

File: 280-20/195-30/CAPP

March 28, 2002

To: Regional Managers - Coast

From: The Honourable Michael de Jong
Minister of Forests

Re: *Coast Appraisal Manual*

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

This manual is effective April 1, 2002, and applies to all subsequent Coastal stumpage appraisals. Amendments or revisions to this manual require my further approval.


fo Michael de Jong
Minister



Attachment

pc: Bill Howard, Director, Revenue Branch

All Subscribers, *Coast Appraisal Manual*



REVENUE BRANCH

Coast Appraisal Manual

Effective April 1, 2002

Cost Base: July 1, 2000



BRITISH
COLUMBIA

This manual is intended for the use of individuals or companies when conducting business with the British Columbia Government. Permission is granted to reproduce it for such purposes. This manual and related documentation and publications, are protected under the *Federal Copyright Act*. They may not be reproduced for sale or for other purposes without the express written permission of the Province of British Columbia.

New Coast Appraisal Manual - Highlights

The new *Coast Appraisal Manual* includes clarification to policy and an updating of the cost base to July 1, 2000. By section, the significant changes are as follows:

Section 1.7	Stumpage appraisal parameters are defined.
Section 2.1	Regional manager approved rates has been deleted.
Section 2.2	Revised appraisal procedure.
Section 2.3	Revised reappraisal procedure.
Section 2.4	Revised anniversary date reappraisal procedure.
Section 2.5	Correctable error section replaces mathematical error.
Section 3.3.2(10)	Cedar grade separation for cruises compiled after April 1, 2002 will be done by the cruise compilation program.
Section 4.1.1	Balloon logging has been deleted.
Table 4-2	Revised subgrade cost estimates.
Table 4-4	Revised culvert cost estimates.
Table 4-5	Revised permanent/portable bridge cost estimates.
Section 4.3.2.3	Revised stabilizing material costs.
Section 4.4.1	Revised conventional tree-to-truck estimate.
Section 4.4.2.1	Revised helicopter logging - conventional cost estimate.
Section 4.4.2.2	New helicopter single tree selection cost estimate.
Section 4.5.1	Revised truck hauling equation.

Section 4.5.2.1	Point of appraisal moved from Chapter 2 to Chapter 4.
Section 4.5.2.2	Revised costs for Dump, Sort, Boom and Scale.
Table 4-7	Revised towing cost estimates.
Table 4-8	Revised barging cost estimates.
Section 4.5.3	Revised road maintenance and deactivation cost estimates.
Section 4.6.1	Revised corporate and forestry overhead cost estimates.
Section 4.6.2	Revised crew transportation cost estimate.
Section 4.6.3	Revised camp operations and overhead cost estimates. Accommodation costs are now included in general camp overhead.
Section 4.8	Revised basic silviculture cost estimates.
Section 4.9	Revised cost trend factors.
Table 6-3	Revised Miscellaneous Stumpage Rates for Timber Licences.
Section 7.4.2	Revised definitions of Discount Factor.
Section 7.4.6.1	Revised definitions of Discount Factor.
Appendix I	Revised Equipment and Labour Rates.
Appendix V	Added.
Appendix VI	Added.

Table of Contents

1 Introduction

1.1 Terms of Reference and Conventions	1-2
1.1.1 Terms and Conventions.....	1-2
1.1.2 Terms of Reference	1-2
1.2 Area of Application	1-3
1.3 Cutting Authority	1-4
1.3.1 Cutting Authority Area.....	1-4
1.4 Responsibility for Stumpage	1-5
1.5 Market Pricing System	1-6
1.6 Comparative Value Timber Pricing	1-7
1.7 Stumpage Adjustments (CVP)	1-8

2 Principles and Procedures

2.1 Types of Determination.....	2-2
2.2 Appraisal Procedure	2-3
2.3 Reappraisals	2-5
2.3.1 Anniversary Date.....	2-5
2.3.2 Sudden and Severe Damage	2-5
2.3.3 Accumulated Amendments	2-6
2.3.4 Minister's Direction	2-6
2.4 Anniversary Date Reappraisal Procedure.....	2-7
2.4.1 Cutting Authority Amendment Reappraisal Procedure.....	2-8
2.4.2 Sudden and Severe Damage Reappraisal Procedure	2-8
2.4.3 Minister Directed Reappraisal Procedure.....	2-8
2.5 Correctable Error.....	2-9
2.6 Fixed Stumpage Rate and Extensions of Term	2-11
2.7 Calculation Conventions	2-13
2.8 Coniferous Timber	2-14

3 Selling Price Estimation

3.1 Average Log Market Value Determination	3-2
3.2 Log Grade Percentages.....	3-3
3.2.1 Billing History Record	3-3
3.2.2 Log Grade Percentage Criteria	3-4
3.2.3 Source of Log Grade Percentage for Each Cutting Authority	3-6

3.2.3.1 Log Grade Percentages for a Cutting Authority Area Within the Geographic Boundaries of a Tree Farm Licence	3-6
3.2.3.2 Log Grade Percentages for a Cutting Authority Area Within a Timber Supply Area.....	3-8
3.2.4 Damaged Timber.....	3-9
3.3 Stand Selling Price	3-10

