value of such a transaction. There have been isolated examples, such as in the northeast corner of the Province, where the value of the actual cutting rights of a defunct company has been estimated to be nil.

Although it was common in the past to generalize that the price for "***quota***" in a particular region was, say, $ 100/Cunit, and actually pay that value, this is no longer the case. Present buyers are much more cautious about the value and the expected conversion return from potential acquisitions. Therefore, we have more site specific valuations and apparent fluctuations in the actual price attached to the value of the cutting right transactions.

The value of cutting rights must be considered in the long term. Extreme market flucations should therefore have little effect on the price paid for these rights. The fact remains, however, that prices paid for cutting rights during optimistic and peak market periods are considerably higher than during depressed market conditions. As much as $ 35/m3 was paid for Crown cutting rights in the Vancouver Forest Region during the high market periods of the late 1970's.

Although recent (last two years) comparable transactions are few, and the actual value attached to the cutting rights is difficult to isolate, values range as indicated below (estimates or unconfirmed reports):

North Coast :	$ 5.00/m3
Mid-Coast :	10.00 "
Lower Coast (Upper Inlets) :	7.00 "
Lower Coast (Sechelt):	25.00 "
Central Interior :	25.00 "

Discussions with industry officials who could potentially be interested in acquiring additional cutting rights on the lower coast, indicate low demand and suggest values in the $ 10.00 to $ 15.00/m3 range. The current problems in the forest industry and the closure of several mills appears to reflect the low demand and value. In the longer term, however, projected general timber shortages are expected to drive "***quota***" values upward.

The table below applies a discounted cash flow (DCF) approach to the calculated M.A.I. and estimated annual net returns from the Take Areas:

MB TAKE AREA - ESTIMATED VALUE OF ANNUAL CUT

		ER 1	ER 5	Total
Estimated M.A.I.,	m3/ha/yr	2943	785	3728
Take Area Volume,	m3	246162	45742	291904
Take Area Estimated Net Return,	$	539851	167263	707114
Estimated Net Return,	$/m3			2.42
Annual Net Return,	$			9030.78
Discount Rate,	%	4	6	8
NPV of Future Annual Returns,	$	225770	150513	112885
Value of Annual Cut,	$/m3	60.56	40.37	30.28

As indicated, the net value of the annual cut exclusive of allowances for profit and risk, as applied to this specific area, range from $ 30/m3 using an eight percent discount rate, to $ 60/m3 using a four percent rate.

Although the annual cut would have this value to the present operator, a prudent purchaser would likely discount this value to allow for profit and risk. It would be reasonable to expect the market value of these cutting rights to be about one half of the above indicated values, $ 15/m3 and $ 30/m3, respectively, for the discount rate examples chosen. A discount rate of about six percent could be supported for forestry investment in long term secure tenure and wood supply.

A reduction in TFL annual allowable cut as a result of the withdrawal of ER 1 and 5, must be looked upon as affecting the average cost conditions of the entire tree farm licence. Without an intimate knowledge of TFL # 39, it is the Appraiser's opinion that the Take Area net return, as applied in this concept, would, because of the high cost of crew transportation, be somewhat lower than the average for Tree Farm # 39.

The Appraiser would estimate the value of the cutting rights on MacMillan Bloedel's TFL # 39 to be in the $ 20.00 to $ 25.00/m3 range, representing a value of about $ 80.000.

"TSITIKA WATERSHED PROPOSED TIMBER EXCHANGE BETWEEN THE PROVINCE OF BRITISH COLUMBIA AND MACMILLAN BLOEDEL LTD"

APPRAISAL REPORT

AMENDMENT NO. 2

BARE LAND VALUE OF LOT 223 BASED ON YIELD CAPACITY

The bare land value of Crown Grant Lot 223 based on the exclusive use for tree farming, capitalizing future periodic incomes, is estimated at

$ 25 900.00

The estimated value is derived using the following procedure and assumptions:

a. Yield Projection - The annual yield contribution of Lot 223 to Tree Farm No. 21 was calculated using MacMillan Bloedel Ltd.'s yield equations for Douglas fir and hemlock applied to the six timber types on the area. Culmination age yields were calculated initially for each type to determine maximum annual yield (**Annex 1a**). As the productive area is only 34.8 hectares, it is assumed that for practical reasons, the area would be cut as one unit, if logged. Therefore, on the basis of the calculated weighted culmination age of 70 years, yield projections were made for all types using a 70-year rotation age (**Annex 1b**). A periodic yield of 27 426 m3 is estimated for the area based on a 70-year rotation.

b. Appraisal Procedure - Conversion returns and upset stumpage values were calculated using the MOF appraisal method as applied to the current valuation. Input values were based on average tree sizes and total merchantable volume derived as shown in **Annex 1b**. Development costs for subsequent rotations were assumed to be one half of original construction costs. All values are in 1985 dollars. Because of the smaller average timber size to be harvested in future rotations, forty percent of the volume is estimated to be harvested with skidders and front-end loaders.

Grade distribution was based on data provided by MB from a second growth stand harvested in the Port McNeill area. Age (77 years), site index (mostly 30), volume (27 862 m3), and species distribution were quite similar to projections used for Lot 223. Species distribution was maintained the same as the original, although grade distribution was applied as indicated by the Port McNeill timber stand. Print-outs of the appraisal calculations are found in **Annex 2.**

Projected market values are the same as the ones applied to the current timber stand for 1985. Estimated upset stumpage value and conversion return are $ 274 836 and $ 395 429, respectively. The conversion return, less forestry costs of 14 percent of stumpage value ($ 38 477), or $ 356 952 has been used as the base value for periodic net returns exclusive of annual property taxes and real value growth rate of timber values.

c. Real Rate of Growth - Earlier studies of long term appreciation of coastal log values have indicated a real inflation free rate of growth of about 2.5 percent per annum. Therefore, a real rate of growth of 2.5 per cent per annum has been applied to the estimated conversion return of $ 395 429 to come as periodic 70-year incomes from timber harvests of Lot 223. The net present value calculation is found in **Annex 3.** The current (1985) property tax of 403.16 (**Annex 4**) has been applied with an assumed growth rate directly related to the timber value of 2.5 percent per annum.

d. Discount Rate - The discount rate is the most sensitive factor in determining the value based on long term yield capacity of the land. The real discount rate to be applied to a **Discounted Cash Flow (DCF)** of this nature is difficult to establish. Basically, the real rate of interest is the ratio between the current prime borrowing rate and inflation rate:

$$R = \frac{i - f}{1 + f}$$

where: R = real discount rate
i = nominal bank rate
f = inflation rate

An analysis of Bank of Montreal's last 25 years' prime commercial lending rates related to inflation rates (All items CPI - Vancouver) indicates a fluctuating relationship (refer to **Annex 5**). Because of sensitivity to timing (inflation and prime rate fluctuations are frequently unsynchronized), the indicated Real Rate of Interest can vary greatly within a few months. Because of the long term aspect of this appraisal, the accumulated average from the 25 years analysed, a **Real Rate of Interest of 3.07 %**, has been used.

Depending on individual or company policies, type of business, financial status and length of discounting period, various upward adjustments may be made to the basic real rate of interest. Applied to timberland valuation for future harvests these adjustments are estimated to range as outlined in **Table 1:**

Table 1 - Estimated Real Rate of Interest Adjustments

Reason for Adjustment	Adjustment Short term		Long term
a. Risk of Loss of Timber	0.0	to	1.0 %
b. Risk of Adverse Change in Tenure	0.0	to	2.0 %
c. Short vs. Long Term Investment	3.0	to	1.0 %
d. Economic Stability (climate)	0.0	to	3.0 %

Applying these adjustments to the **Real Rate of Interest** indicated above, the adjusted discount rates indicated in **Table 2** are applied to the 1971 and 1981 appraisals:

Table 2 - Adjusted Discount Rate, %

	1985 Long term
Real Rate of Interest	3.1
Risk of Loss of Timber	1.0
Risk of Adverse Change in Tenure	0.5
Short vs. Long Term Investment	1.0
Economic Climate (stability)	0.5
Indicated Discount Rate	6.1

The rate developed is considerably lower than going industrial rates. A lower discount rate applied to long term investment in timber is considered acceptable and is supported by Bennett B. Foster in the article **"Multiple Discount Rates for Evaluating Public Forestry Investments"** (The Forestry Chronicle, February 1979). A discount rate, rounded to 6 percent was therefore used in calculation of the present net value.

A company tax rate has not been applied.

The net present value of future net cash flows, or the bare land value, is estimated at **$ 25 877**, or **$ 710.91** per hectare.

Annex 1a

M & B, CROWN GRANT LOT 223, ROBSON BIGHT - Productive Capacity, Annual Yield Contribution to Tree Farm No. 21

Map Type	Forest Type	Establ Year	Stand age 1985	Growth Type grp	Site Index 100	Site Index 50	Area in Type ha	Weighted S.I. 100	Weighted S.I. 50	Stand Ht m	No.stems per ha	Avg.DBH cm	BA m2	Vol/ha m3	M & B M.A.I.	M & B Cul.age	M & B Ann.yield	M & B Tot.Yield
1	BH 961-G		0	7	40	35	9.7	388.0	339.5	35.0	784	33.4	62.7	828.7	15.35	54	148.90	8040
2	H 961-G		0	7	40	35	7.8	312.0	273.0	35.0	784	33.4	62.7	828.7	15.35	54	119.73	6465
3	S 851-G		0	9	40	33	4.3	172.0	141.9	40.8	504	42.5	60.1	863.6	10.66	81	45.84	3713
4	F(S) 340-G		0	2	50	39	1.4	70.0	54.6	46.3	435	48.6	65.9	1074.1	14.51	74	20.31	1503
5	HS(C) 941-P		0	7	28	19	7.7	215.6	146.3	26.9	819	27.5	51.2	521.6	5.49	95	42.27	4016
6	D 340-M		0	16	36	25	3.9	140.4	97.5	30.4	840	30.1	57.1	660.4	8.81	75	34.36	2577
Total Productive					37.30	30.25	34.8	1298.0	1052.8	33.9	749	33.5	59.3	756.1	11.82	70	411.41	26315
	Non-commercial Brush						0.3											
	Non-Productive Rock						1.3											
	Water						0.0											
Total Area							36.4											

Annex 1b

M & B, CROWN GRANT LOT 223, ROBSON BIGHT - Productive Capacity, 70-year Rotation Periodic Harvesting

Map Type	Forest Type	Establ Year	Stand age 1985	Growth Type grp	Site Index 100	Site Index 50	Area in Type ha	Weighted S.I. 100	Weighted S.I. 50	Stand Ht m	No.stems per ha	Avg.DBH cm	BA m2	Vol/ha m3	M & B M.A.I.	M & B Rot.age	M & B Ann.yield	M & B Tot.Yield
1	BH 961-G		0	7	40	35	9.7	388.0	339.5	40.3	650	37.3	66.7	1011.6	14.45	70	140.17	9812
2	H 961-G		0	7	40	35	7.8	312.0	273.0	40.3	650	37.3	66.7	1011.6	14.45	70	112.71	7890
3	S 851-G		0	9	40	33	4.3	172.0	141.9	37.5	547	38.7	55.9	737.0	10.53	70	45.28	3170
4	F(S) 340-G		0	2	50	39	1.4	70.0	54.6	44.8	454	46.8	64.4	1014.6	14.49	70	20.29	1420
5	HS(C) 941-P		0	7	28	19	7.7	215.6	146.3	22.4	697	24.3	41.0	357.0	5.10	70	39.27	2749
6	D 340-M		0	16	36	25	3.9	140.4	97.5	29.2	840	29.2	55.3	611.9	8.74	70	34.09	2386
Total Productive					37.30	30.25	34.8	1298.0	1052.8	34.9	661	34.1	58.3	788.2	11.26	70	391.80	27426
	Non-commercial Brush						0.3											
	Non-Productive Rock						1.3											
	Water						0.0											
Total Area							36.4											

VANCOUVER FOREST REGION
APPRAISAL DATA SHEET

Licence:	ER1 Lot 223	Appraisal Date:	850731		
Cutting Permit:	Crown Grant	Effective Date:	850201		
Location:	Robson Bight	Forest District:	Campbell River		
Approved Cruise: (y=1, n=0)	1	Tenure: TFL & FL = 1 TSL = 2	1		
Net Volume, m3	27426				
Area, ha:	34.8	Marketer: Major=1, Small=2	1		
Side Slope, % :	20.2		1		
Terrain Code:	1.55	Term, yrs:	1		
Log Vol. 10m, m3:	0.75	Annual Volume, m3:	27426		
Log Vol.(scale):		Annual Op.Days:	180		
Net Vol/tree, m3:	1.19				

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total	
Peeler	A				0.0							
	B				0.0							
	C	10.0			20.0			6.0				
Lumber	D	5.0	5.0	0.0	0.0	1.0	0.0	6.0	0.0			
	F		3.0	0.0				1.0				
Sawlog	H	20.0	24.0	0.0	34.0	6.0	0.0	20.0	0.0			
	I	31.0	13.0	0.0	11.0	29.0	0.0	20.0	0.0			
	J	24.0	22.0	0.0	26.0	50.0	100.0	32.0	0.0			
Shingle	K		8.0									
	L		13.0									
	M		5.0									
Utility	X	10.0	5.0	0.0	9.0	13.0	0.0	15.0	0.0			
Chip&Saw	Y	0.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0	100.0		
Total %		100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0		
Total Net Vol, m3:		6590	714	0	1342	10375	28	6459	0	1918	27426	
Decay, % :		8.2	19.4	6	3.5	3	0	1.2	0	1.4	4.4	
Slope Class, %		0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100		49	26	3	3	3	3	2	1	2	1	7

Licence: ER1 Lot 223 Cutting Permit: Crown Grant
Volume, m3: 27426
Highway trucks 1
Off-Highway trucks 2 2
Front-End Loader 1
Heelboom Loader 2 1 Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Hardness S/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
1.43	1	1.5	0	1	1	1	3	1		10	50
0.46	1	6.5	2	1	2	2	3	1		50	50
0.18	1	44	35	2	2	2	4	1		150	50
0.09	1	83	60	2	2	2	4	1		150	50
0.15	1	83	75	2	2	2	4	1		200	50

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
1.43	1	1	6800	-4	7.1	1.73	11778	18878	26995
0.46	2	0.9	5580	0	12.2	6.74	37587	49787	22902
0.18	3	0.6	3540	5	26.6	6.74	23845	50445	9080
0.09	4	0	0	5	49.9	6.74	0	49900	4491
0.15	5	0	0	8	62	6.74	0	62000	9300
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length m	Number	Cost $	Tot.Cost $
1. Cross Drains	Metal	500 mm		8	2480	
2. Seasonal/small streams	Wood	.75 m2		0	0	
3. Intermed/medium streams	Wood	1.5 m2		1	630	
4. Perennial/large streams	Wood	3.75 m2		1	980	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						4090

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
Tsitika River	0.01	9	21	1	577	
				0	0	
					0	
					0	
					0	
Special installations						577

Miscellaneous Development Costs:

					0	
					0	
					0	0

DEVELOPMENT COST SUMMARY

Item	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	2.31	31501	72768	2.65
Culverts			4090	0.15
Bridges			577	0.02
Miscellaneous			0	0.00
Total Development Cost		0.5	38718	1.41

OPERATING COSTS SUMMARY, $/m3 Page 4A

Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	2.31	100	27426	1.41	1.41	1.53
Landings (#/km)	1	100	27426	0.14	0.14	0.16
Ldgs. H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	27426	3.52	3.52	3.82
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		20	5485.2	6.34	1.27	1.38
Skyline		0	0	0.00	0.00	0.00
Grapple		40	10970.4	5.23	2.09	2.27
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELdr,%	40	0	0			
RTLS (T/L=1)	0	40	10970.4	3.46	1.39	1.50
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		60	16455.6	4.06	2.43	2.64
Front End		40	10970.4	1.02	0.41	0.44
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	27426	1.46	1.46	1.58
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	1.0	10	15	10		
Mainline	0.8	25	35	3		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			0.8	29		
Unloading time				15		
Unavoidable delay				15		
Total time				72		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	1.8	100	27426	0.59	0.59	0.64
Spring open (km)	0	100	27426	0.00	0.00	0.00
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended	Trended	
Water Transport						
From: Robson Bight						
To: Gambier						
Rate, $/m3:	2.11					
Towing				0.00	0.00	0.00
Barging				2.11	2.11	2.29
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:						
Machaell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				3.37	3.37	3.65
Crummy, RTT min	110					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp				0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occup'cy, #	0					
Single Occup. #	0					
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead						
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

OPERATING COSTS SUMMARY, $/m3 Page 4

****

Licence:	ER1 Lot 223
Cutting Permit:	Crown Grant
Forest District:	Campbell River
Location:	Robson Bight
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	27426
Area, ha:	34.8

Phase	$/m3
Development	1.55
Felling & Bucking	3.52
Yarding	3.36
Skidding	1.39
Loading	2.84
Hauling	1.46
Swinging	0.00
Road Maintenance	0.59
Dump/Sort/Boom/Scale	3.01
Water Transport	2.11
Owikeno Transfer	0.00
Crew Transport	3.37
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	32.41
Trend Factor	1.0849
Total Trended Op. Cost	35.17

****

VANCOUVER FOREST REGION STUMPAGE CALCULATION — Licence: ER1 Lot 223 —
Forest District: Campbell River — Cutting Permit: Crown Grant
Appraisal Date: 850731 — Volume: 27426 m3 — Location: Robson Bight

		$/M3 Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		44.28	61.86	0.00	53.75	40.23	17.90	72.22	0.00	35.17	
Profit/Risk Ratio		0.14	0.14	0.00	0.14	0.14	0.14	0.14	0.00	0.14	
Discount Value		38.84	54.26	0.00	47.15	35.29	15.70	63.35	0.00	30.85	
Operating Costs		35.17	35.17	0.00	35.17	35.17	35.17	35.17	0.00	35.17	
Conversion Return		9.12	26.69	0.00	18.59	5.06	-17.27	37.06	0.00	0.00	
Indicated Stumpage		3.68	19.10	0.00	11.99	0.12	-19.46	28.19	0.00	-4.32	
Profit/Risk		5.44	7.60	0.00	6.60	4.94	2.20	8.87	0.00	4.32	
Valuation Factor		0.40	0.72	0.00	0.64	0.02	0.00	0.76	0.00	0.00	
Upset Stumpage		3.68	19.10	0.00	11.99	3.22	1.43	28.19	0.00	2.81	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		3.68	19.10	0.00	11.99	3.22	1.43	28.19	0.00	2.81	
Royalty rate		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Final Stpg.less Royalty		3.68	19.10	0.00	11.99	3.22	1.43	28.19	0.00	2.81	
Base AMV,	$/m3	44.28	61.86	0.00	53.75	40.23	17.90	72.22	0.00	35.17	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	6590	714	0	1342	10375	28	6459	0	1918	27426
Total Upset Value,	$	24232	13635	0	16085	33387	40	182061	0	5396	274836
Total Conversion Return,	$	60069	19059	0	24944	52492	-483	239349	0	0	395429
Total Indicated Value,	$	24232	13635	0	16085	1240	-545	182061	0	-8283	228424

FOREST MANAGEMENT MODEL - AREA: MacMillan Bloedel
TYPE: All 1985 Value of Future Crops Crown Grant Lot 223 - Tsitika

1985 $			Subsequent Rotations			
-------	1985	2055				
Rotation Years		70				
Final Cut Year	1985	2055				
Years to Discount	0	70	0	0	0	0
Inflation Rate	0	0	0	0	0	0
Cumulative Inflation Factor	1	1	1	1	1	1
Real Logging/Forestry Chge.	0.025	0.025	0.025	0.025	0.025	0.025
Cumulative Log.Cost Factor	1	5.63	1.00	1.00	1.00	1.00
Real Log Value/Ann.cost Change	0.025	0.025	0.025	0.025	0.025	0.025
Cumulative Log Value Factor	1	5.63	1.00	1.00	1.00	1.00
Real Milling Cost Change	0	0	0	0	0	0
Cum.Milling Cost Factor	1	1.00	1.00	1.00	1.00	1.00
Real Lumber Price Change	0	0	0	0	0	0
Cumulative Lbr. Price Fact.	1	1.00	1.00	1.00	1.00	1.00
Real Chip Value Change	0	0	0	0	0	0
Cumulative Chip Value Fact.	1	1.00	1.00	1.00	1.00	1.00
Tax Rate	0	0	0	0	0	0
Discount Rate	0.06	0.06	0.06	0.06	0.06	0.06
ALT.# 1: INTENSIVE FORESTRY:						

Harvest Volume:	1985	2055	0	0	0	0
Merch S/L Volume	0	1	0	0	0	0
Merch Pulp Log Vol.						
Selling Price:	1985	2055	0	0	0	0
S/L Selling Price		395429	0	0	0	0
S/L S.P. Adjustment	0	2227097	0	0	0	0
Pulp Log S.P.						
P/Log S.P. Adjustmnt	0.00	0.00	0.00	0.00	0.00	0.00
Lumber Recovery,						
Lumber S.P.						
Lbr.S.P. Adjustment	0.00	0.00	0.00	0.00	0.00	0.00
Lumber S.P.	0.00	0.00	0.00	0.00	0.00	0.00
Chip Value, Current						
Chip Val. Adjusted	0.00	0.00	0.00	0.00	0.00	0.00
Chip Recovery Factor						
Chip Sales Value	0.00	0.00	0.00	0.00	0.00	0.00
Total Selling Price	0	2227097	0	0	0	0
OPERATING COSTS:						
Tot.Log Cost,Current						
Log Cost, Time Adj.	0.00	0.00	0.00	0.00	0.00	0.00
Milling Cost, Curr.						
Milling Cost, Adj.	0.00	0.00	0.00	0.00	0.00	0.00
Chipping Cost, Curr.						
Chipping Cost, Adj.	0.00	0.00	0.00	0.00	0.00	0.00
Admin.Sales,Corp.O.H.						
Admin.Etc. Time Adj.	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Cost	0.00	0.00	0.00	0.00	0.00	0.00
CONVERSION RETURN:	0	2227097	0	0	0	0

FOREST MANAGEMENT MODEL - AREA: MacMillan Bloedel
TYPE: All 1985 Value of Future Crops Crown Grant Lot 223 - Tsitika

			Subsequent Rotations			
	1985	2055				
ECONOMIC EVALUATION:						
OPERATING INCOME	0	2227097	0	0	0	0
FORESTRY COSTS:						
Rehabilitation						
Planting/Seeding						
Brush Control						
Spacing						
Fertilization						
Road Rep.& Mtce.						
Survey & Layout						
Overhead and Other 14% of Stpg value		38477				
Total Forestry Cost	0	38477	0	0	0	0
Total Forestry Cost, Adj.	0	216707	0	0	0	0
F.P.Tax Etc. Ann.Cost	403.16					
Tax.Forestry Incentives Etc.						
Tax.For.Incentives Adj.	0	0	0	0	0	0
TAXABLE INCOME	-403	2010390	0	0	0	0
After Tax Earnings	-403	2010390	0	0	0	0
C.C.A. - New Cap.Investment						
Cash Flow After Tax	-403	2010390	0	0	0	0
Pres.Value of Cash Flow A.T.	-403	37396	0	0	0	0
Pres.Value of Fut.Ann.Costs	-11116					
Sum NPV of Cash Flow A.T. $	25877					

Annex 4

Province of British Columbia — Ministry of Finance

PROPERTY TAX NOTICE 1985

NARRATIVE LEGAL DESCRIPTION
DL: 223

COLLECTION DISTRICT: CCMOX NORTH
LAND DISTRICT: RUPERT
TREE FARM 21 TF: 021

FOLIO NUMBER: C11 785 29021.400-1-7
REF. NO. J98659

MACMILLAN BLOEDEL
TIMBERLANDS & PROPERTIES DIV
1075 W GEORGIA ST
VANCOUVER B C
V6E 3R9

LOCAL SERVICE LEVIES BY PROPERTY CLASS		TAX RATE PER $1000.00 ACTUAL VALUE	TAX AMOUNT
MT WADDINGTON HOSP*	7	50726	27.76
VAN ISLE LIBRARY	7	29160	15.96
85D MT WADDING REG	7	139160	76.16
TOTAL LOCAL SERVICE TAX AMOUNT			119.88

SCHOOL TAXES

PROPERTY CLASS	ACTUAL VALUE	TAX RATE PER $1000.00 ACTUAL VALUE	TAX AMOUNT
TREE 7	5473	437600	239.50
TOTAL SCHOOL TAX PAYABLE			239.50

RURAL AREA TAXES

PROPERTY CLASS	ACTUAL VALUE	TAX RATE PER $1000.00 ACTUAL VALUE	TAX AMOUNT
TREE 7	5473	80000	43.78
TAXATION (RURAL AREA) ACT TAX PAYABLE			43.78

IMPORTANT - PENALTY DATES

1985 TAXES ARE DUE AND PAYABLE — JUL 02,1985
5 % PENALTY ADDED (AFTER CLOSE OF BUSINESS) — JUL 02,1985
ADDITIONAL 5% (COMPOUNDED) ADDED — OCT 31,1985

