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To: Jim Gowriluk
Regional Manager
Coast Forest Region

From: The Honourable Rich Coleman, Minister of Forests and Range

Re: *Coast Appraisal Manual*

I hereby approve the new *Coast Appraisal Manual*, and attach a copy for your use.

This manual is effective June 1, 2007. Amendments or revisions to this manual require my further approval.



Rich Coleman
Minister

Attachments

pc: Bill Howard, Director, Revenue Branch





REVENUE BRANCH

Coast Appraisal Manual

Effective June 1, 2007



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New Coast Appraisal Manual Highlights

The new *Coast Appraisal Manual* includes clarification to policy, an update to the market pricing system, and an update of the tenure obligation adjustments and specified operations to June 1, 2007. By section, the significant changes are as follows:

Section 1.1	Definitions expanded and clarified.
Section 3.3.1	Updated for new legislation.
Section 4.2	MPS variables expanded and clarified.
Section 4.2.2 (6) (iv)	New section added.
Section 4.2.4	Clarification of haul distance description.
Section 4.2.5.4	Clarification of log barging description.
Section 4.3	Revision to estimated winning bid equation.
Section 4.4.2	Revised inland water transportation cost estimate.
Section 4.4.3	Revised Clayquot Sound cost estimate.
Section 4.4.5	Addition of destumping to specified operations.
Section 5.2	Revised forest planning and administration cost.
Section 5.3.1.1 (2)	Now included in definitions section.
Section 5.3.1.1 (4)	Now included in definitions section.
Section 5.3.3.2.3	Revision to culverts table.
Section 5.4	Revision to road management cost estimate.
Section 5.6	Revision to basic silviculture table.

Section 5.7	Revision to low grade number table.
Section 5.8	Revision to market logger road cost calculation.
Section 5.9	Revision to RFM factor.
Appendix 1	Revision to equipment rates.
Appendix V	Area where destumping will occur must be shown on map.

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Definitions and Interpretations **1**

1.1 Definitions and Interpretations

In this manual:

"**Act**" means *Forest Act*;

"**Appraisal Data Submission**" means the information required by the person who determines the stumpage rate to determine that rate including the appraisal map, appraisal summary report, cruise compilation and any other information required by the regional manager or district manager in the form required by the director, signed by a registered professional forester (RPF) or registered forest technologist (RFT), registered with the Association of British Columbia Forest Professionals;

"**Billing history record**" means a record of log scale data derived from a record kept by the Revenue Branch of log scale data reported on stumpage invoices issued by the Revenue Branch for timber scaled under section 94 of the *Act*;

"**BCTS**" means British Columbia Timber Sales;

"**Coniferous cruise volume**" means that part of the total net cruise volume which is coniferous timber;

"**Cutting authority**" means:

- (a) a cutting permit issued under a forest licence, a timber sale licence, a timber licence, tree farm licence, a community forest agreement, a community salvage licence, a woodlot licence, or forestry licence to cut,
- (b) a timber sale licence that does not provide for the issuance of a cutting permit,
- (c) a licence to cut, or
- (d) a road permit;

"**Cutting authority area**" means the area where timber may be harvested under authority of:

- (a) a cutting permit,
- (b) a timber sale licence that does not provide for the issuance of a cutting permit,
- (c) a licence to cut, or
- (d) a road permit;

"**Deciduous timber**" means timber that is any of the alder, birch, cottonwood and maple species;

“Detailed engineering” means non-tabular;

"Director" means director of Revenue Branch of the Ministry of Forests and Range;

"District manager" means district manager or district manager's designate;

“Helicopter Selection” means the harvesting of single trees within standing residual timber that have been felled and then removed using a helicopter;

“Immature coniferous timber” means coniferous timber that is younger than 121 years old;

"Licensee" means the holder of a cutting authority;

“Low grade” means grades ‘X’ and ‘Y’ of all species and ‘U’ grade hemlock and balsam;

“Main Access Road” means a long-term (i.e., in use for more than ten years) mainline road that is tributary to the appraised cutting authority area, or is used to transport bulk fuels, supplies, equipment or harvesting crews necessary to carry out day-to-day harvesting activities on that area, and has an average stabilized subgrade width greater than seven metres;

"Manual" means *Coast Appraisal Manual*;

"Mature coniferous timber" means coniferous timber that is 121 years old or older;

"Minister" means Minister of Forests and Range;

"Ministry" means Ministry of Forests and Range;

"Net cruise volume" means the gross volume of all species listed in section 4.2.3(1), plus alder, birch, cottonwood and maple in the cutting authority area minus the volume of decay, waste and breakage in that timber unless otherwise specified in the *Cruising Manual*;

“Old growth coniferous timber” means timber that is 141 years old or greater;

"Regional manager" means regional executive director or regional executive director’s designate;

"Regulations" means regulations under the *Act*;

"Remaining volume" means the total net cruise volume of a cutting authority area minus the total volume of timber in the billing history record of the cutting authority area on the effective date of the reappraisal of the cutting authority area;

"Revenue Branch" means Revenue Branch of the Ministry;

"**Second growth coniferous timber**" means coniferous timber that is less than 141 years old;

"**Selling price zone 51**" means the table of coast market pricing system log values for old growth coniferous timber, approved by the director, Revenue Branch;

"**Selling price zone 52**" means the table of coast market pricing system log values for second growth coniferous timber, approved by the director, Revenue Branch;

"**Stumpage price**" means the market stumpage price;

"**Stumpage rate**" means market stumpage rate;

"**Skyline**" means any method of yarding where the logs are fully suspended above the ground by a short span, long span, or multi-span system using a carriage with standing or running lines;

"**Total net cruise volume**" of a cutting authority area (tncv) is the product of the net cruise volume per hectare of the cutting authority area (ncv/ha) multiplied by the total merchantable timbered area to be harvested under the cutting authority (tmta). Expressed as an equation:
$$\text{tncv} = \frac{\text{ncv}}{\text{ha}} \times \text{tmta};$$

"**Tributary cutting authority area**" means a cutting authority area from which timber must be transported over the road that is developed, or a cutting authority area to which bulk fuels, supplies, equipment and harvesting crews necessary to carry out the day-to-day harvesting activities on that area must be taken on a regular basis over the road that is developed;

"**Unit cost**" means cost estimate expressed in dollars per cubic metre.

Scope and Requirements

2

2.1 Terms of Reference

1. This manual contains the policies and procedures for determining rates of stumpage for Crown timber harvested in the Coast Forest Region (except Manning Park), as established by the *Act* and *Regulations*.

2.1.1 Responsibility for Stumpage Determinations

1. The following employees of the Ministry are authorized to determine, redetermine and vary rates of stumpage:
 - a. Regional Managers, regional appraisal coordinators and employees of the regional revenue section, and
 - b. The Director, and employees of the Revenue Branch.

2.2 Numbering System

The following exemplifies the numbering system that is used in this manual.

- 1. = Chapter
- 1.1 or 1.1.1.1 = Section
- 1.1.1.1 (2) = Subsection.
- Table 4-2 = Table 2 within chapter 4

2.2.1 Calculation Conventions

1. Every calculation required to be performed will be performed to the full capacity of a calculating machine with the results truncated at four places of decimals and rounded to two places.
2. A result from 5 to 9 will be rounded upward and a result from 1 to 4 will be rounded downward.
3. Each calculation of a tenure obligation adjustment or specified operation adjustment expressed in dollars per cubic metre will be rounded to the nearest cent.
4. Where a value is specified as a limit, for example a constraint or a requirement for an equation,
 - a. the value will be treated as an absolute value, and
 - b. an actual measurement or record will not be rounded before use unless otherwise specified in this manual.

2.2.2 Cutblocks within a Cutting Authority Area

1. All cutblocks within a cutting authority area must:
 - a. constitute a logical unit,
 - b. be tributary to the same appraised point of origin, and
 - c. be contained within the same timber supply block, or in the case of a cutting authority area under a tree farm licence, be contained within the same forest district.
2. Helicopter single standing stem selection as described in section 4.4.3 must not be combined with any other harvest method within the same cutting authority area.

3. Except as provided in subsection (2) of this section, there are no other restrictions on what types of harvest methods may be used in or which types of timber can be contained in a cutting authority area.

2.3 Cruise Information

1. A licensee or BCTS must gather and compile cruise data in accordance with the following ministry publications and the coast timber merchantability specifications in Table 2-1:

- a. *Cruising Manual*, (*Cruising Manual* web site: <http://www.for.gov.bc.ca/hva/manuals/cruising/>,

- b. *Cruise Compilation Manual*.

<http://www.for.gov.bc.ca/hva/manuals/cruise compilation/Index.htm>

Table 2-1 Coast Timber Merchantability Specifications

Description		
The following coast timber merchantability specifications must be used in all appraisals.		
	Mature	Immature
1. Maximum stump height (measured from the top of the stump down to the highest ground level adjacent to the stump)	30.0 cm	30.0 cm
2. Minimum slab thickness for cedar only	15.0 cm	10.0 cm
3. Minimum top diameter (inside of the bark)	15.0 cm	10.0 cm
4. Minimum length of a log or slab	3.0 m	3.0 m

2. The licensee must provide, when requested by the district manager a photocopy of the tally sheets and an electronic version of the compilation in a format specified by the regional manager.
3.
 - a. The cutting authority area will be appraised using the total net cruise volume of timber authorized for harvest in that area.
 - b. The total area of merchantable timber in the cutting authority area is obtained from the appraisal summary of the cruise compilation report.
4. If the licensee or BCTS modifies its application for a cutting authority the applicant must recompile the cruise data when any of compiled plots used in the cruise lie outside the boundaries of the proposed cutting authority area.
5.
 - a. Where a boundary of a cutting authority area has been changed after the appraisal or reappraisal of the cutting authority area, every reappraisal of the cutting authority area must use the total net cruise volume of the cutting authority area as it is after the boundary has changed.

- b. If, after a cruise compilation or recompilation was used for an appraisal or reappraisal, the total of all additions or deletions of areas containing merchantable timber made to the cutting authority area exceeds twenty-five hectares or twenty-five percent of the area containing merchantable timber, whichever is less, the entire cruise must be recompiled.

2.4 Appraisal Data Submission

The form of the appraisal data submission required by the director may be found at:

<http://www.for.gov.bc.ca/hva/ECAS/index.htm>

2.5 Appraisal Map

The appraisal map must be completed in accordance with the requirements of Appendix V of this manual.

Appraisals, Reappraisals and Quarterly Adjustments

3

3.1 Types of Determination

1. A stumpage rate is determined, redetermined or varied by:
 - a. an appraisal, reappraisal or a quarterly adjustment,
 - b. an Order-in-Council under section 105 of the *Act*, or
 - c. a procedure identified in chapter 7 of this manual.

3.2 Appraisals

1. An appraisal is a process used to determine a stumpage rate for a cutting authority area using the manual in effect on the effective date of the cutting authority. The appraisal is effective on the effective date of the cutting authority.
2. A licensee or BCTS shall submit the appraisal data submission to the district manager when the licensee or BCTS makes an application for a cutting authority.
3. The district manager may require the licensee or BCTS to complete and submit an estimated stumpage rate calculation for both helicopter and cable methods of harvesting when the district manager is not satisfied that the method proposed by the licensee or BCTS is the only method that is suitable for the area intended to be harvested.
4. The district manager may review the licensee or BCTS appraisal data submission and may inform the licensee or BCTS of any omissions, errors or provisions of the manual that, in the opinion of the district manager, the signing RPF or RFT may not have considered. The licensee or BCTS signing RPF or RFT may consider the district manager's information and may revise the appraisal data submission.
5. The district manager shall give any information supplied by the licensee or BCTS under this section to the person who determines the stumpage rate together with any other information that the district manager considers relevant to the appraisal.
6. The person who determines the stumpage rate may review the licensee or BCTS submission, and information supplied by the district manager, and may inform the licensee or BCTS of any omissions, errors or provisions of the manual that, in the opinion of the person who determines the stumpage rate, the signing RPF or RFT may not have considered. The licensee or BCTS signing RPF or RFT may consider the information and may revise the appraisal data submission.
7. The person who determines the stumpage rate shall consider:
 - a. the information provided by the licensee or BCTS and the district manager, and
 - b. any information available to the person who determines the stumpage rate that is relevant to the appraisal.
8. Regional staff will notify the applicant of the stumpage rate determination.

3.3 Reappraisals

1. A reappraisal is a process used to redetermine a stumpage rate for a cutting authority using the manual in effect on the effective date of the reappraisal.
2. Except as provided for under sections 3.3.1(1)(d), 3.3.2 and 3.3.4, a reappraisal is based on a complete reassessment of the cutting authority area on the effective date of the reappraisal, as if the area has been returned to the condition as it was prior to development or harvesting.
3. Non-tabular cost estimates made in the appraisal of a cutting authority area may be re-estimated once in a subsequent reappraisal after works have been constructed using information required under section 5.3.4.
4. Road development costs originally estimated using ministry approved competitive bids may not be re-estimated in a reappraisal.

3.3.1 Changed Circumstances

1. In this section a changed circumstance means a circumstance where:
 - a. (i) The licensee plans to use a method of harvesting to harvest at least fifteen percent of the volume of timber in the cutting authority area that is different from the method that was planned to be used for that timber at the time of the most recent appraisal or reappraisal of the cutting authority area, and
 - (ii) the different method of harvesting that is planned to be used:
 - (aa) when used in the changed circumstance reappraisal will produce the highest stumpage rate, and
 - (bb) is different from the method of harvesting that was used in the most recent appraisal or reappraisal, or
 - b. there has been or will be a change in the amount of road development of at least fifteen percent in the total road development unit cost since the most recent appraisal or reappraisal caused by changes to the appraisal field data that will be used in the changed circumstances reappraisal, or
 - c. land containing merchantable timber has been either added to or deleted from the cutting authority area since the most recent cruise compilation or recompilation was used in an appraisal or reappraisal that exceeds either:
 - (i) fifteen hectares or

- (ii) fifteen percent of the area of the cutting authority area as it was prior to the addition or deletion of the land, or
 - d. at least fifteen percent of the total net cruise volume that was used in the most recent appraisal or reappraisal of the cutting authority area has been suddenly and severely damaged, unless the timber was damaged by a fire for which the licensee was responsible and the licensee failed to comply with the *Wildfire Act and Regulations*.
2. The licensee must notify the district manager immediately of a changed circumstance.
3. Where the district manager believes that a changed circumstance has occurred, the district manager will notify the licensee of that belief.
4. A cutting authority area other than a cutting authority area that is the subject of a road permit or a cutting authority with fixed rates, must be reappraised when a changed circumstance has occurred.
5. Where a cutting authority area is reappraised because of a changed circumstance, any bonus bid in existence prior to the reappraisal does not change and remains in effect.

3.3.1.1 Changed Circumstance Reappraisal Procedure

1. Where the cutting authority area must be reappraised because of a changed circumstance, the licensee shall submit to the district manager an appraisal data submission.
2. Thereafter, the reappraisal procedure shall be the procedure required by section 3.2(2) through 3.2(8).

3.3.1.2 Effective Date of Changed Circumstance Reappraisal

1. Except as provided in subsections (2) and (3) of this section, a reappraisal because of a changed circumstance is effective on the day after the effective date of the most recent appraisal or reappraisal of the cutting authority area prior to the changed circumstance reappraisal.
2. Where the changed circumstance is because of an amendment to the cutting authority area referred to in subsection 3.3.1 (1)(c), the reappraisal is effective on the first day of the month following the date that the district manager approves the amendment.
3. Where the changed circumstance is a result of sudden and severe damage referred to in subsection 3.3.1(1)(d), the effective date of the reappraisal is the first day of the month following the date when the event that caused the sudden and severe damage stopped on the cutting authority area.

3.3.2 Annual Reappraisal of a Road Permit

1. Subject to section 7.3, a cutting authority area that is the subject of a road permit must be reappraised effective February 1st of every year.
2. The stumpage rate determined under subsection (1) of this section will be a fixed stumpage rate until the cutting authority area is reappraised.

3.3.3 Annual Reappraisal of Salvage Logging Stumpage Rates

1. Except where a cutting authority requires the payment of a bonus bid or a bonus offer, where the stumpage rate for a cutting authority has been determined under section 7.4, the cutting authority area authorized for harvest under that cutting authority must be reappraised effective March 1st of every year.
2. A stumpage rate determined under subsection 1 of this section will be a fixed stumpage rate between the time that the cutting authority area is reappraised and the time that it is subsequently reappraised.

3.3.4 Minister's Direction

1. The Minister may direct that a reappraisal be made at any time and that the redetermined stumpage rate will be effective on any future date.
2. The Minister may specify criteria and procedures for an appraisal or reappraisal.

3.3.4.1 Minister's Direction Reappraisal Procedure

1. Where the Minister directs a reappraisal to be made under section 3.3.4, and the district manager requests the licensee to submit an appraisal data submission, the submission shall be submitted to the district manager within forty-five days of the district manager's request.
2. Thereafter the reappraisal procedure shall be the procedure required by section 3.2 (2) through 3.2 (8).

3.4 Quarterly Adjustments

1. Unless a cutting authority, previous manual, or a provision of this manual specifies that the stumpage rates of a cutting authority are fixed, the stumpage rate of a cutting authority is adjusted quarterly on January 1, April 1, July 1, and October 1 of each year.

2.
 - a. At the time of the quarterly adjustment referred to in subsection (1) of this section, the stumpage rate will be recalculated in accordance with the equations applicable for the appraisal effective date and the appraisal data submission which was used in the most recent appraisal or reappraisal. The log selling prices and CPI effective for the month of the adjustment will be used in the calculation of the adjustment. All other data, including the estimated number of bidders, will remain unchanged.

 - b. The procedure referred to in this subsection is conducted each quarter until the cutting authority area is reappraised or the cutting authority expires.

3.5 Fixed Rates and Extensions of Term

Timber Sale Licences

1. A fixed stumpage rate for a timber sale licence means that the upset stumpage rate and bonus bid will not change during the term of the timber sale licence and all extensions, except where:
 - a. a reappraisal is done under section 3.3.1(d) due to sudden and severe damage, or
 - b. a reappraisal is done under section 3.3.4 due to the Minister's direction.
2. Every timber sale licence entered into under section 20 of the *Act* that was advertised on or after November 1, 2003 must have a fixed stumpage rate.
3. Notwithstanding anything to the contrary in this manual, a fixed stumpage rate for a timber sale licence may not be corrected where there has been an error in the appraisal.

Woodlots

4. a. The stumpage rate for a cutting authority issued under a woodlot licence shall be an adjusting stumpage rate unless:
 - i) the stumpage rate for the cutting authority is changed to a non-adjusting stumpage rate under this section, or
 - ii) the cutting authority is a road permit.
- b. A licensee may choose to have an adjusting stumpage rate changed to a non-adjusting stumpage rate under this subsection by giving written notice of that choice to the regional appraisal coordinator.
- c. Where the licensee gives notice to the regional appraisal coordinator of that choice, the adjusting stumpage rate shall become a non-adjusting stumpage rate three weeks after the regional appraisal coordinator receives the notice.
- d. On the date that the stumpage rate becomes a non-adjusting stumpage rate, the stumpage rate for the cutting authority continues to be the stumpage rate of the cutting authority that was in effect on that date.

- e. Where a stumpage rate is changed from an adjusting stumpage rate to a non-adjusting stumpage rate, the stumpage rate for the cutting authority shall not change for the term of the cutting authority and all extensions from the date that the stumpage rate is changed to a non-adjusting stumpage rate, except where the cutting authority area is reappraised under section 3.3.1(d) or under section 3.3.3.

Average Stumpage Rates by District and Species

5. Where the stumpage rate for a cutting authority has been determined under section 7.1 or section 7.2 and the term of the cutting authority is extended, the stumpage rate shall not change during the term of the cutting authority and all extensions.

Miscellaneous Stumpage Rates

6. Except where miscellaneous stumpage rates are otherwise specified in a cutting authority the miscellaneous stumpage rates applicable to timber under section 7.7 are the rates that are in effect on the date that the timber is scaled.