4 Operating Cost Estimation

4.1 Cost Estimates.....	4-2
4.1.1 Specified Operations	4-3
4.2 Appraisal and Reappraisal Data Requirements	4-4
4.3 Development	4-5
4.3.1 Development Cost Categories.....	4-6
4.3.1.1 Development Cost Allocation	4-9
4.3.2 Tabular Road and Bridge Cost Estimates.....	4-12
4.3.2.1 Subgrade Construction	4-12
4.3.2.2 Drainage Structures	4-16
4.3.2.3 Additional Stabilizing Material.....	4-19
4.3.3 Detailed Engineering Cost Estimates	4-22
4.3.3.1 Data Requirements	4-23
4.4 Tree To Truck.....	4-24
4.4.1 Conventional Logging.....	4-24
4.4.2 Helicopter Logging.....	4-24
4.4.2.1 Helicopter Logging.....	4-25
4.4.2.2 Helicopter Single Tree Selection - Standing Stem	4-25
4.5 Log Transportation.....	4-26
4.5.1 Truck Hauling	4-26
4.5.2 Water Transportation.....	4-27
4.5.2.1 Point of Appraisal.....	4-27
4.5.2.2 Dump, Sort, Boom and Scale	4-27
4.5.2.3 Towing or Barging	4-28
4.5.3 Routine Maintenance and Deactivation	4-31
4.5.4 Road Use Charges	4-31
4.6 Administration and Other Costs	4-33
4.6.1 Corporate and Forestry Overhead	4-33
4.6.2 Crew Transportation (Labour).....	4-34
4.6.3 Camp Operations and Overhead.....	4-35
4.6.3.1 General Camp Overhead	4-35
4.6.4 Low Volume Cost Estimate Additive	4-35
4.6.5 Clayoquot Sound.....	4-36
4.7 Total Logging Cost Estimate.....	4-37
4.8 Basic Silviculture	4-38
4.9 Cost Trend.....	4-39

5 Stumpage Rate Determination

5.1 Indicated Stumpage Rate	5-2
5.2 Value Index	5-3
5.3 Coast Mean Value Index	5-4
5.4 Market Value Indexing.....	5-5
5.5 Coast Base Rate.....	5-7
5.6 Calculation of Stumpage Rate.....	5-8

6 Misc. Timber Pricing Policies

6.1 Coast Value Indexes.....	6-2
6.2 Cutting Authorities With 5 000 m ³ or Less Volume	6-3
6.3 Partially Harvested Timber	6-4
6.4 Small Business Forest Enterprise Program (SBFEP) Sales	6-5
Fixed/Adjustable Stumpage Rates for SBFEP Cutting Authorities	6-5
6.5 Levies	6-6
6.6 Miscellaneous Stumpage Rates.....	6-7
6.6.1 Special Forest Products and Other Miscellaneous Rates	6-7
6.6.2 Salvage Logging Rates	6-7
6.6.3 Miscellaneous Stumpage Rates for Timber Licences	6-9

7 Market Pricing System

7.1 Introduction	7-2
7.2 Principles and Procedures	7-3
7.2.1 Appraisals.....	7-3
7.2.2 Stumpage Adjustments.....	7-3
7.2.3 Reappraisals	7-3
7.2.4 Methodology	7-3
7.3 Log Selling Prices	7-5
7.3.1 Log Grade Percentage	7-5
7.3.2 Calculation of Stand Selling Price	7-5
7.4 Stumpage Calculations.....	7-6
7.4.1 List of MPS Variables	7-6
7.4.2 Preliminary Upset Stumpage Rate (Step 1).....	7-6
7.4.3 Number of Bidders (Step 2)	7-7
7.4.4 Market Stumpage Price (Step 3)	7-9
7.4.5 Total Obligation Adjustment.....	7-10
7.4.6 Indicated Stumpage Rate.....	7-10
7.4.6.1 High Development Cost Discount Factor	7-11
7.4.7 Prescribed Minimum Stumpage Rate.....	7-11
7.4.8 Reserve Stumpage Rate.....	7-11

7.4.9 Upset Stumpage Rate	7-11
7.4.10 Total Stumpage Rate	7-12
7.5 Deciduous and Miscellaneous Forest Products	7-13

Appendices

Appendix I Equipment and Labour Rates	A-2
Appendix II Reconstruction and Replacement	A-4
Appendix III Development Cost Allocation	A-5
Appendix IV Rock Mass Classification	A-6
Appendix V Specifications: Calculating Stumpage Rates for Coast Appraisals Using the Market Pricing System	A-8
Appendix VI Specifications: Calculating Stumpage Rates for Coast Appraisals Using the Comparative Value Pricing System	A-18

Index

Tables

Table 3-1: Billing History Record for Licence or Timber Supply Area.....	3-3
Table 3-2: Billing History Record for Cutting Authority (Mark)	3-4
Table 4-1: Construction Categories.....	4-13
Table 4-2: Subgrade Construction Cost Estimate	4-15
Table 4-3: Log Bridge Cost Estimate	4-17
Table 4-4: Culvert Cost Estimate	4-17
Table 4-5: Permanent/Portable Bridge Cost Estimates	4-18
Table 4-6: Additional Loose Stabilizing Material Depths	4-20
Table 4-7: Towing Cost Estimates	4-29
Table 4-8: Barging Cost Estimates.....	4-30
Table 4-9: District Silviculture Cost Estimates.....	4-38
Table 4-10: Trend Factor by Effective Date.....	4-39
Table 6-1: Miscellaneous Stumpage Rates	6-8
Table 6-3: Miscellaneous Stumpage Rates for Timber Licences	6-9

This page is intentionally left blank.

Introduction

1

1.1 Terms of Reference and Conventions

1.1.1 Terms and Conventions

Procedures	<i>Italics</i>	Indicate the formal name of a document. e.g. <i>Forest Act, Coast Appraisal Manual</i>
	Headings	1. = Chapter 1.1 or 1.1.1.1 = Section of chapter 1 1.1.1.1, (2) = Section within chapter 1, with subsection. Table 4-2 = Table 2 within chapter 4

1.1.2 Terms of Reference

The *Forest Act*, sections 103 to 108, and regulations provide the statutory authority for the determination of stumpage for Crown timber.

The *Forest Act*, section 105, requires adherence to the policies and procedures approved for the forest regions by the Minister of Forests. This *Coast Appraisal Manual*, approved by the minister, contains the policies and procedures for determining stumpage rates charged for Crown timber harvested in the area described in section 1.2.

1.2 Area of Application

This manual applies to the "Coast" which is defined as that geographic area included within the Vancouver Forest Region, as established by the *Forest Act* and *Regulations under the Forest Act*, and the North Coast Forest District.

1.3 Cutting Authority

The term "cutting authority" means one of the following:

1. A cutting permit issued under:
 - a. a forest licence,
 - b. a timber sale licence that provides for the issuance of cutting permits,
 - c. a tree farm licence,
 - d. a community forest agreement,
 - e. a woodlot licence, or
 - f. a timber licence.
2. A timber sale licence under which cutting permits have not or will not be issued.
3. A licence to cut.
4. A road permit.