1985 TAXES BECOME DELINQUENT - DECEMBER 31, 1985

PENALTY WILL BE CALCULATED ON GROSS OUTSTANDING TAXES AT PENALTY DATES

HOME OWNER GRANT
APPLICABLE FIRST TO LOCAL SCHOOL TAXES AND THEN TO OTHER LEVIES. COMPLETE CERTIFICATE IF ELIGIBLE.
NOTE: IF UNDER AGE 65 THE MAXIMUM ALLOWABLE GRANT IS $380 SUBJECT TO A MINIMUM TAX PAYMENT OF $175.00 (SEE BOX B AT RIGHT). IF YOU ARE ELIGIBLE FOR THE ADDITIONAL GRANT, THE MAXIMUM GRANT AMOUNT IS $630.00, SUBJECT TO A MINIMUM TAX PAYMENT OF $1.00 (SEE BOX C AT RIGHT). IF NOT ELIGIBLE FOR EITHER GRANT SEE BOX A AT RIGHT.
* DELINQUENT TAXES - INCLUDES INTEREST IF PAID BY DUE DATE

SUMMARY OF CURRENT TAXES AND HOME OWNER GRANT

TYPE OF LEVY	GROSS TAXES PAYABLE IF NOT ELIGIBLE FOR GRANT	NET TAXES PAYABLE IF ELIGIBLE FOR REGULAR GRANT	NET TAXES PAYABLE IF ELIGIBLE FOR ADDITIONAL GRANT
TOTAL SCHOOL TAX PAYABLE	239.50		
LESS H.O. GRANT (APPLIED TO SCHOOL TAX)			
NET SCHOOL TAX PAYABLE	239.50		
ADD-TAXATION (RURAL AREA) ACT TAX PAYABLE	43.78		
ADD-LOCAL SERVICE TAXES PAYABLE	119.88		
LESS-RESIDUAL H.O. GRANT (IF ANY)			
TOTAL CURRENT TAXES DUE	403.16		
LESS - PREPAYMENT			
ADD - DELINQUENT TAXES *			
TOTAL PAYMENT DUE	403.16	NIL	

RETAIN THIS PORTION FOR YOUR RECORDS

Province of British Columbia — Ministry of Finance

PROPERTY TAX RETURN 1985

0376 COMM. OWN.
429 ACTUAL USE
01 840 SUB DISTRICT
01/01 TENURE/EQUITY

MACMILLAN BLOEDEL
TIMBERLANDS & PROPERTIES DIV
1075 W GEORGIA ST
VANCOUVER B C
V6E 3R9

NARRATIVE LEGAL DESCRIPTION
DL: 223
TREE FARM 21 TF: 021

CHANGE OF ADDRESS OR OWNERSHIP (PLEASE PRINT) (✓) ☐ PERMANENT CHANGE OF ADDRESS. SURVEYOR OF TAXES WILL ADVISE THE B.C. ASSESSMENT AUTHORITY
☐ NEW OWNER
POSTAL CODE

APPLICATION FOR HOME OWNER GRANT (PRINT NAME IN FULL)

NOTE: A PAYMENT OF TAXES IS NOT A REQUIREMENT TO CLAIM THE HOME OWNER GRANT (UNCLAIMED GRANT AMOUNT IS SUBJECT TO PENALTY)

[illegible]

ADDRESS OF RESIDENCE — DATE OF APPLICATION — (SIGN HERE) OWNER (OR SPOUSE OR RELATIVE OF DECEASED OWNER)

(IT IS AN OFFENCE TO MAKE FALSE APPLICATION FOR A HOME OWNER GRANT)
If 65 years of age or over during this calendar year, or in receipt of handicapped persons income assistance under the *Guaranteed Available Income for Need Act*, or an allowance under either the *War Veterans Allowance Act* (Canada) or the *Civilian War Pensions and Allowances Act* (Canada), or handicapped under the regulations, I further certify that I am eligible to apply for the additional grant of up to $250

I WAS BORN ON: MONTH DAY YEAR

OR I AM IN RECEIPT OF
(a) handicapped persons income assistance under the *Guaranteed Available Income for Need Act*. ☐
(b) an allowance under the *War Veterans Allowance Act* (Canada), ☐
(c) an allowance under the *Civilian War Pensions and Allowances Act* (Canada), or ☐
(d) a medical certificate attesting to my physical disability. ☐

INSTRUCTIONS TO TAXPAYER

- A $10.00 SERVICE FEE WILL BE CHARGED FOR DISHONOURED CHEQUES
- NON RESIDENTS OF CANADA - PLEASE PAY IN CANADIAN DOLLAR MONEY ORDER OR BANK DRAFT DRAWN ON A CANADIAN BANK OR THE EQUIVALENT IN U.S. FUNDS
- YOUR CANCELLED CHEQUE OR MONEY ORDER COPY IS YOUR RECEIPT. IF FURTHER PROOF OF PAYMENT IS REQUIRED PLEASE CHECK BOX ☐
- MAKE YOUR CHEQUE OR MONEY ORDER PAYABLE TO THE MINISTER OF FINANCE
- PRESENT THIS RETURN PORTION OF THE NOTICE WITH YOUR PAYMENT OR MAIL TO
  THE SURVEYOR OF TAXES
  1106 COOK STREET
  BOX 2900
  VICTORIA
  BRITISH COLUMBIA
  V8W 3G4
- FOR YOUR CONVENIENCE, PAYMENT MAY ALSO BE MADE AT THE OFFICE OF YOUR LOCAL GOVERNMENT AGENT

SUMMARY OF CURRENT TAXES PAYABLE (LESS PREPAID TAX AMOUNT)

GROSS TAXES IF NOT ELIGIBLE FOR GRANT	A	403.16
NET TAXES IF ELIGIBLE FOR REGULAR GRANT	B	NIL
NET TAXES IF ELIGIBLE FOR ADDITIONAL GRANT	C	
IF PAYMENT IS MADE AFTER JULY 2, 1985 BUT BEFORE OCT. 31, 1985, ADD THE 5% PENALTY AMOUNT OF —	$	20.16
DELINQUENT TAXES DUE INCLUDING INTEREST IF PAID BY THE INDICATED DATES		

COMPLETE BELOW
ENTER CURRENT TAX AMOUNT FROM EITHER LINE A or B or C
ADD PENALTY (IF ANY)
ADD DELINQUENT TAXES (IF ANY)
ENTER TOTAL PAYMENT

1	2	3	4	5	6	7	8	9	10	PREPAYMENT
			N			0	0			

H REG — LEASE EXPIRY — MTG NO
O
G ADD

FOLIO NO C11 785 29021.400-1-7 — MORTGAGE NO.

EXPLANATION FIELD

TRANSACTION DATE YY MM DD — FARM — PAYOR CODE — FEE CODE — STATEMENT CODE — H.O.G PROP — LEASE EXPIRY YY MM — H.O.G T/P

STANDARD EXPLANATION CODES — ☐ CASH ☐ CHEQUE ☐ POST DATED CHEQUE — ☐ NO PAYMENT ☐ H.O.G ONLY — G.A. CODE — STAFF CODE

FIN 248 REV. 85/4

HOLMSEN FORESTRY LTD.

Annex 5 – BANK OF MONTREAL PRIME COMMERCIAL LENDING RATES RELATED TO INFLATION

Year	Prime Lending Rate	Indicat. Inflation Rate	Indicat. Real Rate	Accum. Average	Previous 5-years' Average	Previous 10-years' Average
1961 – 62	5.54	1.27	4.22	4.22		
1962 – 63	5.82	1.88	3.87	4.04		
1963 – 64	5.75	1.84	3.84	3.97		
1964 – 65	5.75	2.41	3.26	3.80		
1965 – 66	5.91	3.53	2.30	3.50	3.50	
1966 – 67	5.90	3.69	2.13	3.27	3.08	
1967 – 68	6.51	4.11	2.31	3.13	2.77	
1968 – 69	7.18	4.47	2.59	3.06	2.52	
1969 – 70	8.44	3.27	5.01	3.28	2.87	
1970 – 71	7.15	1.95	5.10	3.46	3.43	3.46
1971 – 72	6.10	5.50	0.57	3.20	3.11	3.10
1972 – 73	6.37	7.26	-0.83	2.86	2.49	2.63
1973 – 74	9.70	11.63	-1.73	2.51	1.62	2.07
1974 – 75	10.19	10.98	-0.71	2.28	0.48	1.67
1975 – 76	9.79	9.73	0.05	2.13	-0.53	1.45
1976 – 77	9.28	7.15	1.99	2.12	-0.25	1.43
1977 – 78	8.60	7.84	0.70	2.04	0.06	1.27
1978 – 79	11.44	7.67	3.50	2.12	1.11	1.37
1979 – 80	14.46	9.38	4.64	2.25	2.18	1.33
1980 – 81	16.57	14.29	1.99	2.24	2.57	1.02
1981 – 82	18.37	10.50	7.12	2.47	3.59	1.67
1982 – 83	12.66	5.52	6.77	2.67	4.81	2.43
1983 – 84	11.42	4.63	6.49	2.83	5.40	3.26
1984 – 85	11.58	2.95	8.38	3.07	6.15	4.16

4.0 APPRAISAL PROCEDURE

4.1 General

Cost and value calculations in this appraisal generally followed the procedures outlined in the B.C. Ministry of Forests' **Coastal Log Based Appraisal Manual**, effective January 1, 1985. The cost base of the Manual is July 1, 1983. Although the updating of the cost base increased the Logging Equipment Hourly Costs slightly, the revised Trend Factors decreased the total cost allowance by 10 to 15 percent in relation to 1984 appraisals. It was recognized that the trend factors previously used had been overestimated because of the unexpected rapid decline in inflation rates. The 1985 revisions appear, however, to underallow operating costs somewhat. The appraisal calculations were programmed on a Lotus 1-2-3 spreadsheet for IBM (or compatible) micro computer application.

Although realistic cost estimations and accuracy of all input were important factors in the appraisal, consistency in the application of information and data was the prime objective. With this objective in mind, minor modifications were made to the appraisal calculation procedures when the computer spreadsheet was constructed. Samples of the micro computer program output have been checked against the Ministry of Forests' mainframe computer output and conform closely.

Data input was derived from timber cruise and terrain information collected and prepared by Reid, Collins. Discussions were held with MacMillan Bloedel administrative and operational staff to obtain actual current cost and productivity information. Road development requirements and log market values were assessed by the appraiser as described in the following sections.

Appraisal data input and computer input and output summaries are found in the following appendices:

ER 1 Robson Bight		Appendix III
ER 5 Muskeg Creek		" IV
Receive Area Schedule	"A" (Equal Value)	" V A
" " "	" (Equal Volume)	" V B
Crown Grant Lot 223	(Call Grades)	" VI A
" " "	(Computer Grades)	" VI B

4.2 Field Examination

Maps and aerial photos were carefully examined before visiting each block to identify potential problem areas for closer attention in the field. The aerial (Robson Bight properties only) and ground inspections provided a broad picture of the topographic and timber condition of each block and their relative difficulty in development and logging chance. Particular attention was paid to past and present road construction related to proposed developments. Potential extraction routes for all areas and a log dump location at Robson Bight were also identified.

4.3 Road Development

A map lay-out of the potentially required road development was prepared for each area. Detailed topographic maps were provided by MacMillan Bloedel for most areas. Proposed road locations were drawn with the aid of photos and general impressions from the field observations. The proposed development layouts are strictly hypothetical. Extensive engineering would be required for the preparation of an appropriate logging plan.

The theoretical development was designed for harvesting of all merchantable timber with conventional logging equipment, primarily portable high lead spars and grapple yarders. Each road was identified and the distance measured and summarized by area **(Appendix VII).**

4.31 Slope, Terrain Group and Construction Category

Slope and terrain information from the cruise data were summarized for each area to form a consistent basis for input to calculate road costs. A program was developed to distribute the total road distance to be constructed over a maximum six possible road construction groups in each area. The average side slope and area distribution for each slope group were calculated and correlated with terrain distribution to determine the road distance to be constructed within each of the six groups **(Appendix VIII)**. The average slope derived from the cruise data was modified to account for the location of roads and landings on lesser than average side slope. A reduction of 0-5 percent was made to slopes less than 65 percent, and a ten percent reduction was made to slopes over 65 percent. Other road construction input data were determined from general field impressions. The road cost summaries are found on pages 2 and 3 of the respective area appraisal printouts, **Appendices III to VI.**

4.4 Operating Costs

The operational data input for each area is found on pages 4A and 4B of the appraisal printouts. The values selected are based on the appraiser's judgement and investigations as well as on information obtained from MacMillan Bloedel and the Ministry of Forests.

The respective phase costs are computed according to the apprasial manual, incorporating the appropriate trend factor to generate the estimated operating costs as of July 31, 1985.

4.5 Log Market Values

4.51 General

The establishment of log grade distribution and realistic log price levels for all species and grades is possibly the most critical aspect of this appraisal. Projection of historic log prices to a "normal" level during a period of highly fluctuating prices and a depressed economy is difficult. It has been further complicated by the introduction of the letter grades in 1981 which replaced the old industry and statutory grades.

Available data has been carefully analysed and the results thoroughly scrutinized and discussed with MacMillan Bloedel and Canadian Forest Products log marketing specialists. In the opinion of these specialists and the appraiser, the estimates derived are realistic and consistent.

4.52 COFI Log Price Analysis

The Council of Forest Industries' log price records by species and grades were analysed from 1960 to end of June 1985. During this period the log pricing has evolved from **$/MBM** through **$/Ccf** to **$/m3**. Many changes have taken place with the introduction of lumber reject and pulp sorts, and most recently, letter grades. Although the possibility of inconsistency within any one of the grades over such a long period is relatively high, the COFI data is the most complete and reliable data available for Coastal British Columbia.

All individual letter grades that could be isolated were summarized separately. Letter grades that could not be segregated in the historical data were summarized as groups. The data was trended to mid-year 1985 using polynomial as well as natural logarithm curve fitting. The regressions were plotted over the actual price graph without adjustment for inflation (See examples, **Appendices IX & X**). The trended values were summarized and compared with averages for the last five years; for the first six months of 1985, and with the actual all-time high annual average value.

The grouped grades were prorated to individual grade values using the average last five-year percentage price deviation from the grouped value. The graphs and the log price comparison summary were closely examined to select the closest and most realistic relationship **(Appendix XI)**. Subsequent to the review and general acceptance by the industry log marketing specialists, the selected log values outlined in **Appendix XI** were used in the appraisal to compute Average Market Values **(AMV)** by species for each individual area in the timber exchange.

5.0 DETERMINATION OF PRODUCTIVE CAPACITY

5.1 General

The timber exchange includes the replacement of productive capacity lost from Tree Farm Licence # 39 in areas removed for the ecological reserves. The ***Productive Capacity Replacement*** area is to be included with the Schedule "B" lands of the TFL. Area and forest classification system has been described in detail in Reid, Collins' report. The appraiser has assessed and analysed the data provided, applied yield predictions according to the established site indices, and made appropriate area adjustments to the proposed ***Replacement*** area. A summary of the productive capacity exchange calculations is found in **Appendix XII.**

5.2 Determination of Site Index

The site index on all areas was determined by Reid, Collins using the **"Site Index Curves (Sept. 1979)"**, contained in the Ministry of Forests, Inventory Branch's **Field Handbook (1983).** The reference age is 100 years. The ***Take*** areas are classified according to the old Ministry of Forests' labelling system, while the ***Productive Capacity Replacement*** area is classified according to the new system. The new labelling system and the more detailed photo interpretation and stand typing of the ***Replacement*** area has resulted in more refined and detailed information for this area than for the ***Take*** areas.

The height/age relationship for determining site index appears to be relatively consistent where the forest stand has reached a free growth stage. In very young stands, however, and where the stand has been subject to suppression from overstocking or a residual overstory, determination of site index becomes less precise.

To ensure consistency, Reid, Collins determined site index on the basis of the primary forest type within the stand. Where a secondary forest type existed in the form of a scattered overstory of residual mature timber, the productive capacity of the site may, however, have been underestimated. The indicated site index for the overstory, was invariably considerably higher than for the immature stand underneath. Low sites, less than S.I. 16 at 100 years, are generally considered inoperable.

Therefore, any type classified lower than S.I. 16 was excluded from the calculation of productive capacity for the area. Some of the immature stands with a scattered overstory of mature timber fell into the low site category. This would not have been the case if the site index had been based on the height/age relationship of the overstory.

Conversely, an overestimation of site index may occur in a mixed species stand such as Douglas fir/hemlock, where the site index is determined on the height dominating fir. An example of this is Type 8C in ER 1, Robson Bight. The estimated site index, correctly derived from the height/age relationship of the dominant/codominant fir trees in the stand, is recorded as 68. This is equivalent to a Mean Annual Increment **(M.A.I.)** exceeding 21 m3 per hectare per year. Although such a high yield is potentially achievable under intensive forest management and ideal conditions, it is questionable under natural growth conditions and particularly where the site indices of adjacent stands do not exceed 42.

5.3 Yield Table Selection

Yield tables or yield equations applicable to natural stands in the general region were obtained from three sources:

Ministry of Forests: **"Forest Inventory Zone "B", Volume-Age Curve Index by Growth Type and Site"**

MacMillan Bloedel: **"Yield Tables for Natural Stands of Douglas-fir and Western Hemlock"**

Crown Forest: **"Johnstone Straits Yield Simulator"**

The data was compiled using the various yield tables as well as weighted average site indices at 100 and 50 years. The MacMillan Bloedel yield tables were considered most suitable and acceptable for the analysis. The Ministry of Forests' table was restricted to the old classification of Good, Medium, Poor and Low sites, and therefore did not accommodate the detailed site classification available in this appraisal. The Crown Forest yield simulator uses only one culimination age, 77 years, for all sites, and is developed for mixed hemlock-fir types. The summary in **Appendix XII** compares the various methods investigated in the productive capacity exchange analysis.

6.0 VALUATION AND ANALYSIS

6.1 General

Normal stumpage appraisal calculations, incorporating pro-rated selling prices, profit & risk ratio, and operating costs were completed for all areas. Total upset stumpage value, total conversion return less royalty (if applicable), and total indicated value were calculated for each area. Although conversion return for some species could be negative because of low AMV or high operating costs, the total conversion return for the area was considered the most appropriate measure of value for the timber exchange. The summarized values are found on page 5 of the appraisal print-outs for the respective areas.

Because of the relatively low volumes and value differences involved in the exchange, no discounting of values is warranted.

6.2 Schedule "A" Land Exchange

As it was proven impossible to equate volume as well as value, it is the appraiser's opinion that equal value should weigh more heavily than equal volume in the exchange negotiation. To assist in negotiations, calculations are presented for the equal value as well as the equal volume concept.

Several trial recalculations of the ***Receive*** area and volume were required to establish the boundaries of the area which would give equal value or volume. Recompilation of log grades and decay factors for the revised area was requested and obtained from Reid, Collins when a close estimate of equal values had been obtained. The coloured area of the map in **Map Pocket # 1** following the Appendices, outlines the area required to equate value. The heavy dashed line indicates the western boundary of the ***Receive*** area required to approximate equal volume. A new area summary by timber types is printed on the map.

Table 1, below, summarizes the values and volumes calculated for the two options.

Table 1 - Valuation of MB Schedule "A" Exchange Lands

Location	Area ha	Volume m3	Conversion Return, $
Take			
ER1 Robson Bight	315.6	246,162	2,666,317
ER5 Muskeg Creek	80.8	45,742	518,453
Take Area Total	396.4	291,904	3,184,770
Receive (= Value)	378.8	331,646	3,184,653
Difference(= Value)	-17.6	40,742	-117
Receive (= Volume)	332.2	293,924	2,784,560
Difference(= Volume)	-64.2	2,020	-400,210

The main factors contributing to the value difference if equal volume is considered are:

a. Substantially lower AMV for hemlock on ER1, Robson Bight, than on the ***Receive*** area.
b. Higher operating costs on the Robson Bight area. Although hauling cost is considerably lower, yarding and crew transportation are much higher at Robson Bight than on the ***Receive*** area.

The Appraiser recommends the acceptance of the equal value concept. The *Receive* Area should be established at 378.8 hectares as outlined on the revised map to provide a replacement volume of 331,646 m3.

6.3 Productive Capacity Replacement

The estimated productive capacities of ***Take*** and ***Productive Capacity Replacement*** areas are summarized in Table 2, below. **Map Pocket # 2** contains the map showing the proposed division of the area. The proposed division line runs parallel to the western boundary at a distance of **1890 meters** east. The western section of the area borders on three sides to TFL # 39. Inclusion of this portion with the TFL was considered the most logical for administrative and operational reasons.

Table 2 - Productive Capacity Replacement TFL # 39 , Schedule "B"

Location	Total ha	Prod ha	Avg.MAI m3/ha/y	Ann.Yield m3
Take				
ER1 Robson Bight	334.9	315.6	9.32	2,943
ER5 Muskeg Creek	105.7	80.8	9.72	785
Take Area Total	440.6	396.4	9.40	3,728
Replacement	602.2	518.4	7.20	3,731
Difference	161.6	122.0	2.20	3

It is recommended that an area of 602.2 ha,, as outlined on the map in Map Pocket # 2, be incorporated in TFL # 39, Schedule "B" lands, as *Productive Capacity Replacement* for areas proposed for Ecological Reserves No. 1 and 5.

The main reason for the additional area requirement to equal productive capacity of the ***Take*** areas is the lower average site index of the ***Replacement*** area. As outlined in Section 5.2, the procedures used in determining site index may have contributed to some of the difference.

In practical terms, a slight overestimation of ***Replacement*** area in favour of MacMillan Bloedel would not have any drastic effect on future annual cuts in the Forest District. It could be beneficial and desirable from a forest management point of view to incorporate the entire old timber licence area of 762.7 ha into TFL # 39. As this will be Schedule "B" lands subject to normal, full stumpage payments, there would be no economic loss to the Ministry of Forests. The narrow strip of Vacant Crown Land which otherwise will remain between two different TFL's will be difficult to administer efficiently.

There is a disadvantage to MacMillan Bloedel to have to operate on a larger area of lower site land. On the other hand, the established road systems will have some future value, and the operating costs could be lower than on the ***Take*** areas. MacMillan Bloedel would, however, only benefit economically from the existing development and lower operating costs if timber on the area is harvested during periods of minimum stumpages. Present worth of these nebulous values is difficult to quantify and would not be significant. Established advanced growth on the area could have a minor positive effect on TFL # 39's overall annual allowable cut in the intermediate term.

6.4 Crown Grant, Lot 223

The effect of grade distribution on timber value is clearly illustrated in the appraisal of the Crown Grant, Lot 223. At MacMillan Bloedel's request, the Ministry of Forests' letter grades were called and recorded at the time of cruising the property. An estimated total volume of **27249 m3** is concentrated on **34.8 ha** of merchantable area.

Standard computerized log grades were also provided in the cruise summary. Valuations, using identical operating costs and volumes, applied to the two different log grade distributions, resulted in about 50 percent higher value for the computerized log grades. It is generally recognized that the computerized grades overestimate the percentage of higher grades and underestimate the amount of lower grades, particularly **X** and **Y** grades.

The revised appraisal cost trending allowance may have resulted in a slight underestimation of operating costs on Lot 223. Where the appraisal process allowed the flexibility, minor compensating adjustments were made. Because of the low volume involved, the valuation is not highly sensitive to the effect of operating cost per cubic metre. A one dollar per cubic metre change in operating cost would equal $ 27,000, or 6 percent of the toatal property value.

Royalties are not payable on fee simple lands. Royalty rates were therefore excluded from the calculation of estimated total conversion return for Lot 223.

As this property is proposed for outright sale, land as well as timber values have been estimated. The bare land value was estimated by John B. Miller, A.A.C.I., to be **$ 84,600**. A copy of the real estate valuation report is found in **Appendix XIII.**

The value of Crown Grant, Lot 223 is summarized in the following table:

Table 3 - Valuation, Crown Grant, Lot 223

Log Grading Method	Timber Value $	Bare Land Value $	Total Value $
Called Grades	329,522	84,600	414,122
Computerized Grades	488,698	84,600	573,298

Because of the apparent overestimation using computerized grades, supported by MacMillan Bloedel's request to call grades on the Crown Grant, the value using the called grades has been considered the most realistic for valuation of Lot 223.

Estimated Value, Crown Grant, Lot 223: $ 414,122

6.5 Capital Gains Taxation

Although this is an exchange of timber rights within TFL # 37, it is possible Revenue Canada will consider it a disposal of an old timber licence at current value. If so, the transaction may be subject to capital gains taxation on any value increase since 1971. Such taxation would be an unexpected additional cost to MacMillan Bloedel. The taxation may seem unfair, as the Schedule "A" ***Receive*** lands are planned to be logged soon, not disposed of by sale. If the Schedule "A" ***Receive*** area were to be part of a future sale of operations and timber lands, the current valuation would be the new base for capital gains taxation. Therefore, any gains between 1971 and 1985 on the exchanged Schedule "A" lands would be subject to capital gains taxation for that period.

6.6 Comments

Any land base removal from an established timber tenure, even though the timber volume or value may be replaced in another location, will result in a degree of disruption to the planning and operation of a company. This may be in the form of reduced volume available to the existing road system, and consequently higher road amortization rates, or additional unwanted traffic on active haul roads, affecting haul speeds and safety. Where some of these negative effects can be quantified and compensated for in the stumpage appraisal allowances, it is a cost to the Crown in terms of reduced stumpage revenues.