3.6 Correctable Errors

1. In this section, a correctable error means:
 - a. an error made by a Ministry employee in selecting or transcribing the correct log grade source, or
 - b. a stumpage adjustment calculation that has not been made by using a stumpage appraisal parameter in effect on the effective date of the stumpage adjustment.
2. Where a person believes that a correctable error has been made in a stumpage determination, that person shall give written notice of the correctable error as follows:
 - a. in the case of an appraisal or a reappraisal, the notice shall be given to the regional manager, and in the case of a quarterly adjustment, the notice shall be given to the director, and
 - b. the notice shall identify the stumpage determination, the correctable error, and the cause of the correctable error to the extent reasonably possible.
3. The regional manager or the director, upon receipt of the notice shall determine whether or not a correctable error was made.
4. Where the regional manager or the director determines that a correctable error has not been made, the person who determined the stumpage rate or director shall notify the person who gave the notice of the correctable error.
5. Where the regional manager or the director determines that a correctable error has been made, then:
 - a. the regional manager or the director will notify the person who gave the notice of the correctable error,
 - b. the regional manager or the director will take reasonable steps to ensure that all licensees who may have been affected by a similar correctable error are informed of the decision, and
 - c.
 - (i) where the regional manager determines that a correctable error has been made in an appraisal or a reappraisal the cutting authority area shall be reappraised to correct the error by the person who determined the stumpage rate, using the procedure under subsections 3.2(7) to 3.2 (8), and,
 - (ii) the effective date of the reappraisal shall be the first day of the month following the date on which the notice of the correctable error was received by the regional manager.

- d. (i) where the director has determined that a correctable error has been made in the calculation of a quarterly stumpage adjustment, the adjustment must be correctly recalculated unless the cutting authority, the appraisal manual or the application and tender for a timber sale licence specifies that the stumpage rate is fixed, and,
- (ii) the effective date of the redetermined rate shall be the first day of the month following the date on which the notice of the correctable error was received by the director.

3.7 Redetermination of Stumpage Rate by Agreement

1. Where, within twenty-one days of the date of a Stumpage Advisory Notice, the person to whom the Notice has been sent and an employee of the Ministry of Forest authorized to redetermine a stumpage rate under section 1.4 of this manual agree, the stumpage rate set out in the Notice, hereinafter referred to as the original stumpage rate, may be redetermined by the employee, and the redetermined stumpage rate shall be effective on the effective date of the original stumpage rate.
2. The twenty-one day period referred to in subsection (1) of this section may be extended by agreement between the person to whom the Notice has been sent and the employee.

Estimated Winning Bid

4

4.1 Appraisal Methodology

1. The person who determines the stumpage rate must estimate the stumpage rate for a cutting authority area in a manner that will produce the highest stumpage rate for the cutting authority area.
2. For each part of the cutting authority area, the person who determines the stumpage rate must use the procedures in this manual that must be used for the harvest method that produces the highest stumpage rate other than a method that the district manager states is unsuitable for that part of the cutting authority area.
3. Regardless of the harvest method that the holder of a cutting authority uses or intends to use on the cutting authority area or a part of the cutting authority area, or any other fact or law pertaining to the harvest method to be used, the district manager when deciding whether a harvest method is unsuitable may only consider:
 - a. the physical features and terrain stability of the cutting authority area and the areas through which access to the cutting authority area may be gained,
 - b. the physical features of the areas outside of the cutting authority area that may be affected by the harvesting in or the transportation of the timber from the cutting authority area,
 - c. visual quality objectives, and
 - d. public safety.

4.2 Market Pricing System (MPS) Variables

STUMPAGE PRICE	The stumpage price for the cutting authority expressed in \$/m ³ .
ALP	Average coniferous log selling price estimate expressed in \$/m ³ . This is based upon a consideration of log grades and species for the cutting authority area, and schedules of log market values collected and published by the Revenue Branch.
DFIR2G	If selling price zone in the appraisal data submission is 52, then DFIR 2G is the fraction of the coniferous cruise volume that is Douglas-fir. If the selling price zone is not 52, then DFIR 2G = 0. DFIR2G is in decimal form, rounded to 2 decimal places.
HEMBAL	The fraction of the coniferous cruise volume that is hemlock and balsam. HEMBAL is in decimal form, rounded to 2 decimal places.
HEMBALOG	The fraction of the coniferous cruise volume that is hemlock and balsam, if the selling price zone is not zone 52. If the selling price zone is 52, then HEMBALOG = 0. HEMBALOG is in decimal form, rounded to 2 decimal places.
SLOPE	The average side slope percentage for that part of the cutting authority area that will not be helicopter yarded.
NHSVPH	Non-helicopter selection volume per hectare is the cruise volume of coniferous timber per hectare for that part of the cutting authority area that will not be harvested by a helicopter selection method or helicopter single standing stem selection. NHSVPH is expressed in m ³ /ha and is rounded to 2 decimal places.
HS	The fraction of the total net cruise volume, including deciduous volume, of timber in a cutting authority area that will be harvested by a helicopter selection method (excluding helicopter single standing stem selection). HS is in decimal form, rounded to 2 decimal places.
HSSSS	The fraction of the total net cruise volume, including deciduous volume, of timber in a cutting authority area that will be harvested by helicopter single standing stem selection (section 4.4.4). HSSSS is in decimal form, rounded to 2 decimal places.
VPH	$[1 - (HS + HSSSS)] * NHSVPH + (HS + HSSSS) * 442$ VPH is expressed in m ³ /ha and is rounded to 2 decimal places.
PIECESIZE	The cruise coniferous net volume per 10 m log. PIECESIZE is expressed in m ³ and is rounded to 2 decimal places.
HELI	The fraction of the total net cruise volume, including deciduous volume, of timber in a cutting authority area that must be helicopter yarded or yarded by skyline where logs are fully suspended more than 600 m in a straight line to the centre of the closest possible

landing. This is calculated by dividing the total volume of timber that must be helicopter yarded or skyline yarded over 600 m by the total net cruise volume of the cutting authority area. HELI is in decimal form, rounded to 2 decimal places.

VOL That part of the total net cruise volume in the cutting authority area that is coniferous timber except that where the cutting authority is a timber licence or is issued under a licence with an AAC greater than 10 000 m³, then VOL = 19 925. VOL is expressed in m³, rounded to the nearest whole number.

CPIF The BC Consumer Price Index (P110000) approved by the director for use on the effective date of the appraisal, reappraisal or quarterly adjustment, divided by the base CPI of 109.3.

LOCATION The net cruise volume weighted average straight line distance measured in kilometres between the geographic centre of each part of a cutting authority area and the latitude and longitude co-ordinate listed in table 4-1 (which lists the major centres) that is closest to that part of the cutting authority area.

Table 4-1: Latitude and Longitude Co-ordinates

Degrees and Minutes:		At or Near	Code
Latitude	Longitude		
50°01'	125°15'	Campbell River	CARV
49°11'	121°55'	Chilliwack	CHWK
54°23'	126°39'	Houston	HOUS
50°07'	120°46'	Merritt	MERR
49°10'	123°57'	Nanaimo	NANA
54°18'	130°19'	Prince Rupert	PRRU
54°31'	128°36'	Terrace	TERR
49°16'	123°06'	Vancouver	VANC
48°25'	123°21'	Victoria	VICT

GAMBDIST	POA distance is the average straight line distance, weighted by net cruise volume, between the geographic centre of each cutblock in the cutting authority area and Gambier Island. GAMBDIST is measured and rounded to the nearest kilometre. The Gambier Island co-ordinate is 49° 29' 09" N and 123° 26' 44" W.
DISTAVGNBID	The average number of bidders for the forest district within which the cutting authority area is located is listed in Table 4-2.
AUC2006	2006 Auctions dummy variable. AUC2006 = 1.

Table 4-2 Average Number of Bidders by Forest District

Forest District	Average Number of Bidders
Queen Charlotte Island Forest District	4.21
Chilliwack Forest District	3.94
Squamish Forest District	5.81
Sunshine Coast Forest District	5.88
South Island Forest District	6.26
Campbell River Forest District	7.35
North Island- Central Coast Forest District	5.12
North Coast Forest District	3.62

4.2.1 Log Selling Prices

1. The Revenue Branch shall:
 - a. Compile invoiced free on board log market values using prime, domestic, arm's-length sales reported to the Revenue Branch prior to sixty days before the stumpage rate adjustment date that have occurred in areas adjacent to:
 - i. the Strait of Georgia;
 - ii. the Strait of Juan de Fuca;
 - iii. Alberni Inlet east of a line drawn south from Amphitrite Point;

- iv. Johnstone Strait;
 - v. the Queen Charlotte Strait south of a line drawn west from Cape Caution; and
 - vi. Fraser River west of the bridge at the confluence of the Pitt River.
- b. Subject to subsection 2 of this section compile schedules of average log market values by species and log grade using sales data for each one-month reporting period. The data shall be summarized into a three-month schedule of average log market values by species and log grade for mature timber stumpage rate determinations. A three-month schedule of average log market values by species and log grade for second growth stumpage determinations shall also be produced. These schedules can be found at <http://www.for.gov.bc.ca/hva/timberp/parameters/historical.htm>.
2. The volumes and prices of alder, birch, cottonwood and maple shall not be included in the schedules of average log market values.
 3. The director shall approve schedules of average log market values for use in stumpage appraisals, reappraisals and quarterly adjustments.

4.2.1.1 Coniferous Timber

1. The volume of old growth coniferous timber and the volume of second growth coniferous timber in a cutting authority area will each be compiled from the timber cruise of the cutting authority area on a tree by tree basis.
2. Where the volume of second growth coniferous timber in a cutting authority area is at least eighty percent of the volume of all of the coniferous timber in that cutting authority area, the cutting authority area will be appraised and reappraised as if all of the coniferous timber in that cutting authority area were second growth coniferous timber.

4.2.2 Log Grade Percentages

Log grade percentages are obtained for each species of timber in each cutting authority area being appraised or reappraised as described in section 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.3.1, 4.2.2.3.2 and 4.2.2.4.

4.2.2.1 Billing History Record

1. Except as provided in sections 4.2.2.2, and 4.2.2.4, the billing history record that will be used in an appraisal or reappraisal of a cutting authority area will be determined using either Table 4-3 or Table 4-4 as may be required by this manual.

2. The date of issue of a stumpage invoice shall determine the period for which the log scale data in that invoice will be included in a billing history record.
3. Except as provided in sections 4.2.2.3.1(6) and 4.2.2.3.2(8), the billing history record shall be for a period of two years.

Table 4-3: Billing History Record Dates

Column 1 Date of Appraisal or Reappraisal	Column 2 Billing History Record Ends on the Preceding
January 1 to March 31	November 30
April 1 to June 30	February 28/29
July 1 to September 30	May 31
October 1 to December 31	August 31

4. Except as provided in subsection (6) of this section, where the effective date of the appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 4-3, the two-year billing history record shall be for the two-year period ending on the corresponding date in Column 2 of Table 4-3 which immediately precedes the effective date of the appraisal or reappraisal.
5. Where the log grade percentages must be determined in accordance with section 4.2.2.3.1(6) or 4.2.2.3.2(8) and the effective date of an appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 4-3, the five-year billing history record shall be for the five-year period ending on the corresponding date in Column 2 of Table 4-3 which immediately precedes the effective date of the appraisal or reappraisal.
6. Where the log grade percentages must be determined in accordance with section 4.2.2.2(6) and where the effective date of the appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 4-4, the two-year billing history record shall be for the two-year period ending on the corresponding date in Column 2 of Table 4-4 which immediately precedes the effective date of the appraisal or reappraisal.

Table 4-4: Billing History Record Dates

Column 1 Date of Appraisal or Reappraisal	Column 2 Billing History Record Ends on the Preceding
January 1 to 31	November 30
February 1 to 28/29	December 31
March 1 to 31	January 31
April 1 to 30	February 28/29
May 1 to 31	March 31
June 1 to 30	April 30
July 1 to 31	May 31
August 1 to 31	June 30
September 1 to 30	July 31
October 1 to 31	August 31
November 1 to 30	September 30
December 1 to 31	October 31

4.2.2.2 Log Grade Percentage Criteria

The person who determines the stumpage rate will apply the following criteria when determining the log grade percentages to be used for the cutting authority area being appraised or reappraised:

1. The log grade percentage is the percentage by volume that a log grade is of the total net cruise volume for the species of timber being considered.
2. Except as provided in subsections (5) and (6) of this section and section 4.2.2.4, the log grade percentages for a species of timber are derived from the billing history record.
3. The source of log grade percentages may vary by species of timber.
4. (a) Except as provided in paragraph (b) of this subsection, before a two year billing history record for a species of timber can be used in an appraisal or reappraisal, the volume of that species of timber in that two year billing history record must be at least 25 percent of the net cruise volume of that species in

the cutting authority area being appraised or reappraised, or 2 000 m³, whichever is greater.

- (b) Where the cutting authority area being appraised or reappraised is outside of a tree farm licence area and has been authorized for harvest under a cutting authority issued under a timber licence, then before a two-year billing history record for a species of timber can be used in an appraisal or reappraisal the volume of that species of timber in the two-year billing history record must be at least 25 percent or 2 000 m³ for each species of timber that comprises at least 20 percent of the cutting authority area's total net cruise volume.
5. The log grade percentages for each species of timber will be derived from the cruise compilation algorithm predictions when:
 - (a) the cutting authority area being appraised or reappraised is authorized for harvesting under a cutting authority that has been issued under a woodlot licence, or
 - (b) The entire net cruise volume of the cutting authority area being appraised or reappraised will be harvested using helicopter single standing stem selection.
 6. Where:
 - (a) at least eighty percent of the timber in a cutting authority area being appraised or reappraised is second growth coniferous timber, or
 - (b) the cutting authority area is not a cutting authority area referred to in subsection (5) of this section and the timber in the cutting authority area has been authorized for harvest under:
 - i. a cutting permit entered into with a timber sales manager,
 - ii. a licence that is entered into with a timber sales manager,
 - iii. a cutting permit issued under a replaceable timber sale licence, or
 - iv. a cutting authority issued under a licence awarded under section 47.3 of the *Forest Act*.

the log grade percentages for each species of timber will be derived from,

- (c) the two year billing history record, if the two-year billing history record for that cutting authority includes at least 25 percent of the cutting authorities' net cruise volume of that species or 2 000 m³, whichever is greater, or
- (d) the cruise compilation algorithm predictions, where the two year billing history record for that cutting authority does not include at least 25 percent of the cutting authorities' net cruise volume of that species or 2 000 m³, whichever is greater.

7. Where a forest licence is subdivided or forest licences are consolidated into one or more forest licences under section 19 of the *Act*, then for a period of two years after the date of the subdivision or consolidation the log grade percentages for a cutting authority area being appraised or reappraised that are determined under section 4.2.2.3.2 will be the combined billing history record of the licence or licences that existed before the subdivision or consolidation and that exist after the subdivision or consolidation.

4.2.2.3 Source of Log Grade Percentages for Each Cutting Authority Area

1. Except for those harvest methods, cutting authorities or cutting authority areas referred to in subsection 4.2.2.2(5), 4.2.2.2(6), and 4.2.2.2(7) the log grade percentages for each species of timber for the cutting authority area being appraised or reappraised will be determined in accordance with:
 - a. Section 4.2.2.3.1, where the cutting authority area is entirely within the geographic boundaries of one tree farm licence, or
 - b. section 4.2.2.3.2, where the cutting authority area is entirely within the geographic boundaries of one timber supply area.

4.2.2.3.1 Log Grade Percentages for a Cutting Authority Area Within the Geographic Boundaries of a Tree Farm Licence

Where the cutting authority area being appraised or reappraised is entirely within the geographic boundaries of a single tree farm licence area, the log grade percentages for the cutting authority area will be determined in the following manner:

1.
 - a. Where at least eighty percent of the timber in the cutting authority area is second growth coniferous timber, the log grade percentages for that cutting authority area will be determined in accordance with the requirements of subsection 4.2.2.2(6).
 - b. Where at least eighty percent of the timber in the cutting authority area is not comprised of second growth coniferous timber, the person determining the stumpage rate will proceed to subsection 2 of this section.
2.
 - a. Where the cutting authority area is the only cutting authority area in the cutting authority and is entirely within the geographic boundaries of a single timber licence, the person determining the stumpage rate will proceed to subsection 3 of this section.
 - b. Where subsection 2 (a) of this section is not applicable, the person determining the stumpage rate will proceed to subsection 4 of this section.

3. a. Where the species being considered has a billing history record for cutting permits issued under the timber licence under which the cutting permit that authorizes harvesting on the cutting authority area being appraised or reappraised has been issued that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 4 of this section.
4. a. Where the species being considered has a billing history record for cutting authority areas in that part of the tree farm licence area that lies within the geographic boundaries of the forest district that contains the cutting authority area being appraised or reappraised that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 5 of this section.
5. a. Where the species being considered has a billing history record for cutting authority areas in a tree farm licence area that contains the cutting authority area being appraised or reappraised that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 6 of this section.
6. Where the species being considered has a five-year billing history for cutting authority areas in a tree farm licence area that contains the cutting authority area being appraised or reappraised that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.

4.2.2.3.2 Log Grade Percentages for a Cutting Authority Area Within a Timber Supply Area

Where the cutting authority area being appraised or reappraised is entirely within the geographic boundaries of a single timber supply area, the log grade percentages for the cutting authority area will be determined in the following manner:

1. a. Where at least eighty percent of the timber in the cutting authority area is second growth coniferous timber, the log grade percentages for that cutting authority area will be determined in accordance with the requirements of subsection 4.2.2.2(6).
- b. Where at least eighty percent of the timber in the cutting authority area is not second growth coniferous timber the person determining the stumpage rate will proceed to subsection 2 of this section.
2. a. Where the cutting authority area is entirely within the geographic boundaries of one or more timber licences, the person determining the stumpage rate will proceed to subsection 3 of this section.
- b. Where the cutting authority area is not entirely within the geographic boundaries of one or more timber licences, the person determining the stumpage rate will then proceed to subsection 4 of this section.
3. a. Where the cutting authority area being appraised or reappraised is authorized for harvest under a cutting permit issued under a timber licence, and the species being considered has a billing history record for cutting permits issued under that timber licence and any other timber licence with which that licence has been amalgamated and approved by the district manager that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
- b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 6 of this section.
4. a. Where the cutting authority area in a timber supply block being appraised or reappraised is authorized for harvest under a cutting permit issued under either a forest licence or licence to cut, and the species being considered has a billing history record for cutting permits issued under the licence authorizing harvest in that same timber supply block, and that billing history record meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
- b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 5 of this section.

5. a. Where the cutting authority area in a timber supply area being appraised or reappraised is authorized for harvest under a cutting permit issued under either a forest licence or licence to cut, and the species being considered has a billing history record for the cutting authorities issued under the licence authorizing harvest in that same timber supply area and that billing history record meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
 - b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 6 of this section.
6. a. Where the cutting authority area being appraised or reappraised is authorized for harvest under a cutting permit issued under either a forest licence, timber licence or licence to cut, and the species being considered has a billing history record for all cutting authority areas that have been authorized for harvest in that timber supply block that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
 - b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 7 of this section.
7. a. Where the cutting authority area being appraised or reappraised is authorized for harvest under a cutting permit issued under either a forest licence, timber licence or licence to cut, and the species being considered has a two year billing history record for the entire timber supply area that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.
 - b. Where there is no such billing history record, the person determining the stumpage rate will proceed to subsection 8 of this section.
8. a. Where the cutting authority area being appraised or reappraised is authorized for harvest under a cutting permit issued under either a forest licence, timber licence or a licence to cut, and the species being considered has a five-year billing history for cutting authority areas in a timber supply area that contains the cutting authority area being appraised or reappraised that meets the criteria of subsection 4.2.2.2(4), then that billing history record will be the source of the log grade percentages for that species.

4.2.2.4 Damaged Timber

Where the regional manager determines that timber in a cutting authority area is suddenly and severely damaged, then notwithstanding section 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.3.1 and 4.2.2.3.2 the log grade percentages for the cutting authority area being appraised or reappraised may be estimated from available site-specific information.