1.3.1 Cutting Authority Area

The term "cutting authority area" means the area that:

1. Timber may be harvested from, under a cutting authority, and
2. Has a unique timber mark, or marks.

1.4 Responsibility for Stumpage

For the purposes of section 105 of the *Forest Act*, the following employees of the ministry are authorized to determine, redetermine and vary stumpage rates:

- regional managers, regional appraisal coordinators and employees of the regional revenue section, and
- director, Revenue Branch of the Ministry of Forests (Revenue Branch) and employees of the Revenue Branch.

1.5 Market Pricing System

Market pricing system (MPS), subject to a minimum stumpage rate and subsections 2.1 (3) and 2.1 (4), is the basis for determining stumpage rates for cutting authority areas under timber sale licences awarded under sections 20 and 21 of the *Forest Act* on or after January 1, 1999, and other cutting authority areas as directed by the Minister of Forests.

1.6 Comparative Value Timber Pricing

Comparative value pricing (CVP), subject to a minimum stumpage rate and subsections 2.1 (3), and 2.1 (4) is the basis for determining stumpage rates for all cutting authority areas except those specified under section 1.5.

The stumpage rate for a cutting authority area is more or less than the coast base rate (see section 5.5) depending on whether or not the timber in the cutting authority area is more or less valuable than timber from the average cutting authority area. To make that assessment and hence to determine a stumpage rate, the authorized Ministry of Forests employee (see section 1.4) will typically:

1. Estimate the average selling price of the logs for the cutting authority area (see chapter 3).
2. Estimate the least operating cost (see chapter 4) for the cutting authority area.
3. Determine the value index (see chapter 5) for the cutting authority area by subtracting the estimated least operating cost from the estimated average selling price.
4. Determine the indicated stumpage rate by comparing the value index for the cutting authority area with the coast mean value index and adding the coast base rate (see chapter 5).
5. Determine the reserve stumpage rate (see chapter 5) by selecting:
 - a. the greater of the indicated stumpage rate or the prescribed minimum stumpage rate, or
 - b. for an appraised cutting authority area containing timber licence volume, the greater of the adjusted indicated stumpage rate or the prescribed minimum stumpage rate.
6. Determine the upset stumpage rate by adding any development or silviculture levies (see section 6.5) to the reserve stumpage rate,
7. Determine the total stumpage rate by adding any bonus bid to the upset stumpage rate.

One stumpage rate is determined for all appraised timber in each cutting authority area with the exception of miscellaneous stumpage rates under section 6.6.

1.7 Stumpage Adjustments (CVP)

1. Unless a cutting authority or the application and tender for a timber sale licence specifies that stumpage rates are fixed for a specified period or for the full term of the cutting authority, stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1 of each year, subject to section 6.4.
2.
 - a. Each quarterly stumpage adjustment will be calculated using stumpage appraisal parameters approved by the director, Revenue Branch.
 - b. Stumpage appraisal parameters are:
 - i. Statistics Canada coast composite index,
 - ii. coast target rate,
 - iii. coast base rate,
 - iv. coast mean value index,
 - v. average log market values.
3. Stumpage rates are adjusted to reflect changes in estimated average selling prices based on revised average log market values (as authorized in this manual since the previous adjustment) and the recalculated operating cost based on the appropriate trend factors in section 4.9. In addition, the adjustment reflects changes in the Statistics Canada coast composite index, the coast base rate and the coast mean value index (see section 5).

Principles and Procedures

2

2.1 Types of Determination

Stumpage rates are determined, redetermined or varied by:

1. An appraisal, reappraisal or quarterly adjustment using the comparative value pricing system,
2. an appraisal, reappraisal or quarterly adjustment using the market pricing system,
3. an Order-in-Council under the *Forest Act*, section 105, or
4. a procedure identified in chapter 6 of this manual.

2.2 Appraisal Procedure

1. An appraisal is a process used to determine a stumpage rate for a cutting authority area using the *Coast Appraisal Manual* in effect on the effective date of the cutting authority.
2. A licensee shall submit a coast appraisal data submission to the district manager when the licensee makes an application for a cutting authority.
3. The district manager or their designate may require the licensee to complete and submit the least cost assessment page of the coast appraisal data submission for both aerial and cable harvesting methods when the district manager is not satisfied that the method proposed by the licensee is the only method that is suitable for the area intended to be harvested.
4. The licensee shall submit to the district manager any other information required by the district manager or their designate for the purposes of the appraisal.
5. The submissions under subsections (2) to (4) of this section must be signed and sealed by a professional forester registered in the Province of British Columbia.
6. The district manager or their designate may review the licensee's submission and will notify the licensee, in writing, of any omissions, errors or provisions of the *Coast Appraisal Manual* that, in the opinion of the district manager or their designate, the signing professional forester may not have considered. The licensee's signing professional forester will consider the district manager's or their designate's notification and may revise the submission.
7. The district manager or their designate shall give any information supplied by the licensee under this section to the person who determines the stumpage rate together with any other information that the district manager or their designate considers relevant to the appraisal.
8. The person who determines the stumpage rate may review the licensee's submission, and information supplied by the district manager or their designate, and will notify the licensee, in writing, of any omissions, errors or provisions of the *Coast Appraisal Manual* that, in the opinion of the person who determines the stumpage rate, the signing professional forester may not have considered. The licensee's signing professional forester will consider the notification and may revise the submission.
9. To determine the stumpage rate the person who determines the stumpage rate will consider:
 - a. the information provided by the licensee and the district manager or their designate, and

- b. any information available to the person who determines the stumpage rate that is relevant to the appraisal.
10. Regional staff will notify the licensee of the stumpage rate in the form of a stumpage advisory notice and will provide the licensee with a summary of the information used to determine the stumpage rate.
 11. Within three (3) weeks of the date of the stumpage advisory notice, the licensee may notify regional revenue staff, in writing, of any objection to the information contained in the stumpage advisory notice that could be resolved without a review or appeal. The written objection must state the grounds for objection as well as a statement describing the relief requested. At this point, the objection is not considered a review or appeal under the *Forest Act* (section 143 to 150).
 12. Regional revenue staff will notify the licensee, in writing, if the objection referred to in subsection (11) cannot be resolved. In this notification, the regional revenue staff will indicate that the three (3) week time requirement for notice for review specified in section 144 (3) of the *Forest Act*, will commence upon receipt of this notification.