Specifically, the Robson Bight ecological reserve will in the long term be very costly to the Crown in terms of lost stumpage revenue. It is estimated that about 270,000 m3 of the annual allowable cut in the Tsitika drainage would otherwise have been transported on favourable gradients and dumped at Robson Bight.

The difference in hauling cost alone is estimated at $ 2.20 per m3, representing a present worth of about $ 15 million, using a discount rate of 4 percent. Additional road maintenance cost would increase this by $ 2-3 million. At positive stumpage rates this would be the present value of future stumpage losses to the Crown from the Tsitika drainage. At minimum stumpage rates, the full operating cost can not be compensated for in the appraisal allowance and will result in a direct additional cost to the companies operating in the drainage, primarily MacMillan Bloedel.

Because of the adverse haul to a 500 meter elevation summit subject to heavy snowfalls in the winter time, operations in the area are restricted to 150 days per year. A favourable haul to Robson Bight would have allowed up to 200 operating days per year providing greater planning and yarding flexibility.

Robson Bight has been identified as the habitat for a pod of killer whales. It is apparent that the whales are not residing there year round. If the periods of the whales' presence in the area could be charted, it should be possible to restrict industrial as well as other disturbing activities in the area during those periods. At other times, during the whales' migration to other areas, controlled activities in the area could be allowed.

7.0 SUMMARY AND CONCLUSIONS

The long term effect and cost to MacMillan Bloedel's operation of TFL # 39 caused by the establishment of the ecological reserves cannot readily be quantified. This appraisal considers only the actual timber value and volume of the exchange. Although the log market pricing is trended to establish a "normal" current price level, some species are appraised at minimum stumpage. Applied to all the timber and MacMillan Bloedel's operation in the Tsitika drainage, it is apparent that the loss of the operational option to transport and dump logs in Robson Bight will have a negative ecomomic effect on future operations in the area. For the same reason, there will be a substantial loss of future stumpage revenue to the Crown.

In the Appraiser's opinion, the equal value concept as applied and recommended in this report, provides a fair exchange of Schedule "A" timber rights. Although there are differences in volume and area exchanged, these factors have little or no practical significance.

The Appraiser believes, that because of the differences in site index determination and type classification between the ***Take*** areas and ***Productive Capacity Replacement*** area, the required ***Replacement*** area may have been slightly overestimated. This is not considered to be critical, as the Schedule "B" land is subject to full appraised stumpage rates. Furthermore, because of the location of the ***Replacement*** area, it would be desirable to have the entire old timber licence under TFL forest management and administration.

Because the computerized log grades are generally considered to be less reliable than the called grades, the Crown Grant, Lot 223 valuation was based on called log grades. The called log grades resulted in considerably lower AMV's for some of the species than the computerized grades. The revised appraisal cost trending allowance may have resulted in a slight underestimation of operating costs on Lot 223. Where the appraisal process allowed the flexibility, minor compensating adjustments were made.

In summary, the Appraiser feels an equitable exchange could be effected on the basis of recommendations and considerations made in this report. Determination of long term costs and effects on overall operations, as a result of the establishment of the ecological reserves, were not part of the Terms of Reference. Comments, related to overall operations and Crown stumpage revenues offered in this report, are included for informative purposes only.

Information such as cruise data, appraisal manual, COFI historic log price records, and various yield tables, provided to and used by the Appraiser from other sources have been closely examined for reasonable accuracy. The Appraiser cannot assume responsibility for possible undetected errors contained in these documents.

APPENDICES

APPENDIX I

TERMS OF REFERENCE

Instructions for Timberland Appraisals required for Ministry of Forests' Exchanges

I Fee Simple Lands

1. The objective of the appraisal is to estimate the market value of the properties being exchanged. The appraisals should therefore consider the highest and best use that each property is legally capable of.

2. Where the highest and best use of a property is based on growing and/or harvesting timber, an estimated value derived from separate figures for land and merchantable timber should be prepared. If available market evidence provides adequate information to establish a value based on comparable sales, this should also be presented, and the consultant should give his opinion regarding the most relevant figure.

3. In preparing value estimates based on separate figures for land and merchantable timber, the method should incorporate the following features:

   a) land values should be based on comparable sales with due consideration of locality, productivity, and other relevant factors;

   b) the timber value should be based on the following:

      i) the consultant's best estimate of logging costs (and processing costs, if appropriate) as of the date of the appraisal;

      ii) the consultant's best estimate of average product values over the past market cycle, adjusted, if required, to reflect significant trends or changes in the product values which may be realized over the longer term; prior to averaging historic product prices should be inflated to dollars of purchasing power comparable to those used in estimating logging (and processing) costs;

   c) in preparing estimates of timber values the appraiser should identify and estimate any other factors, e.g. value to owner, timing of harvest, etc., affecting timber values in the circumstance of the particular proposed exchange.

II Temporary Tenures

1. The objective of the appraisal is to estimate the market value of the timber on the existing and new licences being exchanged. The land value in timber production or other uses need not be considered.

2. In valuing merchantable timber, the instructions in Sections 3b and 3c above should apply.

3. Any cost to the licensee from restrictions and obligations attached to the tenures in question should be considered in the valuation.

APPRAISAL GUIDELINES
TIMBER EXCHANGE AND LAND VALUATION
TSITIKA ECOLOGICAL RESERVES

Concerted attempts have been made by the Ministries of Forests and Lands, Parks and Housing and MacMillan Bloedel Limited/Canadian Forest Products Ltd., to select candidate areas of:

1. equal timber volume and value
2. equal productive capacity.

It is the task of the cruising consultant to confirm the equal volume criterion and determine site index information on "take" and "receive" areas. Based on the following guidelines, it is the task of the independent appraiser to:

1. With regard to the timber exchange, determine the market value of the "take" and "receive" timber and decide whether the equal volumes are of equal market value.

2. With regard to compensation for loss of cutting rights, determine the m.a.i. of the "take" and "receive" areas based on site index information and decide whether the equal productive capacities constitute equal cutting rights as expressed as a dollar figure.

3. With regard to compensation to MB Ltd. for its private lot, determine the total market value of land and timber. The land valuation portion should be sub-contracted to a qualified real estate appraiser.

The September 21, 1982 document entitled: "Instructions for Timberland Appraisals required for Ministry of Forests Exchanges" shall form the basis for the appraisals of land and timber, with the following clarifications.

1. The appraisal will be on a species by species basis.

2. Values shall be determined by property and species, based on, but not limited to site specific selling price and logging cost estimates.

3. The date of valuation shall be July 31, 1985.

4. If the use of a discount rate is recommended to represent net present timber values, the appraiser shall recommend an appropriate rate and provide justification for its use.

5. The appraisal will assume no real growth in timber values or logging costs over the future harvesting period.

SCHEDULE "B"

SUBCONSULTANTS TO BE USED ON THIS JOB

John B. Miller, A.A.C.I. of
D.R. Coell & Associates Inc.
203 - 3347 Oak Street
Victoria, B.C.
V8X 1R2

APPENDIX II

PHOTOS

Photo # 1 - MB - ER 5 Muskeg Creek
Foreground - SW View

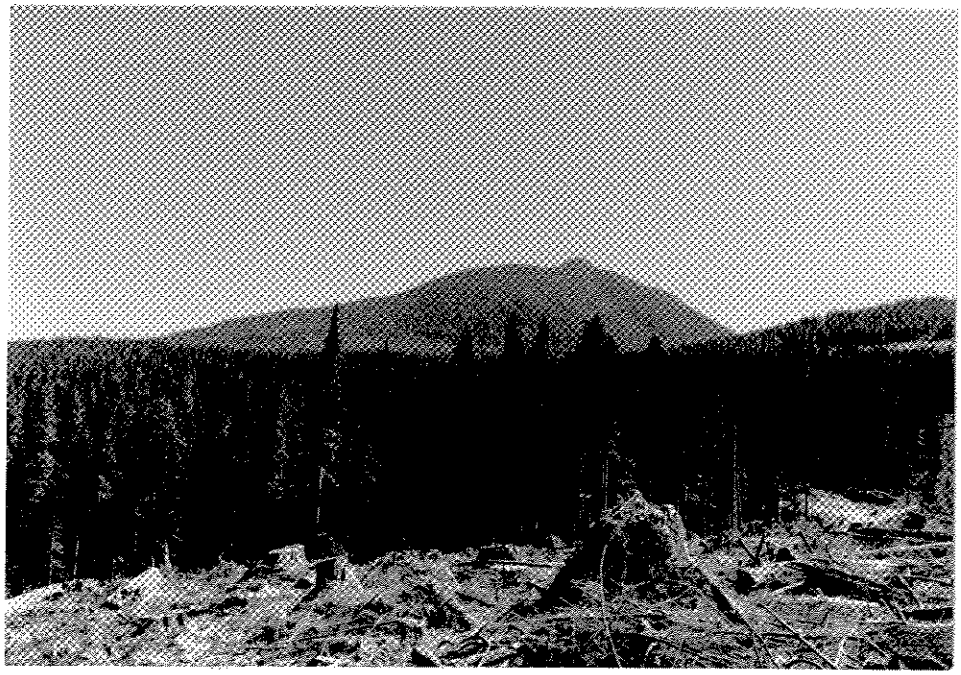


Photo # 2 - MB - Receive Area, Western Portion
Right Background - NW View

APPENDIX III

APPRAISAL SUMMARY

TAKE AREA, ER 1 ROBSON BIGHT

APPRAISAL DATA SHEET

Licence: ERI TFL 39 Appraisal Date: 850731
Cutting Permit: Take Area Effective Date: 850201
Location: Robson Bight Forest District: Campbell River
Approved Cruise: 1 Tenure: 1
(y=1, n=0) TFL & FL = 1
Net Volume, m3 246162 TSL = 2
Area, ha: 215.6 Marketer: 1
Side Slope, % : 43.2 Major=1, Small=2
Terrain Code: 1.84 Term, yrs: 3
Log Vol. Dis, m3: 0.88 Annual Volume, m3: 82054
Log Vol.(scale): Annual Op.Days: 180
Net Vol/tree, m3: 1.9

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	D/S	Total	
Peeler	A				11.2							
	B				15.7							
	C	11.2			3.5			18.7				
Lumber	D	12.1	0.7	0.0	6.0	2.1	0.0	0.8	0.0			
	F		0.2	0.0				7.9				
Sawlog	H	20.8	38.0	0.0	9.8	7.8	0.0	17.2	0.0			
	I	29.9	17.4	0.0	24.6	22.3	0.0	15.9	0.0			
	J	17.1	20.7	0.0	25.5	53.7	100.0	34.7	0.0			
Shingle	K		0.0									
	L		16.1									
	M		7.4									
Utility	X	8.4	5.1	0.0	3.3	12.6	0.0	4.5	0.0			
Chip&Saw	Y	0.0	0.2	0.0	0.1	1.5	0.0	0.3	0.0	100.0		
Total %		100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0		
Total Net Vol, m3:		34851	40920	0	29418	112529	288	26830	0	1327	246162	
Decay, % :		7.8	26.6	0	2.3	2.7	0	1.7	0	1.2	9	
Slope Class, %		0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100		16	14	13	6	11	10	12	1	7	1	9

Licence: ER1 TFL 39 Cutting Permit: Take Area
Volume, m3: 24,162
Highway trucks 1
Off-Highway trucks 2 2
Front-End Loader 1
Heelboom Loader 2 1 Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Hardness S/H=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
5.38	1	8	15	2	2	2	4	1		50	50
0.77	1	13	25	2	2	2	4	1		100	50
4.15	1	45	50	2	2	2	4	1		150	50
1.08	1	79	65	2	2	2	4	1		200	50
1.23	1	79	90	2	2	2	4	1		200	50

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
5.38	3	0.9	5580	0	18.4	6.74	37587	55987	301209
0.77	3	0.9	5580	3	18.4	6.74	37587	55987	43110
4.15	4	0.3	1660	5	39.5	6.74	11316	50816	210888
1.08	5	0	0	8	62	6.74	0	62000	66960
1.23	6	0	0	8	70.9	6.74	0	70900	87207
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length m	Number	Cost $	Tot.Cost $
1. Cross Drains	Metal	500 mm		63	19530	
2. Seasonal/small streams	Wood	.75 m2		10	4200	
3. Intermed/medium streams	Wood	1.5 m2		3	1890	
4. Perennial/large streams	Wood	3.75 m2		2	1960	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						27580

Bridges:

Location	Snare Ratio	Crib ht m	Span m	Number	Cost $	
Tsitika River	0.03	9	21	1	1731	
				0	0	
					0	
					0	
					0	
Special installations						1731

Miscellaneous Development Costs:

	0	
	0	
	0	0

DEVELOPMENT COST SUMMARY

Item	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	12.61	56255	709375	2.88
Culverts			27580	0.11
Bridges			1731	0.01
Miscellaneous			0	0.00
Total Development Cost			738686	3.00

****

Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	12.61	100	246162	3.00	3.00	3.26
Landings (#/km)	2	100	246162	0.27	0.27	0.29
Logs, H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	246162	3.40	3.40	3.69
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		50	123081	3.46	3.23	3.51
Skyline		20	49232.4	1.48	1.44	1.56
Grapple		30	73848.6	2.09	1.53	1.66
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELor,%	0	0	0			
RTLS (T/L=1)	0	0	0	0.00	0.00	0.00
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	246162	2.99	2.99	3.24
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	246162	1.84	1.84	2.00
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	2.6	15	20	18		
Mainline	1.0	25	35	4		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			0.9	39		
Unloading time				15		
Unavoidable delay				15		
Total time				92		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	3.6	100	246162	0.66	0.66	0.72
Spring open (km)	0	100	246162	0.00	0.00	0.00
Dump/Sort/Boom/St.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume		Untrended	Trended
Water Transport						
From: Robson Bight						
To: Gambier						
Rate, $/m3:	2.11					
Towing					0.00	0.00	0.00
Barging					2.11	2.11	2.29
Lake Tow, km:	0	0	0		0.00	0.00	0.00
Owikeno Transfer:						
Machmell		0	0		0.00	0.00	0.00
Sheemahant		0	0		0.00	0.00	0.00
Crew Transport					4.36	4.36	4.73
Crummy, RTT min	110					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp					0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occupicy, #	0					
Single Occup. #	0					
Cookhouse loss					0.00	0.00	0.00
Remote Op. vessl	0				-0.29	-0.29	-0.31
Site Specific, $	0				0.00	0.00	0.00
Overhead						
Gen.& Admin.					2.55	2.55	2.77
Operational					6.41	6.41	6.95
Miscellaneous						0.00	0.00

Licence:	ERI TFL 39
Cutting Permit:	Take Area
Forest District:	Campbell River
Location:	Robson Bight
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	246162
Area, ha:	315.6

Phase	$/m3
Development	3.27
Felling & Bucking	3.40
Yarding	6.20
Skidding	0.00
Loading	2.99
Hauling	1.84
Swinging	0.00
Road Maintenance	0.66
Dump/Sort/Boom/Scale	3.01
Water Transport	2.11
Owikeno Transfer	0.00
Crew Transport	4.36
Camp	0.55
Cookhouse Lost	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	37.05
Trend Factor	1.0849
Total Trended Op. Cost	40.20

VANCOUVER FOREST REGION STUMPAGE CALCULATION — Licence: ER1 TFL 39 —
Forest District: Campbell River — Cutting Permit: Take Area
Appraisal Date: 850731 — Volume: 246162 m3 — Location: Robson Bight

		$/M3 Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		47.41	61.90	0.00	72.93	39.90	17.90	75.81	0.00	40.20	
Profit/Risk Ratio		0.14	0.14	0.00	0.14	0.14	0.14	0.14	0.00	0.14	
Discount Value		41.59	54.30	0.00	63.97	35.00	15.70	66.50	0.00	35.26	
Operating Costs		40.20	40.20	0.00	40.20	40.20	40.20	40.20	0.00	40.20	
Conversion Return		7.22	21.70	0.00	32.73	-0.30	-22.30	35.61	0.00	0.00	
Indicated Stumpage		1.39	14.10	0.00	23.78	-5.20	-24.50	26.30	0.00	-4.94	
Profit/Risk		5.82	7.60	0.00	8.96	4.90	2.20	9.31	0.00	4.94	
Valuation Factor		0.19	0.65	0.00	0.73	0.00	0.00	0.74	0.00	0.00	
Upset Stumpage		3.79	14.10	0.00	23.78	3.19	1.43	26.30	0.00	3.22	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		3.79	14.10	0.00	23.78	3.19	1.43	26.30	0.00	3.22	
Royalty rate		1.20	1.50	1.50	2.00	1.20	0.80	2.00	0.80	0.50	
Final Stpg.less Royalty		2.59	12.60	0.00	21.78	1.99	0.63	24.30	0.00	2.72	
Base AMV,	$/m3	47.41	61.90	0.00	72.93	39.90	17.90	75.81	0.00	40.20	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	34851	40920	0	29418	112528	288	26830	0	1327	246162
Total Upset Value,	$	90370	515619	0	640588	224148	182	651955	0	3604	2126466
Total Conversion Return,	$	209677	826678	0	904058	-168508	-6652	901727	0	-664	2666317
Total Indicated Value,	$	6752	515619	0	640588	-719884	-7285	651955	0	-7214	1080531

APPENDIX IV

APPRAISAL SUMMARY

TAKE AREA, ER 5 MUSKEG CREEK

APPRAISAL DATA SHEET

Licence:	ER5 TFL 39	Appraisal Date:	850731	
Cutting Permit:	Take Area	Effective Date:	850201	
Location:	Tsitika River	Forest District:	Campbell River	
Approved Cruise: (y=1, n=0)	1	Tenure: TFL & FL = 1 TSL = 2	1	
Net Volume, m3	45742			
Area, ha:	80.8	Marketer: Major=1, Small=2	1	
Side Slope, % :	16.1			
Terrain Code:	1.45	Term, yrs:	1	
Log Vol. 10m, m3:	1.05	Annual Volume, m3:	45742	
Log Vol.(scale):		Annual Op.Days:	150	
Net Vol/tree, m3:	2.31			

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	D/S	Total
Peeler	A				0.0						
	B				0.0						
	C	13.2			0.0			0.0			
Lumber	D	3.1	0.0	0.0	0.0	3.2	0.0	0.0	20.4		
	F		0.0	0.0				43.6			
Sawlog	H	5.7	41.9	0.0	0.0	16.4	0.0	22.6	13.6		
	I	18.3	21.5	0.0	0.0	37.5	0.0	20.9	27.8		
	J	53.9	11.8	0.0	0.0	30.2	0.0	6.8	26.4		
Shingle	K		0.0								
	L		11.2								
	M		9.2								
Utility	X	5.8	4.2	0.0	0.0	11.6	0.0	4.1	11.8		
Chip&Saw	Y	0.0	0.2	0.0	0.0	1.1	0.0	0.0	0.0	0.0	
Total %		100.0	100.0	0.0	0.0	100.0	0.0	100.0	100.0	0.0	
Total Net Vol, m3:		6550	11940	0	0	25200	0	1316	736	0	45742
Decay, % :		10.4	25.6	0	0	5.6	0	4.6	6.6	0	13.1

Slope Class, %	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100	55	23	9	0	9	0	0	0	0	0	4

Licence: ER5 TFL 39 Cutting Permit: Take Area
Volume, m3: 45742
Highway trucks 1
Off-Highway trucks 2 2
Front-End Loader 1
Heelboom Loader 2 1 Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Haroness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Haroness S/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
2.1	1	1.3	0	1	2	1.5	4	1		250	300
0.75	1	6.3	0	1	2	1.5	4	1		250	300
0.3	1	35	15	1	2	1.5	4	1		250	300
0.15	1	90	50	1	2	1.5	4	1		250	300

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
2.1	1	1	6300	-3	7.1	6.61	41671	48771	102420
0.75	1	0.9	5580	-3	8.2	6.61	36909	45109	33832
0.3	3	0.6	3540	-3	20.9	6.61	23415	44315	13295
0.15	4	0	0	-3	38.1	6.61	0	38100	5715
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length m	Number	Cost $	Tot.Cost $
1. Cross Drains	Metal	500 mm		15	4650	
2. Seasonal/small streams	Wood	.75 m2		2	840	
3. Intermed/medium streams	Wood	1.5 m2		0	0	
4. Perennial/large streams	Wood	3.75 m2		0	0	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						5490

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
					0	
				0	0	
					0	
					0	
					0	
Special installations						0

Miscellaneous Development Costs:

					0	
					0	
					0	0

DEVELOPMENT COST SUMMARY

Item	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	3.3	47049	155261	3.39
Culverts			5490	0.12
Bridges			0	0.00
Miscellaneous			0	0.00
Total Development Cost			160751	3.51

Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	3.3	100	45742	3.51	3.51	3.81
Landings (#/km)	2	100	45742	0.36	0.36	0.39
Logs, H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	45742	3.31	3.31	3.59
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		60	27445.2	5.74	3.45	3.74
Skyline		0	0	0.00	0.00	0.00
Grapple		40	18296.8	4.55	1.82	1.97
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELor,%	0	0	0			
RTLS (T/L=1)	0	0	0	0.00	0.00	0.00
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	45742	2.61	2.61	2.84
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	45742	3.35	3.35	3.64
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	1.7	10	15	17		
Mainline	28.0	35	45	65		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			1.1	34		
Unloading time				15		
Unavoidable delay				15		
Total time				167		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	29.7	25	11435.5	1.10	0.27	0.30
Spring open (km)	22	25	11435.5	0.16	0.04	0.04
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended	Trended
Water Transport					
From: Eve River					
To: Gambier					
Rate, $/m3:	1.95				
Towing				0.00	0.00	0.00
Barging				1.95	1.95	2.12
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:						
Macmaell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				2.07	2.07	2.24
Crummy, RTT min	50					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp				0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occup'cy, #	0					
Single Occup. #	0					
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead						
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

****

Licence:	ER5 TFL 39
Cutting Permit:	Take Area
Forest District:	Campbell River
Location:	Tsitika River
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	45742
Area, ha:	80.8

Phase	$/m3
Development	3.87
Felling & Bucking	3.31
Yarding	5.27
Skidding	0.00
Loading	2.61
Hauling	3.35
Swinging	0.00
Road Maintenance	0.31
Dump/Sort/Boom/Scale	3.01
Water Transport	1.95
Owikeno Transfer	0.00
Crew Transport	2.07
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	34.98
Trend Factor	1.0849
Total Trended Op. Cost	37.95

****

Forest District: Campbell River Cutting Permit: Take Area

Appraisal Date: 850731 Volume: 45742 m3 Location: Tsitika River

		$/M3								
	Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price	40.26	63.12	0.00	0.00	44.31	0.00	121.63	26.48	0.00	
Profit/Risk Ratio	0.14	0.14	0.00	0.00	0.14	0.00	0.14	0.14	0.00	
Discount Value	35.32	55.37	0.00	0.00	38.87	0.00	106.69	23.23	0.00	
Operating Costs	37.95	37.95	0.00	0.00	37.95	0.00	37.95	37.95	0.00	
Conversion Return	2.31	25.17	0.00	0.00	6.36	0.00	83.68	-11.47	0.00	
Indicated Stumpage	-2.63	17.42	0.00	0.00	0.92	0.00	68.74	-14.72	0.00	
Profit/Risk	4.94	7.75	0.00	0.00	5.44	0.00	14.94	3.25	0.00	
Valuation Factor	-1.14	0.69	0.00	0.00	0.14	0.00	0.82	0.00	0.00	
Upset Stumpage	3.22	17.42	0.00	0.00	3.55	0.00	68.74	2.12	0.00	
Pro-Rate %										
Pro-Rate Value, $/m3										
Bonus Bid, $/m3										
Final Stumpage	3.22	17.42	0.00	0.00	3.55	0.00	68.74	2.12	0.00	
Royalty rate	1.20	1.50	1.50	2.00	1.20	0.80	2.00	0.80	0.50	
Final Stpg.less Royalty	2.02	15.92	0.00	0.00	2.35	0.00	66.74	1.32	0.00	
Base AMV, $/m3	40.26	63.12	0.00	0.00	44.31	0.00	121.63	26.48	0.00	
Small Operator Indicator	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:	5									
Volume m3	6550	11940	0	0	25200	0	1316	736	0	45742
Total Upset Value, $	13238	190052	0	0	59094	0	87835	970	0	351190
Total Conversion Return, $	7296	282604	0	0	130092	0	107492	-9032	0	518453
Total Indicated Value, $	-25092	190052	0	0	-7044	0	87835	-11425	0	234326

APPENDIX V A

APPRAISAL SUMMARY

RECEIVE AREA - SCHEDULE "A" (EQUAL VALUE)

APPRAISAL DATA SHEET

Licence:	TFL 39	Appraisal Date:	850731	
Cutting Permit:	Receive Area	Effective Date:	850201	
Location:	Tsitika River	Forest District:	Campbell River	
Approved Cruise: (y=1, n=0)	1	Tenure: TFL & FL = 1 TSL = 2	1	
Net Volume, m3	332646			
Area, ha:	378.8	Marketer: Major=1, Small=2	1	
Side Slope, % :	29.6			
Terrain Code:	1.46	Term, yrs:	3	
Log Vol. Use, m3:	1.13	Annual Volume, m3:	110882	
Log Vol.(scale):		Annual Op.Days:	150	
Net Vol/tree, m3:	2.53			