4.2.3 Stand Selling Price

1. The stand selling price shall be calculated in an appraisal or reappraisal by using the net cruise volumes and species selling prices of the following species of timber:

Balsam	Lodgepole Pine
Cedar	White Pine
Cypress	Sitka Spruce
Fir	Engelmann Spruce
Hemlock	

4.2.3.1 Stand Selling Price Calculation

1. Subject to subsection 2 of this section:
 - a. a species grade value for a species of timber in a cutting authority area is the product of the percentage of that grade of that species as derived from section 4.2.2 multiplied by the average log market value for that grade of that species of timber,
 - b. a species selling price for a species of timber in a cutting authority area is the sum of all of the species grade values for that species of timber in the cutting authority area,
 - c. the rounded species selling price is the species selling price for a species of timber in a cutting authority area rounded to the nearest cent,
 - d. a species value is the product of the rounded species selling price multiplied by the species net cruise volume in the cutting authority area, and
 - e. the stand selling price is the quotient of the sum of all of the species values in a cutting authority area divided by the total net cruise volume of all of the species in the cutting authority area.
2. For the purposes of determining a stand selling price:
 - a. in the Pemberton, Yale and Nahatlatch timber supply blocks:
 - i. all spruce is deemed to be Engelmann spruce, and

- ii. the hemlock and balsam species grade average log market values will be used to determine the species grade values for all spruce in the cutting authority area,
- b. where outside the Pemberton, Yale and Nahatlatch timber supply blocks:
 - i. Engelmann spruce is identified as the predominant spruce species in the cruise of the cutting authority area, or
 - ii. the district manager determines that Engelmann spruce is the predominant spruce species in the cutting authority area,

the hemlock and balsam species grade average log market values will be used to determine the species grade values of all spruce in the cutting authority area,
- c. where a cutting authority area is located on Cortes Island or on an Island between Vancouver Island and the British Columbia mainland west of a line drawn between Grief Point near Powell River and the Tsawwassen ferry terminal, and south of 50 degrees north latitude, the second growth Douglas-fir species grade average log market values will be used to calculate the species selling price for all Douglas-fir timber.

4.2.4 Haul Distance

1. Haul distance does not contribute to the calculation of a stumpage rate but must be determined and reported on the appraisal data submission.
2. The haul distance for a cutting authority area being appraised or reappraised shall be determined as follows:
 - a. For each cutblock in the cutting authority area from which any timber may be removed by road from that cutblock:
 - i. determine for that cutblock the point that is the closest point on a road to the geographical centre of the cutblock,
 - ii. determine the shortest distance by road from the point on the road determined in subparagraph (i) of this paragraph to the appraisal log dump for that cutblock, measured in kilometres (km) and rounded to the nearest 0.1 km,
 - iii. weight for that cutblock the distance determined in subparagraph (ii) of this paragraph by the net cruise volume of timber on the cutblock.
 - b. Determine the average weighted distance of all the cutblocks for which a weighted distance was determined in subparagraph (iii) of paragraph (a), rounded to the nearest 0.1 km.

- c. Haul distance is the average weighted distance calculated in paragraph (b) of this subsection plus the rehaul distance in the case of inland water transportation as described in section 4.4.2.
- d. Where a rehaul is required for inland water transportation, the appraisal log dump is the final log dump at the end of the rehaul.

4.2.5 Marine Log Transportation

4.2.5.1 Point of Appraisal

1. The Points of Appraisal are:

<u>Points of Appraisal</u>	<u>Location</u>
Alberni	At the head of Alberni Inlet.
Chemainus	At Chemainus Bay.
Gambier Island	At Gambier Harbour on Gambier Island.
Pitt River Bridge	At the confluence of the Fraser and Pitt Rivers.

4.2.5.2 Appraisal Log Dump

1. Except as provided in subsection 2 of this section, where any timber may be removed from any part of a cutblock by road, the appraisal log dump for that cutblock that must be used in the appraisal or reappraisal of the cutting authority area is the closest location by road listed in Appendix VI to that cutblock,
2. Where any timber may be removed from any part of a cutblock by road, and a log dump exists or will exist during the removal of the timber from the cutblock at a location that is closer to the cutblock than any location listed in Appendix VI, then that log dump location is the appraisal log dump for that cutblock that must be used in the appraisal or reappraisal of the cutting authority area.
3.
 - a. When no timber may be removed from any part of a cutblock by road, and except as provided in paragraph (b) of this subsection, the appraisal log dump for that cutblock that must be used in the appraisal or reappraisal of a cutting authority area is the closest location to that cutblock listed in Appendix VI to which logs may be yarded by helicopter or A-frame and placed in water.
 - b. If a location to which timber will be yarded by helicopter or A-frame from the cutblock and placed in water is closer to the cutblock than any location listed in Appendix VI, then that location must be used as the appraisal log dump for that cutblock in the appraisal or reappraisal of the cutting authority area.

4.2.5.3 Log Towing

1. a. The information in Table 4-5 is not used in the calculation of a stumpage rate but must be used by the licensee when completing the appraisal data submission.
- b. Where the appraisal log dump is at a towing point of origin listed in Table 4-5, that towing point of origin must be reported in the appraisal data submission.
- c. Where the appraisal log dump lies between two towing points of origin, both towing points of origin must be reported in the appraisal data submission.

4.2.5.4 Log Barging

1. a. The information in Table 4-6 is not used in the calculation of a stumpage rate but must be used by the licensee when completing the appraisal data submission.
- b. Where the appraisal log dump is at a barging point of origin listed in Table 4-6, that barging point of origin must be reported in the appraisal data submission.
- c. Where the appraisal log dump lies between two barging points of origin, both barging points of origin must be reported in the appraisal data submission.

Table 4-5 Towing Points of Origin

Code	Point of Origin	P/A	Code	Point of Origin	P/A
ALBE	ALBERNI	A	BUIM	M. OF BUTE INLET	G
CHCK	CHINA CREEK	A	KIIM	M. OF KINGCOME INLET	G
COCK	COLEMAN CREEK	A	KNIM	M. OF KNIGHT INLET	G
SARV	SARITA RIVER	A	LOUM	M. OF LOUGHBOROUGH	G
SPCK	SPENCER CREEK	A	TOIM	M. OF TOBA	G
TOBY	TOQUART BAY	A	NACK	NAKA CREEK	G
UCHU	UCHUCKLESIT	A	NOBY	NORTHWEST BAY	G
UCLU	UCLUELET	A	PHAR	PHILLIPS ARM	G
CHEM	CHEMAINUS	C	PTEB	PORT ELIZABETH	G
COBY	COWICHAN BAY	C	PTHD	PORT HARDY	G
JORV	JORDAN RIVER	C	PTHV	PORT HARVEY	G
LADY	LADYSMITH	C	PTMN	PORT McNEILL	G
NANA	NANAIMO	C	PTNE	PORT NEVILLE	G
SOOK	SOOKE	C	PORV	POWELL RIVER	G
VICT	VICTORIA	C	SENA	SECOND NARROWS	G
AGAM	AGAMEMNON	G	SYIN	SEYMOUR INLET	G
BECV	BEAVER COVE	G	SEBY	SOUTHWEST BAY	G
COUR	COURTENAY	G	SQUA	SQUAMISH	G
DRIN	DRURY INLET	G	STIL	STILLWATER	G
EVRV	EVE RIVER	G	TEAR	TEAKERNE ARM	G
FOHA	FORWARD HARBOUR	G	THIN	THEODOSIA INLET	G
FRAR	FREDERICK ARM	G	THSO	THOMPSON SOUND	G
BUIH	H. OF BUTE INLET	G	WASA	WAKEMAN SOUND	G
JEIH	H. OF JERVIS INLET	G	GAMB	GAMBIER ISLAND	G
KIIH	H. OF KINGCOME INLET	G	CHWK	CHILLIWACK	P
KNIH	H. OF KNIGHT INLET	G	HALF	FOOT HARRISON LAKE	P
LOUH	H. LOUGHBOROUGH	G	PILF	FOOT OF PITT LAKE	P
SEIH	H. OF SECHELT INLET	G	HABY	HARRISON BAY	P
TOIH	H. OF TOBA INLET	G	HATZ	HATZIC	P
INAR	INDIAN ARM	G	HALH	HEAD HARRISON LAKE	P
KLBY	KELSEY BAY	G	PILH	HEAD OF PITT LAKE	P
MNCK	McNAB CREEK	G	HALM	MID HARRISON LAKE	P
MEBY	MENZIES BAY	G	PIRV	PITT RIVER BRIDGE	P
MESD	MEREWORTH SOUND	G	SICK	SILVERHOPE CREEK	P
JEIM	MOUTH JERVIS INLET	G	WHON	WHONNOCK	P

P/A = Point of Appraisal as follows:

A = ALBE = Alberni
 C = CHEM = Chemainus
 G = GAMB = Gambier Island
 P = PIRV = Pitt River Bridge

Table 4-6 Barging Points of Origin

Code	Point of Origin	P/A	Code	Point of Origin	P/A
BACK	BARR CREEK	A	BOIN	BOSWELL INLET /SECURITY BAY	G
BLBY	BLOWHOLE BAY	A	CAIS	CAMPBELL ISLAND	G
CLCK	CLEAGH CREEK	A	DIBY	DINAN BAY	G
COHA	COAL HARBOUR	A	ELHA	ELCHO HARBOUR	G
CYRV	CYPRE RIVER	A	FEBY	FERGUSON BAY	G
EAIN	EASY INLET	A	RIIH	HEAD OF RIVERS INLET	G
ESIN	ESPINOSA INLET	A	SBEH	HEAD OF SOUTH BENTINCK ARM	G
GORV	GOLD RIVER	A	HNRV	HONNA RIVER	G
HEBY	HEAD BAY	A	KMBY	KEMANO BAY	G
BESH	HEAD OF BEDWELL SOUND	A	KHIN	KHUTZEMATEEN INLET	G
HENO	HECATE CHANNEL - NOOTKA	A			
HOLB	HOLBERG	A	KIMS	KIMSQUIT	G
HORV	HOUSTON RIVER	A	KLEM	KLEMTU	G
HUCK	HUSHAMU	A	KUIN	KUMEALON INLET	G
INGE	INGERSOLL	A	KWBY	KWATNA BAY/MINERVA CREEK	G
JELA	JEUNE LANDING	A	KWRV	KWINAMASS RIVER	G
KEIN	KENDRICK INLET	A	MCBY	McCLINTON BAY	G
KOHA	KOPRINO HARBOUR	A	MOIN	MOSES INLET/INRIG BAY	G
KUCV	KULTUS COVE	A	NAHA	NADEN HARBOUR	G
MCCK	McCURDY CREEK	A	NABY	NASS BAY	G
MORV	MOOYAH RIVER	A	NORV	NOOTUM RIVER	G
OUIV	OUOUKINSH INLET	A	OCFA	OCEAN FALLS	G
PLHA	PLUMPER HARBOUR	A	POIS	PORCHER ISLAND	G
PTEL	PORT ELIZA	A	PRRU	PRINCE RUPERT	G
RACV	RANKIN COVE	A	RESO	RENNELL SOUND	G
STCV	STEAMER COVE	A	REPA	RENNERS PASSAGE	G
TLRV	TLUPANA RIVER	A	SCRV	SCOTIA RIVER	G
TSRV	TSOWWIN	A	SWIN	SEWELL INLET	G
WIHA	WINTER HARBOUR	A	SKIN	SKIDEGATE INLET	G
ZEBA	ZEBALLOS	A	SOBY	SOUTH BAY	G
ALAR	ALICE ARM	G	STEW	STEWART	G
ALBY	ALLIFORD BAY	G	TASU	TASU SOUND	G
BEAN	BEATTIE ANCHORAGE	G	TUIN	TUCK INLET	G
BECO	BELLA COOLA	G	WECK	WEEWANIE CREEK	G
BIBY	BISHOP BAY	G	WOCH	WORK CHANNEL	G

P/A = Point of Appraisal as follows:

A = ALBE = Alberni
G = GAMB = Gambier Island

4.3 Estimated Winning Bid (EWB) Equation

1. The equation used in the calculation of the estimated winning bid (EWB) is:

$$\begin{aligned} \text{EWB} = & [18.16 + 0.688(\text{ALP}/\text{CPIF}) - 15.71(\text{HEMBAL}) - \\ & 11.99(\text{HEMBALOG}) + 2.65(\text{DFIR2G}) - 0.245(\text{SLOPE}(1\text{-HELI})) - \\ & 40.47 (\text{HELI}) + 12.83(\text{Ln}(\text{VPH}/1000)) + 6.08(\text{Ln}(\text{PIECESIZE})) - \\ & 0.0715(\text{LOCATION}) - 0.00734(\text{GAMBDIST}) + \\ & 2.23(\text{Ln}(\text{VOL}/1000)) + 1.17 (\text{DISTAVGNBID}) - 8.08 \\ & (\text{AUC2006})] \text{CPIF} \end{aligned}$$

2. The EWB shall be rounded to 2 decimal places.
3. Where the calculated EWB is less than \$0.25, the EWB shall be \$0.25.

4.4 Specified Operations

1. The specified operations in sections 4.4.1 to 4.4.6 may be considered in an appraisal or a reappraisal.

4.4.1 Skyline

1. A skyline adjustment expressed in $\$/\text{m}^3$ may be calculated for those areas within a cutblock that:
 - a. are 600 metres or greater measured in a straight line horizontal distance from the centre of the closest possible landing or place where a landing may be located, and
 - b. are yarded by skyline.
2. The skyline adjustment may be calculated by adding the volume of timber to which the skyline may apply to the volume of timber to be helicopter yarded as prescribed in section 4.2.

4.4.2 Inland Water Transportation

1. An inland water transportation adjustment will be determined for that part of the cutting authority area where timber must be towed on Great Central, Owikeno or Powell Lake or any other inland water authorized by the person that determines the stumpage rate in order for the timber to be transported to the point of appraisal.
2. The adjustment shall be \$4.41 per cubic metre.

4.4.3 Clayoquot Sound Operating Costs

1. For the purposes of this section the Clayoquot Sound area is:

That part of the Hesquiatic Peninsula, Esowista Peninsula, and the islands, sea and all lands and waters draining into the Pacific Ocean from the height of land between Escalante Point and Quisitis Point.

2. An adjustment of $\$6.11/\text{m}^3$ will be included in an appraisal or a reappraisal of a cutting authority area that is located entirely within the Clayoquot Sound area.

4.4.4 Helicopter Single Standing Stem Selection

1. In this manual helicopter single standing stem selection means the harvesting of standing single trees that have been marked, limbed, undercut and wedged and then broken from the stump and removed using a helicopter.
2. This adjustment may only be included in the appraisal or reappraisal of a cutting authority area if:
 - a. helicopter single standing stem selection is the only harvest method that has been permitted by the district manager to harvest timber in the cutting authority area, and
 - b. helicopter single standing stem selection is also, the only harvest method used to harvest all of the timber in the cutting authority area.
3. The adjustment for helicopter single standing stem selection includes the cost of marking, climbing, limbing, undercutting, wedging, breaking and removal of the tree by helicopter.
4. The adjustment for helicopter single standing stem selection is \$37.78/m³.

4.4.5 Destumping for Root Disease Control

1. Destumping includes the following activities:
 - a. The lifting and rolling of stumps out of the ground to lessen soil disturbance and root breakage;
 - b. The shaking of stumps to remove soil and the replacing of the stump upside down in the hole created by its removal;
 - c. The raking of the area immediately around the hole to remove any large root pieces greater than 8 cm in diameter.
2. A destumping adjustment will be determined for that part of the cutting authority area where destumping for root disease control is required. The treatment area must be accurately delineated and shown on the appraisal map and be included in the site plan.
3. The adjustment shall be \$1,114.00 per hectare of area that will be destumped.

4.4.6 Tree Crown Modification

1. Where the protection of trees is deemed necessary by a forest professional to achieve forest management objectives, a tree crown modification adjustment may be considered in the appraisal or reappraisal.
2. The adjustment is the sum of the costs for all of the trees that are modified divided by the total net cruise volume of the cutting authority area.
3. Where tree crown modification is approved:
 - a. the rate for each mature coniferous tree that is modified is \$53.50, and
 - b. the rate for each second growth coniferous tree that is modified is \$36.38.

4.5 Final Estimated Winning Bid

1. Subject to subsection 3 of this section the Final Estimated Winning Bid (FEWB) is the difference between the estimated winning bid and the total of the specified operations adjustments that are applicable to the appraisal or reappraisal of the cutting authority.
2. Expressed as an equation:

$$\text{FEWB} = \text{EWB} - \text{SOA}$$

Where:

EWB = The Estimated Winning Bid determined under section 4.3.

SOA = The sum of specified operations adjustments in an appraisal or a reappraisal of a cutting authority area as may be calculated under sections 4.4.1 through 4.4.6 and expressed in $\$/\text{m}^3$.

3. Where the FEWB calculated is less than $\$0.25/\text{m}^3$, then the FEWB shall be $\$0.25/\text{m}^3$.

Tenure Obligation Adjustments

5

5.1 Tenure Obligation Adjustment

1. Except where a cutting authority area is the area authorized for harvest under a timber sale licence entered into under section 20 of the *Act* and subject to subsection 2 of this section, the kinds of costs that may be used in the calculation of a tenure obligation adjustment in the appraisal or reappraisal of a cutting authority area are:
 - a. the forest planning and administration costs,
 - b. the road development costs,
 - c. the road management costs,
 - d. the road use charges,
 - e. the basic silviculture costs, and
 - f. the low volume cost.
2. A kind of cost that may be calculated under this chapter may only be calculated and used in the appraisal or reappraisal of a cutting authority area where:
 - a. except for the low volume cost, the licensee will incur a cost of that kind when exercising their authorities or obligations under the cutting authority, or
 - b. in the case of a low volume cost, where that cost may be calculated under section 5.2.1 of this manual.
3. The tenure obligation adjustment is calculated under section 5.10.

5.2 Forest Planning and Administration Cost

1. Forest planning and administration costs are those costs directly related to supervision and administration required to manage the public forest on behalf of the province. They are the costs that the long-term licensee bears, but that a market logger does not.

The forest planning and administration costs do not include business related or discretionary costs such as certain legal fees, corporate aircraft, stumpage, directors fees and expenses, sales expenses, restructuring costs, etc., unless portions of these costs are directly attributable to the management of the forest.

2. The total forest planning and administration cost is \$9.43/m³.

5.2.1 Low Volume Cost

1. A low volume cost of \$7.51/m³ may be included in the tenure obligation adjustment where:
 - a. the cutting authority area being appraised or reappraised is the subject of cutting authority issued under either a licence or its parent licence prior to subdivision that provides for an allowable annual cut of not more than 10 000 m³ of Crown timber, and
 - b. the total net cruise volume of the cutting authority area is not more than 10 000 m³.

5.3 Road Development Cost

1. Except as provided in section 5.3.2, where a road development provides access to Crown timber a road development cost may be estimated for new road construction, and road reconstruction.
2.
 - a. except as provided in subsections (2)(b) and (2)(c) of this section the total net cruise volume is used to calculate the unit cost for new road construction and road reconstruction in an appraisal or reappraisal of a cutting authority area.
 - b. where a road development project was not taken into consideration in a prior appraisal or reappraisal of the cutting authority area, the remaining volume shall be used to calculate the road development unit cost for that project in the reappraisal of the cutting authority area.
 - c. where the reappraisal is because of sudden and severe damage the road development cost is calculated as follows:
 - i) the road construction project costs prior to the sudden and severe damage reappraisal are totalled,
 - ii) the sum of those project costs is the total project cost,
 - iii) from the total project cost calculated in subsection 2(c)(i) of this section is subtracted the product of the total project cost multiplied by the total volume of timber in the billing history record of the cutting authority area on the effective date of the reappraisal, divided by the total net cruise volume of the cutting authority area,
 - iv) the difference calculated in subsection (2)(c)(iii) of this section is then divided by the sum of the remaining volume plus the volume of timber that was suddenly and severely damaged,
 - v) the calculation of the road development cost expressed as an algorithm is:

$$\text{Road Development Cost} = \frac{\text{total project cost} - (\text{total project costs} \times \text{volume in the billing history record}) / \text{total net cruise volume}}{\text{remaining volume} + \text{volume suddenly and severely damaged}}$$

3. Except as further provided for in this manual the road development cost for a road development may only be used in the appraisal or reappraisal of a tributary cutting authority area.
4. A road development cost may be amortized in accordance with section 5.3.2.1.