2.3 Reappraisals

1. A reappraisal is a process used to redetermine a stumpage rate for a cutting authority area using the *Coast Appraisal Manual* in effect on the effective date of the reappraisal.
2. A reappraisal is based on a complete reassessment of the cutting authority area at the time of the reappraisal, as if the area has been returned to the condition it was in prior to development or harvesting.
3. At the time of a reappraisal, initial detailed engineering cost estimates may be re-estimated once after construction utilizing information as specified in section 4.3.3. However, development costs originally estimated using ministry approved competitive bids, are not re-estimated in a reappraisal.

2.3.1 Anniversary Date

1.
 - a. In this manual “anniversary date” of a cutting authority means, in any given year, the anniversary of the effective date of the cutting authority.
 - b. A cutting authority area of a cutting authority that has an adjustable stumpage rate must be reappraised. The reappraisal is effective on the anniversary date.

2.3.2 Sudden and Severe Damage

1. A cutting authority area that has a fixed stumpage rate or a stumpage rate that is adjusted quarterly may be reappraised if the licensee submits a written request for a reappraisal to the regional manager because of sudden and severe damage to the previously appraised timber, and the regional manager is satisfied that the sudden and severe damage has occurred.
2. Where the cutting authority area is reappraised because of sudden and severe damage to the appraised timber, the effective date of the reappraisal is the first of the month following the occurrence of the damage, unless otherwise specified by the regional manager. A reappraisal will not be made in the case of fire damage caused by the licensee if the licensee has failed to comply with any of sections 75 through 95 of the *Forest Practices Code of British Columbia Act* or the *Forest Fire Prevention and Suppression Regulation*.
3. Despite subsection (2) where the cutting authority area is reappraised because of sudden and severe damage the redetermined stumpage rate is based upon the remaining timber only. The reappraisal cost estimate for development takes into account volume already removed.

4. Where a cutting authority area is reappraised because of sudden and severe damage any existing bonus bid remains in effect despite a redetermination of the upset stumpage rate because of the damage.

2.3.3 Accumulated Amendments

1.
 - a. If accumulated amendments (either addition or deletion of area containing merchantable timber) made to the cutting authority area exceed 25 ha or 25 percent of the area containing merchantable timber, whichever is less, then the entire cruise must be recompiled and the cutting authority area shall be reappraised.
 - b. The reappraisal is effective on the first of the month following the notice to the licensee of the amendment approval.

2.3.4 Minister's Direction

1. The Minister of Forests may direct that a reappraisal be made at any time and that the redetermined stumpage rate be effective on any future date, and may specify criteria and procedures for the reappraisal.
2. A reappraisal directed by the Minister of Forests, may be a re-estimation of operating cost, log grade percentages, or selling price, or any combination of them, as may be directed by the Minister of Forests.
3. The Minister of Forests may direct that a reappraisal be made using the market pricing system.

2.4 Anniversary Date Reappraisal Procedure

1. The licensee shall submit to the district manager a coast appraisal data submission at least 45 days prior to the anniversary of the cutting authority.
2. The district manager or their designate may require the licensee to complete and submit the least cost assessment page of the coast appraisal data submission for both aerial and cable harvesting methods when the district manager is not satisfied that the method proposed by the licensee is the only method that will be suitable for the area intended to be harvested by that method.
3. The licensee shall submit to the district manager any other information required by the district manager or their designate for the purposes of the appraisal.
4. The submissions under subsections (1), (2) and (3) of this section must be signed by a professional forester registered in the Province of British Columbia.
5. The district manager or their designate may review the licensee's submission and will notify the licensee, in writing, of any omissions, errors or provisions of the *Coast Appraisal Manual* that, in the opinion of the district manager or their designate, the signing professional forester may not have considered. The licensee's signing professional forester will consider the district manager's or their designate's notification and may revise the submission.
6. The district manager or their designate shall give any information supplied by the licensee under this section to the person who determines the stumpage rate and the licensee together with any other information that the district manager or their designate considers relevant to the appraisal.
7. The person who determines the stumpage rate may review the licensee's submission, and information supplied by the district manager or their designate, and will notify the licensee, in writing, of any omissions, errors or provisions of the *Coast Appraisal Manual* that, in the opinion of the person who determines the stumpage rate, the signing professional forester may not have considered. The licensee's signing professional forester will consider the notification and may revise the submission.
8. To determine the stumpage rate, the person who determines the stumpage rate will consider:
 - a. any information provided by the licensee and the district manager or their designate, and
 - b. any information available to the person who determines the stumpage rate that is relevant to the appraisal.

9. Regional staff will notify the licensee of the stumpage rate in the form of a stumpage advisory notice and will provide the licensee with a summary of the information used to determine the rate.
10. Within three (3) weeks of the date of the stumpage advisory notice, the licensee may notify regional revenue staff, in writing, of any objection to the information contained in the stumpage advisory notice that could be resolved without a review or appeal. The written objection must state the grounds for objection as well as a statement describing the relief requested. At this point, the objection is not considered a review or appeal under the *Forest Act* (section 143 to 150).
11. Regional revenue staff will notify the licensee, in writing, if the objection referred to in subsection (10) cannot be resolved. In this notification, the regional revenue staff will indicate that the three (3) week time requirement for notice for review specified in section 144 (3) of the *Forest Act*, will commence upon receipt of this notification.

2.4.1 Cutting Authority Amendment Reappraisal Procedure

1. The licensee shall submit to the district manager a coast appraisal data submission when the accumulated amendments to the cutting authority area require a reappraisal under subsection 2.3.3.
2. Thereafter the cutting authority area amendment reappraisal procedure shall be the same procedure as that required by subsections 2.4 (2) through 2.4 (11).