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Peeler	A				39.6						
	B				26.7						
	C	21.6			0.0			0.0			
Lumber	D	2.3	2.6	2.3	0.0	5.3	0.0	0.0	0.0		
	F		1.0	4.1				0.0			
Sawlog	H	3.5	36.4	30.5	0.0	13.6	0.0	0.0	0.0		
	I	19.6	26.7	7.7	31.0	37.8	0.0	0.0	0.0		
	J	46.1	8.5	5.2	0.0	25.2	0.0	0.0	0.0		
Shingle	K		0.0								
	L		9.7								
	M		11.5								
Utility	X	6.7	3.5	36.6	2.7	9.2	0.0	0.0	0.0		
Chip&Saw	Y	0.2	0.1	13.6	0.0	8.9	0.0	0.0	0.0	0.0	
Total %		100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	
Total Net Vol, m3:		76052	62481	14034	258	179921	0	0	0	0	332646
Decay, % :		7.2	27	34.9	1.5	8.4	0	0	0	0	14.6

Slope Class, %	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100	2	11	48	20	7	4	3	3	1	0	1

Licence: TFL 39 Cutting Permit: Receive Area
Volume, m3: 332646
Highway trucks 1
Off-Highway trucks 2 2
Front-End Loader 1
Heelboom Loader 2 1 Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Hardness S/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
8.95	1	16	0	1	2	2	2	1		500	300
2.98	1	21	15	1	2	1.5	2	1		600	500
1.94	1	47	25	1	2	2.5	2	1		700	500
0.15	1	47	30	1	2	2.5	2	1		700	500
0.60	1	68	50	2	2	3	2	1		800	500
0.15	1	68	75	2	2	3	2	1		800	500

Section Length km	Const. Category 1-5	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
8.95	1	0.8	4880	10	9.3	6.74	32872	42172	377437
2.98	3	0.8	4880	7	16.7	6.61	32279	48979	145957
1.94	3	0.5	2900	8	23	6.86	19887	42887	83200
0.15	3	0.5	2900	8	23	6.86	19887	42887	6433
0.6	4	0.1	540	10	46.5	6.98	3769	50269	30161
0.15	5	0	0	10	57.7	6.98	0	57700	8655
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length m	Number	Cost $	Tot.Cost $
1. Cross Drains	Metal	500 mm		73	22630	
2. Seasonal/small streams	Wood	.75 m2		8	3360	
3. Intermed/medium streams	Wood	1.5 m2		4	2520	
4. Perennial/large streams	Wood	3.75 m2		0	0	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						28510

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
					0	
				0	0	
					0	
					0	
					0	
Special installations						0

Miscellaneous Development Costs:

		0	
		0	
		0	0

DEVELOPMENT COST SUMMARY

	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	14.77	44133	651843	1.96
Culverts			28510	0.09
Bridges			0	0.00
Miscellaneous			0	0.00
Total Development Cost			680353	2.05

Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	14.77	100	332646	2.05	2.05	2.22
Landings (#/km)	2	100	332646	0.15	0.15	0.16
Ldgs. H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	332646	3.29	3.29	3.57
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		30	99793.8	5.66	1.70	1.84
Skyline		0	0	0.00	0.00	0.00
Grapple		70	232852.2	4.46	3.12	3.39
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELor,%	0	0	0			
RTLS (T/L=1)	0	0	0	0.00	0.00	0.00
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	332646	2.43	2.43	2.64
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	332646	3.94	3.94	4.27
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	5.3	10	15	53		
Mainline	26.2	35	45	80		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			1.1	33		
Unloading time				15		
Unavoidable delay				15		
Total time				196		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	31.5	100	332646	1.02	1.02	1.11
Spring open (km)	25	100	332646	0.05	0.05	0.05
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended		Trended
Water Transport						
From: Eve River						
To: Gambier						
Rate, $/m3:	1.95					
Towing				0.00	0.00	0.00
Barging				1.95	1.95	2.12
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:						
Machmell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				2.18	2.18	2.37
Crummy, RTT min	60					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp				0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occup'cy, #	0					
Single Occup. #	0					
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead						
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

****

Licence:	TFL 39
Cutting Permit:	Receive Area
Forest District:	Campbell River
Location:	Tsitika River
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	332646
Area, ha:	378.8

Phase	$/m3
Development	2.19
Felling & Bucking	3.29
Yarding	4.82
Skidding	0.00
Loading	2.43
Hauling	3.94
Swinging	0.00
Road Maintenance	1.08
Dump/Sort/Boom/Scale	3.01
Water Transport	1.95
Owikeno Transfer	0.00
Crew Transport	2.18
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	34.11
Trend Factor	1.0849
Total Trended Op. Cost	37.01

****

VANCOUVER FOREST REGION STUMPAGE CALCULATION — Licence: TFL 39 —
Forest District: Campbell River — Cutting Permit: Receive Area
Appraisal Date: 850731 — Volume: 332646 m3 — Location: Tsitika River

		$/M3								
		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		41.54	63.95	66.33	105.72	43.40	0.00	0.00	0.00	0.00	
Profit/Risk Ratio		0.14	0.14	0.14	0.14	0.14	0.00	0.00	0.00	0.00	
Discount Value		36.44	56.10	58.19	92.74	38.07	0.00	0.00	0.00	0.00	
Operating Costs		37.01	37.01	37.01	37.01	37.01	0.00	0.00	0.00	0.00	
Conversion Return		4.54	26.94	29.33	68.72	6.39	0.00	0.00	0.00	0.00	
Indicated Stumpage		-0.57	19.09	21.18	55.73	1.06	0.00	0.00	0.00	0.00	
Profit/Risk		5.10	7.85	8.15	12.98	5.33	0.00	0.00	0.00	0.00	
Valuation Factor		-0.12	0.71	0.72	0.81	0.17	0.00	0.00	0.00	0.00	
Upset Stumpage		3.32	19.09	21.18	55.73	3.47	0.00	0.00	0.00	0.00	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		3.32	19.09	21.18	55.73	3.47	0.00	0.00	0.00	0.00	
Royalty rate		1.20	1.50	1.50	2.00	1.20	0.80	2.00	0.80	0.50	
Final Stpg.less Royalty		2.12	17.59	19.68	53.73	2.27	0.00	0.00	0.00	0.00	
Base AMV,	$/m3	41.54	63.95	66.33	105.72	43.40	0.00	0.00	0.00	0.00	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	76052	62481	14034	258	179821	0	0	0	0	332646
Total Upset Value,	$	161489	1098958	276211	13864	408524	0	0	0	0	1959047
Total Conversion Return,	$	253717	1589642	390537	17213	933543	0	0	0	0	3184653
Total Indicated Value,	$	-134279	1098958	276211	13864	-24827	0	0	0	0	1229928

APPENDIX V B

APPRAISAL SUMMARY

RECEIVE AREA - SCHEDULE "A" (EQUAL VOLUME)

APPRAISAL DATA SHEET

Licence: TFL 39 Appraisal Date: 850731
Cutting Permit: Receive Area Effective Date: 850201
Location: Tsitika River Forest District: Campbell River
Approved Cruise: 1 Tenure: 1
(y=1, n=0) TFL & FL = 1
Net Volume, m3 293924 TSL = 2
Area, ha: 332.2 Marketer: 1
Side Slope, % : 29.8 Major=1, Small=2
Terrain Code: 1.46 Term, yrs: 3
Log Vol. 10m, m3: 1.13 Annual Volume, m3:97974.66
Log Vol.(scale): Annual Op.Days: 150
Net Vol/tree, m3: 2.53

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	D/S	Total	
Peeler	A				39.6							
	B				26.7							
	C	21.6			0.0			0.0				
Lumber	D	2.3	2.6	2.3	0.0	5.3	0.0	0.0	0.0			
	F		1.0	4.1				0.0				
Sawlog	H	3.5	16.4	30.5	0.0	15.6	0.0	0.0	0.0			
	I	19.6	26.7	7.7	31.0	37.8	0.0	0.0	0.0			
	J	46.1	5.5	5.2	0.0	25.2	0.0	0.0	0.0			
Shingle	K		0.0									
	L		9.7									
	M		11.5									
Utility	X	6.7	3.5	36.6	2.7	9.2	0.0	0.0	0.0			
Chip&Saw	Y	0.2	0.1	13.6	0.0	8.9	0.0	0.0	0.0	0.0		
Total %		100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0		
Total Net Vol, m3:		66594	56898	10818	258	159356	0	0	0	0	293924	
Decay, % :		7.2	27	34.9	1.5	8.4	0	0	0	0	14.6	
Slope Class, %		0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
	100	2	11	48	20	7	4	3	3	1	0	1

Licence: TFL 39 Cutting Permit: Receive Area
Volume, m3: 293924
Highway trucks 1
Off-Highway trucks 2 2
Front-End Loader 1
Heelboom Loader 2 1 Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 3-4	Ballast Hardness B/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
8.16	1	16	0	1	2	2	2	1		500	300
2.72	1	21	15	1	2	1.5	2	1		600	500
1.77	1	47	25	1	2	2.5	2	1		700	500
0.14	1	47	30	1	2	2.5	2	1		700	500
0.55	1	68	50	2	2	3	2	1		800	500
0.14	1	68	75	2	2	3	2	1		800	500

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
8.16	1	0.8	4880	10	9.3	6.74	32872	42172	344121
2.72	3	0.8	4880	7	16.7	6.61	32279	48979	133222
1.77	3	0.5	2900	8	23	6.86	19887	42887	75910
0.14	3	0.5	2900	8	23	6.86	19887	42887	6004
0.55	4	0.1	540	10	46.5	6.98	3769	50269	27648
0.14	5	0	0	10	57.7	6.98	0	57700	8078
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length	Number	Cost	Tot.Cost
			m		$	$
1. Cross Drains	Metal	500 mm		67	20770	
2. Seasonal/small streams	Wood	.75 m2		7	2940	
3. Intermed/medium streams	Wood	1.5 m2		4	2520	
4. Perennial/large streams	Wood	3.75 m2		0	0	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						26230

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
					0	
				0	0	
					0	
					0	
					0	
Special installations						0

Miscellaneous Development Costs:

	0	
	0	
	0	0

DEVELOPMENT COST SUMMARY

	Distance	Average Cost	Total Cost	Unit Cost
	km	$/km	$	$/m3
Roads	13.48	44138	594983	2.02
Culverts			26230	0.09
Bridges			0	0.00
Miscellaneous			0	0.00
Total Development Cost			621213	2.11

****

Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trenced Cost
Development						
Roads (km)	13.48	100	293924	2.11	2.11	2.29
Landings (#/km)	2	100	293924	0.16	0.16	0.18
Logs. H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	293924	3.29	3.29	3.57
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		30	88177.2	5.66	1.70	1.84
Skyline		0	0	0.00	0.00	0.00
Grapple		70	205746.8	4.46	3.12	3.39
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELdr,%	0	0	0			
RTLS (T/L=1)	0	0	0	0.00	0.00	0.00
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	293924	2.43	2.43	2.64
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	293924	3.94	3.94	4.27
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	5.3	10	15	53		
Mainline	26.2	35	45	80		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			1.1	33		
Unloading time				15		
Unavoidable delay				15		
Total time				196		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	31.5	100	293924	1.03	1.03	1.12
Spring open (km)	25	100	293924	0.06	0.06	0.06
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended	Trended
Water Transport					
From: Eve River					
To: Gambier					
Rate, $/m3:	1.95				
Towing				0.00	0.00	0.00
Barging				1.95	1.95	2.12
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:						
Machmell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				2.18	2.18	2.37
Crummy, RTT min	60					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp				0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occup'cy, #	0					
Single Occup. #	0					
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead						
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

Licence:	TFL 39
Cutting Permit:	Receive Area
Forest District:	Campbell River
Location:	Tsitika River
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	293924
Area, ha:	332.2

Phase	$/m3
Development	2.28
Felling & Bucking	3.29
Yarding	4.82
Skidding	0.00
Loading	2.43
Hauling	3.94
Swinging	0.00
Road Maintenance	1.09
Dump/Sort/Boom/Scale	3.61
Water Transport	1.95
Owikeno Transfer	0.00
Crew Transport	2.18
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	34.21
Trend Factor	1.0849
Total Trended Op. Cost	37.11

VANCOUVER FOREST REGION STUMPAGE CALCULATION — Licence: TFL 39 —
Forest District: Campbell River — Cutting Permit: Receive Area
Appraisal Date: 850731 — Volume: 293924 m3 — Location: Tsitika River

		$/M3								
		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		41.54	63.95	66.33	105.72	43.40	0.00	0.00	0.00	0.00	
Profit/Risk Ratio		0.14	0.14	0.14	0.14	0.14	0.00	0.00	0.00	0.00	
Discount Value		36.44	56.10	58.19	92.74	38.07	0.00	0.00	0.00	0.00	
Operating Costs		37.11	37.11	37.11	37.11	37.11	0.00	0.00	0.00	0.00	
Conversion Return		4.43	26.84	29.22	68.61	6.29	0.00	0.00	0.00	0.00	
Indicated Stumpage		-0.67	18.98	21.08	55.63	0.96	0.00	0.00	0.00	0.00	
Profit/Risk		5.10	7.85	8.15	12.98	5.33	0.00	0.00	0.00	0.00	
Valuation Factor		-0.15	0.71	0.72	0.81	0.15	0.00	0.00	0.00	0.00	
Upset Stumpage		3.32	18.98	21.08	55.63	3.47	0.00	0.00	0.00	0.00	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		3.32	18.98	21.08	55.63	3.47	0.00	0.00	0.00	0.00	
Royalty rate		1.20	1.50	1.50	2.00	1.20	0.80	2.00	0.80	0.50	
Final Stpg.less Royalty		2.12	17.48	19.58	53.63	2.27	0.00	0.00	0.00	0.00	
Base AMV,	$/m3	41.54	63.95	66.33	105.72	43.40	0.00	0.00	0.00	0.00	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	66594	56898	10818	258	159356	0	0	0	0	293924
Total Upset Value,	$	141406	994806	211783	13837	362031	0	0	0	0	1723864
Total Conversion Return,	$	215196	1441645	299910	17186	810623	0	0	0	0	2784560
Total Indicated Value,	$	-124548	994806	211783	13837	-38677	0	0	0	0	1057201

APPENDIX VI A

APPRAISAL SUMMARY

CROWN GRANT, LOT 223 - (CALL GRADES)

Licence: ER1 Lot 223 Appraisal Date: 850731
Cutting Permit: Crown Grant Effective Date: 850201
Location: Robson Bight Forest District: Campbell River
Approved Cruise: 1 Tenure: 1
(y=1, n=0) TFL & FL = 1
Net Volume, m3 27249 TSL = 2
Area, ha: 34.8 Marketer: 1
Side Slope, % : 20.2 Major=1, Small=2
Terrain Code: 1.55 Term. yrs: 1
Log Vol. 10m, m3: 0.92 Annual Volume, m3: 27249
Log Vol.(scale): Annual Op.Days: 180
Net Vol/tree, m3: 1.83

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Peeler	A				1.3						
	B				9.5						
	C	14.7			1.6			17.2			
Lumber	D	16.7	0.0	0.0	0.0	6.8	0.0	3.7	0.0		
	F		0.0	0.0				5.6			
Sawlog	H	14.3	17.6	0.0	13.8	14.5	0.0	36.1	0.0		
	I	26.8	1.6	0.0	14.2	35.0	0.0	0.0	0.0		
	J	20.3	71.2	0.0	56.8	36.2	100.0	32.6	0.0		
Shingle	K		0.0								
	L		4.7								
	M		0.7								
Utility	X	6.9	4.1	0.0	2.7	7.5	0.0	4.8	0.0		
Chip&Saw	Y	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	100.0	
Total %		100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0	
Total Net Vol, m3:		6547	709	0	1334	10308	28	6417	0	1906	27249
Decay, % :		8.2	19.4	6	3.5	3	0	1.2	0	1.4	4.4

Slope Class, %	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100	49	26	3	3	3	3	2	1	2	1	7

Licence: ERI Lot 223 Cutting Permit: Crown Grant
Volume, m3: 27249

Highway trucks	1			
Off-Highway trucks	2	2		
Front-End Loader	1			
Heelboom Loader	2	1	Road Width, m:	4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Hardness S/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
1.43	1	1.5	0	1	1	1	3	1		10	50
0.46	1	6.5	2	1	2	2	3	1		50	50
0.18	1	44	35	2	2	2	4	1		150	50
0.09	1	83	60	2	2	2	4	1		150	50
0.15	1	83	75	2	2	2	4	1		200	50

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
1.43	1	1	6800	-4	7.1	1.73	11778	18878	26995
0.46	2	0.9	5580	0	12.2	6.74	37587	49787	22902
0.18	3	0.6	3540	5	26.6	6.74	23845	50445	9080
0.09	4	0	0	5	49.9	6.74	0	49900	4491
0.15	5	0	0	8	62	6.74	0	62000	9300
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

Culverts:

Drainage Class	Type	Diam	Length	Number	Cost	Tot.Cost
			m		$	$
1. Cross Drains	Metal	500 mm		8	2480	
2. Seasonal/small streams	Wood	.75 m2		0	0	
3. Intermed/medium streams	Wood	1.5 m2		1	630	
4. Perennial/large streams	Wood	3.75 m2		1	980	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						4090

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
Tsitika River	0.01	9	21	1	577	
				0	0	
					0	
					0	
					0	
Special installations						577

Miscellaneous Development Costs:

	0	
	0	
	0	0

DEVELOPMENT COST SUMMARY

Item	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	2.31	31501	72768	2.67
Culverts			4090	0.15
Bridges			577	0.02
Miscellaneous			0	0.00
Total Development Cost			77435	2.84

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Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	2.31	100	27249	2.84	2.84	3.06
Landings (#/km)	1	100	27249	0.19	0.19	0.20
Ldgs. H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	27249	3.38	3.38	3.66
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		20	5449.8	5.90	1.18	1.28
Skyline		0	0	0.00	0.00	0.00
Grapple		60	16349.4	4.85	2.91	3.15
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELdr,%	0	0	0			
RTLS (T/L=1)	0	20	5449.8	3.23	0.65	0.70
RTGS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	27249	2.64	2.64	2.87
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	27249	1.63	1.63	1.77
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	1.0	10	15	10		
Mainline	0.8	25	35	3		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			0.9	38		
Unloading time				15		
Unavoidable delay				15		
Total time				81		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	1.8	100	27249	0.59	0.59	0.64
Spring open (km)	0	100	27249	0.00	0.00	0.00
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended	Trended	
Water Transport						
From: Robson Bight						
To: Gambier						
Rate, $/m3:	2.11					
Towing				0.00	0.00	0.00
Barging				2.11	2.11	2.29
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:						
Machmell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				3.41	3.41	3.70
Crummy, RTT min	110					
Town Run,RRT min	111					
Commuting Crew,%	100					
Boat Crummy, RRT	0					
Camp				0.55	0.55	0.60
Shop/Office only	1					
Crew size, #	0					
Camp Occup'cy, #	0					
Single Occup. #	0					
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead						
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

****

Licence:	ER1 Lot 223
Cutting Permit:	Crown Grant
Forest District:	Campbell River
Location:	Robson Bight
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	27249
Area, ha:	34.8

Phase	$/m3
Development	3.03
Felling & Bucking	3.38
Yarding	4.09
Skidding	0.65
Loading	2.64
Hauling	1.63
Swinging	0.00
Road Maintenance	0.59
Dump/Sort/Boom/Scale	3.01
Water Transport	2.11
Owikeno Transfer	0.00
Crew Transport	3.41
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	33.76
Trend Factor	1.0849
Total Trended Op. Cost	36.63

****

VANCOUVER FOREST REGION STUMPAGE CALCULATION — Licence: ER1 Lot 223 — Page 5

Forest District: Campbell River — Cutting Permit: Crown Grant

Appraisal Date: 850731 — Volume: 27249 m3 — Location: Robson Bight

		$/M3								
		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		48.14	55.75	0.00	51.35	45.15	17.90	82.25	0.00	36.63	
Profit/Risk Ratio		0.14	0.14	0.00	0.14	0.14	0.14	0.14	0.00	0.14	
Discount Value		42.23	48.90	0.00	45.05	39.61	15.70	72.15	0.00	32.13	
Operating Costs		36.63	36.63	0.00	36.63	36.63	36.63	36.63	0.00	36.63	
Conversion Return		11.51	19.12	0.00	14.73	8.53	-18.73	45.62	0.00	0.00	
Indicated Stumpage		5.60	12.28	0.00	8.42	2.98	-20.92	35.52	0.00	-4.50	
Profit/Risk		5.91	6.85	0.00	6.31	5.55	2.20	10.10	0.00	4.50	
Valuation Factor		0.49	0.64	0.00	0.57	0.35	0.00	0.78	0.00	0.00	
Upset Stumpage		5.60	12.28	0.00	8.42	3.61	1.43	35.52	0.00	2.93	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		5.60	12.28	0.00	8.42	3.61	1.43	35.52	0.00	2.93	
Royalty rate		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Final Stpg.less Royalty		5.60	12.28	0.00	8.42	3.61	1.43	35.52	0.00	2.93	
Base AMV,	$/m3	48.14	55.75	0.00	51.35	45.15	17.90	82.25	0.00	36.63	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	6547	709	0	1334	10308	28	6417	0	1906	27249
Total Upset Value,	$	36672	8703	0	11231	37235	40	227933	0	5585	327400
Total Conversion Return,	$	75377	13557	0	19644	87896	-524	292748	0	0	488698
Total Indicated Value,	$	36672	8703	0	11231	30737	-586	227933	0	-8573	306118

APPENDIX VI B

APPRAISAL SUMMARY

CROWN GRANT, LOT 223 - (COMPUTER GRADES)

Licence: ER1 Lot 223 | Appraisal Date: 850731
Cutting Permit: Crown Grant | Effective Date: 850201
Location: Robson Bight | Forest District: Campbell River
Approved Cruise: 1 | Tenure: 1
(y=1, n=0) | TFL & FL = 1
Net Volume, m3 27249 | TSL = 2
Area, ha: 34.8 | Marketer: 1
Side Slope, % : 20.2 | Major=1, Small=2
Terrain Code: 1.55 | Term, yrs: 1
Log Vol. 10m, m3: 0.92 | Annual Volume, m3: 27249
Log Vol.(scale): | Annual Op.Days: 180
Net Vol/tree, m3: 1.83

Grade, %:		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Peeler	A				0.0						
	B				1.7						
	C	30.0			8.3			8.8			
Lumber	D	12.6	0.0	0.0	1.7	2.6	0.0	3.4	0.0		
	F		0.0	0.0				2.8			
Sawlog	H	11.6	10.9	0.0	14.2	16.3	0.0	10.3	0.0		
	I	15.8	8.2	0.0	8.2	32.5	0.0	18.2	0.0		
	J	21.7	57.5	0.0	53.7	32.5	100.0	29.5	0.0		
Shingle	K		0.0								
	L		0.0								
	M		0.0								
Utility	X	6.1	23.4	0.0	11.5	14.3	0.0	19.4	0.0		
Chip&Saw	Y	2.2	0.0	0.0	0.7	1.8	0.0	7.6	0.0	100.0	
Total %		100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0	
Total Net Vol, m3:		6547	709	0	1334	10308	28	6417	0	1906	27249
Decay, % :		8.2	19.4	6	3.5	3	0	1.2	0	1.4	4.4

Slope Class, %	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	>=95
100	49	26	3	3	3	3	2	1	2	1	7

Licence: ER1 Lot 223 Cutting Permit:
Volume, m3: 27249

Highway trucks	1	
Off-Highway trucks	2	2
Front-End Loader	1	
Heelboom Loader	2	1

Road Width, m: 4.9

Section Length km	Const. Type B/H=1 Cat=3	Side Slope %	Grade Rock %	Rock Hardness Soft=1 M/H=2	Ballast Type Gravel=1 Rock=2	Ballast Haul Distance km	Pit Class Gravel 2-4	Ballast Hardness S/M=1 Hard=2	End Haul km	Ball. Haul Road Elev. m	Grade Pit Elev. m
1.43	1	1.5	0	1	1	1	3	1		10	50
0.46	1	6.5	2	1	2	2	3	1		50	50
0.18	1	44	35	2	2	2	4	1		150	50
0.09	1	83	60	2	2	2	4	1		150	50
0.15	1	83	75	2	2	2	4	1		200	50

Section Length km	Const. Category 1-6	Ballast Depth m	Ballast Volume m3	Average Gradient %	Basic Cost B/H $/km	Ballast Cost $/m3	Ballast Cost $/km	Total Cost $/km	Section Cost $
1.43	1	1	6800	-4	7.1	1.73	11778	18878	26995
0.46	2	0.9	5580	0	12.2	6.74	37587	49787	22902
0.18	3	0.6	3540	5	26.6	6.74	23845	50445	9080
0.09	4	0	0	5	49.9	6.74	0	49900	4491
0.15	5	0	0	8	62	6.74	0	62000	9300
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0
0	1		0	0		0.00	0	0	0

ROAD CONSTRUCTION COSTS

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Culverts:

Drainage Class	Type	Diam	Length m	Number	Cost $	Tot.Cost $
1. Cross Drains	Metal	500 mm		8	2480	
2. Seasonal/small streams	Wood	.75 m2		0	0	
3. Intermed/medium streams	Wood	1.5 m2		1	630	
4. Perennial/large streams	Wood	3.75 m2		1	980	
Other installations	Metal	600	10	0	0	
	Metal	900	12	0	0	
	Metal	1220	14	0	0	
Special installations						4090

Bridges:

Location	Share Ratio	Crib ht m	Span m	Number	Cost $	
Tsitika River	0.01	9	21	1	577	
				0	0	
					0	
					0	
					0	
Special installations						577

Miscellaneous Development Costs:

		0	
		0	
		0	0

****

DEVELOPMENT COST SUMMARY

Item	Distance km	Average Cost $/km	Total Cost $	Unit Cost $/m3
Roads	2.31	31501	72768	2.67
Culverts			4090	0.15
Bridges			577	0.02
Miscellaneous			0	0.00
Total Development Cost			77435	2.84

****

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Phase		Volume % of Tot	Volume m3	Untrended Unit	Prorated	Trended Cost
Development						
Roads (km)	2.31	100	27249	2.84	2.84	3.06
Landings (#/km)	1	100	27249	0.19	0.19	0.20
Ldgs. H/C (m2)	0	0	0	0.00	0.00	0.00
Skid Trails				0.00	0.00	0.00
Fell & Buck		100	27249	3.38	3.38	3.66
Blowdown Area,ha	0					
Affected %	0					
Yarding						
High Lead Spar		20	5449.8	5.90	1.18	1.28
Skyline		0	0	0.00	0.00	0.00
Grapple		60	16349.4	4.85	2.91	3.15
Helicopter S-t-W		0	0	0.00	0.00	0.00
Helicopter S-t-T		0	0	0.00	0.00	0.00
Skidding, FELdr,%	0	0	0			
RTLS (T/L=1)	0	20	5449.8	3.23	0.65	0.70
RTBS		0	0		0.00	0.00
STLS		0	0		0.00	0.00
Loading		0	0			
Heelboom		100	27249	2.64	2.64	2.87
Front End		0	0	0.00	0.00	0.00
Hauling (one type only)						
Highway (m3/ld)		0	0	0.00	0.00	0.00
On-Off Highway		0	0	0.00	0.00	0.00
Off-Highway	0	100	27249	1.63	1.63	1.77
Cycle time:	Dist. km	Loaded kph	Empty kph	Time min		
Branch	1.0	10	15	10		
Mainline	0.8	25	35	3		
Highway	0.0	0	0	0		
Loading time (Log avg.,m3)			0.9	38		
Unloading time				15		
Unavoidable delay				15		
Total time				81		
Swinging (km)	0.0	0	0	0.00	0.00	0.00
Road Mtce. (km)	1.8	100	27249	0.59	0.59	0.64
Spring open (km)	0	100	27249	0.00	0.00	0.00
Dump/Sort/Boom/Sc.				3.01	3.01	3.27
(System # 1-6)	3					
Rehaul, RTT min	0					

Phase		Volume	Volume	Untrended	Trended
Water Transport					
From: Robson Bight					
To: Gambier					
Rate, $/m3:	2.11				
Towing				0.00	0.00	0.00
Barging				2.11	2.11	2.29
Lake Tow, km:	0	0	0	0.00	0.00	0.00
Owikeno Transfer:					
Machmell		0	0	0.00	0.00	0.00
Sheemahant		0	0	0.00	0.00	0.00
Crew Transport				3.41	3.41	3.70
Crummy, RTT min	110				
Town Run,RRT min	111				
Commuting Crew,%	100				
Boat Crummy, RRT	0				
Camp				0.55	0.55	0.60
Shop/Office only	1				
Crew size, #	0				
Camp Occup'cy, #	0				
Single Occup. #	0				
Cookhouse loss				0.00	0.00	0.00
Remote Op. yes=1	0			-0.29	-0.29	-0.31
Site Specific, $	0			0.00	0.00	0.00
Overhead					
Gen.& Admin.				2.55	2.55	2.77
Operational				6.41	6.41	6.95
Miscellaneous					0.00	0.00

****

Licence:	ER1 Lot 223
Cutting Permit:	Crown Grant
Forest District:	Campbell River
Location:	Robson Bight
Appraisal Date:	850731
Effective Date:	850201
Volume, m3:	27249
Area, ha:	34.8

Phase	$/m3
Development	3.03
Felling & Bucking	3.38
Yarding	4.09
Skidding	0.65
Loading	2.64
Hauling	1.63
Swinging	0.00
Road Maintenance	0.59
Dump/Sort/Boom/Scale	3.01
Water Transport	2.11
Owikeno Transfer	0.00
Crew Transport	3.41
Camp	0.55
Cookhouse Loss	0.00
Remote Operation	-0.29
Overhead	8.96
Miscellaneous	0.00
Total Untrended Op. Cost	33.76
Trend Factor	1.0849
Total Trended Op. Cost	36.63

****

Forest District: Campbell River Cutting Permit: Crown Grant

Appraisal Date: 850731 Volume: 27249 m3 Location: Robson Bight

		$/M3								
		Balsam	Cedar	Cypress	Fir	Hemlock	Pine L.	Spruce	Pine W.	O/S	Total
Pro-rated Selling Price		48.09	49.19	0.00	45.77	43.03	17.90	62.78	0.00	36.63	
Profit/Risk Ratio		0.14	0.14	0.00	0.14	0.14	0.14	0.14	0.00	0.14	
Discount Value		42.19	43.14	0.00	40.15	37.75	15.70	55.07	0.00	32.13	
Operating Costs		36.63	36.63	0.00	36.63	36.63	36.63	36.63	0.00	36.63	
Conversion Return		11.47	12.56	0.00	9.15	6.40	-18.73	26.16	0.00	0.00	
Indicated Stumpage		5.56	6.52	0.00	3.53	1.12	-20.92	18.45	0.00	-4.50	
Profit/Risk		5.91	6.04	0.00	5.62	5.28	2.20	7.71	0.00	4.50	
Valuation Factor		0.48	0.52	0.00	0.39	0.17	0.00	0.71	0.00	0.00	
Upset Stumpage		5.56	6.52	0.00	3.66	3.44	1.43	18.45	0.00	2.93	
Pro-Rate %											
Pro-Rate Value,	$/m3										
Bonus Bid,	$/m3										
Final Stumpage		5.56	6.52	0.00	3.66	3.44	1.43	18.45	0.00	2.93	
Royalty rate		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Final Stpg.less Royalty		5.56	6.52	0.00	3.66	3.44	1.43	18.45	0.00	2.93	
Base AMV,	$/m3	48.09	49.19	0.00	45.77	43.03	17.90	62.78	0.00	36.63	
Small Operator Indicator		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Code Type:		5									
Volume	m3	6547	709	0	1334	10308	28	6417	0	1906	27249
Total Upset Value,	$	36406	4622	0	4885	35484	40	118379	0	5385	205402
Total Conversion Return,	$	75074	8904	0	12203	66008	-524	167857	0	0	329522
Total Indicated Value,	$	36406	4622	0	4704	11537	-586	118379	0	-8573	166490

APPENDIX VII

ROAD DISTANCE SUMMARIES

ROAD SUMMARY AREA: #ER 1 MB TAKE AREA ROBSON BIGHT

ROAD NAME	ROADS OUTSIDE AREA TO BE MAINTAINED FROM KM	TO KM	DISTANCE KM	ROADS TO SERVICE AREA CONSTRUCTED FROM KM	TO KM	DISTANCE KM	TO BE CONSTRUCTED FROM KM	TO KM	DISTANCE KM
ML	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.55	.55
ML	.55	.77	.22	0.00	0.00	0.00	.77	2.09	1.32
ML	2.04	8.25	6.22	0.00	0.00	0.00	8.25	9.35	1.10
M1	0.00	0.00	0.00	0.00	0.00	0.00	.17	3.69	3.52
M11	0.00	0.00	0.00	0.00	0.00	0.00	1.10	1.21	.11
M12	0.00	0.00	0.00	0.00	0.00	0.00	3.08	3.96	.88
M12	3.63	3.96	.33	0.00	0.00	0.00	0.00	0.00	0.00
M13	0.00	0.00	0.00	0.00	0.00	0.00	3.19	3.30	.11
M2	0.00	0.00	0.00	0.00	0.00	0.00	.83	1.10	.28
M2	1.10	2.09	.99	0.00	0.00	0.00	1.98	2.42	.44
M21	0.00	0.00	0.00	0.00	0.00	0.00	.88	1.10	.22
M24	0.00	0.00	0.00	0.00	0.00	0.00	2.09	2.37	.28
M3	0.00	0.00	0.00	0.00	0.00	0.00	1.21	1.32	.11
M4	0.00	0.00	0.00	0.00	0.00	0.00	1.60	2.04	.44
M5	2.09	5.06	2.97	0.00	0.00	0.00	5.06	5.17	.11
M51	4.02	4.18	.17	0.00	0.00	0.00	4.18	4.84	.66
M6	5.39	5.45	.06	0.00	0.00	0.00	5.45	6.11	.66
M7	5.83	6.05	.22	0.00	0.00	0.00	6.05	7.15	1.10
M8	6.82	7.48	.66	0.00	0.00	0.00	7.48	7.92	.44
M9	0.00	0.00	0.00	0.00	0.00	0.00	8.91	9.19	.28
TOTAL			11.83	0.00	0.00	0.00	62.26	74.86	12.60
EST.AVG. HAUL DIST									3.62

ROAD SUMMARY AREA: #ER 5 MB TAKE AREA

ROAD NAME	ROADS OUTSIDE AREA TO BE MAINTAINED			ROADS TO SERVICE AREA CONSTRUCTED			TO BE CONSTRUCTED		
	FROM KM	TO KM	DISTANCE KM	FROM KM	TO KM	DISTANCE KM	FROM KM	TO KM	DISTANCE KM
M	0.00	28.30	28.30	0.00	0.00	0.00	28.30	31.00	2.70
M1	0.00	0.00	0.00	0.00	0.00	0.00	28.65	29.05	.40
M2	0.00	0.00	0.00	0.00	0.00	0.00	30.50	30.60	.10
TOTAL			28.30	0.00	0.00	0.00	87.45	90.65	3.20
EST.AVG. HAUL DIST									29.58

ROAD SUMMARY AREA: #LOT 223 MB ER 1 TAKE AREA

ROAD NAME	ROADS OUTSIDE AREA TO BE MAINTAINED			ROADS TO SERVICE AREA CONSTRUCTED			TO BE CONSTRUCTED		
	FROM KM	TO KM	DISTANCE KM	FROM KM	TO KM	DISTANCE KM	FROM KM	TO KM	DISTANCE KM
M	0.00	.55	.55	0.00	0.00	0.00	.55	1.76	1.21
M	.77	5.39	4.62	0.00	0.00	0.00	0.00	0.00	0.00
M2	.83	1.10	.28	0.00	0.00	0.00	1.10	1.76	.66
M22	0.00	0.00	0.00	0.00	0.00	0.00	1.21	1.32	.11
M23	0.00	0.00	0.00	0.00	0.00	0.00	1.54	1.65	.11
M6	5.39	6.16	.77	0.00	0.00	0.00	6.16	6.38	.22
TOTAL			6.22	0.00	0.00	0.00	10.56	12.87	2.31
EST.AVG. HAUL DIST									1.75

APPENDIX VIII

CONSTRUCTION GROUP DISTRIBUTION

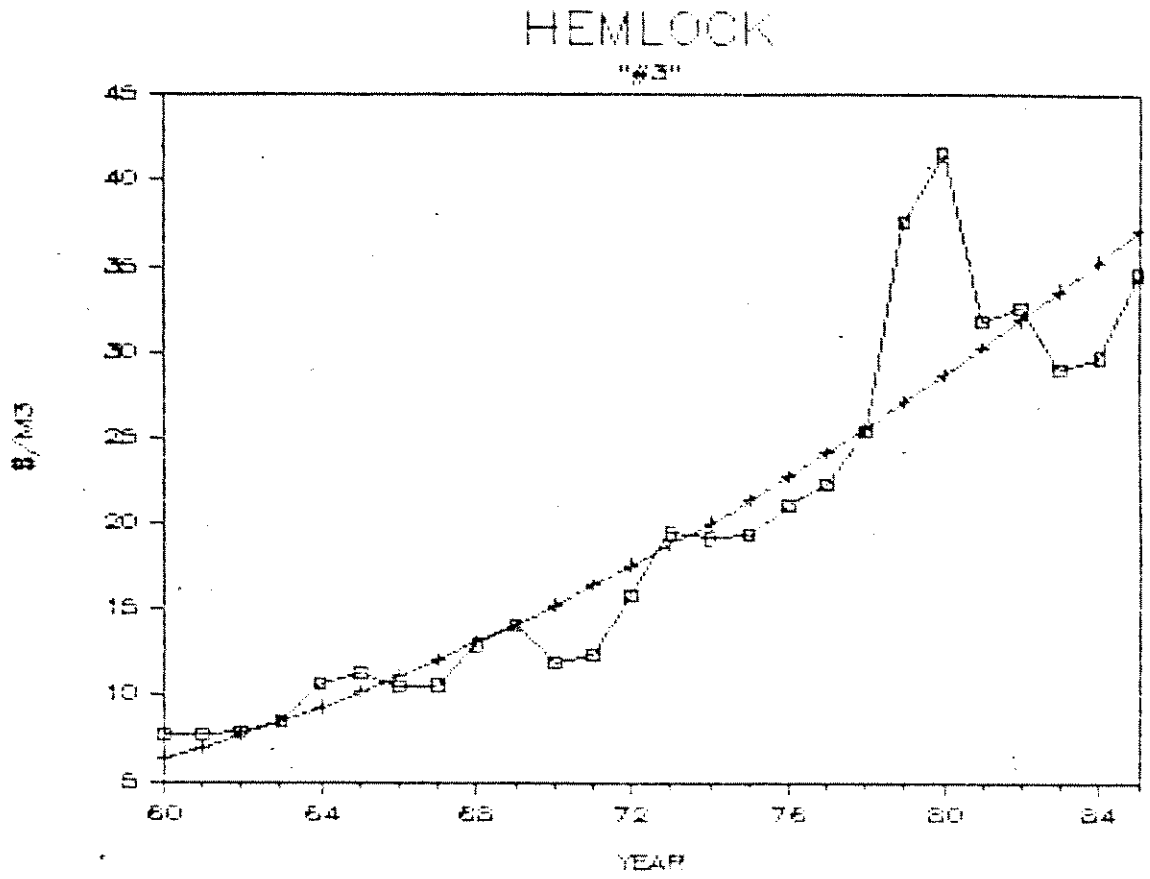
ROAD DISTANCE DISTRIBUTION BY SLOPE AND TERRAIN CLASS

AREA	SLOPE DISTRIBUTION 0-35	36-65	>66	TERRAIN DISTRIBUTION 1	2	3	4	TOT.ROAD LENGTH KM	ROAD DISTANCE DISTRIBUTION 1 0-35	2 0-35	2 36-65	3 36-65	3 >66	4 >66
ER 5 MB TAKE AREA								3.2	2.04	.73	.29	0.00	0.00	.15
AVG.SLOPE	6.32	40.00	100.00											
AVG.DISTR	86.36	9.09	4.55	63.64	31.82	0.00	4.55							
ER 1 ROBSON BIGHT								12.6	5.38	.77	4.15	0.00	1.08	1.23
AVG.SLOPE	12.81	50.37	89.33											
AVG.DISTR	48.78	32.93	18.29	42.68	40.24	7.32	9.76							
ER 1 LOT 223 MB								2.31	1.43	.46	.18	0.00	.09	.15
AVG.SLOPE	6.51	48.75	92.73											
AVG.DISTR	81.90	7.62	10.48	61.90	27.62	3.81	6.67							
TFL 39 MB RECEIVE								14.77	8.95	2.98	1.94	.15	.60	.15
AVG.SLOPE	20.69	47.14	78.00											
AVG.DISTR	80.81	14.14	5.05	60.61	33.33	5.05	1.01							

APPENDIX IX

LOG PRICE TREND - POLYNOMIAL CURVE FIT

HEMLOCK # 3 - EXAMPLE



COF: Log Price Trend
Species & Grade: HEMLOCK # 3
Equation: y=A+Bx+C(x^2) y= (46.74580) + (-2.01785)(x) + (0.022403)(x^2)

YEAR:	60	64	68	72	76	79	80	81	82	83	84	84.5	85
$/MBF:	$6.33	$9.37	$13.13	$17.60	$22.79	$27.16	$28.70	$30.29	$31.92	$33.60	$35.32	$36.20	$37.09
$/CCF:	$17.92	$26.53	$37.17	$49.84	$64.54	$76.90	$81.27	$85.77	$90.40	$95.15	$100.03	$102.52	$105.04

APPENDIX X

LOG PRICE TREND - NATURAL LOGARITHM CURVE FIT

HEMLOCK # 3 - EXAMPLE

Results of Curve Fit
14:16:05 08-01-1985

Dependent variable = 7

HEMLOCK * 3

LN((v/L)/[1-(v/L)]) = m*t + b

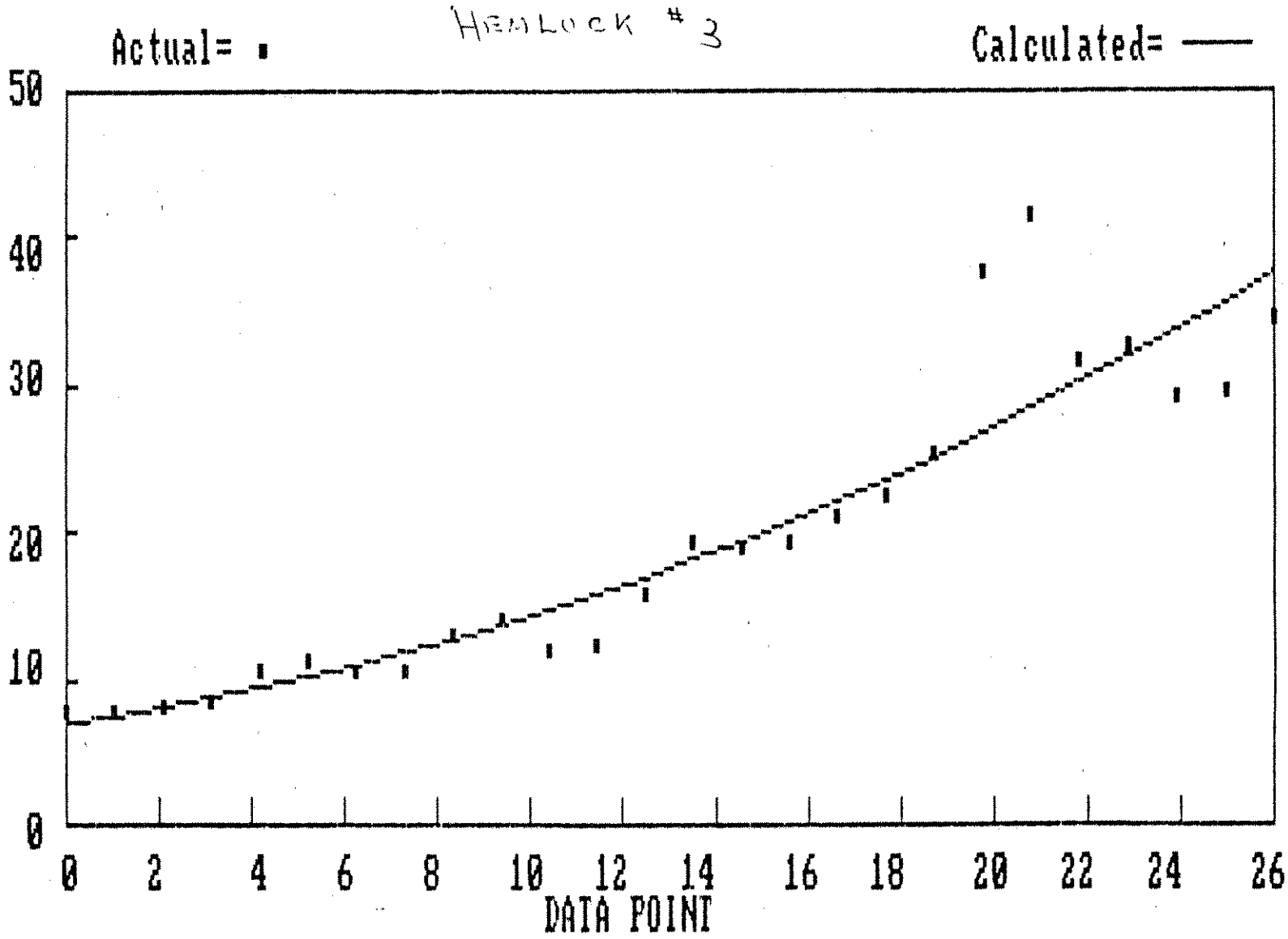
R-squared = .913

where:

v = value of variable
t = time
m = .08309
b = -2.668492
L = 100

Table of Residuals

Data Point	Actual Value	Calculated Value	Residual
1	7.708	7.008	0.700
2	7.731	7.570	0.161
3	7.952	8.172	-0.220
4	8.494	8.817	-0.324
5	10.723	9.509	1.214
6	11.329	10.248	1.081
7	10.523	11.038	-0.515
8	10.603	11.881	-1.278
9	12.945	12.779	0.166
10	14.177	13.734	0.443
11	11.978	14.748	-2.770
12	12.378	15.824	-3.446
13	15.853	16.962	-1.109
14	19.494	18.165	1.329
15	19.186	19.433	-0.246
16	19.352	20.767	-1.414
17	21.058	22.167	-1.109
18	22.386	23.634	-1.248
19	25.465	25.166	0.299
20	37.570	26.763	10.807
21	41.550	28.422	13.128
22	31.809	30.143	1.666
23	32.580	31.921	0.660
24	29.060	33.753	-4.693
25	29.731	35.635	-5.904
26	34.579	37.563	-2.983


Actual=
HEMLOCK #3
Calculated=
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
DATA POINT

APPENDIX XI

LOG PRICE COMPARISON AND SUMMARY

Species	Grade	Polynom Natural Logarithm 1960/85 $/m3	1960/85 $/m3	R^2	Average Last 5-yr $/m3	6-mos'85 $/m3	Actual all-time high (ann.avg.) $/m3	Year	Selected AMV $/m3	Comments
Balsam	C,D	62.27	62.00	0.918	55.13	53.32	63.67	1980	60.09	1983
	C	58.88	58.63		53.94	48.46	56.07	1983	56.82	PR 1983
	D	71.31	71.00		54.01	59.29	67.43	1983	68.81	*
	H	55.08	53.78	0.935	49.33	46.57	53.79	1982	53.78	LN
	I,J,X,Y	34.63	30.90	0.864	30.90	33.88	33.88	1985	33.88	1985
	I	46.86	41.81		41.65	41.43	43.56	1982	45.85	PR 1985
	J	33.91	30.26		30.19	33.13	33.13	1985	33.18	*
	X	22.77	20.32		20.47	25.18	25.18	1985	22.28	*
	Y	15.61	13.93		12.94	15.38	15.90	1981	15.27	*
Cedar	D	91.59	90.84	0.927	78.54	83.11	91.87	1983	90.84	LN
	F	88.34	87.86	0.935	75.58	81.56	90.23	1983	87.86	*
	H	73.10	74.15	0.924	62.38	62.07	76.53	1983	74.15	*
	K	72.20	70.40	0.885	61.40	63.72	71.68	1979	70.40	*
	L	59.85	58.61	0.889	51.28	51.66	56.34	1979	58.61	*
	H/L								66.89	PR LN
	M,I,J,X,Y	48.62	50.11	0.885	41.04	38.35	53.47	1979	50.11	LN
	M/I								56.24	PR LN
	M	46.35	47.77		38.52	38.30	44.77	1984	47.77	*
	I	62.58	64.50		52.91	50.78	66.84	1983	64.50	*
	J	51.26	52.83		43.54	41.64	55.34	1983	52.83	*
	X	22.54	23.23		18.96	17.94	22.54	1983	23.23	*
	Y	3.74	3.86		3.10	1.73	4.40	1981	3.86	*
Cypress	D,E	228.94	304.50	0.405	256.01	228.27	365.94	1980	304.50	LN
	D	232.63	309.40		260.30	229.83	291.24	1983	309.40	PR LN
	E	202.50	269.33		227.30	169.90	264.88	1981	269.33	*
	F,G,H	129.75	141.69	0.137	118.76	105.64	224.59	1979	127.79	1983
	F	197.30	215.45		179.82	165.62	197.65	1981	194.32	PR 1983
	G	157.98	172.52		145.74	107.82	188.51	1981	155.60	*
	H	114.89	125.47		105.23	93.69	130.03	1981	113.16	*
	H/I								102.40	
	I,J,X,Y	50.83	35.98	0.229	35.61	33.83	73.66	1979	45.40	10-yr avg
	I	91.44	64.73		63.90	60.35	79.57	1981	81.67	* PR
	J	47.12	33.36		33.09	30.90	43.55	1981	42.09	*
	X	24.43	17.30		17.33	15.65	26.18	1981	21.82	*
	Y	3.17	2.25		2.30	3.24	4.39	1981	2.83	*