5.3.1 Road Development Cost Proration

1. The provisions of this section apply to each of the road development categories described in sections 5.3.1.2 and 5.3.1.3.
2. Where a road development cost estimate must be prorated under this section, only the Crown share of the road development cost estimate may be used in the appraisal or reappraisal of the cutting authority area.
3.
 - a. where road development on Crown land provides access to both Crown timber and timber that is not Crown timber held by the licensee, or a company legally associated with the licensee then the development cost is prorated between Crown timber and timber that is not Crown timber in accordance with subsection (6) of this section.
 - b. where road development on private land provides access to both Crown timber and timber that is not Crown timber, then the development cost is prorated between Crown timber and timber that is not Crown timber in accordance with subsection (6) of this section.
4. Where a proration is required under subsections (3)(a) or (3)(b) of this section:

$$\text{Crown share of total estimated cost} = \text{Total Estimated Cost} \times \frac{\text{Crown Timber Volume}}{\text{Total Timber Volume}}$$

Where:

Crown share of total estimated cost	means the dollar amount to be used to determine a cost estimate for the appraisal or reappraisal of the cutting authority being appraised.
Total Estimated Cost	means the total road development cost estimate expressed in \$.
Crown Timber Volume	means the volume of Crown timber that is under the control of the licensee or a company legally associated with the licensee that may be transported over that road.
Total Timber Volume	means the total volume of Crown and privately owned timber that is under the control of the licensee or a company legally associated with the licensee and that may be transported over that road.

5. In all cases, volumes are estimated from the latest approved operational or inventory cruise data and maps of the area within the drainage to the height of land.
6. Appendix III illustrates the proration process.

5.3.1.1 New Road Construction

1. New Road Construction includes only subgrade construction, placement of additional stabilizing material, bridges, the construction and installation of drainage structures, and other necessary types of structures pertaining to the road that the regional manager authorizes to be used in the appraisal or reappraisal of a cutting authority area.
2. New road construction costs may only be used in the appraisal or reappraisal of the first tributary cutting authority excluding cutting authorities subject to sections 7.3 or 7.4.
3. Tabular road cost estimates:
 - a. where the physical dimensions and conditions of the new road construction fall within the tabular limits set out in section 5.3.3, a tabular cost estimate will be made using the applicable tables and formulas in this section of the manual.
 - b. each road section cost estimate is determined using the appropriate tables in section 5.3.3.
 - c. the tabular road unit cost is the sum of the unit cost estimates of all of the road sections.
4. Non-tabular road cost estimates
 - a. non-tabular cost estimates may be calculated in accordance with section 5.3.4 for the following kinds of new road construction:
 - i. construction and upgrading of main access roads,
 - ii. road construction on uphill side slopes that are over 150 percent,
 - iii. road construction on terrain with two or more gullies over 10 m deep at centreline in a 300 m section,
 - iv. end haul construction requiring removal of excavated material to a spoil area,
 - v. overland construction to provide a roadbed by trucking in material for extensive fill sections,

- vi. switchbacks with over 10 000 m³ excavation volume to complete the designed grade percent and horizontal alignment,
 - vii. bank height road sections with rock faces exceeding 7.50 metres in vertical height, and
 - viii. projects approved by the regional manager.
- b. the non-tabular road unit cost is the sum of the non-tabular road unit cost estimates.
5. Bridge Cost Estimates
- a. except where a bridge cost estimate cannot be calculated using table 5-2 or 5-3 each bridge cost estimate must be determined using the appropriate table.
 - b. where the bridge cost estimate cannot be made using one of the appropriate tables, a non-tabular bridge cost estimate may be calculated under section 5.3.4.
 - c. where bridge materials are reused by the original purchaser at a different site, the bridge cost estimate may include the cost of dismantling the materials at the site where they were previously used, and transportation to and installation at the different site, but may not include the initial materials cost and delivery costs.
 - d. where used bridge materials are purchased by the licensee from a legally non-associated party, only the lowest possible cost of purchasing and shipping those materials may be included in the bridge cost estimate.
 - e. the bridge unit cost is the sum of the bridge unit cost estimates for all of the bridges.
6. Culvert Cost Estimates
- a. except where a culvert cost estimate cannot be calculated using table 5-4, each culvert cost estimate must be determined using that table.
 - b. where the culvert cost estimate cannot be made using table 5-4 the non-tabular culvert cost estimate may be calculated under section 5.3.4.
 - c. the culvert unit cost is the sum of the culvert unit cost estimates for all of the culverts.
7. The total of the unit costs for tabular roads, non-tabular roads, bridges and culverts is the total new road construction unit cost.

5.3.1.2 Road Reconstruction

1. road reconstruction is the:
 - a. replacement of a bridge,
 - b. major structural repair of a bridge,
 - c. redecking of an entire bridge,
 - d. reconstruction of a road,
 - e. resurfacing of a road required because of extensive wear and tear, with a minimum loose depth of 0.1 m over a continuous length of 0.5 km or greater, or
 - f. replacement of a pipe culvert 1.0 m or larger in diameter,
 - g. additional resurfacing, required because the road having been permanently deactivated, or a water or slope failure event.
2. A road reconstruction cost estimate may only be used in an appraisal or reappraisal of a cutting authority area when the district manager authorizes the use of that estimate in that appraisal or reappraisal.
3. A road reconstruction cost estimate must be made in accordance with section 5.3.4.
4. Where road reconstruction projects are associated because of one natural event the reconstruction projects should be grouped into one project cost estimate using a non-tabular cost form.
5. That part of the cost to replace or repair a bridge on a forest service road that is paid for by the Crown, may not be considered in any appraisal or reappraisal.
6. The reconstruction cost estimate of a project may be used in the appraisal or reappraisal of one existing or proposed tributary cutting authority area. The licensee must identify that cutting authority area when the reconstruction cost estimate is submitted in the appraisal data submission.
7. Where bridge materials are reused by the original purchaser at a different site, the bridge reconstruction cost estimate may include the cost of dismantling the materials at the site where they were previously used, and transportation to and installation at the different site, but may not include the initial materials cost and delivery costs.
8. Where used bridge materials are purchased by the licensee from a legally non-associated party, only the lowest possible cost of purchasing and shipping those materials may be included in the bridge reconstruction cost estimate.

9. The total road reconstruction unit cost is the sum of all of the road reconstruction unit cost estimates for all of the reconstruction projects.

5.3.1.3 Total Road Development Cost

1. The total road development cost is the sum of the total new road construction unit cost plus the total road reconstruction unit cost.

5.3.2 Existing Roads

1. The following roads may not be considered in the appraisal or reappraisal of a cutting authority area:
 - a. a constructed road that has been previously included in an appraisal or reappraisal of another cutting authority area,
 - b. a road previously constructed to access private timber, and
 - c. a road previously constructed in whole or in part for a purpose unrelated to the harvesting of timber on the cutting authority area being appraised or reappraised.

5.3.2.1 Extended Road Amortization

1. Subject to subsection (2) of this section for new appraisals where the total road development cost calculated in an appraisal or reappraisal is greater than \$14.00/m³, the licensee and regional manager may agree that only a portion of an estimated road development cost will be used in the appraisal or reappraisal of the cutting authority area and that the balance of the estimated road development cost will be used in the appraisal or reappraisal of one or more tributary cutting authority areas.
2. Future tributary timber included in the extended road amortization agreement must be within a woodlot licence area, or in an approved cutting permit or cutblocks shown in the licence's forest development plan or forest stewardship plan in effect on the appraisal effective date.
3. The agreement must provide that:
 - a. it may not be changed unless by mutual agreement, and
 - b. it is entered into only for the purposes of calculating a stumpage rate and confers no obligation on the Crown to compensate the licensee for any unamortized costs.

5.3.3 Tabular Cost Estimates

1. A tabular cost estimate must be calculated on the basis that the construction project will be completed using commonly used logging road construction practices and that the roads will have single lane width roads, turnouts and landings.

5.3.3.1 New Road Construction

1. New road construction cost estimate includes the cost of clearing and grubbing, stripping, stump removal, incidental log decking, ditch construction, landing and turnout construction.
2. The estimated cost per kilometre for new road construction is provided for each combination of rock hardness and bank height category.
3. New road section data is recorded using appendix VII and the following criteria:
 - a. road section lengths are measured along the road centreline and recorded to the nearest 0.001 km, and
 - b. the bank height is measured at right angles to the road centreline from the road surface to the top of the rock face.
 - c. road sections are measured over culverts (including wood culverts with a span length less than 4 m).
 - d. total bridge deck length for permanent and portable bridges, and span length on log bridges, is excluded from a road section length.
 - e. rock face height measurement on a through-cut section is taken from the highest side of the two road cuts.
4. If a tabular road section requires the trucking in of additional stabilizing material greater than 3.2 kilometres, use the non-tabular method to estimate the additional cost of trucking this distance.
5. Rock mass classification (RMC) is based on the physical characteristics of rock encountered in forest road development and is the subject of a report commissioned by the Forest Engineering Research Institute of Canada in 1978 and prepared by Piteau & Associates/Geotechnical Consultants. The text and tables in Appendix IV are based on this report and are used to determine the RMC-based factors required for road cost estimates.
6. Rock can be classified into five types referred to as rock mass classification (RMC) values and identified as RMC 1, 2, 3, 4 and 5. For the purpose of determining rock hardness, 'soft/medium' rock hardness category includes RMCs 1, 2, 3 and 4; 'hard' rock hardness category is equivalent to RMC 5.

7. The steps taken to determine RMC values and apply these to road development cost estimates are:
 - a. examine and record surface hardness, weathering, and block diameter in the field,
 - b. determine subsurface hardness from the table in Appendix IV with this title,
 - c. determine RMC value from the table Appendix IV with this title, and
 - d. apply selected RMC values to applicable tables and formulas for road cost estimates.
8. In all circumstances where a complete interpretation of the rock mass classification system is required, the Piteau & Associates report is to be consulted directly.

Table 5-1: Road Cost Estimates Expressed in Dollars per Kilometre of Road Length

Bank Height Category	Rock Face Height (m)	Cost Estimate per Kilometre (\$/km)	
		Soft/Medium	Hard
OMLB	n/a	69 940	69 940
OMPR	n/a	91 600	91 600
OMRB	n/a	92 270	103 050
TOE	(up to 1.50)	92 270	103 050
MRK	(1.51 – 3.00)	105 030	115 620
HRK	(3.01 – 4.50)	117 270	133 580
XRK	(4.51 – 6.00)	130 750	149 560
XXRK	(6.01 – 7.50)	139 570	168 780

5.3.3.2 Bridges and Culverts

1. A cost estimate for a bridge or a culvert may only be made and used in the appraisal or reappraisal of a cutting authority area where its necessity is substantiated by field data.
2. Crib back-fills and all site preparation and bridge protection features are included, as well as material supply and erection. Except where noted below, no adjustment of table values is permitted.
3. Input data within table boundaries is rounded to fit; no interpolation of values is permitted.

5.3.3.2.1 Log Bridges

1. Cost estimates for log bridges are based on span lengths (distance between the centres of the top sill logs) and average crib height (distance from the bottom of the bottom sill log to the point where the stringer rests on the top sill log as measured along the centre line of the bridge) from Table 5-2. The average crib height is the numerical average of the crib heights on both banks of the water course.
2. Table 5-2 is used for estimating costs of all timber-decked and gravel surfaced log bridges with span lengths from 3.5 to 20.4 m and crib heights from single log to 5.4 m.

Table 5-2: Log Bridge Cost Estimates Expressed in Thousands of Dollars

Span Length (m)	Single Log Sill	Multi-Log Crib Average Crib Height (m)				
	1	2	3	4	5	
4	2.0	5.5	10.5	15.5	20.5	
5	2.3	7.3	12.4	17.4	22.4	
6	4.2	9.2	14.2	19.3	24.3	
7	6.1	11.1	16.1	21.1	26.2	
8	7.9	13.0	18.0	23.0	28.0	
9	9.8	14.8	19.9	24.9	29.9	
10	11.7	16.7	21.7	26.7	31.8	
11	13.5	18.6	23.6	28.6	33.6	
12	15.4	20.4	25.5	30.5	35.5	
13	17.3	22.3	27.3	32.4	37.4	
14	19.2	24.2	29.2	34.2	39.3	
15	21.0	26.1	31.1	36.1	41.1	
16	22.9	27.9	32.9	38.0	43.0	
17	24.8	29.8	34.8	39.8	44.9	
18	26.6	31.7	36.7	41.7	46.7	
19	28.5	33.5	38.6	43.6	48.6	
20	30.4	35.4	40.4	45.5	50.5	

5.3.3.2.2 Permanent or Portable Bridges

1. Cost estimates for permanent or portable bridges, built of any material except logs, are based on total span length and average abutment height (distance from the ground surface interface to the bottom contact point with the girders) from Table 5-3. Each bridge abutment must be measured at the mid-point, from the ground surface interface to the bottom contact point with the girders. Each measured abutment height is then added together and averaged to get a resultant abutment height.

2. Table 5-3 is used for estimating costs of permanent or portable bridges with span lengths from 2.0 to 30.4 m and abutment heights from 0 to 10.4 m.
3. Table 5-3 includes costs for supervision, design, site preparation, supply and installation, freight and haulage (excluding barging), and rip-rap to flood design. Barging costs are allowed as an add-on to the tabular cost estimate. If the barging of bridge materials is done in conjunction with other equipment/materials, then the cost of barging the bridge material should be prorated by the licensee. This table covers any bridge with L60 to L165 load rating.
4. Table 5-3 does not apply to:
 - a. multi-span bridges: A construction estimate form must be completed.
 - b. pile driving: Where piles may be driven to depths of 13 m or more, a construction estimate form must be completed for the bridge construction.
 - c. portable bridges that are reused (see section 5.3.1).
 - d. cost estimates for bridge sizes outside the table limits and pipe culverts greater than the aforementioned sizes require non-tabular cost estimates completed in accordance with section 5.3.4.
 - e. extra width bridges with one or more additional stringers and/or deck panels installed (i.e., exceeding 4.9 metres in total width between guardrails measured at mid-span).

Table 5-3: Permanent/Portable Bridge Cost Estimates Expressed in Thousands of Dollars

Span Length (metres)	Abutment Height (metres)										
	0	1	2	3	4	5	6	7	8	9	10
2	10.9	13.5	16.2	18.8	21.5	24.2	26.8	29.5	32.1	34.8	37.4
3	16.3	19.0	21.6	24.3	26.9	29.6	32.3	34.9	37.6	40.2	42.9
4	21.8	24.4	27.1	29.7	32.4	35.0	37.7	40.3	43.0	45.7	48.3
5	27.2	29.9	32.5	35.2	37.8	40.5	43.1	45.8	48.4	51.1	53.8
6	32.6	35.3	37.9	40.6	43.3	45.9	48.6	51.2	53.9	56.5	59.2
7	38.1	40.7	43.4	46.0	48.7	51.4	54.0	56.7	59.3	62.0	64.6
8	43.5	46.2	48.8	51.5	54.1	56.8	59.4	62.1	64.8	67.4	70.1
9	49.0	51.6	54.3	56.9	59.6	62.2	64.9	67.5	70.2	72.9	75.5
10	54.4	57.0	59.7	62.4	65.0	67.7	70.3	73.0	75.6	78.3	81.0
11	59.8	62.5	65.1	67.8	70.5	73.1	75.8	78.4	81.1	83.7	86.4
12	65.3	67.9	70.6	73.2	75.9	78.5	81.2	83.9	86.5	89.2	91.8
13	70.7	73.4	76.0	78.7	81.3	84.0	86.6	89.3	92.0	94.6	97.3
14	76.1	78.8	81.5	84.1	86.8	89.4	92.1	94.7	97.4	100.1	102.7
15	81.6	84.2	86.9	89.6	92.2	94.9	97.5	100.2	102.8	105.5	108.1
16	87.0	89.7	92.3	95.0	97.6	100.3	103.0	105.6	108.3	110.9	113.6
17	92.5	95.1	97.8	100.4	103.1	105.7	108.4	111.1	113.7	116.4	119.0
18	97.9	100.6	103.2	105.9	108.5	111.2	113.8	116.5	119.2	121.8	124.5
19	103.3	106.0	108.7	111.3	114.0	116.6	119.3	121.9	124.6	127.2	129.9
20	108.8	111.4	114.1	116.7	119.4	122.1	124.7	127.4	130.0	132.7	135.3
21	114.2	116.9	119.5	122.2	124.8	127.5	130.2	132.8	135.5	138.1	140.8
22	119.7	122.3	125.0	127.6	130.3	132.9	135.6	138.3	140.9	143.6	146.2
23	125.1	127.8	130.4	133.1	135.7	138.4	141.0	143.7	146.3	149.0	151.7
24	130.5	133.2	135.8	138.5	141.2	143.8	146.5	149.1	151.8	154.4	157.1
25	136.0	138.6	141.3	143.9	146.6	149.3	151.9	154.6	157.2	159.9	162.5
26	141.4	144.1	146.7	149.4	152.0	154.7	157.4	160.0	162.7	165.3	168.0
27	146.9	149.5	152.2	154.8	157.5	160.1	162.8	165.4	168.1	170.8	173.4
28	152.3	154.9	157.6	160.3	162.9	165.6	168.2	170.9	173.5	176.2	178.9
29	157.7	160.4	163.0	165.7	168.4	171.0	173.7	176.3	179.0	181.6	184.3
30	163.2	165.8	168.5	171.1	173.8	176.5	179.1	181.8	184.4	187.1	189.7

5.3.3.2.3 Culverts

1. All pipe culverts 0.3 m diameter to 1.8 m diameter are estimated using Table 5-4.
2. All wood culverts up to 3.4 m span length are estimated at \$1000.00 each.

Table 5-4 Culvert Cost Estimate

Diameter (m)	Cost per lineal metre	Diameter (m)	Cost per lineal metre
0.3	\$46.00	0.9	\$137.00
0.4	\$55.00	1.0	\$148.00
0.5	\$77.00	1.2	\$273.00
0.6	\$94.00	1.4	\$330.00
0.7	\$108.00	1.6	\$456.00
0.8	\$122.00	1.8	\$520.00

5.3.4 Non-tabular Cost Estimates

1. The cost for any of the non-tabular projects identified in section 5.3.1.1(4)(a) will be estimated by preparing a non-tabular cost estimate. The regional manager may approve a standardized methodology to estimate the cost for the following projects:
 - a. end hauling,
 - b. road reconstruction and replacement,
 - c. stabilizing material, including:
 - i. capping,
 - ii. surfacing,
 - iii. material hauls (greater than 3.2 km),
 - iv. bridge approaches,
 - v. fords,
 - vi. culverts,
 - vii. keyed-in fills,

- d. overlanding, including:
 - i. trucked in fills,
 - ii. large fills,
 - iii. stored fills,
 - e. permanent bridge construction,
 - f. bridge structural repair.
 - g. regional manager approved tributary development projects.
2. The cost information contained in Appendix VIII is to be used in conjunction with the *Detailed Engineering Estimates for Coast Stumpage Appraisal* - February 1, 2001 and as amended to September 1, 2002.
 3. Where the cost estimate of road development project requires a non-tabular cost estimate, the district manager shall be advised by the licensee of project details prior to the commencement of construction. This notice is required to facilitate a current cost review of the project for later consideration in an appraisal.
 4. The road development project cost estimate will be based on the data that is required by the regional manager and the equipment and labour rates as specified in Appendix I. Where a piece of equipment required to complete the project is not included in Appendix I then the equipment rate may be obtained from the *2005 - 2006 Equipment Rental Rate Guide 'The Blue Book'*. All equipment rates are assumed to be for a 3 year old machine using the July 1, 2005 cost base.
 5. Where the cost of a project is the subject of a contract entered into after arms-length competitive bids have been made for the contract, the cost of completing that project may be used as the development project cost estimate where that is authorized by the regional manager.

5.3.4.1 Data Requirements

1. A project requiring a non-tabular cost estimate must be designed so as to require only the amount of materials and labour that are necessary to build a safe and functional structure.
2. The data that may be required by the district manager for non-tabular “excavation and fill” cost estimates are:
 - a. plans, profiles, cross-sections showing the ground and design grade lines,
 - b. volume summary sheets giving quantities by various soil types,

- c. time and materials, equipment and labour, repairs, drainage structures and surfacing where required, and
 - d. a cost estimate for the project.
3. The data that may be required by the district manager for non-tabular reconstruction cost estimates are:
 - a. a map showing details of the project including stations, drainages, and other information important to the project,
 - b. time and materials, equipment and labour, estimate for excavation, repairs, drainage structures, re-ditching, and resurfacing where required, and
 - c. a cost estimate for the project.
4. The data that may be required by the district manager for non-tabular bridge and culvert construction cost estimates are:
 - a. for permanent structures of 30.4 m span or greater: plans, specifications and design for the proposed structure, detailed materials cost estimate, equipment and labour, amount of timber accessed by the structure, and usage in years for harvesting all the timber,
 - b. for permanent structures of 20.4 m span or less: an economic comparison between a log structure and the permanent structure, and
 - c. for pipe culverts greater than 1.8 m in diameter: the same information as required for permanent structures of 30.4 span or greater.