2.4.2 Sudden and Severe Damage Reappraisal Procedure

1. The licensee shall submit to the district manager a coast appraisal data submission at the same time as the licensee requests a reappraisal.
2. Thereafter the sudden and severe damage reappraisal procedure shall be the same procedure as that required by subsections 2.4 (2) through 2.4 (11).

2.4.3 Minister Directed Reappraisal Procedure

1. The licensee shall submit to the district manager a coast appraisal data submission, if requested by the district manager or their designate, within thirty days of the minister's direction.
2. Thereafter the ministerial direction reappraisal procedure shall be the same procedure as that required by subsections 2.4 (2) through 2.4 (11).

2.5 Correctable Error

1. In this section, a correctable error means:
 - a. an error made by a Ministry of Forests 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 may 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, Revenue Branch,
 - 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 shall notify the person who gave the notice of the correctable error,
 - b. the regional manager or the director shall take reasonable steps to ensure that all licensees who may have been affected by a similar correctable error are informed of the decision,
 - 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 by the person who determined the stumpage rate,
 - (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,

- (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.

2.6 Fixed Stumpage Rate and Extensions of Term

Small Business Forest Enterprise Program

1. Under the small business forest enterprise program a fixed stumpage rate means that the reserve stumpage rate, levies and bonus bids will not change during the term of the cutting authority and all extensions. The only exceptions are if a reappraisal is done under section 2.3.2 due to sudden and severe damage or under section 2.3.4 because of a minister's direction.

Woodlots

2.
 - a. A stumpage rate of a cutting authority issued under a woodlot licence shall be adjusted quarterly unless a woodlot licensee chooses in accordance with this section to have a stumpage rate that is not adjusted quarterly.
 - b. Where before or after the appraisal of the cutting authority area a licensee chooses to have a stumpage rate that is not adjusted quarterly, he or she may give written notice of that choice to the regional appraisal coordinator no more than three (3) weeks after the date of the stumpage advisory notice. Where proper notice is given the stumpage rate will not be adjusted quarterly.
 - c. Where prior to the anniversary date of a cutting authority a licensee who has a stumpage rate that is not adjusted quarterly wishes to have a quarterly adjusted stumpage rate after the anniversary date, the licensee must give written notice of that request to the regional appraisal coordinator prior to the issuance of the anniversary date reappraisal stumpage advisory notice. Where proper notice is given, the stumpage rate shall thereafter be adjusted quarterly.
 - d. Where prior to the anniversary date of a cutting authority a licensee who has a quarterly adjusted stumpage rate wishes to have a stumpage rate that is not adjusted quarterly after the anniversary date, the licensee must give written notice of that request to the regional appraisal coordinator prior to the issuance of the anniversary date reappraisal stumpage advisory notice. Where proper notice is given, the stumpage rate shall thereafter not be adjusted quarterly.

District Average Value Index

3. Where the stumpage rate has been determined under section 6.1 or section 6.2 and the term of the cutting authority is extended, the cutting authority area must be reappraised. The reappraisal is effective on the anniversary date.

Timber Licence

4. Where the term of a cutting authority that includes the authorization to harvest timber in a timber licence area has been extended, the stumpage rate will be determined under section 6.6, if:
 - a. the cutting authority has a term that began before May 1, 1995, and
 - b. the cutting authority area has not been appraised.

Miscellaneous Stumpage Rates

5. Miscellaneous stumpage rates (section 6.6) will be based on the *Coast Appraisal Manual* in effect on the date of scale, except for those cutting authorities that specify miscellaneous stumpage rates in their cutting authority document.

2.7 Calculation Conventions

1. All operating cost calculations will be performed to the full capacity of the calculating machine with the results truncated at four places of decimals and rounded to two places.
2. Results from 5 to 9 will be rounded upward and from 1 to 4 will be rounded downward.
3. Each phase cost estimate (\$/m³) (see chapter 4) will be rounded to the nearest cent and will be added to the other phase cost estimates to obtain the total cost estimate.
4. Where values are specified as limits (constraints or requirements for equations), they will be treated as absolute values and actual measurements or records will not be rounded before use unless otherwise specified in this manual.
5. MPS stumpage rate calculations will be performed according to the methods outlined in Appendix V, entitled *Specifications: Calculating Stumpage Rates for Coast Appraisals for the Market Pricing System*.
6. CVP stumpage rate calculations will be performed according to the methods outlined in Appendix VI, entitled *Specifications: Calculating Stumpage Rates for Coast Appraisals*.

2.8 Coniferous Timber

1. In this manual, second growth coniferous timber means timber that is less than 141 years old.
2. In this manual, mature coniferous timber means timber that is 141 years old or older.
3. The volume of mature 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.
4. Where the volume of second growth timber in a cutting authority area is eighty percent or greater of the volume of all 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 timber using the second growth average log market values.

Selling Price Estimation

3

3.1 Average Log Market Value Determination

1. Invoiced free on board log market values shall be compiled by the Revenue Branch from prime, domestic, arms-length sales reported to the Revenue Branch to have occurred in areas adjacent to the Strait of Georgia; the Strait of Juan de Fuca and the Alberni Inlet east of a line drawn south from Amphitrite Point; Johnstone Strait; the Queen Charlotte Strait south of a line drawn west from Cape Caution; and the Fraser River west of the bridge at the confluence of the Pitt River. The cut-off date for the collected log market value input is forty-five (45) days prior to the stumpage rate adjustment date.
2. Schedules of average log market values by species and log grade are compiled using sales data for each one-month reporting period. The data shall be summarized into a six-month schedule of average log market values by species and log grade for mature timber stumpage rate determinations. A six-month schedule of average log market values by species and log grade for second growth stumpage determinations shall be produced in accordance with the information paper entitled *Calculation of Log Average Market Values*.
3. Schedules of average log market values used in stumpage appraisals, reappraisals and quarterly adjustments shall be approved by the director, Revenue Branch.

3.2 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 sections 3.2.1, 3.2.2, 3.2.3 and 3.2.4.

3.2.1 Billing History Record

The log scale data reported on stumpage invoices issued by Revenue Branch of the Ministry of Forests is the billing history record. The billing history record is kept by the Ministry of Forests.

A billing history record of a particular geographic area is a record of log scale data reported on stumpage invoices issued by the Revenue Branch of the Ministry of Forests for timber harvested in that geographic area.