Species	Grade	Polynom 1960/85 $/m3	Natural Logarithm 1960/85 $/m3	R^2	Average Last 5-yr $/m3	Average 6-mos'85 $/m3	Actual all-time high (ann.avg.) $/m3	Year	Selected AMV $/m3	Comments
Fir	A	151.92	129.42	0.902	134.94	183.77	183.77	1985	151.92	Polynom.
	B	107.56	101.13	0.935	95.03	124.24	124.24	1985	107.56	*
	C	74.85	78.27	0.912	67.05	64.56	80.23	1980	74.85	*
	D	115.36	97.64	0.881	101.33	131.73	131.73	1985	115.36	*
	H	63.04	63.86	0.903	55.07	56.23	68.23	1980	63.04	*
	I,J,X,Y	34.42	35.22	0.832	29.89	29.32	44.80	1979	34.42	*
	I	52.55	53.77		45.60	46.30	50.21	1981	52.55	* PR
	J	37.38	38.25		30.16	34.41	36.47	1981	37.38	*
	X	20.55	21.03		22.14	18.81	22.51	1981	20.55	*
	Y	10.38	10.63		17.24	7.55	14.72	1981	10.38	*
Hemlock	D	67.80	64.20	0.918	59.64	61.28	66.32	1980	64.20	LN
	H	57.08	56.35	0.899	50.58	47.06	61.61	1980	56.35	*
	I,J,X,Y	38.20	37.56	0.913	31.55	34.35	41.55	1980	37.56	*
	I	48.55	50.38		42.18	41.82	43.84	1982	50.38	PR LN
	J	34.67	35.97		30.16	32.89	32.89	1985	35.97	*
	X	25.25	26.20		22.14	25.36	25.36	1985	26.20	*
	Y	19.66	20.40		17.24	23.62	23.62	1985	20.40	*
Pine	D	41.74	36.32	0.792	37.83	42.42	42.42	1985	41.74	Polynom.
	H	31.79	28.80	0.804	28.80	30.00	31.77	1981	31.79	*
	I,J,X,Y	18.71	17.72	0.683	16.86	16.50	22.21	1980	18.71	*
	I	26.34	24.95		23.62	23.45	28.95	1981	26.34	* PR
	J	17.90	16.95		15.88	15.92	19.03	1984	17.90	*
	X	13.48	12.77		12.32	13.23	15.40	1981	13.48	*
	Y	3.50	3.31		3.21	0.02	6.58	1982	3.50	*
Spruce	D,E	225.67	248.37	0.829	186.96	196.26	302.27	1979	248.37	LN
	D	227.20	250.06		188.33	196.57	262.46	1980	250.06	PR LN
	E	185.75	204.43		153.16	171.35	179.39	1981	204.43	*
	F,G,C,H	104.31	109.72	0.828	86.37	90.49	133.24	1980	109.72	LN
	F	176.82	185.99		146.94	145.28	195.28	1981	185.99	PR LN
	G	169.17	177.94		141.03	165.53	179.48	1981	177.94	*
	C	87.17	91.69		71.96	81.54	82.36	1981	91.69	*
	H	86.56	91.05		71.32	78.50	79.71	1981	91.05	*
	H/I								85.61	
	I,J,X,Y	42.03	46.16	0.873	34.61	39.87	59.38	1980	46.16	LN
	I	66.60	73.15		54.66	60.36	60.36	1985	73.15	PR LN
	J	34.59	37.99		28.69	31.15	31.15	1985	37.99	*
	X	29.52	32.42		24.39	31.32	31.32	1985	32.42	*
	Y	9.82	10.78		7.80	2.62	15.66	1981	10.78	*

Polynomial Curve: $y=A+Bx+C(x^2)$ PR=Pro-rated value

Natural Logarithm Curve: $LN((y/L)/((1-(y/L)))=Ax+B$

y = $/m3, x = year(time), L = estimated upper value limit

APPENDIX XII

PRODUCTIVE CAPACITY EXCHANGE SUMMARY

Map Type	Forest Type	Establ Year	Stand age 1985	Growth Type grp	Site Index 100	Site Index 50	Area in Type ha	Weighted S.I. 100	Weighted S.I. 50	M. A. I. M & B M.A.I.	M. A. I. M & B Cut.age	M. A. I. M & B Ann.yield	M. A. I. CROWN FOREST M.A.I.	M. A. I. CROWN FOREST Cut.age	M. A. I. CROWN FOREST Ann.yield	MOF FIZ "B" M.A.I.	MOF FIZ "B" Cut.age	MOF FIZ "B" Ann.yield
O'CONNOR LAKE (Receive Area)																		
78	F6C3H1	1685	-5	2	27	20		0.0	0.0	3.62	105	0.00	4.19	77	0.00	8.8	66	0.00
28B	C5H4B1	1600	-5	5	42	29		0.0	0.0	11.42	64	0.00	10.03	77	0.00	8.0	56	0.00
34	D5D-M C7H3	1969	16	5	33	23	9.0	297.0	207.0	7.69	83	69.21	6.23	77	56.07	6.1	108	54.90
29	D5D-M C7H3	1980	5	5	33	23	21.5	709.5	494.5	7.69	83	165.34	6.23	77	133.95	6.1	108	131.15
48	C7H3	1685	-5	5	33	23	2.6	85.8	59.8	7.69	83	19.99	6.23	77	16.20	6.1	108	15.86
98	C8H2	1685	-5	5	31	21		0.0	0.0	6.60	90	0.00	5.51	77	0.00	6.1	108	0.00
8	C8H3B1	1685	-5	5	30	21	3.0	90.0	63.0	6.60	90	19.60	5.16	77	15.48	6.1	108	18.30
70	C5H5	1968	17	5	30	21	26.1	783.0	548.1	6.60	90	172.26	5.16	77	134.68	6.1	108	159.21
31	C5H4F1	1685	-5	5	27	19	5.2	140.4	98.8	5.49	97	28.55	4.19	77	21.79	3.8	111	19.76
42	C6H3F1	1685	-5	5	23	16	1.7	39.1	27.2	4.04	104	6.87	3.05	77	5.19	3.8	111	6.46
66	C5B4C1	1685	-5	5	23	16	0.9	20.7	14.4	4.04	104	3.64	3.05	77	2.75	3.8	111	3.42
5	H9D1	1963	22	6	48	33	10.5	504.0	346.5	13.74	55	144.27	13.06	77	137.13	12.8	56	134.40
4	H9B1	1966	19	6	48	33	2.6	124.8	85.8	13.74	55	35.72	13.06	77	33.96	12.8	56	33.28
10	H9D1	1963	22	6	48	33	5.6	268.8	184.8	13.74	55	76.94	13.06	77	73.14	12.8	56	71.68
37	H9C1	1966	19	6	46	31	5.9	271.4	182.9	12.43	60	73.34	12.01	77	70.86	12.8	56	75.52
40	H9C1	1966	19	6	46	31	19.8	910.8	613.8	12.43	60	246.11	12.01	77	237.80	12.8	56	253.44
14	H9B1	1982	3	6	38	26	5.7	216.6	148.2	9.36	72	53.35	8.67	77	49.42	6.6	56	37.62
17	H8B1C1	1964	21	6	36	25	2.2	79.2	55.0	8.81	75	19.38	7.40	77	16.28	6.6	56	14.52
43	H8B1C1	1971	14	6	21	14	14.1	296.1	197.4	3.13	120	44.13	2.54	77	35.81	2.8	91	39.48
13	H7B2C1	1964	21	7	48	32	4.6	220.8	151.8	13.74	55	63.20	13.06	77	60.08	11.4	56	52.44
12	H7B2C1	1964	21	7	48	32	1.1	52.8	36.3	13.74	55	15.11	13.06	77	14.37	11.4	56	12.54
51	H7B2C1	1966	19	7	46	31	14.9	685.4	461.9	12.43	60	185.21	12.01	77	178.95	11.4	56	169.86
47	H7B3	1964	21	7	45	31	2.7	121.5	83.7	12.43	60	33.56	11.50	77	31.05	11.4	56	30.78
30	H7C2F1	1966	19	7	45	31	5.3	238.5	164.3	12.43	60	65.88	11.50	77	60.95	11.4	56	60.42
41	H7B2C1	1964	21	7	45	31	9.2	414.0	285.2	12.43	60	114.36	11.50	77	105.80	11.4	56	104.88
39	H7B3	1964	21	7	43	29	3.4	146.2	98.6	11.24	64	38.22	10.51	77	35.73	11.4	56	38.76
6	H6B3C1	1685	-5	7	43	29	8.2	352.6	237.8	11.24	64	92.17	10.51	77	86.18	11.4	56	93.48
60	H7B2C1	1965	20	7	42	29	12.4	520.8	359.6	11.24	64	139.38	10.03	77	124.27	11.4	56	141.36
45	H5C3B2	1685	-5	7	39	27	13.9	542.1	375.3	9.92	70	157.89	8.67	77	120.51	6.4	98	88.96
63	H7B2C1	1966	19	7	38	26	1.8	68.4	46.8	9.36	72	16.85	8.24	77	14.83	6.4	98	11.52
67	H7B2C1	1966	19	7	38	26	15.2	591.6	403.2	9.36	72	123.55	8.24	77	108.77	6.4	98	84.48
27	H7C2B1	1966	19	7	38	26	25.4	965.2	660.4	9.36	72	237.74	8.24	77	209.30	6.4	98	162.56
50	H7B2C1	1964	21	7	38	26	39.4	1497.2	1024.4	9.36	72	368.78	8.24	77	324.66	6.4	98	252.16
33	H7C3	1969	16	7	33	23	44.1	1455.3	1014.3	7.69	83	339.13	6.23	77	274.74	6.4	98	282.24
25	H7C3	1966	19	7	33	23	2.0	66.0	46.0	7.69	83	15.38	6.23	77	12.46	6.4	98	12.80
3	H7C3	1966	19	7	33	23	1.2	39.6	27.6	7.69	83	9.23	6.23	77	7.48	6.4	98	7.68
1	H7C3	1966	19	7	32	22	8.0	256.0	176.0	7.14	87	57.12	5.87	77	46.96	6.4	98	51.20
46	H6C3B1	1685	-5	7	29	20	15.8	458.2	316.0	6.00	95	94.80	4.83	77	76.31	6.4	98	101.12
44	H7C3	1966	19	7	29	20	5.7	165.3	114.0	6.00	95	34.20	4.83	77	27.53	6.4	98	36.48
7A	H5F2C2	1971	14	7	27	18	6.3	170.1	113.4	4.99	100	31.44	4.19	77	26.40	4.8	102	30.24
62	H5C3B2	1685	-5	7	27	18	1.9	51.3	34.2	4.99	100	9.48	4.19	77	7.96	4.8	102	9.12
15	H6C3B1	1966	19	7	26	18	2.7	70.2	48.6	4.99	100	13.47	3.89	77	10.50	4.8	102	12.96

Map Type	Forest Type	Establ Year	Stand age 1985	Growth Type grp	Site Index 100	Site Index 50	Area in Type ha	Weighted S.I. 100	Weighted S.I. 50	M. A. I. M & B M.A.I.	M & B Cul.age	M & B Ann.yield	M. A. I. CROWN FOREST M.A.I.	CROWN FOREST Cul.age	CROWN FOREST Ann.yield	MOF FIZ "B" M.A.I.	MOF FIZ "B" Cul.age	MOF FIZ "B" Ann.yield
57	H5C4B1	1685	-5	7	26	18	2.0	59.8	41.4	4.99	100	11.48	3.89	77	8.95	4.8	102	11.04
58	H5C4B1	1685	-5	7	23	16	0.9	20.7	14.4	4.04	104	3.64	3.05	77	2.75	4.8	102	4.32
9A	H7B2C1	1905	-5	7	18	12	2.9	52.2	34.8	2.23	140	6.47	1.68	77	4.87	4.8	102	13.92
61	H6C4	1971	14	7	16	11	14.9	238.4	165.9	1.81	145	26.97	1.49	77	22.20	4.8	102	71.52
39	H6C4	1986	19	7	16	11	9.4	150.4	103.4	1.81	145	17.01	1.49	77	14.01	4.8	102	45.12
64	H6C3B1	1966	19	7	16	11	2.2	35.2	24.2	1.81	145	3.98	1.49	77	3.28	4.8	102	10.56
36	H5C5	1966	19	7	16	11	24.9	398.4	273.9	1.81	145	45.07	1.49	77	37.10	4.8	102	119.52
59	H6C3B1	1965	20	7	16	11	71.5	1144.0	786.5	1.81	145	129.42	1.49	77	106.54	4.8	102	343.20
26A	H6C3B1	1970	15	7	16	11	4.4	70.4	48.4	1.81	145	7.96	1.49	77	6.56	4.8	102	21.12
11	D10	1963	22	16	33	20	5.4	178.2	162.0	11.83	62	63.88	6.23	77	33.64	7.2	41	38.88
Total Productive - Receive Area					31.3	21.6	518.4	16244.0	11199.5	7.20		3730.93	6.26		3246.25	6.94		3596.24
71	Urban (GP)						0.4											
74	Urban (GP)						0.6											
78	Urban (GP)						0.3											
72	Swamp						2.6											
73	Swamp						1.4											
75	Swamp						0.4											
28	C7B3	1969	16	5	14	10	18.9	264.6	189.0	1.40	160	26.46	1.14	77	21.55	1.1	150	20.79
25	C6H2	1969	16	5	12	8	0.5	6.0	4.0	0.68	190	0.34	0.84	77	0.42	1.1	150	0.55
1A	C6H2	1968	17	5	11	8	0.9	9.9	7.2	0.68	190	0.61	0.71	77	0.64	1.1	150	0.99
65	H7B1	1966	19	6	12	8	1.7	20.4	13.6	0.68	190	1.16	0.84	77	1.43	1.1	150	1.87
22	H7C3	1969	16	7	14	10	30.3	424.2	303.0	1.40	157	42.42	1.14	77	34.54	1.1	150	33.33
2	H7C3	1966	19	7	12	8	18.9	226.8	151.2	0.68	190	12.85	0.84	77	15.88	1.1	150	20.79
49	H6C4	1964	21	7	11	7	6.9	75.9	48.3	0.37	210	2.55	0.71	77	4.90	1.1	150	7.59
Total Low Site and Non-Productive							86.8											
Total Receive Area					27.0	18.6	605.2	16244.0	11199.5	6.20		3730.93	5.39		3246.25	5.97		3596.24

Map Type	Forest Type	Estab year	Stand age 1985	Growth Type grp	Site Index 100	Site Index 50	Area in Type ha	Weighted S.I. 100	Weighted S.I. 50	N. A. I. M & B M.A.I.	M & B Cul.age	M & B Ann.yield	N. A. I. CROWN FOREST M.A.I.	CROWN FOREST Cul.age	CROWN FOREST Ann.yield	MOF FIZ "B" M.A.I.	MOF FIZ "B" Cul.age	MOF FIZ "B" Ann.yield
ERI - ROBSON BIGHT (Take Area)																		
8C	FH(S) 971-G		-5	2	68	50	3.6	244.8	180.0	21.55	59	77.58	25.88	77	93.17	12.3	70	44.28
8B	FH(S) 971-G		-5	2	68	50	13.4	911.2	670.0	21.55	59	288.77	25.88	77	346.79	12.3	70	164.82
8A	FH(S) 971-G		-5	2	68	50	1.2	81.6	60.0	21.55	59	25.86	25.88	77	31.06	12.3	70	14.76
7B	FS 951-M		-5	2	41	33	3.9	159.9	128.7	10.66	81	41.57	9.57	77	37.32	12.3	70	47.97
7A	FS 951-M		-5	2	41	33	10.9	446.9	359.7	10.66	81	116.19	9.57	77	104.31	12.3	70	134.07
1B	C 951-M		-5	5	37	26	14.2	525.4	369.2	9.36	72	132.91	7.81	77	110.90	8.0	56	113.60
2C	C(H) 951-M		-5	5	37	26	20.5	758.5	533.0	9.36	72	191.88	7.81	77	160.11	8.0	56	164.00
2A	C(H) 951-M		-5	5	35	24	12.0	420.0	288.0	8.25	80	99.00	7.00	77	84.00	8.0	56	96.00
1A	C 951-M		-5	5	30	21	35.4	1062.0	743.4	6.60	90	233.64	5.16	77	182.66	8.0	56	283.20
9	H(C) 430-M+CH Vets		-5	6	39	27	16.3	635.7	440.1	9.92	70	161.70	8.67	77	141.32	6.6	56	107.58
11A	H(C) 951 M		-5	6	34	23	2.5	85.0	57.5	9.68	83	24.20	6.61	77	16.53	6.6	56	16.50
11B	H(C) 951 M		-5	6	34	23	7.7	261.8	177.1	9.68	83	74.54	6.61	77	50.90	6.6	56	50.82
10	H(F) 951-M		-5	6	33	23	11.0	363.0	253.0	9.68	83	106.48	6.23	77	68.53	6.6	56	72.60
6A	HB 861-G		-5	7	42	29	48.2	2024.4	1397.8	11.24	64	541.77	10.03	77	483.45	11.4	56	549.48
3B	HC(BS) 851-M		-5	7	39	27	6.1	237.9	164.7	9.92	70	60.51	8.67	77	52.89	6.4	98	39.04
4A	HSF 540-M+CF Vets		-5	7	38	26	2.5	95.0	65.0	9.36	72	23.40	8.24	77	20.60	6.4	98	16.00
6B	HB 861-G		-5	7	38	26	12.9	490.2	335.4	9.36	72	120.74	8.24	77	106.30	6.4	98	82.56
4E	HSF 540-M+CF Vets		-5	7	36	25	12.1	435.6	302.5	8.81	75	106.60	7.40	77	89.54	6.4	98	77.44
4B	HSF 540-M+CF Vets		-5	7	36	25	2.6	93.6	65.0	8.81	75	22.91	7.40	77	19.24	6.4	98	16.64
4C	HSF 540-M+CF Vets		-5	7	34	23	9.8	333.2	225.4	7.68	83	75.26	6.61	77	64.78	6.4	98	62.72
3E	HC(BS) 851-M		-5	7	33	23	13.4	442.2	308.2	7.68	83	102.91	6.23	77	83.48	6.4	98	85.76
4D	HSF 540-M+CF Vets		-5	7	33	23	6.0	198.0	138.0	7.68	83	46.08	6.23	77	37.38	6.4	98	38.40
3D	HC(BS) 851-M		-5	7	32	22	9.2	294.4	202.4	7.14	87	65.69	5.87	77	54.00	6.4	98	58.88
3C	HC(BS) 851-M		-5	7	29	20	19.6	568.4	392.0	6.00	95	117.60	4.83	77	94.67	6.4	98	125.44
5A	HCF 420-P+Scat.Vets		-5	7	27	18	9.2	248.4	165.6	4.99	100	45.91	4.19	77	38.55	4.8	102	44.16
3A	HC(BS) 851-M		-5	7	22	15	7.6	167.2	114.0	3.58	110	27.21	2.79	77	21.20	4.8	102	36.48
5B	HCF 420-P+Scat.Vets		-5	7	21	14	3.8	79.8	53.2	3.13	120	11.89	2.54	77	9.65	4.8	102	18.24
Total Productive					36.96	25.95	315.6	11664.1	8188.9	9.22		2942.81	8.25		2603.32	8.12		2561.44
Non-commercial Brush-G							1.0											
Non-Productive Land							4.4											
Water							13.9											
Total Area							334.9											
ERS - MUSKEG CREEK (Take Area)																		
2	CH 961-G		-5	5	40	28	18.8	752.0	526.4	10.65	66	200.22	9.11	77	171.27	8.0	56	150.40
4	CH(S) 951-M		-5	5	36	25	17.0	612.0	425.0	8.81	75	149.77	7.40	77	125.80	6.1	108	103.70
1	HB(C) 951-M		-5	7	39	27	24.8	967.2	669.6	9.92	70	246.02	8.67	77	215.02	6.4	98	158.72
3	HB 951-M		-5	7	38	26	20.2	767.6	525.2	9.36	72	189.07	8.24	77	166.45	6.4	98	129.28
Total Productive					38.35	26.56	80.8	3098.8	2146.2	9.72		785.08	8.40		678.53	6.71		542.10
Non-productive							24.9											
Total Area							105.7											
Total Productive - Take Area					37.24	26.07	396.4	14762.9	10335.1	9.40		3727.89	8.28		3281.85	7.83		3103.54
Net Difference (Receive Area less Take Area)					-5.91	-4.47	122.0	1481.1	864.4	-2.21		3.04	-2.32		-35.60	-0.89		492.70
AREA REQUIRED TO EQUATE PRODUCTIVE CAPACITY					547.2	555.7				601.7			608.8			519.7		

APPENDIX XIII

REAL ESTATE VALUATION REPORT

CROWN GRANT, LOT 223

APPRAISAL OF

LOT 223, RUPERT DISTRICT

"ROBSON BIGHT"

PREPARED FOR

Holmsen Forestry Ltd.
540 Shannon Way,
Delta, British Columbia.
V4M 2W5

D. R. COELL & ASSOCIATES, INC.
REAL ESTATE APPRAISERS & CONSULTANTS

RICHARD W. GORDON, A.A.C.I., R.I. (B.C.)
MICHAEL A. MARTYN, A.A.C.I.
JOHN B. MILLER, A.A.C.I.
WILFRED C. GAMMIE, C.R.A.
DAVID R. COELL, A.A.C.I., R.I. (B.C.) ASSOCIATE

SUITE 203 - 3347 OAK STREET
VICTORIA, B.C. V8X 1R2
TELEPHONE (604) 388-6242

Our File: 2231-RA-UC 263

July 17, 1985.

Holmsen Forestry Ltd.,
540 Shannon Way,
Delta, B.C.
V4M 2W5

Attention: Mr. Karsten H. Holmsen, R.P.F., President.

Dear Sir:

Re: Lot 223, Rupert District
"Robson Bight"

Pursuant to your instructions, this is to advise that we have completed an appraisal of the property described above, more particularly described within this report.

It is our considered opinion that the market value (by definition) of the "bare land component" of the subject property as of June 30, 1985, is:

Eighty-Four Thousand, Six Hundred Dollars
($84,600.00)

A detailed description, summary and analysis leading to the conclusion of value is included herein. Should you require further information with regard to this report or wish to discuss same, please do not hesitate to contact us.

Yours very truly,
D.R. COELL & ASSOCIATES INC.
Per:

John B. Miller

JBM/k

Lot 223, Rupert District

Mouth of Tsitika River

CONTINGENT AND LIMITING CONDITIONS

The legal description of the subject property as stated herein is that which is recorded at the Victoria Land Titles Office and is assumed to be correct.

Sketches, drawings, diagrams, photographs etc. present in this report are included for the sole purpose of illustration. No legal survey or soil test concerning the subject property has been provided. Accordingly, no responsibility is assumed concerning these matters, or other technical or engineering techniques which would be required to discover any inherent or hidden conditions of the subject property.

The client to whom this report is addressed may use it in deliberations affecting the subject property only, and in so doing, the report should not be extracted but used in its entirety.

The compensation for services rendered do not included a fee for court preparation or appearance. Should either of these be required in connection with this report, additional arrangements are required.

This report involves the gathering, investigation and analysis of material inherent to the purpose of this report. As part of this investigation, it was found necessary to utilize both verbal and documented evidence. A concerted effort has been put forward to verify the accuracy of the information contained herein. The information is believed to be reliable and correct, and has been gathered according to procedures which are recognized by the Appraisal Institute of Canada.

PURPOSE OF THE APPRAISAL AND DEFINITION OF VALUE

Pursuant to instructions, this appraisal has been prepared in an attempt to recognize the following criteria:

(a) The Highest and Best Use of the property has been estimated through the consideration of all physical, economical and legal factors associated with the property.

(b) A bare land component of value has been estimated through the utilization of comparable sales transactions. These sales have been adjusted to June 30, 1985, the effective date of the appraisal.

(c) The definition of value attributable to the bare land component is as follows:

> "Market Value is the highest price estimated in terms of money which a property will bring if exposed to sale in the open market, allowing a reasonable time to find a purchaser who buys with the knowledge of all uses to which it is adapted and for which it is capable of being used."

(d) The component of value attributable to the existing forest cover has been estimated by Holmsen Forestry Ltd. The specific method of valuation can be found in the Timber Appraisal Report prepared by Karsten H. Holmsen, R.P.F.

PROPERTY RIGHTS APPRAISED

The property right appraised is the unencumbered fee simple interest of the deeded property.

FUNCTION OF THE APPRAISAL

The function of the appraisal is to assist the Ministry of Forests, Ministry of Lands, Parks and Housing and MacMillan Bloedel Limited in negotiations to exchange the subject property which will be relinquished by MacMillan Bloedel Limited due to its inclusion within the boundaries of a proposed Ecological Reserve.