5.4 Road Management Cost

1. A road management cost may be used in the calculation of a tenure obligation adjustment to take into account the licensee's performance of the following activities:
 - a. grading,
 - b. brush control,
 - c. minor surfacing repairs,
 - d. sanding,
 - e. snowplowing,
 - f. ditch maintenance and repair,
 - g. replacement of culverts ≤ 0.9 m on active roads,
 - h. slough removal (confined to ditchline),
 - i. deactivation,
 - j. minor repairs to roads due to slides, erosion and flood damage,
 - k. road use charges except those described in section 5.5.
2. A road management cost may only be included in the calculation of a tenure obligation adjustment for those parts of a cutting authority area where the logs will be transported over a road by truck.
3. The road management cost is \$1.34/m³.

5.5 Road Use Charges

1. A road use charge may be used in the calculation of a tenure obligation adjustment, if:
 - a. the road to which the road use charge applies is required to transport logs from the cutting authority area to the appraisal log dump,
 - b. the road use charge is not referred to in subsection 2, or 3a or 3b of this section,
 - c. the licensee submits to the district manager with the appraisal data submission:
 - i. a completed Request for Approval of a Road Use Charge Form,
 - ii. a map showing the location of the road and a copy of the written road use agreement, and
 - iii. written confirmation by the regional manager that the road use charge specified in the application, or an amount specified by the regional manager is approved, and
 - d. the term of the road use agreement is completely within the period for which the appraisal shall apply, and
 - e. the licensee promises in writing to submit a copy of every auditable monetary transaction evidencing payment by the licensee for road use when that is requested by the regional manager.
2. Charges as a Share of Road Maintenance
 - a. These charges may not be included in an appraisal or reappraisal.
3. Miscellaneous Road Charges
 - a. Forest Service Roads

no road use charges with respect to a road that is declared, determined, built, maintained or modified by the ministry, may be included in an appraisal or reappraisal;
 - b. Permitted Road

no road use charges for roads built on Crown land, authorized by road permit or any other cutting authority document may be included in an appraisal or reappraisal;

c. Other Roads

no road use charge for a road on an Indian reserve or on private land owned by a third party at arm's length and not subject to a lease held by the licensee, its affiliate or agent of either the licensee or the third party, may be included in an appraisal or reappraisal unless there is no route capable of being built at a lower cost through Crown land and the charges are reasonable, do not exceed compensation that might be determined under the forest legislation, and are proven through the presentation of auditable documents.

4. Land Use Charges

no land use charges may be considered in an appraisal or a reappraisal.

5.6 Basic Silviculture Cost

1. Except where basic silviculture performed or to be performed on a cutting authority area is or will be funded by the Crown or an agent of the Crown a basic silviculture cost may be used in the calculation of a tenure obligation adjustment where the licensee is required to perform basic silviculture on the cutting authority area being appraised or reappraised.
2. The basic silviculture cost depends on the geographic location of the cutting authority area being appraised or reappraised as described in table 5-5.

Table 5-5: Basic Silviculture Cost

Where the cutting authority area is located in:	The basic silviculture cost expressed in \$/m ³ is:
Queen Charlotte Island Forest District	3.70
Chilliwack Forest District	5.21
Squamish Forest District	3.77
Sunshine Coast Forest District	2.39
South Island Forest District	2.06
Campbell River Forest District	2.02
North Island - Central Coast Forest District	1.85
North Coast Forest District	3.78

5.7 Low Grade Number

1. The forest district low grade fractions by timber species as shown in Table 5-6 shall be used in the calculation of the tenure obligation adjustment to account for the low grade timber that is not subject to the appraised stumpage rate.
2. The low grade fraction for each timber species to be used in the appraisal or reappraisal of the cutting authority area shall be the fraction by timber species by the forest district in which the cutting authority area is located (refer to Table 5-6).
3. The low grade number to be used in the calculation of the tenure obligation adjustment for a cutting authority area being appraised or reappraised is the sum of the products of the net cruise volume of each timber species in the cutting authority area multiplied by the low grade fraction for that species, divided by the total net cruise volume in the cutting authority area.

Table 5-6: Forest District Low Grade Fractions by Timber Species

Forest District	BA	CE	CY	FI	HE	LO	SP	WH	Decid.
Chilliwack	0.2265	0.0511	0.0819	0.0381	0.1768	0.0779	0.0490	0.0802	0.1103
Campbell River	0.1434	0.0205	0.0521	0.0119	0.1592	0.1634	0.0300	0.0818	0.0302
North Coast	0.2838	0.0294	0.0277	0.0658	0.4319	0.4707	0.1117	0.0658	0.0658
North Island Central Coast	0.1546	0.0278	0.0693	0.0341	0.1598	0.0680	0.0485	0.0617	0.0319
Queen Charlotte Islands	0.1314	0.0348	0.1190	0.1314	0.3157	0.0543	0.0763	0.1314	0.0429
Sunshine Coast	0.1610	0.0303	0.0826	0.0303	0.1525	0.0865	0.0580	0.0424	0.0180
South Island	0.1360	0.0270	0.0752	0.0199	0.2015	0.0262	0.1743	0.1820	0.0354
Squamish	0.2774	0.0705	0.1358	0.0496	0.2942	0.1154	0.1577	0.2464	0.0385

5.8 Market Logger Road Cost

1. The market logger road cost (MLRC) is used in the calculation of the tenure obligation adjustment in an appraisal or reappraisal of a cutting authority area. MLRC is expressed in \$/m³.
2. Where the volume of second growth coniferous timber in a cutting authority area is less than eighty percent of the volume of all of the coniferous timber in that cutting authority area, the MLRC is calculated as follow:

$$\text{MLRC} = \left[\frac{8.71(1 - \text{HW})}{1 - \text{LG}} \right]$$

3. Where the volume of second growth coniferous timber in a cutting authority area is at least eighty percent of the volume of all of the coniferous timber in that cutting authority area, the MLRC is calculated as follows:

$$\text{MLRC} = \left[\frac{7.83(1 - \text{HW})}{1 - \text{LG}} \right]$$

4. For the purpose of subsection 5.8(2) and 5.8(3):

HW = Is the fraction of the cutting authority area's volume harvested by helicopter to a water drop

LG = Low grade number calculated under section 5.7

5.9 Return to Forest Management (RFM)

The return to forest management factor is 1.075.

5.10 Tenure Obligation Adjustment

1. The tenure obligation adjustment is used to calculate the stumpage rate for a cutting authority other than a timber sale licence entered into under section 20 of the *Act*.
2. The tenure obligation adjustment (TOA) is calculated as follows:

$$\mathbf{TOA} = \left[\frac{\mathbf{FPA + LVC + RD + RM + RU + BS}}{\mathbf{1 - LG}} \right] * \mathbf{RFM - MLRC}$$

Where:

FPA	=	forest planning and administration cost
LVC	=	low volume cost
RD	=	total road development cost
RM	=	road management cost
RU	=	road use charges cost
BS	=	basic silviculture cost
LG	=	low grade number
RFM	=	return to forest management
MLRC	=	market logger road cost

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Stumpage Rate Determination

6

6.1 Stumpage Rate Calculation for a Cutting Authority Entered into Under Section 20 of the Act

Sections 6.1.1 through 6.1.5 are the policies and procedures for determining a stumpage rate for a cutting authority that is entered into under section 20 of the *Act*.

6.1.1 Indicated Upset Stumpage Rate (IUSR)

1. The IUSR for a timber sale licence shall be determined by the timber sales manager and shall be the greater of:
 - a. The variable cost to prepare the timber for sale, or
 - b. Seventy percent of the final estimated winning bid (FEWB) for that timber sale licence calculated according to section 4.5.

For timber sale licences containing greater than 20 % mature coniferous timber, the IUSR is the lesser of a. and b., above.

2. The variable cost per cubic metre of preparing the timber for sale shall be calculated by the timber sales manager.

6.1.2 Prescribed Minimum Stumpage Rate

The minimum stumpage rate is prescribed by the minimum stumpage rate regulation (BC Regulation 354/87). The current minimum stumpage rate is \$0.25 per cubic metre.

6.1.3 Upset Stumpage Rate

The upset stumpage rate for a timber sale licence is the greater of:

1. The indicated upset stumpage rate, or
2. the prescribed minimum stumpage rate.

6.1.4 Stumpage Rate

The stumpage rate is the total of the upset stumpage rate plus the bonus bid, if any, that must be paid by the licensee.

6.1.5 Market Price

The stumpage rate is the market price.

6.2 Stumpage Rate Calculation for a Cutting Authority Other than a Cutting Authority Entered into Under Section 20 of the Act or a Cutting Authority for which a Stumpage Rate is Determined Under Chapter 7

Sections 6.2.1 through 6.2.5 are the policies and procedures for determining a stumpage rate for a cutting authority other than timber sale licence entered into under section 20 of the Act or a cutting authority for which a stumpage rate is determined under chapter 7.

6.2.1 Indicated Rate (IR)

1. The IR is the difference between the final estimated winning bid (FEWB) determined for the cutting authority under section 4.5 and the tenure obligation adjustment (TOA) determined under section 5.10.
2. Expressed as an equation:

$$\text{IR} = \text{FEWB} - \text{TOA}$$

6.2.2 Prescribed Minimum Stumpage Rate

The minimum stumpage rate is prescribed by the Minimum Stumpage Rate Regulation (BC Regulation 354/87). The current minimum stumpage rate is \$0.25 per cubic metre.

6.2.3 Reserve Stumpage Rate

The reserve stumpage rate for a cutting authority is determined by selecting the greater of:

1. the indicated rate, or
2. the prescribed minimum stumpage rate.

6.2.4 Upset Stumpage Rate

The upset stumpage rate is the total of the reserve stumpage rate plus any administration levies which may be charged under section 7.4.1.

6.2.5 Total Stumpage Rate

The total stumpage rate is the upset stumpage rate plus the bonus bid, if any, that must be paid by the licensee.

6.2.6 Market Price

The stumpage rate is the market price.

Miscellaneous Timber Pricing

Policies

7

7.1 Average Stumpage Rates by District and Species

1. Revenue Branch shall produce a schedule of average sawlog stumpage rates for each species of timber in each forest district of the coast forest region. Those rates are effective on the date they are approved by the Director.

7.2 Community Forest Agreements

1. a. The sawlog stumpage rate for each species of coniferous timber harvested under a community forest agreement entered into under the *Forest Act* or an associated road permit will be:

Balsam	6.97
Hemlock	6.14
Cedar	8.51
Cypress	8.00
Fir	4.37
Spruce	4.07
All Pine	6.47

- b. The stumpage rate determined under paragraph (a) of this subsection shall be redetermined on March 1st of each year in accordance with this subsection.
2. Section 7.3, 7.4, 7.4.1, 7.5 and 7.6 do not apply to community forest agreements and associated road permits.

7.3 Road Permits

1. Except as provided in subsection (2) of this section, the stumpage rate for a road permit will be determined using Ministry stumpage billing records.
2. The stumpage rate for a road permit issued in conjunction with a timber sale licence entered into under sections 20, 21 and 23 of the *Act* or a licence to cut entered into under Section 47.6 of the *Act* will be the stumpage rate applicable to the cutting authority that authorizes harvesting in the cutting authority area to which the road permit provides access.
3. For the purposes of this section, a stumpage billing history record of timber harvested under a timber licence, where the timber licence area is within a tree farm licence area will be included with and be considered the stumpage billing history record of timber harvested under the tree farm licence.
4.
 - a. Where the Ministry has a stumpage billing history record of timber harvested under a licence, the stumpage rate for a road permit is the weighted average sawlog stumpage rate of cutting authorities, other than a road permit, for cutting authority areas that are located in the same forest district as the area to which the road permit applies, and that are issued under the licence that entitles the licensee to apply for the road permit.
 - b. The weighted average stumpage rate is the sum of the stumpage billed for all coniferous sawlogs during the billing period referred to in paragraph (c) of this subsection, divided by the sum of the volume of those species and grades.
 - c. The billing period referred to in paragraph (b) of this subsection for a road permit appraisal or reappraisal, with an effective date between November 1, 2004 and January 31, 2005 is the twelve month billing period ending August 31, 2004. Thereafter, the billing period will be updated annually effective February 1st and will be the twelve month period ending November 30th.
5. Where there are no stumpage billing history records from which the stumpage rate may be determined under subsection (4), and the licence that the cutting authority is issued under does not provide for an allowable annual cut or has an allowable annual cut of Crown timber equal to or greater than 5 000 m³, the stumpage rate for a road permit is the weighted average sawlog stumpage rate of:
 - a. all cutting authorities, other than road permits, that are issued under the licence that entitles the licensee to apply for the road permit, or
 - b. where there is no volume in the stumpage billing history record, all the cutting authorities that do not provide for an allowable annual cut or have an allowable

- annual cut of Crown timber equal to or greater than 5 000 m³ other than road permits, that are for areas located in the same forest district as the area to which the road permit applies.
6. Where there are no stumpage billing history records from which the stumpage rate may be determined under subsection (4), and the licence that the cutting authority is issued under has an allowable annual cut of Crown timber less than 5 000 m³ per year the stumpage rate for a road permit is the weighted average sawlog stumpage rate of all the cutting authorities, other than road permits, that are for licences that have an allowable annual cut of less than 5 000 m³ in the same forest district as the area to which the road permit applies.
 7. The cost of a road constructed under a road permit may be eligible for inclusion as a tenure obligation adjustment under chapter 5 in the appraisal of the first tributary cutting authority.
 8. All road permits will be reappraised in accordance with section 3.3.2.

7.4 Salvage Logging Stumpage Rates

1. The source of salvaged timber is:
 - a. Post-Harvest Material:
 - i. wooden culverts and bridges, and
 - ii. post-logging residue, and
 - b. Damaged Timber:
 - i. blowdown green and aged timber, and
 - ii. fire, disease, insect or physically damaged timber.
2. The qualifying criteria and methodology for calculating salvage logging stumpage rates for round logs is specified below:
 - a. post-harvest material must not be combined in the same cutting authority area with timber damaged through natural events.
 - b. except where damage to adjacent or contiguous timber occurs after harvesting is completed on the adjacent primary logging cutting permit area and the harvesting equipment has been demobilized from the area, damaged timber salvage cutting authority areas must be scattered, and not adjacent or contiguous to an existing cutting authority area.
 - c. the total cutting authority area for damaged salvage harvesting may vary in size but individual clearcut openings within the cutting authority area shall not exceed two hectares.
 - d. only damaged trees and hazard trees as approved by the Ministry may be removed on a damaged timber salvage cutting permit.
 - e. post-harvest salvage may only occur after primary logging has been satisfactorily completed and residue and waste assessments have been submitted to and accepted by the Ministry.
 - f. salvage cannot occur on a road right-of-way which has an active timber mark associated with it.
 - g. the stumpage rate will be fixed for a period not exceeding one year.
3. Where the source of the salvaged timber is damaged timber, the stumpage rate for each species of the salvaged timber in a forest district will be determined using

schedule of average sawlog stumpage rates for damaged timber approved by the Director.

4. Where the source of the salvaged timber is post-harvest material, the stumpage rate for each species of timber in a forest district will be determined using the schedule of average sawlog stumpage rates for post-harvest material approved by the Director.

7.4.1 Levies for Salvage Forestry Licences to Cut Cutting Authorities

1. An administration levy may be added to the reserve stumpage rate. The administration levy is equal to the district manager's cost estimate of administration provided by the Crown for preparing a Forestry Licence to Cut for salvage timber. An administration cost estimate is made for every cutting authority where the district office has to prepare all details of a Forestry Licence to Cut for salvage. No levy is applicable to professional applications.
2. A basic silviculture levy may be added to the reserve stumpage rate. The levy is equal to the district manager's cost estimate of silviculture liability to be incurred by the Crown.

7.5 Cutting Authority Area With Less than 2 500 m³ of Timber Volume

1. Where a cutting authority area has less than 2 500 m³ of timber the stumpage rate may be determined by using the stumpage rates that the Revenue Branch determines under section 7.1 for each of those species in the forest district in which the cutting area is located.
2. The stumpage rate calculated under this section is not adjusted quarterly.

7.6 Decked Timber

In the case of decked timber, or timber which has been felled and bucked, such as on rights-of-way, and the volume exceeds 300 m³, an appraisal is completed on an “as is, where is” basis by using the procedures in section 7.5 to calculate the stumpage rate and adding to it the person who determines the stumpage rate's estimate of the costs of felling, bucking, yarding and decking.

7.7 Miscellaneous Stumpage Rates

Unless otherwise specified in a cutting authority the table in effect on the date of scale shall be used to determine the stumpage rate.

7.7.1 Miscellaneous Stumpage Rates

Table 7-1 shall be used for determining stumpage rates for deciduous species, low grade logs and timber in specified areas.

7.7.2 Special Forest Products

Unless otherwise specified in a cutting authority, Table 7-2 shall be used for determining stumpage rates for the specified products from all sources of Crown timber.

7.7.3 Marine Log Salvage

7.7.3.1 Beachcomb

A beachcomb rate may apply to logs salvaged in the Vancouver log salvage district under Part 9 of the *Act*, and stray logs salvaged elsewhere in coastal waters.

The stumpage rate for beachcomb is listed in table 7-1.

7.7.3.2 Root Buck

A root buck rate may apply to any species where the roots are attached at the time stray logs are salvaged in coastal waters. Excludes logs salvaged from coastal waters within the boundaries of the North Coast and Kalum Forest Districts.

The rate for root buck is listed in table 7-1.

7.7.3.3 Wahleach Island Catchment Basin

The stumpage rate for logs salvaged at Wahleach Island catchment basin operated by B.C. Debris Control Board is listed in table 7-1.

7.7.3.4 Deadhead Logs

A deadhead rate may apply to deadhead logs as defined in the log salvage regulation, salvaged in coastal waters and subject to scaling requirements under part 6 of the *Act*.

The stumpage rate for deadhead logs is listed in table 7-1.

Table 7-1: Miscellaneous Stumpage Rates

Species	Product Code	Logs	Stumpage Rate (\$/m ³)
Deciduous	N/A	All (except grades 'Y', 'Z')	\$1.00
Yew, Arbutus, Aspen, Willow	N/A	All	\$0.25
Hemlock & Balsam	N/A	Grade 'U'	\$0.25
Coniferous	N/A	Grade 'X'	\$0.25
All Species	N/A	Grade 'Y'	\$0.25
All Species	RB	Root buck	\$7.80
All Species	N/A	Beachcomb (BC)	\$0.70
All Species	N/A	Wahleach Island catchment basin (DH)	\$0.25
All Species	N/A	Deadhead logs (DH)	\$0.25

Table 7-2: Special Forest Products Stumpage Rates

Species	Product Code	Product	Stumpage Rate
All Species	CA	Cants (produced from dead and down post-logging residue)	\$9.60/m ³
All Species	FW	Firewood (round or split) - maximum length 1.2 m	\$1.00/m ³
All Species	MT	Mining Timbers - maximum length 2.4 m	\$3.00/m ³
All Species (except Cedar)	PR	Posts and Rails (split and round)	\$1.20/m ³
Cedar	PR	Posts and Rails (split and round)	\$3.00/m ³
All Species	SB	Shake and Shingle Bolts, Blocks and Blanks	\$5.30/m ³
All Species	SK	Shakes	\$6.00/m ³
All Species	SS	Stakes and Sticks (Car Stakes, Grape Stakes, Hop Poles, Lagging (split, Orchard Props, Pickets and Palings, Stakes and Stocks (sticks))	\$1.20/m ³
All Species	XM	Christmas Trees	Less than 3 m \$0.20 each 3 m to 5 m \$1.00 each greater than 5 m \$1.50 each

Cants are produced from dead and down post-logging material that would not make a sawlog as determined by the regional manager.