Except as provided in sections 3.2.2, 3.2.3 and 3.2.4, the part of the billing history record that will be used when the person who determines the stumpage rate does an appraisal or reappraisal of a cutting authority area will be the two year billing history record as determined in Table 3-1 and Table 3-2. The date of issue on the stumpage invoice determines whether or not the log scale data is included in the two year billing history record.

Where the effective date of the appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 3-1, the two year billing history record for the licence or timber supply area shall end on the corresponding date in Column 2 of Table 3-1 which immediately precedes the effective date of the appraisal or reappraisal.

Table 3-1: Billing History Record for Licence or Timber Supply Area

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

Where the effective date of the appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 3-2, the two year billing history record for the cutting authority shall end on the corresponding date in Column 2 of Table 3-2 which immediately precedes the effective date of the appraisal or reappraisal.

Table 3-2: Billing History Record for Cutting Authority (Mark)

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

3.2.2 Log Grade Percentage Criteria

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

1. The log grade percentage is the percentage by volume that log grade is of the total volume, of the species of timber being considered.
2. Except as provided in subsections (6), (7), (8) and (9) of this section and section 3.2.4, 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. Before a two year billing history record for a species of timber can be used in an appraisal or reappraisal, that two year billing history record must be at least 25 percent of the cutting authorities' net cruise volume of that species or 2 000 m³ whichever is greater.
5. Where there is not at least 25 percent of the cutting authorities' net cruise volume of that species or 2 000 m³ whichever is greater, within the two year billing history record of a tree farm licence area or a timber supply area.
 - a. the billing history record that will be used for that species of timber will be the five year billing history record, and
 - b. where the effective date of the appraisal or reappraisal falls within the period of the year listed in Column 1 of Table 3-1 or Table 3-2, the five year billing history shall end on the corresponding date in Column 2 of Table 3-1 or Table 3-2, which immediately precedes the effective date of the appraisal or reappraisal.
6. Where the cutting authority area of a cutting authority is issued under a woodlot licence is appraised or reappraised the log grade percentages for each species of timber will be derived from the cruise compilation algorithm predictions.
7. Where the cutting authority area of a cutting authority issued under the small business forest enterprise program, or a replaceable timber sale licence that does not consist of second growth coniferous timber is appraised or reappraised, the log grade percentages for each species of timber will be derived from:
 - a. the two year billing history record, where 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
 - b. 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.
8. Where the cutting authority area being appraised or reappraised contains second growth coniferous timber and is not a cutting authority area referred to in subsections (6) or (7) of this section, the log grade percentages for each species of timber will be derived from either:
 - a. the two year billing history record, where 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
 - b. the cruise compilation algorithm predictions, where the two year billing history record for the 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.

9. Where the cutting authority area being appraised or reappraised consists of partial harvesting where eighty percent of the cutting authority volume is in cut blocks having at least thirty percent volume retention, the log grade percentage for each species of timber will be derived from either:
 - i. the two-year billing history record, where the two-year billing history record for that cutting authority includes at least twenty-five percent of the cutting authorities' net cruise volume of that species or 2 000 m³ whichever is greater, or
 - ii. the cruise compilation algorithm predictions, where the two year billing history record for the cutting authority does not include at least twenty-five percent of the cutting authorities net cruise volume of that species or 2 000 m³, whichever is greater.
10.
 - a. For cruises compiled before April 1, 2002, the cruise summary log grade data for cedar grades D and K, F and L, and I and M must be separated by using the proportional grade percentages from the first appropriate level in section 3.2.3.
 - b. For cruises compiled on and after April 1, 2002 the cedar grades will be separated by the cruise compilation program.

3.2.3 Source of Log Grade Percentage for Each Cutting Authority

1. Except for those cutting authorities or cutting authority areas referred to in subsections 3.2.2 (6), 3.2.2 (7), 3.2.2 (8) and 3.2.2(9), 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 3.2.3.1, where the cutting authority area is entirely within the geographic boundaries of one tree farm licence, or
 - b. Section 3.2.3.2, where the cutting authority area is entirely within the geographic boundaries of one timber supply area.

3.2.3.1 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 the cutting authority area is comprised of at least eighty percent second growth coniferous timber, the log grade percentages for that cutting authority

area will be determined in accordance with the requirements of subsection 3.2.2 (8).

- b. Where the cutting authority area is not comprised of at least eighty percent second growth coniferous timber, then 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 that timber licence that meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
 - 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 the portion of the tree farm licence area that lies within the geographic boundaries of the forest district that contains the cutting authority area and that meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
 - 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 two year billing history record for the entire tree farm licence area that contains at least 25 percent of the cutting authorities' net cruise volume of that species or 2 000 m³ whichever is greater, then that billing history record will be the source of the log grade percentages for that species, or
 - b. Where there is no such billing history record, the person determining the stumpage rate will determine the log grade percentages for that species in accordance with subsection 3.2.2 (5).

3.2.3.2 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, of the log grade percentages for the cutting authority area will be determined in the following manner:

1. a. Where the cutting authority area is comprised of at least eighty percent second growth coniferous timber, the log grade percentages for that cutting authority area will be determined in accordance with the requirements of subsection 3.2.2 (8), or
 - b. where the cutting authority area is not comprised of at least eighty percent 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 a timber licence or licences, the person determining the stumpage rate will proceed to subsection 3 of this section, or
 - b. where the cutting authority area is not entirely within the geographic boundaries of a timber licence or licences, the person determining the stumpage rate will then proceed to subsection 4 of this section.
3. a. Where the species being considered has a billing history record for that timber licence or licences that meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
 - 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 species being considered has a billing history record for the supply block of the timber supply area for the cutting authorities that were issued under the same licence as the cutting authority area being appraised or reappraised and that billing history record meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
 - 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 the timber supply area for the cutting authorities that were issued under the same licence as the cutting authority area being appraised or reappraised and that billing history record meets the criteria of subsection 3.2.2 (4), then that billing history record

- will be the source of the log grade percentages for that species, or
- 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 species being considered has a billing history record for the entire supply block in the timber supply area that meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
- 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 species being considered has a two year billing history record for the entire timber supply area that meets the criteria of subsection 3.2.2 (4), then that billing history record will be the source of the log grade percentages for that species, or
- b. where there is no such billing history record, the person determining the stumpage rate will determine the log grade percentages for that species in accordance with subsection 3.2.2 (5).