REGISTERED OWNER

MacMillan Bloedel Limited

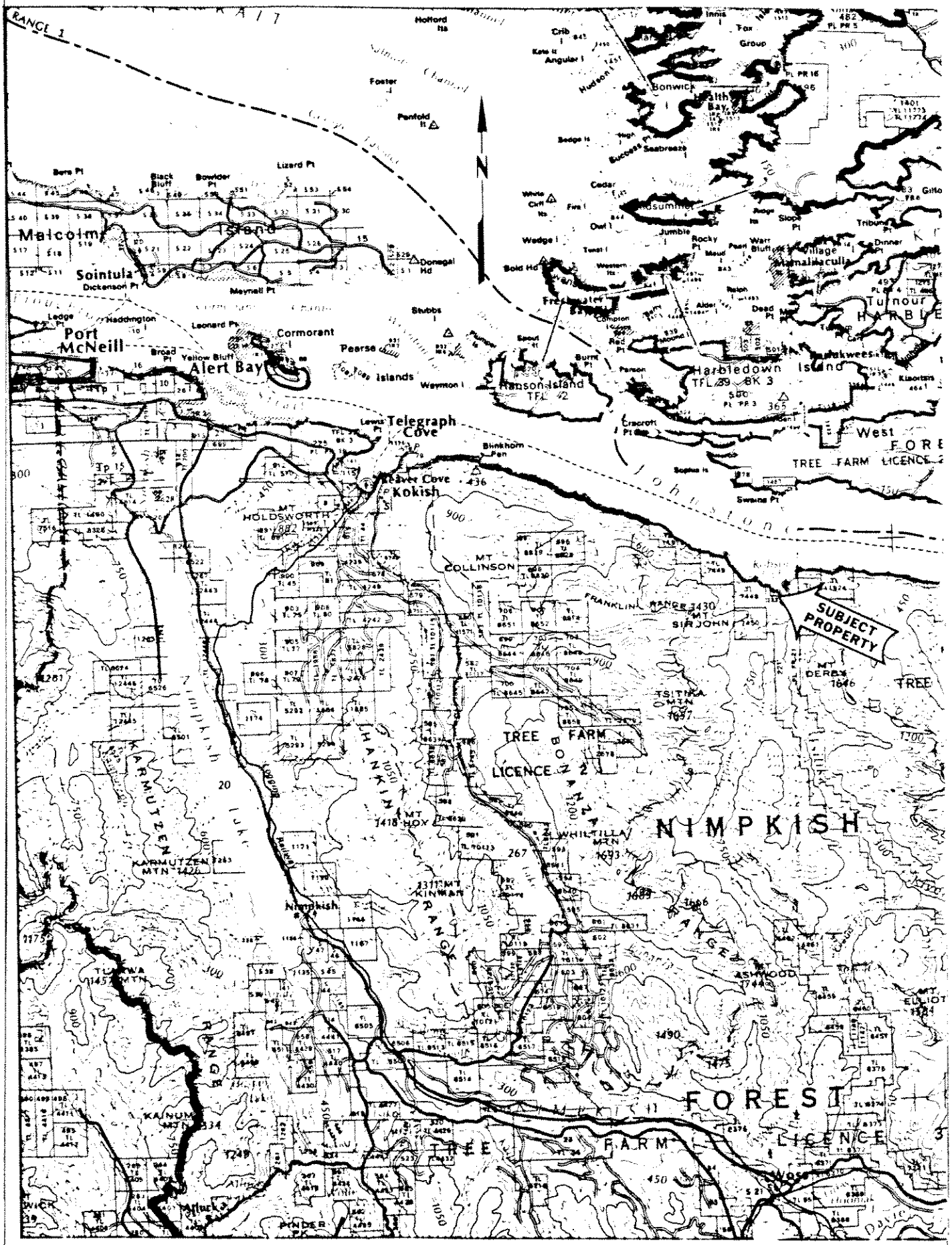
EFFECTIVE DATE OF THE APPRAISAL

June 30, 1985

DATE OF INSPECTION

June 18, 1985

TOPOGRAPHIC MAP



REGIONAL DATA

The Mount Waddington Regional District covers the northern portion of Vancouver Island. Electoral Areas B, C and D run from Sayward in the south to Port Hardy and Cape Scott in the north. The land area involves some 2,191,788 acres and contains the Villages of Alert Bay, Port Alice; District Municipality of Port Hardy and Town of Port McNeill. The 1981 census indicated the overall area to have an estimated population of 14,671 with the following organized area breakdowns:

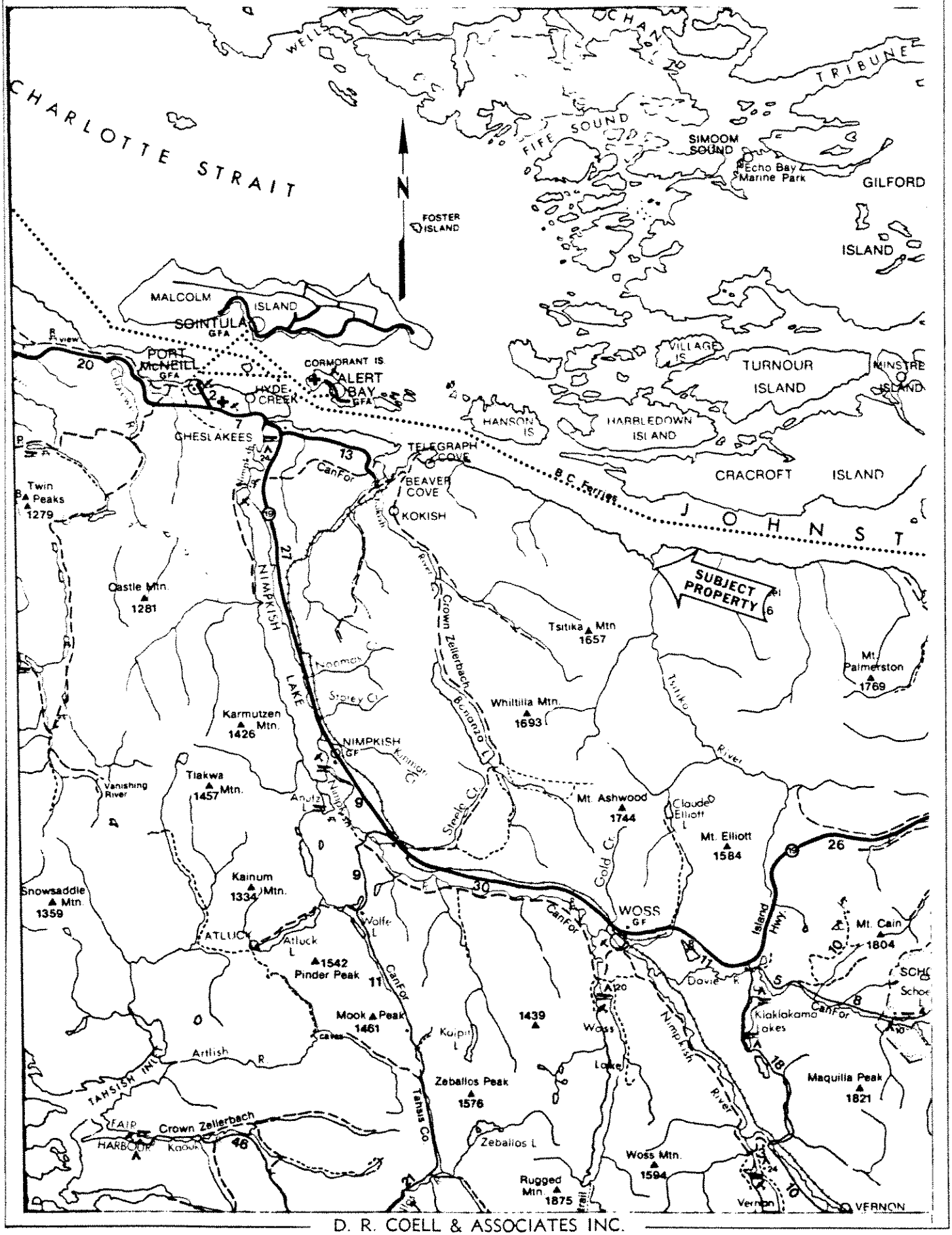
Alert Bay	-	626
Port Alice	-	1,668
Port Hardy	-	5,075
Port McNeill	-	2,474

The Forest Industry is the number one employer with widespread logging operations and a pulp mill at Port Alice. Ranking next in importance is mining and in particular, the Island Copper mine at Coal Harbour. Commercial fishing and a limited amount of tourism round out the local economy.

The area has grown since the late 1970's with the completion of a good all-weather public road link from Port Hardy to Campbell River. In addition, several remote logging camps have downsized, giving employees opportunities to have homes in the Port Hardy and Port McNeill areas.

The area also serves as the southerly terminal for the B.C. Ferries Prince Rupert ferry system.

ROAD SYSTEM MAP



D. R. COELL & ASSOCIATES INC.

B.C. GOVERNMENT AIR PHOTOGRAPH

BCC 209 #17

June 14, 1979

LOCATION AND AREA DATA

The subject is located near the north end of Vancouver Island at the mouth of the Tsitika River approximately 24 miles southeast of Port McNeill and approximately 27 miles northwest of Kelsey Bay. The subject is accessible by water only at this time.

SITE DESCRIPTION

As indicated, the subject is located at the mouth of the Tsitika River. In actual fact, the subject forms the delta or flood plain for the Tsitika River.

The subject contains a legal acreage of 94 acres with the following dimensions:

West side	25.95 chains	(1,713 feet)	
South side	40.00 chains	(2,640 feet)	
East side	40.00 chains	(2,640 feet)	
North side	±90.00 chains	(5,940 feet)	irregular oceanfrontage

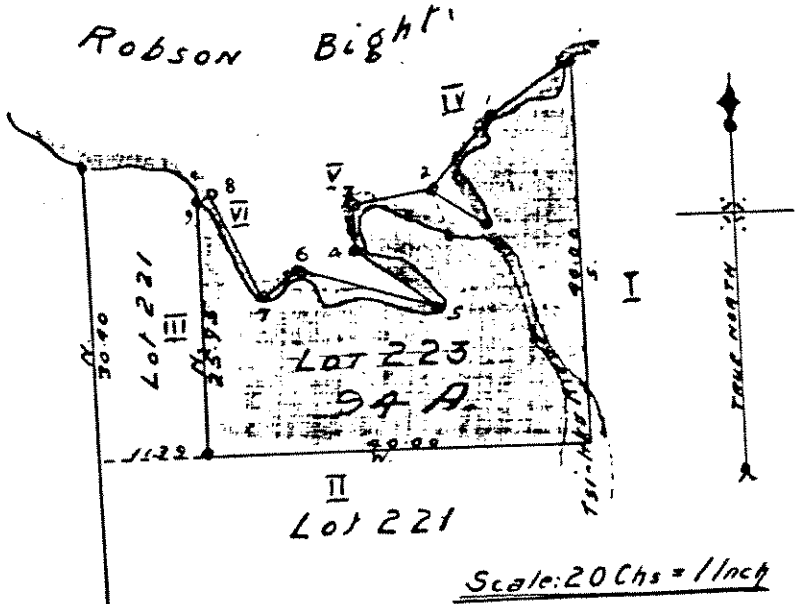
The north side or oceanfrontage, because it is a delta area with tidal influence, does experience shoreline changes.

The subject contains a variety of site conditions. The area west of the Tsitika River is level to gently sloping at the oceanfront and rises up the hillside to 80 - 100 feet in elevation in the southwest corner. The area east of the Tsitika River which contains approximately 20% of the total acreage is steep with a large area of rock outcroppings. The shoreline is steep and rocky.

The Tsitika River enters the property at the southeast corner and flows in a northerly direction to the high water mark of Johnstone Strait. There is some evidence that the riverbed has varied in location over the years since the original survey.

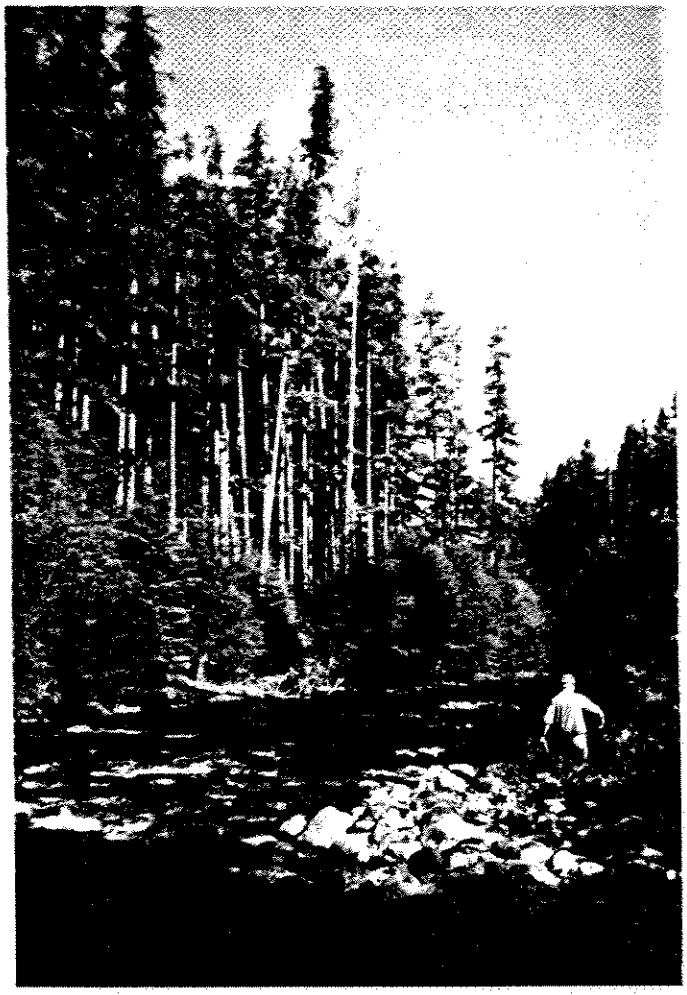
SURVEY PLAN

(Survey Field Notes)

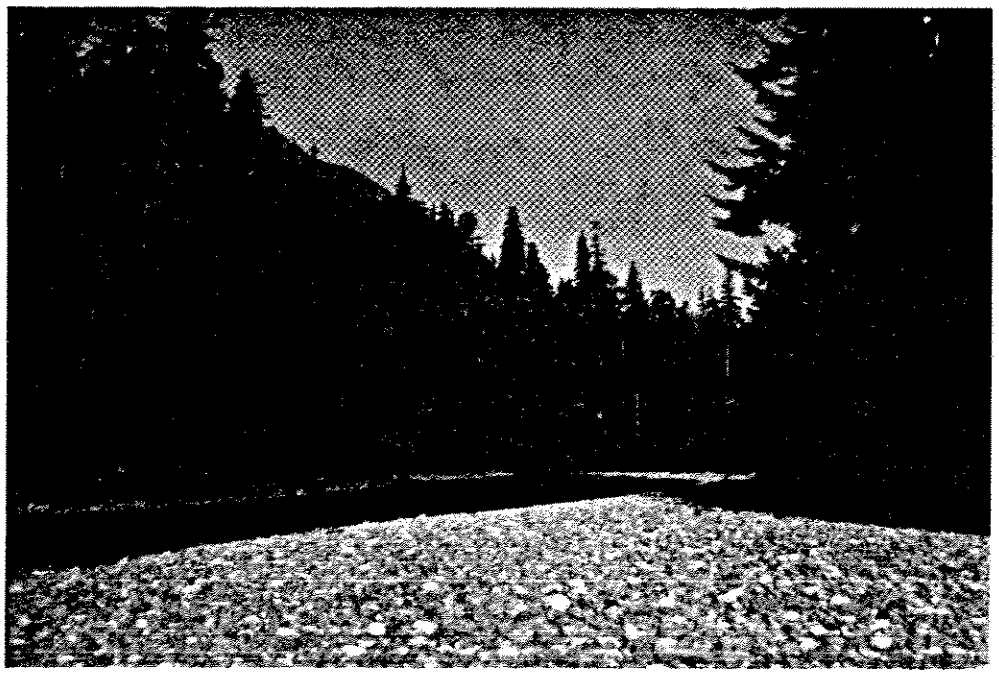


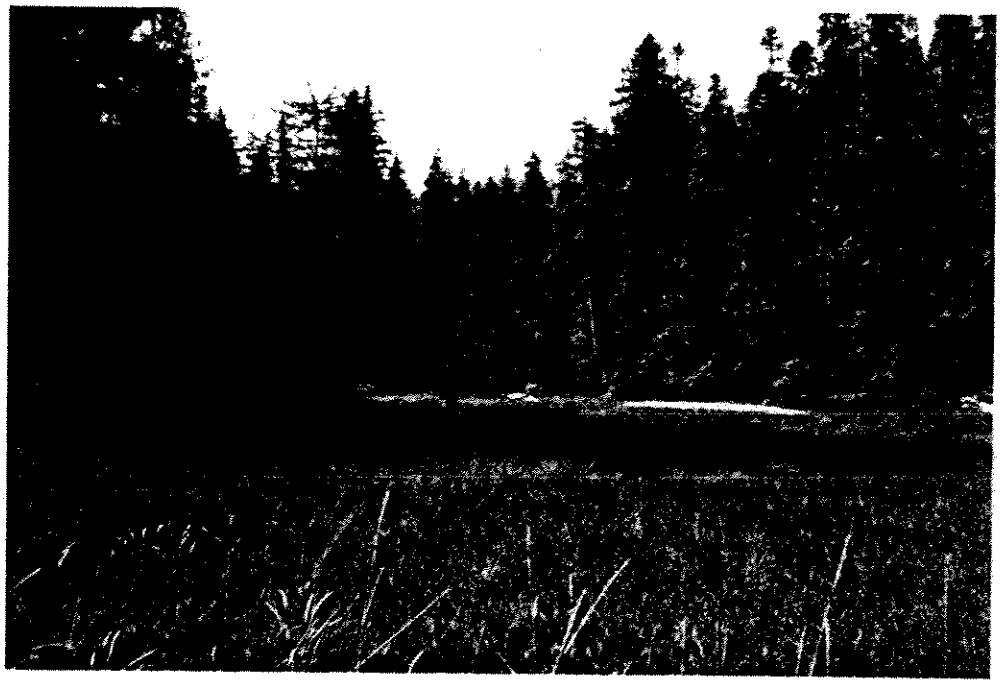
Scale: 20 Chs = 1 Inch

C.E. Dunn B.C.L.S.
Duncan B.C.
26 Sept 1960



Tsitika River





Salt Marsh Area

Typical Forest Cover

Typical Forest Cover

LEGAL DESCRIPTION:	District Lot 223, Rupert Land District Certificate of Title:- J 98659	
REGISTERED OWNER:	MacMillan Bloedel, Timberland & Properties Division, 1075 West Georgia Street, Vancouver, B.C.	
ASSESSMENTS AND TAXES:	1985 Assessment:	Land $5,473 Tree Farm Class Assessed Area - 94.0 ac.
	1985 Taxes:	$403.16

ZONING

The subject is located within the Nimpkish Provincial Forest which requires the Ministry of Forests to manage Crown land and timber. As the subject is a fee simple, Crown granted site, land use controls are the responsibility of the Regional District of Mount Waddington.

The appraiser is advised that the site is zoned A-1 Rural Zone with the following permitted uses and regulations:

PERMITTED USES

In a Rural (A-1) Zone the use of land, buildings and structures is restrited to:

a) Single family and two family dwellings,
b) Agricultural uses
c) Recreational uses and structures
d) Cemeteries
e) Public and quasi-public buildings and uses
f) Garbage dumps, provided that the location of the site in respect of water courses and air pollution has the approval in writing by the Medical Health Officer, or other such person designated by him, or the Director, Pollution Control Board whichever has jurisdiction in the case,
g) Public utility structures and uses
h) Buildings and uses accessory to a permitted use in this sub-section.

MINIMUM SITE AREA

The minimum site area shall be four (4) ha for single family dwellings and agricultural uses.

DWELLING UNITS PER SITE

There shall be no more than one single family or one two family dwelling per site or parcel.

UNSIGHTLY STORAGE

No parcel shall be used for the wrecking or storage of derelict vehicles or equipment or as a junkyard and no person shall permit such vehicles, equipment or junk to remain on any parcel.

It should be noted that the present registered owner has committed this property to Forestry use as it has been included within the forest management commitment of Tree Farm Licence 25 and Taxation Tree Farm #21.

In addition to the foregoing noted land use controls, the foreshore area located north of the subject has been designated as an Ecological Reserve. This ecological reserve known as the Robson Bight Ecological Reserve, covering a water area of 1248 hectares, was created in 1982 in order to protect valuable killer-whale habitat.

The purpose of this appraisal is to assist in negotiations to acquire an upland component to this ecological reserve.

A detailed description and map of the ecological reserve is included in the addenda of this report.

TIMBER CRUISE SUMMARY
AND
FOREST COVER MAP

MINISTRY OF LAND PARKS

PROJECT NO. 522/9

CLOSE UTILIZATION

SUMMARY OF CRUISE DATA
GRADES - MOF COMPUTERIZED

REPORT DATE 19 JUNE 1985

ERI TAKE AREA	LOT 223	MINIMUM DBH	17.5 CM	NET FACTORS	FOREST REGION	VANCOUVER
CUTTING PERMIT		STUMP HEIGHT	30.0 CM	ALL ZONAL SPECIES	FOREST DISTRICT	CAMPBELL RIVER
MERCH. HECTARES	34.8	TOP DIAMETER	15.0 CM		TIMBER SUPPLY AREA	
		LOG LENGTH	10.0 M		P.S.Y.U.	
		NET BASIS	DWB		FOREST INVENTORY ZONE	B

SPECIES:		ALL	F	C	H	B	S	PL	D
GROSS	M3	30536	1471	1060	11306	7788	6847	29	2035
NET	M3	27249	1334	709	10308	6547	6417	28	1906
NET M3	%	100.0	4.9	2.6	37.8	24.0	23.5	0.1	7.0
NET M3/HA		783.0	38.3	20.4	296.2	188.1	184.4	0.8	54.8
DECAY /GROSS	%	4.4	3.5	19.4	3.0	8.2	1.2	0.0	1.4
WASTE /GROSS	%	1.2	1.3	6.7	0.4	2.6	0.2	0.0	0.0
WASTE /NET	%	1.3	1.4	10.0	0.4	3.1	0.2	0.0	0.0
BREAKAGE/GROSS	%	5.2	4.5	7.0	5.4	5.2	4.9	2.0	5.0
CULL /GROSS	%	10.8	9.3	33.1	8.8	15.9	6.3	2.0	6.4
TREES/HA (LIVE&DF)		427.2	26.0	28.8	152.6	53.8	79.3	1.0	85.8
DBH, AVG (LIVE&DF)	CM	44.9	43.4	41.9	45.6	56.9	50.0	34.5	28.4
TREES 20-CM DBH CL.	%	22.7	1.2	1.0	8.4	4.8	2.1	0.0	5.3
SNAGS/HA (DU)		32.9							
DBH, AVG (DU)	CM	66.1							
HEIGHT, AVG MERCH	M	34.5	31.8	20.9	33.8	41.2	35.4	16.9	19.3
HEIGHT, AVG TOTAL	M	40.7	38.4	27.2	40.7	46.1	41.2	23.2	29.6
GROSS /TREE	M3	2.05	1.63	1.06	2.13	4.16	2.48	0.85	0.68
NET /TREE	M3	1.83	1.48	0.71	1.94	3.50	2.33	0.83	0.64
10M LOGS/TREE		2.11	2.25	1.59	2.17	2.65	2.18	2.00	1.76
GROSS /10M LOG	M3	0.97	0.72	0.67	0.98	1.57	1.14	0.43	0.39
NET /10M LOG	M3	0.92	0.69	0.49	0.95	1.40	1.12	0.43	0.38
10M LOGS/NET M3		1.15	1.52	2.24	1.12	0.76	0.94	2.40	2.76
SPECIAL REPORT	M3								
SUMMARY OF GRADES									
A #1 PEELER	%	0.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0
B #2 PEELER	%	0.5	9.5	0.0	0.0	0.0	0.0	0.0	0.0
C #3 PEELER	%	7.7	1.6	0.0	0.0	14.7	17.2	0.0	0.0
D #1 LUMBER	%	7.4	0.0	0.0	6.8	16.7	3.7	0.0	0.0
F #2 LUMBER	%	1.3	0.0	0.0	0.0	0.0	5.6	0.0	0.0
H #2 SAWLOG	%	18.7	13.8	22.3	14.5	14.3	36.0	0.0	0.0
I #3 SAWLOG	%	20.4	14.2	2.3	35.0	26.7	0.0	0.0	0.0
J #4 SAWLOG	%	31.0	56.7	71.2	36.2	20.3	32.6	100.0	0.0
K #1 SHINGLE	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X #5 UTILITY	%	5.9	2.7	4.1	7.5	6.9	4.8	0.0	0.0
Y #6 CHIPPER	%	7.1	0.1	0.1	0.0	0.3	0.0	0.0	100.0
SAM. ERROR (95% CI)	%	9.8	48.4	61.5	22.6	30.5	30.7	0.0	87.6
COEFF. OF VARIATION	%	31.1							
NO. POTENTIAL TREES		293							
NO. OF PLOTS,MEASURED		41	41 PRISM						
COUNT		66	66						
TOTAL		107	107						