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Appendices

Appendix I Equipment and Labour Rates

(Cost Base July 1, 2005)

MACHINE DESCRIPTION	TYPICAL MODEL	\$/HOUR
Crawler Tractor	Cat D9R, Komatsu D275/355	272.45
Crawler Tractor	Cat D9N (years: 1992 thru 1996)	247.75
Crawler Tractor	Cat D8R, Komatsu D155AX-3	207.80
Crawler Tractor	Cat D7R, Deere 950C, Komatsu D65/85	177.95
Crawler Tractor	Cat D6, Dresser TD15, Komatsu D61	141.45
Crawler Tractor	Cat D5, Case 850, Komatsu D39	118.75
Rock Drill (includes labour)	Compressor: 750 cfm on tank chassis	216.83
Grader	Cat 140H, Komatsu GD750, Deere 772	129.40
Front End Loader (Gravel)	Cat966G, Komatsu WA450, Case 921C	147.75
Front End Loader (Logs)	Cat 972G, Kawasaki 90Z, Volvo L180D	171.30
Hydraulic Excavator incl. Brush Guard & Thumb	Hitachi EX450LC, Komatsu PC400LC-7	250.42
Hydraulic Excavator incl. Brush Guard & Thumb	Komatsu PC300/400	206.14
Hydraulic Excavator incl. Brush Guard & Thumb	Hitachi EX330LC, Kobelco PC300	181.83
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 325BL, Hitachi EX270LC, JD 270LC	166.65
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 322CL, Komatsu PC220LC-6, JD 230LC	154.00
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 320CL, Hitachi EX200LC-5, JD 200CLC	143.88
Gradall	Volvo EW 180	166.45
Logging Truck (Highway)	All Triaxle (6 axle unit)	104.65
Self Loading Log Truck	Highway log truck + 5 tonne deck crane	116.70
Gravel Truck	10.7 m ³ m(14 cu yd)	87.95
Gravel Truck Articulated (labour included)	25 - 30 tonne: Cat 730, Deere 300C	146.05
Gravel Truck Articulated (labour included)	20 - 25 tonne: Cat 725, Terex TA25	129.95
Lowbed	5 axle unit: tandem tractor and lowbed	94.60
Concrete Mix Truck	6.1 m ³	92.30
Concrete Vibrator (labour not included)	5 m ³	4.68
Concrete Mixer (labour not included)	0.17 m ³	7.09
Crane - Truck Mounted	18 tonne	102.95
Soft Track Skidder	KMC/FMC 2100/2400 (out of date model)	139.95
Rubber Tired Skidder	Cat 515, Clark H-66-G, (out of date model)	96.80
Vibrator Compactor	Cat 515 plus 2.7 t to 3.6 t roller	110.05
Tractor and Grid Roller	Cat 515 plus grid roller	110.80
Labourer	Group I: Includes 40% payroll loading	32.01
Roadman	Group II: Includes 40% payroll loading	32.27
Crib/Culvert Maker, Powderman	Group VII: Includes 40% payroll loading	33.89
Landingman	Group VIII: Includes 40% payroll loading	34.32
Rockdriller & Powderman (for load & blast only)	Group VII & XI: Includes 40% payroll loading	73.79
Bridgeman	Tradesman: Includes 40% payroll loading	40.69
Powersaw (labour not included)	All: one man, 20 inches + bar	3.40
Faller, including powersaw cost	Includes 40% payroll loading	60.58

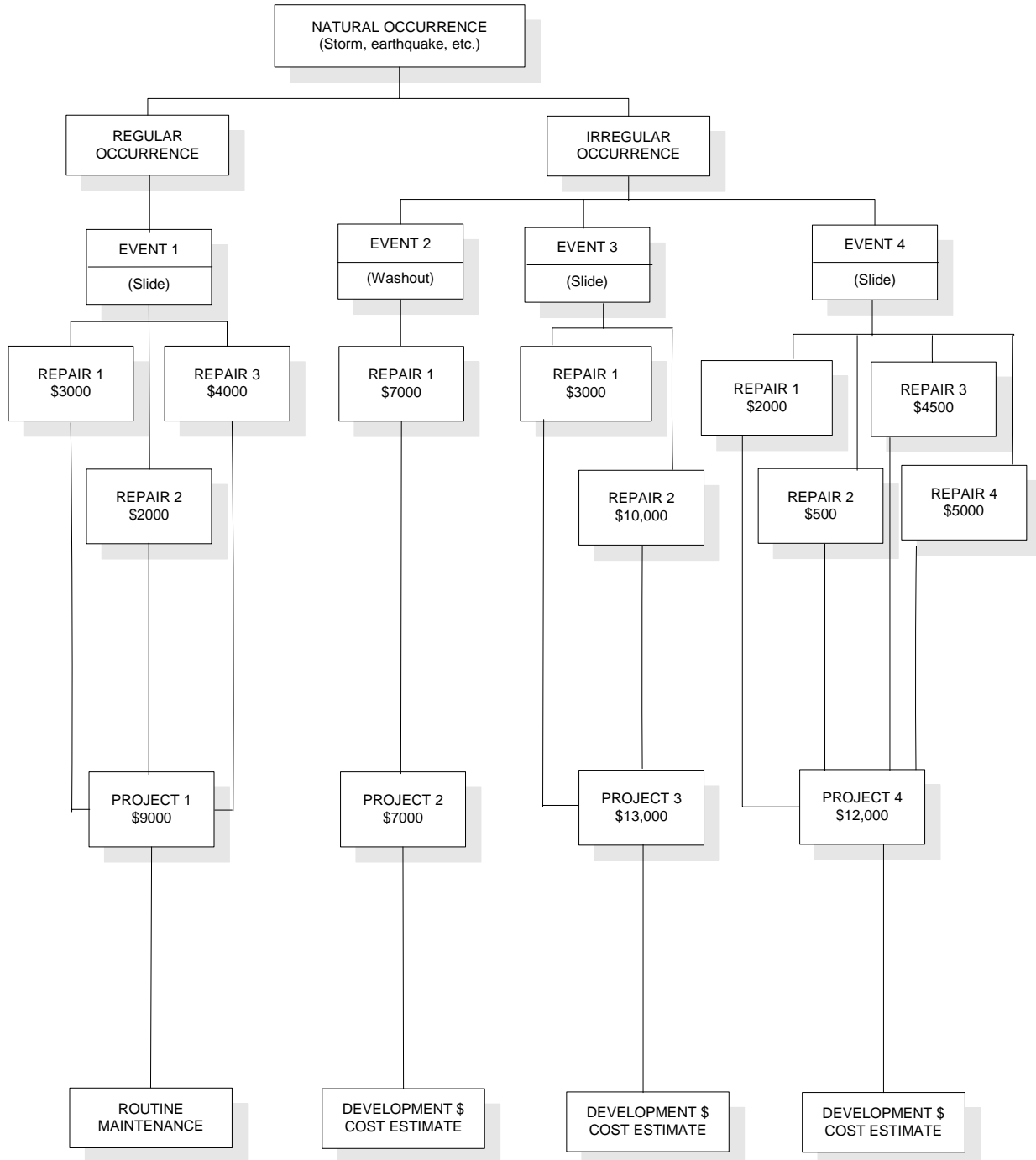
Sources:

Cost surveys, B.C. Road Builders & Heavy Construction Association, Equipment Rental Rate Guide (rates based on a 3 year old machine), and USW agreement rates including payroll loading.

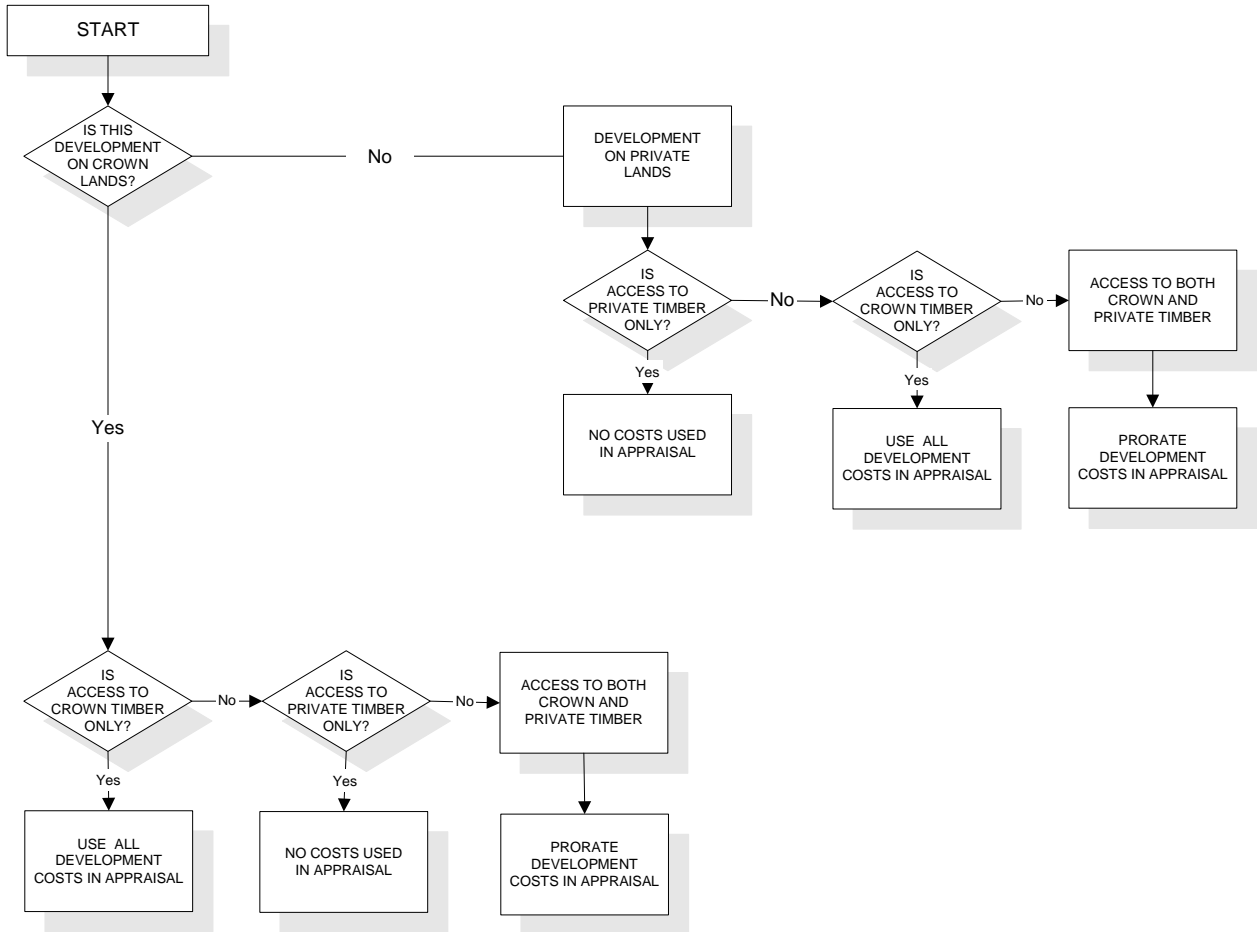
Notes:

1. All equipment rates include labour for operators and swampers unless otherwise noted,
2. Labour components include all payroll loading, and
3. Lowbedding cost estimates for tracked equipment only may be recognized for non-tabular cost estimates (section 5.3.4).
4. The degree of recognition of lowbedding costs varies by the estimated number of hours of each machine usage as follows:
 - a. 1 - 40 hours: to and from the site (mobilization and demobilization),
 - b. 41 - 80 hours: to the site (mobilization) only, and
 - c. 81 plus hours: nil.

Appendix II Reconstruction and Replacement



Appendix III Development Cost Proration



Appendix IV Rock Mass Classification

Surface Hardness	Weathering on Surface				
	W1	W2	W3	W4	W5
H2	R2	R2	R2, R3	R3, R4	R4, R5
H3	R3	R3	R3, R4	R4, R5	
H4	R4	R4	R4, R5		
H5	R5	R5			

Hardness Factors:

- H2 Can be scraped and peeled by a pocket knife with difficulty. Shallow indentations (i.e., 1/16 inch to 1/8 inch) made by firm blow of geological pick.
- H3 Cannot be scraped or peeled with a pocket knife. Hand-held specimen can be fractured with single firm blow of hammer end of geological pick.
- H4 Hand-held specimen requires more than one blow with hammer end of geological pick to fracture it.
- H5 Hand-held specimen is very hard and requires many blows of hammer end of geological pick to fracture it.

Weathering Factors:

- W1 The rock shows no loss of strength or any other effect of weathering other than slight staining on a few discontinuities*.
- W2 The intact rock is slightly discoloured but not noticeably lower in strength than the fresh rock. The discontinuities are discoloured and some discolouration extends into the rock.
- W3 The intact rock is discoloured and noticeably weakened. Discontinuities are stained and/or contain filling comprising altered material.
- W4 Discolouration and weakening extends throughout rock mass and rock mass tends to crumble somewhat. Rock can be excavated with geological pick.
- W5 The rock is totally discoloured and decomposed and is entirely changed to a soil but the original structure of the rock is mostly preserved.
- * The term discontinuities refers to natural breaks, shears or faults in the bedrock.

Surface Hardness	Average Block Diameter				
	0 to 3"	3" to 6"	6" to 1'	1' to 4'	4'+
R2	RMC1	RMC2	RMC2	RMC2	RMC2
R3	RMC2	RMC2	RMC3	RMC3	RMC3
R4	RMC2	RMC3	RMC4	RMC4	RMC4
R5	RMC3	RMC4	RMC5	RMC5	RMC5

Description of RMC Values:

- RMC1** Rock crumbles under firm blows with the point of a geological pick and can be peeled by a pocket knife (R1). The average block diameter is not important. The rock may be harder (R2) but must have an average block diameter of less than 3 inches. This rock can be excavated by free digging or ripping.
- RMC2** Rock can be scraped and peeled by a pocket knife with difficulty and shallow indentations (i.e., 1/16 inch to 1/8 inch) can be made by a firm blow of a geological pick (R2) and has an average block diameter greater than 3 inches. The rock may be somewhat harder (R3) but must have an average block diameter less than 6 inches or hard (R4) and have an average block diameter less than 3 inches. The rock is usually rippable.
- RMC3** Rock cannot be scraped or peeled with a pocket knife. Hand-held specimen can be fractured with a single firm blow of the hammer end of a geological pick (R3) and has an average block diameter greater than 6 inches. Rock may be harder (R4) but must have an average block diameter of 3 to 6 inches or very hard (R5) and have an average block diameter of less than 3 inches. The rock is usually not rippable.
- RMC4** Hand-held specimen requires more than one blow with hammer end of geological pick to fracture (R4) and has an average block diameter greater than 6 inches. Rock may be very hard (R5) but must have an average block diameter of 3 to 6 inches. The rock must be blasted.
- RMC5** Hand-held specimen is very hard and requires many blows of the hammer end of a geological pick to fracture it (R5) and has an average block diameter greater than 6 inches. The rock must be blasted.

Appendix V Appraisal Map Content

1. The appraisal map(s) submitted with the appraisal data submission must be at a scale of 1:5000 or 1:10000. Additional maps at other scales may also be included as required.
2. At a minimum, the maps shall provide the following information:
 - a. Cutting permit and block boundaries.
 - b. Delineation of timber to be harvested and timber to be retained within the cutting authority area.
 - c. Delineation of areas by harvest method.
 - d. Delineation of areas where tree crown modification is planned.
 - e. Delineation of areas where destumping for root disease control is required.
 - f. The geographic centre and common junction of the permit for truck haul distance calculations.
 - g. Existing roads.
 - h. Roads to be constructed.
 - i. Location of roads/structures that are the subject of non-tabular estimates.
 - j. Location, size and types of culverts and bridges.
3. For appraisal data submission where an extension is requested reference may be made to the original map submitted.
4. The appraisal map may be attached to the initial appraisal data submission in electronic format prior to the cutting permit being approved.

Appendix VI Appraisal Log Dumps

Chilliwack Forest District

District: Chilliwack					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Coquitlam, Pacific Custom Log Sort	COPA	49	13	122	51
Delta, Northwest Hardwoods	DENH	49	05	123	06
Fort Langley - Whonnock DLS	FORT	49	10	122	35
Haney, Northview Sort	HANO	49	12	122	37
Harrison Bay DLS	HABA	49	15	121	57
Harrison Lake - 20 Mile Bay	HLTM	49	32	121	53
Harrison Lake - Bear Creek	HLBC	49	31	121	45
Harrison Lake - Head	HLHE	49	44	122	08
Harrison Lake - Silver River DLS	HLSR	49	34	121	49
Harrison Lake - Trio Creek (Doctor's Point)	HLTC	49	39	121	59
Hatzic, Lougheed Highway	HALO	49	08	122	14
Indian Arm	INDA	49	27	122	52
North Vancouver, Second Narrows	NOVA	49	18	123	01
Pitt Lake - Head	PLHE	49	32	122	35
Port Coquitlam, Valiant Sort	POCO	49	14	122	44
Sardis, Cattermole DLS	SACA	49	09	122	02
Sardis, Probyn DLS	SAPR	49	09	122	03
Silverhope Creek, Hope	SCHO	49	22	121	27
Surrey, Interfor - Mackenzie Yard	SIMY	49	12	122	53

Sunshine Coast Forest District

District: Sunshine Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Agamemnon Channel - Ruby Lake	AGRU	49	45	123	59
Agamemnon Channel - Sakinaw Lake DLS	AGSA	49	39	124	04
Agamemnon Channel - Kokomo Lake	AGKO	49	41	124	03
Agamemnon Channel - Acadia Creek	AGAC	49	42	124	02
Agamemnon Channel - West Lake	AGWE	49	44	124	03
Bute Inlet - Amour Point	BUAM	50	32	125	00
Bute Inlet - Bear Bay	BUBE	50	50	124	57
Bute Inlet - Clipper Point	BUCL	50	32	124	56
Bute Inlet - Hare Creek	BUHA	50	30	124	58
Bute Inlet - Homathko	BUHO	50	54	124	51
Bute Inlet - Mellersh	BUME	50	46	124	57
Bute Inlet - Mellersh 2	BUMF	50	45	124	57
Bute Inlet - Mellersh 3	BUMG	50	45	124	56
Bute Inlet - Moh Creek	BUMO	50	31	125	02
Bute Inlet - Orford Bay	BUOR	50	36	124	52
Bute Inlet - Paradise River	BUPA	50	35	124	57
Bute Inlet - Purcell Point	BUPU	50	46	124	52
Bute Inlet - Scott Paper (Homathko River)	BUSC	50	56	124	51
Bute Inlet - Stuart Island	BUST	50	22	125	06
Calm Channel - Churchhouse	CACH	50	20	125	04
Calm Channel - Raza Island	CARA	50	18	125	01
Cortes Island - Gorge Harbour	COGO	50	06	125	00
Desolation Sound - Theodosia Inlet	DETH	50	04	124	41
Homfray Channel - Attwood Bay	HOAB	50	19	124	40
Homfray Channel - Homfray Creek	HOHO	50	17	124	38
Jervis Inlet - Dacres Point	JEDP	49	49	123	55
Jervis Inlet - Deserted Bay	JEDB	50	05	123	45
Jervis Inlet - Glacial Creek	JEGC	50	00	123	54
Jervis Inlet - Glacial Creek North	JEGN	50	01	123	52

District: Sunshine Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Jervis Inlet - Granville Bay DLS	JEGR	49	50	123	59
Jervis Inlet - Hardy Island	JEHA	49	44	124	11
Jervis Inlet - Hunaechin River DLS	JEHU	50	12	123	58
Jervis Inlet - Killam Bay	JEKI	49	46	123	55
Jervis Inlet - Nelson Island, Annis Bay North	JENN	49	46	124	00
Jervis Inlet - Nelson Island, Vanguard Bay	JEVA	49	45	124	06
Jervis Inlet - Perketts Creek	JEPE	49	52	123	52
Jervis Inlet - Potato Creek	JEPO	50	08	123	48
Jervis Inlet - Queens Reach, Smanit Creek	JEQU	50	10	123	56
Jervis Inlet - Saltery Bay	JESA	49	46	124	10
Jervis Inlet - Seshal Creek	JESE	50	01	123	55
Jervis Inlet - St. Vincent Bay DLS	JEST	49	48	124	05
Jervis Inlet - Stakawus Creek DLS	JESV	50	04	123	46
Jervis Inlet - Treat Creek	JETC	49	50	123	52
Jervis Inlet - Vancouver Bay	JEVB	49	55	123	51
Malaspina Peninsula - Lund	MPLU	49	58	124	45
Malaspina Peninsula - Steamboat Bay	MPSB	50	00	124	47
Malaspina Peninsula East - Malaspina Inlet	MPMI	50	02	124	47
Malaspina Peninsula East - Okeover Inlet	MPOI	49	59	124	41
Malaspina Strait - Stillwater Bay - Stillwater DLS	MSSB	49	46	124	18
Malaspina Strait - Lang Bay	MSLB	49	46	124	21
Maurelle Island - East-West Bay	MIEW	50	18	125	06
Maurelle Island - Florence Cove (Hole in the Wall)	MIFC	50	18	125	09
Maurelle Island - West Side	MIWS	50	15	125	10
Nelson Island - Fearney Point	NIFP	49	39	124	06
Nelson Island - Cockburn Bay	NICB	49	41	124	11