3.2.4 Damaged Timber

Where the regional manager determines that the timber in a cutting authority area is significantly damaged, then notwithstanding sections 3.2.1, 3.2.2 and 3.2.3, the log grade percentages for the cutting authority area being appraised or reappraised may be estimated from available site specific information.

3.3 Stand Selling Price

1. For appraisals and reappraisals, in all cases and without regard to utilization requirements, the stand selling price is determined using the net cruise volumes and species selling prices of the following species of timber:

Alder	Fir
Balsam	Hemlock
Cedar	Lodgepole Pine
Cottonwood	White Pine
Cypress	Sitka Spruce
Birch	Engelmann Spruce
Maple	

Stand Selling Price Calculation

2. Subject to subsection 3 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 in that cutting authority area 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.
3. For the purposes of determining a stand selling price:
 - a. birch and maple are deemed to be alder,
 - b. in the Pemberton, Yale and Nahatlatch timber supply blocks:
 - i. all spruce is deemed to be Engelmann spruce, and

- ii. the hemlock and balsam average log market value will be used to determine the species grade values for all spruce in the cutting authority area,
- c. 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 average log market values will be used to determine the species grade values of all spruce in the cutting authority area,
- d. 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 average log market values will be used to calculate the species selling price for both old growth and second growth Douglas-fir timber, and
- e. where the cypress net cruise volume of the cutting authority area is less than 2 000 m³, the cypress J log grade average market value will be used to calculate the species selling price of cypress grades D, F, H, I, and J.

This page is intentionally left blank.

Operating Cost Estimation

4

4.1 Cost Estimates

1. The operating cost estimate is the sum of the trended total logging cost estimate and the trended basic silviculture cost estimate as detailed in this chapter.
2. Phase cost estimates, predictive formulas and most of the tables in this manual are derived from data collected through surveys of logging and forest management costs incurred by licensees and contractors operating in the coastal region of British Columbia.
3. The surveys collect licensee costs from both licensee and contractor operations: including wages, benefits, overtime, depreciation, fuel, supplies, repair and maintenance, moving assistance, freight, applicable licences, insurance, etc. from a representative sample of coast operations. Contract costs, including contractor profit and risk margins, overhead, crew transportation, etc., are also included.
4. Phase cost estimates reflect average conditions, operating practices, and phase accounting allocations as found in the survey data.
5. With the exception of specified operations listed in section 4.1.1, no additions to or subtractions from the phase cost estimates are permitted.
6. The person who determines the stumpage rate must estimate total operating costs for a cutting authority area in a manner that will produce the appraisal least total operating cost estimate for the cutting authority area.
7. The appraisal estimate of harvesting and transportation costs must be determined by using the criteria for determining the harvesting and transportation costs as set out in this manual.
8. The estimate of harvesting costs must be determined for the method of harvesting referred to in this manual, other than a method that the district manager states is unsuitable for the cutting authority area, that will produce the appraisal least total operating cost estimate.
9. The estimate of the transportation costs must be determined for the method of transportation referred to in this manual, other than a method that the district manager states is unsuitable for the cutting authority area, that will produce the appraisal least total operating cost estimate.

4.1.1 Specified Operations

In addition to the logging phases and systems that are covered by this manual, there are specified operations which require special cost estimates.

The following is a complete list of specified operations for which certain cost phase estimates are based on the information on hand rather than on the tables and formulas in this manual. Specified operation cost estimates are combined with associated *Coast Appraisal Manual* phase cost estimates to determine the total operating cost for the cutting authority being appraised.

SPECIFIED OPERATIONS	AFFECTED PHASE
A-frame Logging	Tree-to-Truck (section 4.4)
Blowdown Timber	Tree-to-Truck (section 4.4)
Partial Harvesting	Tree-to-Truck (section 4.4)
Skyline Logging	Tree-to Truck (section 4.4)
Tree Crown Modification	Tree-to-Truck (section 4.4)
Lake Transportation	Log Transportation (section 4.5)
Skidder Swinging	Log Transportation (section 4.5)
Towing to Tie-up Grounds (over 10 km Distance)	Log Transportation (section 4.5)
Camp Moves (of greater than 10 km)	Administration and Other Costs (section 4.6) except Helicopter Logging
Destumping for Root Disease Control	Administration and Other Costs (section 4.6)

The specified operations phase costs are monitored and updated by the regional manager and may not be part of the annual cost collection and analysis process.

4.2 Appraisal and Reappraisal Data Requirements

The cruise and all other pertinent information required for the appraisal must be submitted with the appropriate coast appraisal data submission.

Unless otherwise specified by the director, Revenue Branch, cruise data must be gathered and compiled according to the approved utilization specifications and in accordance with the following ministry of forests publications:

- Ministry of Forests *Cruising Manual*,
- Ministry of Forests *Cruise Compilation Manual*,
- Forest Service Policies (e.g., Timber Utilization Policy & Procedures for the Coast of the Province), and
- Regional Publications (e.g., chapter 9 of *Cruising Manual*).

In order to verify the accuracy of the cruise compilation program, the licensee must provide, on request, photocopies of the tally sheets and a magnetic copy of the compilation in a format required by the regional manager.

The appraisal is done using the net cruise volume of timber. The net cruise volume (m^3) is the gross volume (m^3) less decay, waste and breakage for all the species listed in section 3.3. The cutting authority total net cruise volume is determined by multiplying the net cruise volume per hectare (m^3/ha) by the total merchantable timbered area (ha) to be harvested under the cutting authority. The total merchantable timbered area is determined from the cruise summary.

If the application for a cutting authority is subsequently modified, the cruise submission must be recompiled by the applicant when more than five percent of the total number of compiled plots used in the cruise submission lie outside the boundaries established for the initial appraisal of the cutting authority.