MERCH.TIMBER	=	34.8 HA.
BRUSH	=	0.3
ROCK	=	1.3
TOTAL	=	36.4

ROJECT NO. 522/9

EPORT DATE 19 JUNE 1985

MINISTRY OF LAND PARKS

CU CLOSE UTILIZATION

COMPILED BY REID,COLLINS & ASSOC.LTD

CRUISED BY REID,COLLINS & ASSOC.LTD

OMPILATION SPECIFICATIONS

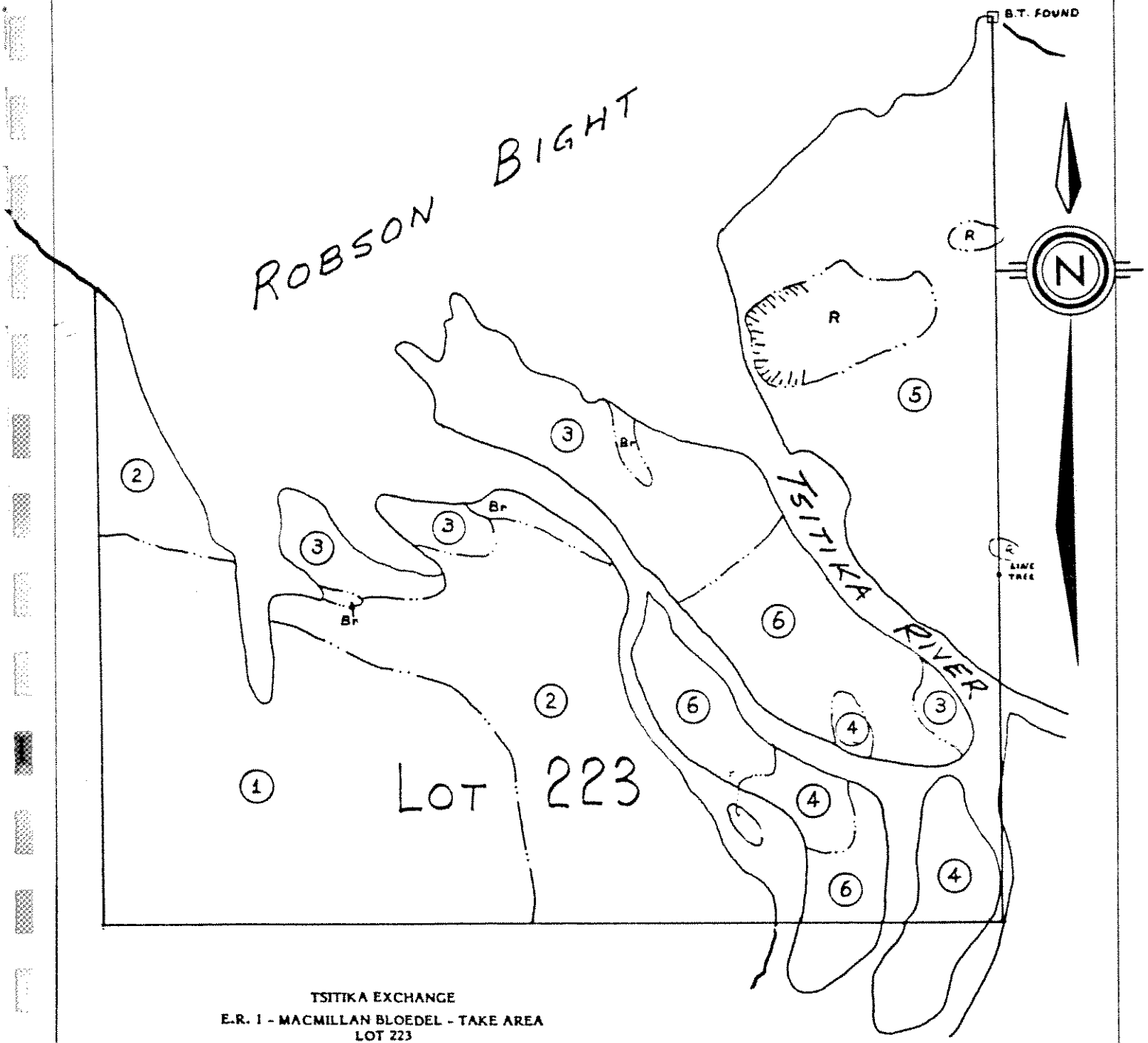
INIMUM DBH	CU 17.5 CM
OP DIAMETER	CU 15.0 CM
STUMP HEIGHT	CU 30.0 CM
ET BASIS	CU DECAY WASTE BREAKAGE
ET FACTORS	ALL SPECIES APPROPRIATE ZONAL LOSS FACTORS
RADES	CU MOF ESTIMATED GRADES - VARIABLE.
OG LENGTH	CU 10.0 METRES, MIN 2.5, MAX 12.5

TENURE AND LOCATION

ERI TAKE AREA	LOT 223
NUMBER OF CUT BLOCKS	ONE
FOREST INVENTORY ZONE	B
FOREST REGION	1,VANCOUVER
FOREST DISTRICT	8 CAMPBELL RIVER

RUISE STATISTICS OF CLOSE UTILIZATION

#	TIMBER TYPE	HECTARES	AVE.NET M3/HA.	TOTAL NET M3	PLOTS	NO.TREES COMPILED	STANDARD DEVIATION	COEFF. OF VARIATION	SAMPLING 1 S.E.	ERROR 95% CI	MEAS.PLOTS SE 95% CI
		34.8	783.0	27249	107	838		31.1 %	4.9 %	9.8 %	14.2 %
1	BH 961-G	9.7	924.1	8964	32	263	245.7879	27.9 %	5.2 %	12.0 %	
2	H 961-G	7.8	844.2	6585	30	229	235.3801	35.3 %	7.5 %	17.3 %	
3	S 851-G	4.3	1039.8	4471	11	103	498.3023	43.8 %	13.4 %	32.7 %	
4	F(S) 340-G	1.4	643.6	901	4	28	260.4351	40.5 %	20.2 %	64.4 %	
5	HS(C) 941-P	7.7	501.4	3861	22	156	347.5222	69.0 %	15.8 %	37.4 %	
6	D 340-M	3.9	632.6	2467	8	59	340.0894	81.4 %	29.5 %	93.7 %	



TSITIKA EXCHANGE
E.R. 1 - MACMILLAN BLOEDEL - TAKE AREA
LOT 223

LEGEND

Type Number	Description		Area (ha)
1	BH	961-G	9.7
2	H	961-G	7.8
3	S	851-G	4.3
4	F(5)	340-G	1.4
5	HS(C)	941-P	7.7
6	D	340-M	3.9
	Brush		0.3
	Rock		1.3
Total			**36.4**

Scale: 1:5 000

June 1985 - 522/9

D. R. COELL & ASSOCIATES INC.

HIGHEST AND BEST USE

Highest and Best Use refers to the use which is, or can be made, of the land to the best advantage, and is defined as "that use which is most likely to produce the greatest net return in terms of money and/or amenities over a given period of time". The principle of highest and best use is fundamental to the concept of value in real estate. The decision made as to a property's highest and best use must be a legal one from the standpoint of zoning, health regulations and the like, and there must exist a demand for the use.

Ecological Reserve

The purpose of this appraisal is to assist the owner, MacMillan Bloedel Ltd. and the Government of British Columbia in negotiations to effect a land exchange that will see this property included within the Robson Bight Ecological Reserve. A foreshore area of 3084 acres (1248 ha.) was designated on June 17, 1982 as the Robson Bight Ecological Reserve. The purpose of this ecological reserve is to protect and preserve killer whale habitat.

Location

The subject is considered to be in a remote location, ±40 km southeast of Port McNeill and it is surrounded by Crown land under forest management.

Forest Cover

The property was recently cruised at which time it was estimated that 34.8 ha (86 acres) contained merchantable timber and that the timbered area consisted of predominantly Good growing site. It is estimated that the property would yield a net volume of 27,249 cubic meters of merchantable timber or 783m^3 per hectare.

Recreational Potential

In recent years, the area has become popular because of the Ecological Reserve and the increasing public awareness of the importance of protecting the killer whale habitat.

Considering the foregoing factors, the appraiser is of the opinion that the highest and best use for the subject property is as a holding property, pending the growth in recreational demand and the limited utilization of the forest resource, pursuant to the restrictions of the Ecological Reserve.

ESTIMATE OF VACANT LAND VALUE

DIRECT SALES COMPARISON APPROACH

The direct sales comparison approach is the utilization and analysis of actual market conditions and transactions that have concerned properties similar to the one being appraised. It is a process of comparing sales, listings and other factors affecting the market value.

The direct sales comparison approach can usually be considered good evidence of value as it represents the actions of the typical buyer, user or investor of property.

The approach requires the rating of the property being appraised with other properties for which the market data is known. All the relevant facts about each sale property used are assembled and weighed against the corresponding facts relating to the subject property. Thus a standard is established upon which an estimate of value for the property under appraisal may be based. The valuation assumes the land is vacant and capable of utilization within its existing zoning.

As a result of the appraiser's investigations and analysis, a cross-section of the available transactions have been analysed, and narrowed to those contained in this report.

Sale No. 1

Legal Description:	Lot 157, Renfrew District
Location:	Port Renfrew - Port San Juan
Lot size/area:	64.5 acres
Sale Price:	$156,600
Sale Date:	January 1985
Indicated price per acre:	* $647 per acre (bare land)
Zoning:	Rural
Comments:	* Merchantable timber is estimated to contribute $114,900. A remote property within the proposed boundary of Pacific Rim National Park. Negotiations to purchase were carried out over a three year period.

Sale No. 2

Legal Description:	That part of the fractional Southeast ¼ of Lot 280 Barclay District, lying to the East of Parcel "B" of said lot and to the East of the Pachena Light house Reserve as shown outlined in red on Plan deposited under No. 61256-I
Location:	Pachena Point - south of Bamfield
Lot size/area:	107 acres
Sale Price:	$216,500
Sale Date:	December 1981
Indicated price per acre:	*$793 per acre (bare land)
Zoning:	Rural
Comments:	*Merchantable timber is estimated to contribute $131,600. A remote parcel without road access on a rugged section of coastline.

Sale No. 3

Legal Description:	Section 146, Renfrew District
Location:	Owen Point - Port San Juan
Lot size/area:	725 acres
Sale Price:	$1,682,000
Sale Date:	January 1982
Indicated price per acre:	*$607 (bare land)
Comments:	This sale involved a waterfront timberland property which was purchased by the Provincial Government for inclusion in Pacific Rim National Park. The property was appraised independently at $1,682,000 with an allocated bare land value of *$440,000.

Sale No. 4

Legal Description:	Lots 1486, 1487, 1488 & 1489, New Westminster District
Location:	Hardy Island - Jervis Inlet
Lot size/area:	1,699 acres
Sale Price:	$1,200,000
Sale Date:	June 1985
Indicated price per acre:	$706
Comments:	Four district lots which make up the entire area of Hardy Island. This island was purchased in the late 70's and subsequently logged, leaving a narrow fringe of trees along the shoreline. This is a popular boating area and the south side of the island offers seasonal small boat anchorages.

Sale No. 5

Legal Description:	Parts of D.L. 1894 & 1371 Clayoquot District
Location:	Hot Springs Cove - Refuge Cove
Lot size/area:	231 acres
Sale Price:	$188,500
Sale Date:	May 1985
Indicated price per acre:	$816
Comments:	An oceanfront site consisting of six properties located just north of the Hot Springs Cove Park. The property is improved with residential structures which provide a nominal contribution in the purchase price. The land did contain some cedar suitable for shakes which is presently being extracted.

Sale No. 6

Legal Description:	D.L. 156, Range 1, Coast District, except that part included in Plan 645.
Location:	Shoal Bay - north side East Thurlow Island
Lot size/area:	144 acres
Sale Price:	$185,000
Sale Date:	March 1985
Indicated price per acre:	$1,285 per acre
Comments:	A waterfront property with good quality anchorage and marginal forest cover.

Sale No. 7

Legal Description:	Lot 10 Sayward District and Lot A, D.L. 1028 Plan 4063 Sayward District
Location:	Open Bay - Quadra Island
Lot size/area:	275 acres
Sale Price:	$550,000*
Sale Date:	February 1984
Indicated price per acre:	$1,455 per acre
Comments:	* It is reported that the merchantable timber contributed approximately $150,000 at the time of sale.

SALES SUMMARY

Sale No.	Location	Size/acres	Sale Price per Acre	Sale Date
1	Port Renfrew	64.5	$ 647	January 1985
2	Pachena Point	107.0	793	December 1981
3	Owen Point	725.0	607	January 1982
4	Hardy Island	1,699.0	706	June 1985
5	Hot Springs Cove	231.0	816	May 1985
6	Shoal Bay	144.0	1,285	March 1985
7	Open Bay	275.0	1,455	February 1984.

Sales Analysis

Our sales investigation covered both the east and west coasts of Vancouver Island. Market trading of waterfront timberland has been very limited over the past four years with the downturn in the economy and, in particular, a recession in the Forest Industry.

We have investigated the Government acquisition of three timberland acreages associated with Pacific Rim National Park. In all three cases, the sites were remote waterfront sites and timber cruise and economic timber value estimates were available.

Sale No. 1 - $647 per acre (bare land) - Port Renfrew

A steep, rugged timberland acreage that did not have road access. Although this site was within the mouth of Port San Juan Harbour, its topography required land access rather than water access for logging. The vendor was an informed land owner of resource properties and conducted extensive negotiations before a final sale was executed. The subject enjoys superior site conditions and logging opportunities.

Sale No. 2 - $793 per acre (bare land) - Pachena Point

A remote site on the west coast of Vancouver Island situated adjacent to the Pachena Lighthouse on the West Coast Life Saving Trail. This property has a rugged exposed coast shoreline that would not permit log

booming. This sale is considered inferior to the subject, however, it occurred at the peak of the marketplace in 1981.

Sale No. 3 - $607 per acre (bare land) - Owen Point

A larger acreage located adjacent to Sale No. 1 near Port Renfrew. The vendor was a major forest products company who was well informed as to the quantity and value of timber.

Sale No. 4 - $706 per acre - Hardy Island

A large acreage transaction involving an entire island. It is reported that the purchasers are a syndicated group who have development plans for the island. The island was clear-cut logged with the exception of a small fringe along the shoreline. An upward adjustment is considered necessary to reflect the difference in size.

Sale No. 5 - $816 per acre - Hot Springs Cove

A group of six properties totalling 231 acres located on the west coast of Vancouver Island north of Tofino. The sale itself does not contain any hot springs, however, it is adjacent to the new Hot Springs Cove Provincial Park which is gaining in popularity.

Sale No. 6 - $1,285 per acre - Shoal Bay

A recent sale of an acreage on the east side of Vancouver Island located on the north side of East Thurlow Island. The sale is reported to contain only marginal timber values, however, it does have good sheltered anchorage.

Sale No. 7 - $1,455 per acre (bare land) - Open Bay - Quadra Island

A timberland acreage on the east side of Quadra Island with extensive good quality waterfrontage. The purchaser bought the property for its forest resources. Access to the site is by water only, however, its location is considered superior to the subject and a downward adjustment is required.

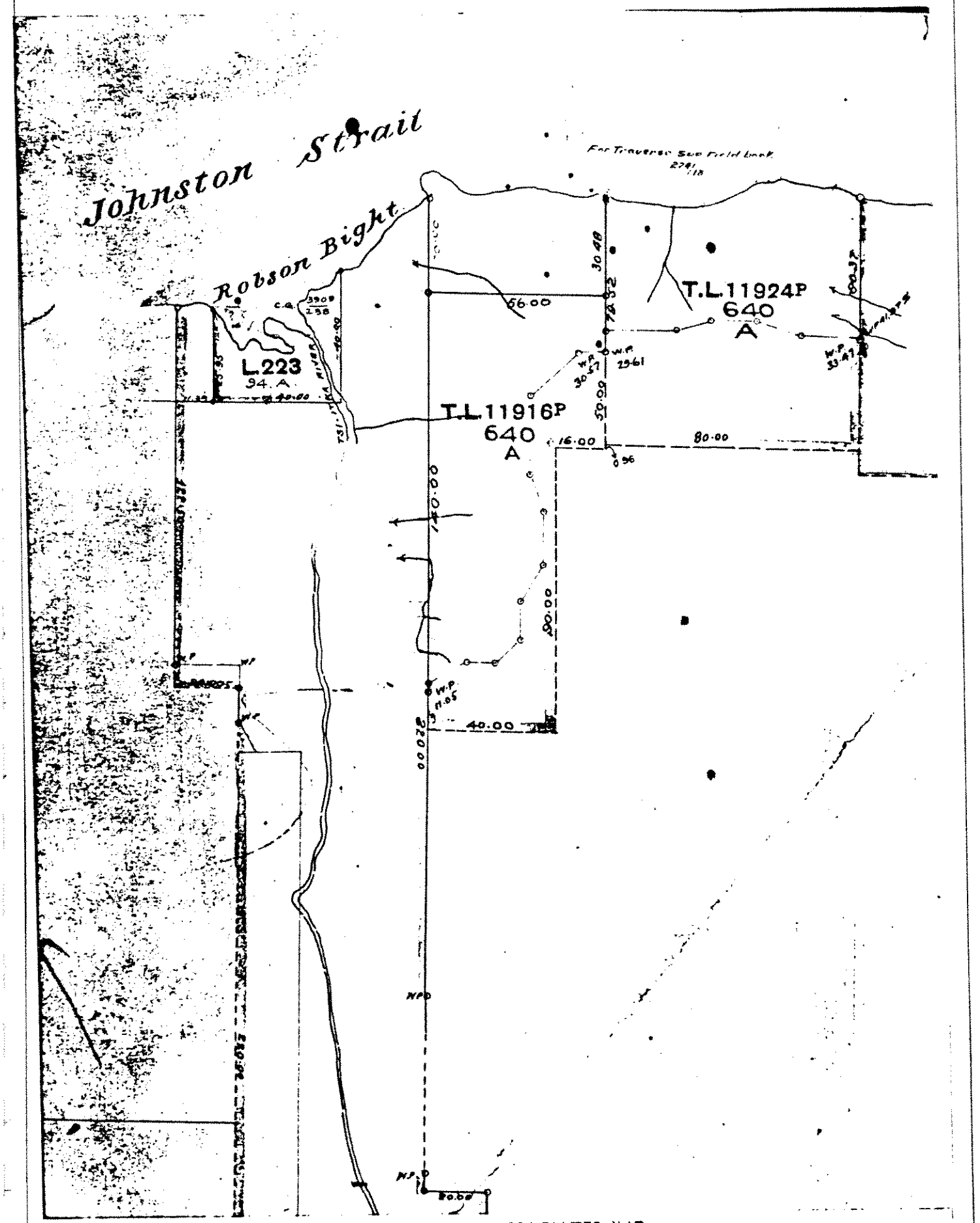
In reviewing the market activity, the appraiser considers Sales No. 1 to No. 3, which are Government purchases, to provide a limited indicator to value due to the non-arms length nature of the transactions. Sale No. 4 is much larger in size and it would appear to have been purchased for future development purposes as well as its capability for growing timber. Sale No. 5 consisted of six parcels which when assembled made a contiguous waterfront block. Sales No. 6 and 7 are located on islands in Johnstone Strait and contained excellent waterfront site conditions.

After carefully considering the relevant factors set out above for each of the comparables in relation to the subject and in addition, the overall condition of the large acreage market activity, the appraiser is of the opinion that the market value of the subject's "bare land" as of June 30, 1985 was:

94 acres at $900 per acre = $84,600

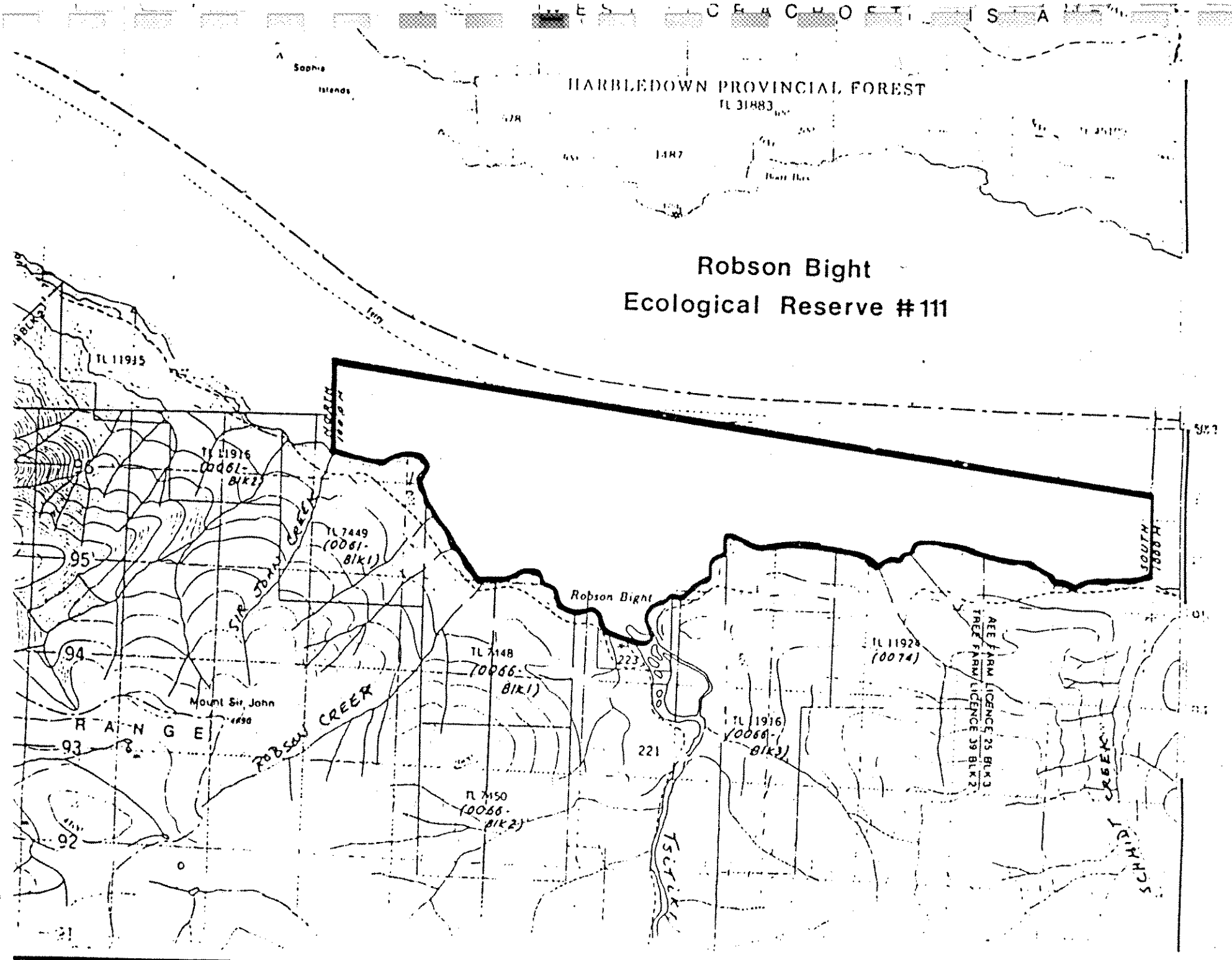
ADDENDA

OFFICIAL SURVEY PLAN



D. R. COELL & ASSOCIATES INC.

Ecological Reserve No.:	111
Order-in-Council No.:	1134, 1148
File Number:	0357634
Name of Reserve:	Robson Bight Ecological Reserve
Date Established:	June 17, 1982
Location:	Robson Bight is a small, remote bay on the northeast coast of Vancouver Island situated 40 km southeast of Port McNeill and 43 km northwest of Sayward at the mouth of the Tsitika River.
Legal Description:	All that foreshore or land covered by water in the vicinity of Robson Bight, Rupert District more particularly described as commencing at the point of intersection of the right bank of Sir John Creek with the southerly boundary of Johnstone Strait; thence due north a distance of 1000 metres; thence southeasterly in a straight line 8900 metres more or less to a point 1000 metres due north of the point of intersection of the left bank of Schmidt Creek and the southerly boundary of the aforementioned Johnstone Strait; thence due south 1000 metres to said point; thence in a general northwesterly and southwesterly direction along the southerly boundary of Johnstone Strait to a point due east of the northwest corner of Lot 223, Rupert District; thence due west to said point; thence continuing along said southerly boundary of Johnstone Strait in a general northwesterly direction to the aforementioned point of commencement, containing 1248 ha more or less.
Area:	1,248 ha (water)
Object and Community Type:	The Robson Bight area has been set aside to protect killer whales and a crucial part of their habitat. Killer whales use Robson Bight as their home base. Behaviours observed there include resting and sleeping, playing and rubbing on beaches and rocks. It is suspected, but not confirmed, that Robson Bight is significant in killer whale reproduction.


HARBLEDOWN PROVINCIAL FOREST
TL 31883
Robson Bight
Ecological Reserve #111
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TL 11916
(0061-
BLK2)
TL 7449
(0061-
BLK1)
SIR JOHN CREEK
NORTH
SOUTH
Robson Bight
TL 7148
(0066-
BLK1)
TL 11928
(0074)
AEE FARM LICENCE 25 BLK 3
TREE FARM LICENCE 39 BLK 2
TL 1916
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BLK3)
Mount Sir John
4490
ROBSON CREEK
RANGE
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TSITSIKT
SCHICKER CREEK
96
95
94
93
92
91
221
223