District: Sunshine Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Powell River - Powell River Mill	PLPR	49	52	124	33
Princess Royal Reach - Brittain River North	PRBR	49	59	123	59
Pryce Channel	PRYC	50	19	124	53
Ramsay Arm - Quatum Bay	RAQU	50	23	124	56
Ramsay Arm - Ramsay Head	RARH	50	26	124	59
Ramsay Arm - Head	RAHE	50	27	125	00
Raza Passage - Francis Bay	RAZA	50	21	125	02
Read Island - Evans Bay	RIEB	50	13	125	04
Salmon Inlet - Camp "L" DLS	SICL	49	40	123	32
Salmon Inlet - Clowhom Falls DLS	SICF	49	42	123	31
Salmon Inlet - Misery Creek	SIMC	49	40	123	34
Sechelt - Narrows Inlet - Tzoonie Narrows	SNTN	49	42	123	46
Sechelt Inlet - Clipper Point (Piper Point) DLS	SICP	49	33	123	47
Sechelt Inlet - Doriston	SIDO	49	42	123	53
Sechelt Inlet - Kunechin Point	SIKP	49	39	123	49
Sechelt Inlet - Nine Mile Point	SINM	49	36	123	46
Sechelt Inlet - Oyster Bay	SIOB	49	34	123	48
Sechelt Inlet - Powerlines	SIPO	49	39	123	52
Sechelt Inlet - Skaiakos Point	SESP	49	36	123	49
Sechelt Inlet - Snake Bay (Carlson Point)	SISN	49	32	123	47
Sechelt Pen. - Skookumchuck Narrows, Earle Creek	SPSN	49	44	123	53
Texada Island - Anderson Bay	TIAB	49	31	124	08
Texada Island - Cook Bay	TICB	49	32	124	15
Texada Island - Mount Bay	TIMB	49	38	124	26
Thornbrough Channel - Avalon DLS	TCAV	49	30	123	29
Thornbrough Channel - McNab Creek	TCMC	49	33	123	23
Thornbrough Channel - Terminal DLS	TCTE	49	27	123	28
Thornbrough Channel - Twin Creeks DLS	TCTC	49	28	123	29

District: Sunshine Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Toba Inlet - Higgins Bay	TOHB	50	22	124	40
West Redonda Island - Desolation	WRDE	50	08	124	46
West Redonda Island - Doctor Bay	WRDB	50	15	124	49
West Redonda Island - Lewis Channel	WRLC	50	12	124	56
West Redonda Island - Redonda Bay	WRRB	50	15	124	57
West Redonda Island - Talbot Cove	WRTC	50	10	124	52
West Redonda Island - Teakerne Arm	WRTA	50	11	124	49

Squamish Forest District

District: Squamish Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Squamish DLS	SQUA	49	40	123	10

Queen Charlotte Islands Forest District

District: Queen Charlotte Islands					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Cumshewa Inlet - Beatty Anchorage, Louise Island DLS	CUBE	53	02	131	54
Masset Inlet - Collison Point Dump	MICP	53	47	132	13
Masset Inlet - Dinan Bay DLS	MIDB	53	41	132	36
Masset Inlet - Ferguson Bay DLS	MIFB	53	40	132	16
Masset Inlet – McClinton Bay DLS	MIMB	53	38	132	35
Masset Inlet – Port Clements, Abfam Mill	MIAM	53	41	132	10
Masset Inlet – Port Clements, O'Brien DLS	MIOB	53	42	132	09
Naden Harbour – Colnett Point DLS	NHCP	53	58	132	40
Naden Harbour - Davidson DLS	NHDA	53	59	132	34
Rennell Sound - Clonard Bay Dump	RSCB	53	20	132	30
Rennell Sound - Rennell Sound DLS	RSRS	53	21	132	28
Rennell Sound - Tartu Inlet DLS	RSTI	53	29	132	40
Sewell Inlet - Sewell Inlet DLS	SISI	52	53	131	58
Skidegate inlet - Alliford Bay DLS	SIAB	53	12	131	59
Skidegate Inlet - Long Inlet, Lagins Creek DLS	SILI	53	13	132	18
Skidegate Inlet - Queen Charlotte City, Skidegate DLS	SIQC	53	14	132	09
Skidegate Inlet - South Bay DLS (South of Sandilands Island)	SISB	53	09	132	05
Van Inlet - (South of Rennell Sound)	VIRS	53	16	132	30

North Coast Forest District

District: North Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Alan Reach - Collins Bay DLS	ARCO	53	33	128	44
Alan Reach - Ochwe Bay, Paril Creek Log Dump	ALOC	53	29	128	46
Alan Reach - Proposed BCTS	ALTS	53	25	128	34
Alice Arm - Kitsault	ALKI	55	28	129	27
Alice Arm - Proposed BCTS	AATS	55	28	129	29
Banks Island - Banks Island DLS, Donaldson Lake	BADO	53	28	130	02
Banks Island - Patterson Inlet	BAPA	53	26	129	46
Devastation Channel - Heysham Creek - BCTS	DVHE	53	35	128	48
Devastation Channel - Verney Pass Log Dump	DVVE	53	32	128	51
Devastation Channel - Weewanie Creek	DVWE	53	41	128	47
Douglas Channel - Kitkiata - BCTS	DOKI	53	38	129	15
Douglas Channel - Little Tillhorn DLS	DOTI	53	33	129	10
Ecxstall River - Cuthbert Creek DLS	ETCC	54	05	129	51
Grenville Channel - Farrant Island Log Dump	GRFA	53	19	129	23
Grenville Channel - Baker Inlet	GRBA	53	48	129	53
Kaien Island - Kaien Island DLS	KAIS	54	18	130	15
Kennedy Island - Kennedy Island DLS	KEIS	54	03	130	09
Kumealon Inlet - Kumealon DLS	KUIN	53	52	129	59
Nass Bay - Mill Bay	NBMB	55	00	129	52
Nass Bay - Welda Creek	NBWC	54	56	129	52
Pearse Island - Dogfish Bite	PIDB	55	01	130	11
Pitt Island - Captain's Cove	PICC	53	48	130	11
Pitt Island (South) - Payne Channel Log Dump	PIPC	53	19	129	28
Porcher Island - Hunts Island - BCTS	POHI	54	03	130	33
Porcher Island - Oona River	POOR	53	56	130	15
Porcher Island - Porcher Inlet (North) - BCTS	POPNI	53	59	130	25
Porcher Island - Porcher Inlet (South) - BCTS	POPS	53	58	130	24

District: North Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Port Edward - Bawey Wood Products	PEBW	54	14	130	17
Port Edward - Galloway Rapids	PEGR	54	14	130	16
Port Simpson - Stumaun Bay DLS	PSSB	54	33	130	23
Portland Canal - Donahue Creek (BCTS)	PCDC	55	28	130	02
Portland Canal - Swamp Point	PCSP	55	23	130	01
Portland Inlet - BCTS - Sommerville Island	PISI	54	46	130	13
Portland Inlet - Nasoga Gulf, Chambers Creek	PING	54	53	130	03
Prince Rupert - Sabre Marine	PRSM	54	19	130	16
Princess Royal Channel - Fraser Reach #2	PRCF	53	15	128	51
Princess Royal Channel - Fraser Reach #1	PRFR	53	16	128	53
Princess Royal Island - Chapple Inlet DLS	PRCI	52	57	129	08
Princess Royal Island - Head of Surf Inlet Log Dump	PRHS	53	01	128	54
Princess Royal Island - Surf Inlet	PRSI	53	01	128	54
Princess Royal Island - Surf Inlet Log Dump	PRSD	53	01	128	54
Princess Royal Island - Surf Inlet, Cedar Creek Log Dump	PRCC	53	01	128	56
Princess Royal Island - Triven Point - BCTS	P RTP	53	18	129	01
Quatoon Inlet	QUIN	54	27	130	05
Ridley Island	RIIS	54	13	130	19
Ridley Island - Ridley Island DLS	RIRI	54	14	130	18
Scotia River - Scotia River DLS	SRSR	54	10	129	38
Skeena River - Alder Creek DLS	SRAC	54	14	129	25
Sommerville Island - BCTS - Steamer Passage (east)	SISP	54	42	130	15
Sommerville Island - BCTS - Steamer Passage (west)	SISQ	54	42	130	18
Steamer Passage - Crow Lagoon	SPCL	54	42	130	13
Triumph Bay - Trip Creek Log Dump	TBTC	53	28	128	42
Triumph Bay - Triumph Bay DLS	TBTB	53	26	128	41

District: North Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Ursula Channel - Bishop Bay Log Dump	UCBB	53	26	128	53
Ursula Channel - East Gribble Island Log Dump	UCGI	53	21	128	55
Ursula Channel - Goat Harbour	UCGH	53	21	128	50
Ursula Channel - Proposed BCTS	UCTS	53	29	128	57
Ursula Channel - Riordan Creek Log Dump	UCRC	53	26	128	57
Verney Passage - Cheenis Creek	VPCC	53	33	129	01
Whale Channel - Cornwall Inlet, Drake Inlet Log Dump	WCDI	53	08	128	58
Work Channel - Bill Lake	WCBL	54	23	130	05
Work Channel - Marion Creek	WCMC	54	21	130	03
Work Channel - Union Inlet	WCUI	54	33	130	24

Campbell River Forest District

District: Campbell River					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Bligh Island	BLIS	49	41	126	32
Brooks Bay - Cordero Channel	BRCO	50	27	125	25
Brougham - Nodales Channel	BRNO	50	23	125	22
Bute Inlet – East of Estero Basin (Egerton)	BUES	50	30	125	06
Call Inlet - Head of Call Inlet (south side)	CAHS	50	37	125	56
Call Inlet - Head of Call Inlet (north side)	CAHN	50	38	125	58
Call Inlet (North) - Call Inlet	CACN	50	36	126	05
Call Inlet (South) - Call Inlet	CACS	50	35	126	06
Chancellor Channel - Darcy Point South	CHDA	50	25	125	41
Comox	COMO	49	39	124	55
Cordero Channel - Picton Point	COPI	50	27	125	23
Cordero Channel - Cordero 1	COCO	50	26	125	33
Cordero Channel - Cordero 2	COCP	50	26	125	32
Cordero Channel - Tallac Bay	COTA	50	26	125	28
Courtenay	COUR	49	40	124	58
Discovery Passage - Elk Bay	DIEB	50	16	125	26
Discovery Passage - Menzies Bay	DIMB	50	07	125	23
Discovery Passage - West Sonora Island	DIWS	50	18	125	24
East Thurlow Island - Bickley Bay	ETBB	50	26	125	24
East Thurlow Island - Crawford Anchorage, Erasmus Island	ETCA	50	26	125	28
East Thurlow Island - Edith Point	ETEP	50	22	125	32
East Thurlow Island - Hemming Bay	ETHB	50	23	125	22
East Thurlow Island - Mayne Passage	ETMP	50	23	125	31
East Thurlow Island - Turn Harbour	ETTH	50	21	125	28
Esperanza Inlet - Port Eliza	ESPE	49	52	127	00
Esperanza Inlet - Port Eliza, Weasel Creek	ESWC	49	56	127	02
Espinosa Inlet - Mid Espinosa Inlet	ESME	49	55	126	56
Espinosa Inlet - South Espinosa	ESSE	49	52	126	56
Frederick Arm	FRED	50	30	125	15
Frederick Arm - Egerton Creek South	FAEC	50	27	125	15
Frederick Arm - Owen Point	FAOP	50	27	125	17

District: Campbell River					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Hardwicke Island – South East at Chancellor Channel	HACC	50	25	125	45
Johnstone Strait - Bear Bay	JSBB	50	21	125	39
Johnstone Strait - Eve River	JSER	50	28	126	17
Johnstone Strait - Hardwicke Island (South)	JSHS	50	25	125	45
Johnstone Strait - Hardwicke Island South West	JSHI	50	25	125	55
Johnstone Strait - Havannah Channel, South of East Cracroft Island	JSHA	50	32	126	13
Johnstone Strait - Kelsey Bay	JSKB	50	23	125	57
Johnstone Strait - Naka Creek	JSNC	50	28	126	25
Johnstone Strait - Port Neville Head	JSPH	50	32	125	58
Johnstone Strait - Port Neville South	JSPS	50	30	126	03
Johnstone Strait - Port Neville West	JSPW	50	31	126	04
Johnstone Strait - South East Bay	JSSE	50	27	126	11
Johnstone Strait - Tuna Point, Sunderland Channel	JSTP	50	28	125	58
Kyuquot Channel – Cachalot Inlet	KYCA	50	00	127	10
Kyuquot Sound - Amai Inlet	KYAM	50	01	127	10
Kyuquot Sound - Chamiss Bay	KYCH	50	04	127	17
Kyuquot Sound - Eelstow Passage	KYEE	50	06	127	10
Kyuquot Sound - Hohoae Island	KYHO	50	02	127	14
Kyuquot Sound - Kashutl River	KYKA	50	11	127	18
Kyuquot Sound - Kauwinch River, Kashutl Inlet	KYKR	50	08	127	16
Kyuquot Sound - Tahsish Inlet	KYTA	50	05	127	07
Kyuquot Sound - Union Island East	KYUE	50	01	127	14
Kyuquot Sound - Union Island West	KYUW	50	01	127	19
Loughborough Inlet - Cooper Reach East	LICR	50	41	125	26
Loughborough Inlet - Beaver	LIBE	50	30	125	36
Loughborough Inlet - Beaver West	LIBW	50	29	125	37
Loughborough Inlet - Heydon Bay	LIHB	50	35	125	33
Loughborough Inlet - Poison Creek	LIPC	50	37	125	31
Loughborough Inlet - Poison (North)	LIPN	50	39	125	31

District: Campbell River					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Loughborough Inlet - Poison (South)	LIPS	50	36	125	32
Loughborough Inlet - Satham	LIBE	50	31	125	32
Loughborough Inlet (Head) - Stafford Lake	LIBW	50	43	125	28
Loughborough Inlet - Styles	LIST	50	27	125	37
Loughborough Inlet SW	LISW	50	28	125	34
Muchalat Inlet - Gold River DLS	MUGR	49	41	126	07
Muchalat Inlet - Houston River	MUHR	49	38	126	18
Muchalat Inlet - Jacklah River	MUJR	49	39	126	09
Muchalat Inlet - Kleeptee Creek, North of Gore Island	MUKC	49	39	126	22
Muchalat Inlet - McCurdy Creek	MUMC	49	40	126	11
Muchalat Inlet - Silverado Creek	MUSC	49	37	126	21
Muchalat Inlet (Head) - Matchlee Bay east	MUME	49	39	126	05
Muchalat Inlet (Head) - Matchlee Bay west	MUMW	49	38	126	05
Muchalat Inlet (Head) - Matchlee Bay, Burman River	MUMB	49	37	126	03
Nodales Channel - Extension	NOEX	50	25	125	18
Nodales Channel - Wyssen	NOWY	50	24	125	18
Nootka Island - Blowhole Bay	NIBB	49	49	126	40
Nootka Island - Brodick Creek, Esperanza Inlet	NIBC	49	51	126	53
Nootka Island - Kendrick Inlet DLS	NIKI	49	43	126	39
Nootka Island - Kendrick Inlet, Plumper Harbour	NIPH	49	41	126	38
Nootka Sound - Bligh Island, South of Conception Point	NSBI	49	39	126	29
North Kanish	NOKA	50	15	125	19
Phillips Arm - Fanny Bay	PAFB	50	31	125	23
Phillips Arm - Phillips Arm South	PAPA	50	30	125	21
Portland - Nodales Channel	PONC	50	26	125	18
Quadra Island - Chonat Bay	QICB	50	18	125	17
Quadra Island - Gowland Harbour	QIGH	50	05	125	15
Quadra Island - Kanish Bay	QIKB	50	14	125	21

District: Campbell River					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Quadra Island - Plumper Bay	QIPB	50	09	125	20
Royston	ROYS	49	39	124	57
Sonora Island - Barnes Bay	SIBA	50	19	125	15
Sonora Island - Horn Bay, North of Sonora Island	SIHB	50	25	125	12
Sonora Island - Innes	SIIN	50	23	125	10
Sonora Island - Nutcracker Bay	SINB	50	18	125	17
Sunderland Channel - Bessborough Bay	SCBB	50	29	125	46
Sunderland Channel - Forward Harbour, East of Hardwicke Island	SCFH	50	28	125	44
Sunderland Channel - Jackson Bay, Topaze Harbour	SCJB	50	31	125	45
Sunderland Channel - McLeod Bay	SCMB	50	28	125	57
Sunderland Channel - Shaw	SCSH	50	28	125	54
Sunderland Channel - Topaze Harbour, Jackson Bay	SCTH	50	31	125	49
Tahsis Inlet - Tsowwin River	TITR	49	46	126	38
Tahsis Inlet - West Tahsis	TIWT	49	52	126	40
Tahsish Inlet - Artlish River DLS	TIAR	50	06	127	05
Thurston - Sonora Island	THUR	50	22	125	18
Tlupana Inlet - Head Bay	TLHB	49	47	126	29
Tlupana Inlet - Deserted Lake	TLDL	49	46	126	28
Tlupana Inlet - Nesook Bay	TLNB	49	45	126	25
Union Bay - Union Bay DLS	UBUB	49	35	124	53
Wellbore Channel - Darcy Point, East of Hardwicke Island	WCDP	50	25	125	43
West Thurlow North	WTNO	50	26	125	33
West Thurlow Island - Butterfly Bay	WTBB	50	24	125	33
West Thurlow Island - Knox Bay DLS	WTKB	50	23	125	37
Zeballos Inlet - Little Zeballos	ZILZ	49	57	126	49
Zeballos Inlet - South (Ciriaco)	ZISC	49	55	126	48
Zeballos Inlet - Zeballos	ZIZE	49	59	126	51

South Island Forest District

District: South Island					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Alberni Inlet - China Creek	ALCH	49	9	124	47
Alberni Inlet - Shoemaker Bay	MISB	49	13	124	50
Alberni Inlet - Spencer Creek DLS	ALSP	48	58	124	56
Barkley Sound - Cataract Lake DLS	BACA	48	58	125	16
Barkley Sound - Sarita DLS	BASA	48	54	125	00
Barkley Sound - Skull Lake DLS	BASK	49	02	125	09
Barkley Sound - Toquart Bay DLS	BATO	49	01	125	21
Barkley Sound - Tzartus Island	BATZ	48	56	125	04
Chemainus	CHEM	48	55	123	43
Coastland	COAS	49	10	123	56
Cypre River DLS, Hecate Bay	CYPR	49	14	125	56
Duke Point	DUKE	49	09	123	53
Effingham Inlet	EFIN	49	05	125	12
Flores Island - Steamer Cove	FLSC	49	22	126	11
Galiano Island	GALI	48	53	123	20
Great Central Lake - Dorothy	GCDO	49	21	125	23
Great Central Lake - Lakeside	GCLA	49	21	125	13
Great Central Lake - McBride	GCMC	49	23	125	25
Great Central Lake - Mercs	GCME	49	21	125	18
Great Central Lake - View	GCVI	49	21	125	15
Herbert Inlet - Beddingfield Bay DLS	HEBE	49	21	125	59
Jordan River	JORD	48	25	124	02
Ladysmith DLS	LADY	48	59	123	48
Ladysmith Head	LADH	49	01	123	51
Mayne Island - Horton Bay	MIHB	48	49	123	15
Mud Bay, Fanny Bay DLS	MUDB	49	27	124	47
Mooyah	MOOY	49	37	126	27
Nootka Sound - Zuciarte Channel, Mooyah Bay	NSZC	49	38	126	27
Northwest Bay, Parksville	NBPA	49	17	124	12

District: South Island					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Otter Point Log Sort	OPLS	48	22	123	51
Saltspring Island, Burgoyne Bay	SIBU	48	47	123	31
Shoal Island DLS	SHOA	48	52	123	38
Stewardson Inlet	STEW	49	25	126	19
Stewardson Inlet (Mouth)	STEM	49	27	126	17
Strait of Georgia - Valdes Island	SGVI	49	03	123	39
Tofino Inlet - Rankin Cove	TIRC	49	10	125	42
Uchuklesit Inlet - Silverside DLS	UISI	49	00	125	02
Uchuklesit Inlet - Snug Cove	UISC	49	00	125	01
Ucluelet (East)	UCLU	48	58	125	34
Vargas Island	VARG	49	12	125	58

North Island - Central Coast Forest District

District: North Island - Central Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Actaeon Sound	ACSD	50	59	127	02
Beaver Cove	BEAV	50	32	126	51
Bella Coola	BECO	52	23	126	45
Bonwick Island, Grebe Cove	BOGR	50	42	126	37
Boswell Inlet DLS	BOIN	51	22	127	27
Bouhey	BOUG	50	31	126	10
Briggs Inlet	BRIN	52	20	128	01
Burke Channel, Doc Creek	BUDO	51	57	127	40
Burke Channel, Twin Creeks DLS	BUTW	52	15	127	16
Chief Nollis Bay	CHNO	51	11	127	06
Clayton Falls DLS	CLFA	52	22	126	49
Cleagh Creek DLS	CLCR	50	28	127	45
Cousins Inlet	COUS	52	17	127	47
Creasy Bay	CREA	50	57	127	04
Cutter Cove	CUTT	50	37	126	15
Dawsons Landing	DALA	51	34	127	35
Dean Channel, Parker Creek	DEPA	52	15	127	43
Denny Island, Kliksoatli Harbour	DEKL	52	08	128	04
Disco Bluff - South Bentinck Arm	DISB	52	07	126	45
Don Peninsula - Tom Bay	DOTB	52	23	128	15
Draney Inlet	DRIN	51	26	127	25
Drury Inlet	DRUR	50	55	127	05
Drury Inlet - Caviar Cove DLS	DRCA	50	53	127	02
Fish Egg Inlet DLS	FISH	51	35	127	46
Forward	FORW	50	29	125	43
Frederick Bay DLS	FRBA	51	02	127	14
Frederick Sound - Snowdrift Mt. DLS	FSSM	51	04	126	44
Frenchman Creek - Dean Channel	FRDC	52	20	127	32
Gilford Island - Duck Cove	GIDU	50	39	126	31
Gilford Island - Shoal Harbour	GISH	50	44	126	29
Gilford Island - Scott Cove DLS	GISC	50	46	126	28
Harbledown Island, DLS	HARB	50	35	126	34

District: North Island - Central Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Hardy Inlet	HARD	51	41	127	32
Hardy Inlet - MacNair DLS	HAMA	51	42	127	33
Holberg	HOLB	50	38	128	59
Holberg Inlet - Hushamu Creek	HOHU	50	36	127	42
Holberg Inlet - Michelsen Point	HOMI	50	35	127	41
Hopetown Passage	HOPE	50	55	126	50
Jennis Bay DLS	JENB	50	54	127	01
Jenny Inlet DLS - King Island	JNKI	52	14	127	35
Kimsquit DLS	KIMS	52	52	127	05
Kingcome Inlet DLS	KIDL	50	56	126	11
Kingcome Inlet - Anchorage Cove	KIAC	50	54	126	12
Knight Inlet – Head	KIHD	51	04	125	35
Knight Inlet, Blind Creek	KIBC	50	41	125	42
Knight Inlet, Escape Point	KIEP	50	52	125	41
Knight Inlet, Glendale Cove	KIGC	50	40	125	44
Knight Inlet, Hoeya Sound	KIHS	50	42	125	58
Knight Inlet, Lull Bay	KILB	50	42	126	01
Knight Inlet, Matsui Creek	KIMC	50	42	125	49
Knight Inlet, Prominent Point	KIPP	50	40	126	01
Knight Inlet, Protection Point	KIPR	50	39	126	10
Knight Inlet, Sallie Creek	KISC	50	43	125	43
Knight Inlet, Tsakonu Cove	KITC	50	30	126	10
Kokish	KOKI	50	32	126	51
Koprino Harbour	KOPR	50	30	127	52
Kwatna Bay DLS	KWAT	52	06	127	23
Kwatna Inlet, Quatlana	KWQU	52	02	127	35
MacKenzie Sound DLS	MKSD	50	56	126	39
Mahatta River	MAHA	50	27	127	47
Malcolm Island, Mitchell Bay	MALC	50	38	126	51
Mathieson Channel, Tom Bay	MATB	52	23	128	16
Mereworth Sound DLS	MESD	51	12	127	21
Moses Inlet	MOIN	51	52	127	21

District: North Island - Central Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Neroutsos Inlet - Thurburn Bay	NETB	50	23	127	28
North Broughton Island, Tracey Harbour	NBTH	50	51	126	52
Nimpkish DLS	NIMP	50	32	126	52
Ocean Falls, Link Lake DLS	OFLI	52	21	127	43
Owikeno Lake, Macmell, Neechanz DLS	OLMN	51	40	126	41
Owikeno Lake, Sheemahant DLS	OLSH	51	44	126	38
Pack Lake	PACK	51	10	127	28
Pooley Island - James Bay	PIJB	52	42	128	13
Quatsino DLS	QUAT	50	27	127	31
Quatsino Sound - Ingersoll	QUSI	50	29	127	41
Port Hardy - Shushartie DLS	PHSH	50	42	127	28
Port McNeill	PTMN	50	35	127	05
Port McNeill - WFP DLS	PMWF	50	35	127	06
Rivers Inlet - Kilbella Bay	RIKB	51	42	127	20
Rivers Inlet - Owikeno First Nations DLS	RIOW	51	41	127	15
Rivers Inlet - Ripon Island	RIRP	51	29	127	38
Roderick Island - Griffen Passage, DLS	ROGP	52	45	128	21
Sargeaunt Pass	SARG	50	41	126	11
Seaforth Channel	SEAF	52	14	128	19
Seymour Inlet - East Head	SEEH	51	11	126	39
Seymour Inlet, Warner Bay	SEWB	51	02	127	06
Seymour Inlet, Wigwam Bay	SEWI	51	08	126	43
Seymour Inlet - Woods Lagoon	SEWO	51	00	127	18
Shearwater DLS	SHEA	52	08	128	05
Simoon Sound	SISO	50	51	126	32
Smith Inlet, Walkum Bay	SIWB	51	21	127	07
South Bentinck Arm, Bentinck Narrows	SBBN	51	59	126	40
South Bentinck Arm, Larso Bay	SBLB	52	10	126	51
South Bentinck Arm, Noeick River	SBNR	52	03	126	41
South Bentinck Arm, Taleomy	SBTA	52	00	126	40
South Bentinck Arm - West Side	SBWS	52	06	126	47
Strachan Bay	STRA	51	10	127	28

District: North Island - Central Coast					
Location	ALD Code	Co-ordinates (Approximately)			
		Latitude		Longitude	
		Degrees	Minutes	Degrees	Minutes
Thompson Sound DLS	THSD	50	48	126	01
Tribune Channel, London Point	TCLP	50	46	126	06
Wakeman Sound	WAKE	50	59	126	29
Walbran Island, Taylor Bay	WITB	51	30	127	36
Wallace Bay - Cousins Inlet	WBCI	52	17	127	45
Watson Island - Turnbull Cove	WITC	50	57	126	50
West Cracroft Island - Port Harvey	WCPH	50	34	126	16
West Cracroft Island - Potts North	WCPN	50	34	126	27
West Cracroft Island - Potts South	WCPS	50	33	126	28
Yeo Cove, Yeo Island	YCYI	52	18	128	10

Appendix VII Definition of 'Bankheight' Tabular Road Categories

OMLB:	Other Material – Local Ballast Other material and rock/hardpan that does not require drilling and blasting - ballast/surface with local material (i.e., no truck haul) - includes patch ballasting and surfacing with endhaul material.
OMPR	Other Material – Pit Run Ballast Other material that does not require drilling and blasting and surfacing is pit run material (i.e., not drilled and blasted) or stored end haul material, requiring truck haul.
OMRB	Other Material – Rock Ballast Other material that does not require drilling and blasting and surfacing is quarried (i.e., drilled and blasted) rock.
TOE	Low rock face height. Rock (including hardpan) that must be drilled and blasted and results in up to 1.50 metre inside rock face. Includes ditchlines or boulders less than 1.50 metres in height that require drilling and blasting.
MRK	Medium rock face height. Rock (including hardpan) that must be drilled and blasted and results in a 1.51 to 3.00 metre inside rock fact. Includes boulders between 1.51 and 3.00 metres in height that require drilling and blasting.
HRK	High rock face height. Rock (including hardpan) that must be drilled and blasted and results in a 3.01 to 4.50 metre inside rock face. Includes boulders between 3.01 and 4.50 metres in height that require drilling and blasting.
XRK	Rock (including hardpan) that must be drilled and blasted and results in a 4.51 to 6.00 metre inside rock face. Includes boulders between 4.51 and 6.00 metres in height that require drilling and blasting.
XXRK	Rock (including hardpan) that must be drilled and blasted and results in a 6.01 to 7.50 metre inside rock face. Includes boulders between 6.01 and 7.50 metres in height that require drilling and blasting.

Appendix VIII Non-Tabular Cost Estimates

VIII.1 Non-Tabular Cost Estimates

1. The cost information contained in this appendix are to be used in conjunction with the Detailed Engineering Estimates for Coast Stumpage Appraisal – February 1, 2001 and as amended to September 1, 2002.
2. A non-tabular cost estimate must be calculated on the basis that the construction project will be completed using commonly used logging road construction practices and that the roads will have single lane width roads, turnouts and landings.
3. Weighted averages for each variable (e.g., uphill side slope, rock, etc.) are applied to each road section. Averages are obtained by weighting the cross-section measurements taken at representative points along the road by the applicable road section length.

VIII.2 Subgrade Construction

1. The estimated cost per kilometre for subgrade construction is provided for each combination of construction category and uphill side-slope for two rock mass classification categories, 'RMC 5 Only' and 'Other RMCs'.
2. Construction category (CC) is determined on the basis of the percent rock in relation to the total volume of all materials.
3. The percent rock is determined as follows:

$$\% \text{rock} = \frac{h^2}{H^2} * 100\%$$

Where:

- h = the vertical cut height of all rock measured from the bottom of the ditch
- H = the total vertical cut height of all materials including organic layers, glacial till and hardpan measured from the bottom of the ditch

4. Construction category may show a range of variation (\pm one CC) within any section length, and is recorded to the nearest integer. Hardpan is CC1, whether drilled and blasted or not. Rippable rock and boulders may occur in CC2 to CC6.
5. The following table defines the construction categories.

Table Appendix VIII-1: Construction Categories

Construction Category (CC)	1	2	3	4	5	6
% rock	0	1-12	13-37	38-62	63-87	88+

6. Rock mass classification (RMC) is based on the physical characteristics of rock encountered in forest road development and is the subject of a report commissioned by the Forest Engineering Research Institute of Canada in 1978 and prepared by Piteau & Associates/Geotechnical Consultants.
7. Rock can be classified into five types referred to as rock mass classification (RMC) values and identified as RMC 1, 2, 3, 4, and 5.
8. The steps taken to determine RMC values and apply these to road development cost estimates are:
 - a. examine and record surface hardness, weathering, and block diameter in the field,
 - b. determine subsurface hardness from the table in Appendix IV with this title,
 - c. determine RMC value from the table Appendix IV with this title, and
 - d. apply selected RMC values to applicable tables and formulas for road cost estimates.
9. The text and tables in Appendix IV have been derived from the report prepared by Piteau & Associates. These tables are used to determine the RMC-based factors required for road cost estimates.
10. In all circumstances where a complete interpretation of the rock mass classification system is required, the Piteau & Associates report is to be consulted directly.
11. Subgrade cost estimates are determined as follows:
 - a. all section lengths must be 0.3 km or longer, with the exception of short spurs and those sections which do not qualify under Subsection 3.b. Lengths are recorded to the nearest 0.001 km,
 - b. In general each section should consist of a length of road wherein:
 - i. variations in slope percentage measurement are within ± 15 percent of the average slope measured in the section. The uphill slope percent is measured at right angles to the road centreline, parallel to the ground of the uphill slope and recorded to the nearest percent (no rounding permitted). Where the road is located on a bench, the slope of the bench is used,

- ii. construction categories vary by no more than ± 1 construction category about the average construction category in the section,
 - iii. one rock mass class predominates,
 - iv. all stabilizing material is trucked or no stabilizing material is trucked,
 - v. stabilizing material is either all gravel or all rock.
- e. All sections with 60 percent or more (by length) of RMC 5 are designated as 'hard'.
 - f. If the total length of all 'hard' sections is greater than 90 percent of the total length of sections containing rock (i.e., CC 2-6), then the cost table for RMC 5 Only is applied to all roads in the appraisal.
 - g. If the roads do not qualify under 'c.' and 'd.' above, then the subgrade construction cost estimate table for other RMCs is applied to all roads in the appraisal.
12. The subgrade construction cost estimate includes the cost of clearing and grubbing, stripping, stump removal, incidental log decking, ditch construction, landing and turnout construction, and single log abutment culverts with spans less than 3.5 m. All pipe culverts 0.3 m diameter to 1.8 m diameter are estimated using Table 5-4.

Table Appendix VIII-2: Subgrade Construction Cost Estimates Expressed in Thousands of Dollars per Kilometre

a) RMC 5 ONLY						
Uphill Side Slope %	Construction Category					
	CC1	CC2	CC3	CC4	CC5	CC6
0-4	27.3	36.2	59.9	85.8	108.1	123.4
5-14	28.3	37.9	63.1	90.3	113.6	129.5
15-24	29.6	40.0	67.0	95.7	120.1	136.8
25-34	30.7	42.0	70.7	100.8	126.3	143.7
35-44	31.7	43.8	74.2	105.7	132.2	150.3
45-54	32.6	45.5	77.5	110.3	137.9	156.3
55-64	33.4	47.2	80.8	114.8	143.3	162.6
65-74	34.2	48.8	83.9	119.1	148.5	168.4
75-84	35.0	50.3	86.8	123.3	153.6	174.1
85-94	35.6	51.8	89.7	127.3	158.4	179.5
95-104	36.3	53.2	92.5	131.1	163.2	184.9
105-114	36.8	54.6	95.2	134.9	167.8	190.0
115-124	37.4	55.9	97.8	138.5	172.2	195.1
125-134	37.9	57.2	100.4	142.1	176.6	200.0
135-144	38.4	58.4	102.8	145.5	180.8	204.8
145-150	38.8	59.6	105.3	148.9	185.0	209.5

b) OTHER RMC's						
Uphill Side Slope %	Construction Category					
	CC1	CC2	CC3	CC4	CC5	CC6
0-4	27.3	34.0	51.9	72.0	89.6	101.9
5-14	28.3	35.5	54.5	75.5	93.9	106.6
15-24	29.6	37.3	57.6	79.7	98.9	112.2
25-34	30.7	39.0	60.6	83.7	103.7	117.5
35-44	31.7	40.6	63.4	87.5	108.3	122.6
45-54	32.6	42.1	66.0	91.1	112.7	127.5
55-64	33.4	43.5	68.6	94.6	116.9	132.1
65-74	34.2	44.9	71.0	97.9	120.9	136.7
75-84	35.0	46.2	73.3	101.2	124.8	141.0
85-94	35.6	47.4	75.6	104.2	128.5	145.2
95-104	36.3	48.6	77.8	107.2	132.2	149.3
105-114	36.8	49.7	79.9	110.1	135.7	153.3
115-124	37.4	50.8	81.9	112.9	139.2	157.2
125-134	37.9	51.9	83.9	115.7	142.5	161.0
135-144	38.4	52.9	85.8	118.3	145.8	164.7
145-150	38.8	53.9	87.7	120.9	149.0	168.3

VIII.3 Additional Stabilizing Material

1. Stabilizing material is gravel or broken rock which is placed on the road subgrade to provide stable support and a running surface for logging related equipment. Some stabilizing material may be created on site during subgrade construction. If additional stabilizing material is required it may be obtained from the adjacent cut-bank or trucked in.

VIII.4 Additional Stabilizing Material Cost Estimate

1. The total cost estimate per kilometre for the stabilizing material is:

$$\text{Cost Estimate (\$/km)} = V \text{ multiplied by } U$$

Where:

- a. V is the loose volume of additional stabilizing material expressed in cubic metres of material per kilometre of road, and
 - b. U is the cost estimate of the additional stabilizing material expressed in dollars per loose cubic metre of material.
2. The volume of rock or gravel expressed in cubic metres required to stabilize one kilometre of road which includes the length of turnouts and landings is calculated as follows:
 - a. Where rock is used, $VR = 1000D (W + 1.0D)$,
 - b. Where gravel is used, $VG = 1000D (W + 1.5D)$,

Where:

- i. W is the stabilized road width and has the value of 6.2 metres,
- ii. D is the loose depth of stabilizing material measured in metres determined from the table VIII-3,
- iii. VR is the volume of rock, and
- iv. VG is the volume of gravel.

Table Appendix VIII-3: Additional Loose Stabilizing Material Depths Expressed in Metres

Side Slope	Construction Category					
	1	2	3	4	5	6
0-4	0.8	0.8	0.7	0.6	0.6	0.5
5-14	0.7	0.7	0.7	0.6	0.5	0.4
15-24	0.7	0.6	0.6	0.5	0.4	0.4
25-34	0.6	0.6	0.5	0.4	0.3	0.3
35-44	0.5	0.5	0.4	0.3	0.3	0.2
45-54	0.4	0.4	0.3	0.3	0.2	0.1
55-64	0.3	0.3	0.3	0.2	0.1	0.0
65-74	0.2	0.2	0.2	0.1	0.0	0.0
75-84	0.2	0.1	0.1	0.0	0.0	0.0
85-94	0.1	0.1	0.0	0.0	0.0	0.0
95-104	0.0	0.0	0.0	0.0	0.0	0.0
105-114	0.0	0.0	0.0	0.0	0.0	0.0
115+	0.0	0.0	0.0	0.0	0.0	0.0

3. The factors of 1.0 and 1.5 relate to the slope of the fill material. More gravel than rock is required to stabilize a given kilometre of road (i.e., 1.5:1 fill slopes for gravel and 1:1 fill slopes for rock).
4. The quantities per kilometre and the depths by construction categories are only used in conjunction with tabular cost estimates.
5. a. A cost estimate may be calculated for the cost of additional stabilizing material and associated labour including:
 - i. borrow pit preparation,
 - ii. rock drilling, explosives, loading of explosives and blasting (e.g., compacted or cemented gravel, oversize material, etc.),
 - iii. loading gravel trucks when truck haul required, or placement of materials when trucking is not required,
 - iv. truck hauling, when required, and
 - v. spreading and compacting material.

- c. The cost estimates assume borrow pits are located adjacent to a road right-of-way. If an access road must be constructed to a borrow pit to build a road to a cutting authority area (the cutting authority area road), then a road cost estimate may be calculated for that access road and included as part of the road development adjustment in the appraisal of the first cutting authority area accessed by the cutting authority area road.
- d. Where the material to be used to stabilize the subgrade will be moved less than 0.1 km, the cost estimate for each material is:

i.	Gravel	\$5.65/m ³
ii.	Soft and Medium Rock	\$9.03/m ³
iii.	Hard Rock	\$11.86/m ³

Where: m³ = cubic metre of stabilizing material

- e. Where the material to be used to stabilize the subgrade must be moved a distance of 0.1 km or further, the cost estimate for each material is:

i.	Gravel	\$(7.74 + 0.616 d)/m ³
ii.	Soft and Medium Rock	\$(11.11 + 0.616 d)/m ³
iii.	Hard Rock	\$(13.94 + 0.616 d)/m ³

Where:

‘d’ is the distance that the material must be moved from the source of the material to the mid-point of the road section to be stabilized.

- e. In this section:
- ‘Soft-medium-Rock’ is rock where less than 60 percent of the rock from the excavation is RMC 5.
 - ‘Hard Rock’ is rock where 60 percent or more of the rock from the excavation is RMC 5.

VIII.5 Capping

1. Where the available material consists of large round or broken rock or 'dirty' or fine gravel which is unsuitable for normal traffic conditions, the appraisal may include a cost estimate for 'capping' of 0.2 m (loose depth) of suitable rock or gravel surfacing on road sections where required and providing the application is substantiated. This material is trucked in from a different borrow pit than the source of the stabilizing material unless the material has been sorted in the pit.
2. For further information, refer to the surfacing section in the regional manager's standardized methodology (i.e., *Detailed Engineering Estimates for Coast Stumpage Appraisal, February 1, 2001*).

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