Each reappraisal of a cutting authority area that has been amended after the appraisal must be done using the net cruise volume by species which is determined by adjusting the original cruise volume on the basis of approved amendments after the appraisal.

Plots located in areas requiring helicopter logging or specified operations are included in the cruise compilation calculation of conventional logging.

4.3 Development

Development costs are estimated for each of two categories:

1. New construction.
2. Reconstruction and replacement.

A unit cost (\$/m³) is calculated for each category of section 4.3.1 and section 4.3.1.1 and these unit costs are totalled to give a total development cost estimate (\$/m³).

In order to calculate the unit costs (\$/m³) by category, the applicable volume will be the total net cruise volume (as defined in section 4.2) or the remaining volume.

The costs for development works may only be allocated to tributary cutting authorities. A cutting authority is considered to be tributary if:

1. Timber from the cutting authority is appraised over the development works in question.
2. The development works occur on a main service road. A main service road is defined as a main access road to the operation necessary to maintain and supply the day-to-day harvesting activities of the cutting authority area being appraised. To qualify, the road must be used on a regular basis for the transport of bulk fuels, supplies, equipment and harvesting crews.

Two methods of estimating development costs are used in the appraisal system:

1. Tabular cost estimates are made for new construction of roads and drainage structures using the applicable tables and formulas in section 4.3.2 of this manual. Tabular estimates are used for an appraisal when physical dimensions and conditions fall within the tabular limitations.
2. Detailed engineering cost estimates are made when the physical dimensions and conditions of a road section or a drainage structure exceed the tabular limitations of the manual. If a tabular estimate cannot be made due to table limitations, then a detailed engineering estimate is made according to section 4.3.3. Projects eligible for this costing method are listed by category in section 4.3.1. Other projects approved by the regional manager also qualify.

Throughout section 4.3 the term "roads" is meant to include both roads, and drainage and other pertinent structures.

4.3.1 Development Cost Categories

Development cost allocation (section 4.3.1.1) applies to all cost estimates made under this section.

1. New Construction

New construction is defined as the following construction phases: subgrade construction, placement of additional stabilizing material and the construction and installation of drainage and other pertinent structures.

New construction costs are allocated to the first tributary cutting authority.

a. Road Cost Estimates

i. Tabular cost estimates

Each road section cost estimate is determined from the appropriate tables (section 4.3.2.1). These section costs are totalled to give a road cost estimate for each road. For each road the total approved cost estimate is divided by the total net cruise volume to give a unit cost (\$/m³). The unit costs (\$/m³) for all roads are then totalled to give a unit cost (\$/m³) for tabular roads.

ii. Detailed engineering cost estimates

Each project cost is estimated according to section 4.3.3. These projects may include:

- new construction and upgrading of main access roads that meet the criteria and conditions provided in the *Ministry of Forests Main Access Roads Policy*,
- road construction on uphill side slopes that are over 150 percent,
- road construction on terrain with two or more gullies over 10 m deep at centreline in a 300 m section,
- end haul construction requiring removal of excavated material to a spoil area,
- overland construction to provide a roadbed by trucking in material for extensive fill sections, and
- switchbacks with over 10 000 m³ excavation volume to complete the designed grade percent and horizontal alignment.

The total of the estimated costs for each project is divided by the total net cruise volume to give a unit cost (\$/m³) for engineered roads. For new construction costs that occur during the term of the cutting authority, those costs are applied against the remaining cutting authority volume at reappraisal.

b. Bridge Cost Estimates

Each bridge cost estimate is determined either from the appropriate table (section 4.3.2.2) or as a detailed engineering cost estimate (section 4.3.3).

Where bridge materials are reused by the original purchaser at a second or subsequent location, the cost estimate will include dismantling, transport and installation at the new site. The initial materials cost and delivery costs are excluded.

Where used bridge materials are purchased from a legally non-associated party, the cost of purchase and shipping those materials will be included in the cost estimate. The requirements of section 4.1 still apply.

The total of the estimated costs for all bridges is divided by the total net cruise volume to give a unit cost (\$/m³) for bridges.

The unit costs (\$/m³) for tabular roads, engineered roads, and bridges are totalled to give a unit cost (\$/m³) for new construction. For new construction costs that occur during the term of the cutting authority, these costs are applied against the remaining cutting authority volume at reappraisal.

2. Reconstruction and Replacement

Reconstruction and replacement are defined as replacement or repair of a major drainage structure, or major reconstruction or resurfacing of a section of road, required because:

- of extensive "wear and tear",
- the road has been permanently or semi-permanently deactivated previously,
- the road has been abandoned, or
- of a water or slope failure "event".

A water or slope failure "event" is the result of an irregular natural occurrence which leads to the blockage or destruction of a road or bridge making the road or bridge impassable for vehicular traffic. The repairs required should be grouped, if linked by event, into one project cost estimate (see Appendix II) via a detailed engineering cost form.

The costs approved under section 4.3.1, (2.) must not qualify under routine maintenance as described in section 4.5.3 or be eligible for reporting under the routine maintenance portion of the coastal logging cost survey.

Bridges replaced on forest service roads that are funded by the Forest Renewal B.C. five year "Bridge Replacement Program on Forest Service Roads", or are otherwise funded by the Crown, will not be included in any appraisal.

The cost estimate may be allocated, by the licensee, to any individual proposed or existing tributary cutting authority that is in the licensee's approved forest development plan at the time of the project. The licensee must identify this cutting authority when submitting the detailed engineering cost estimate.

Reconstruction and replacement cost estimates will be determined on an individual project basis as detailed engineering cost estimates (see sections 4.3 and 4.3.3) and must be approved by the district manager.

These projects may include:

- bridge structural maintenance including redecking (ties and decking) or replacement of a major drainage structure,
- reconstruction of a road,
- resurfacing of a road, with a minimum loose depth of 0.1 m over a continuous length of 0.5 km or greater, or
- replacing pipe culverts larger than 0.9 m in diameter.

Where bridge materials are reused by the original purchaser at a second or subsequent location and they qualify as engineered estimates, the cost estimate will include dismantling, transport and installation at the new site. The initial materials cost and delivery costs are excluded.

Where used bridge materials are purchased from a legally non-associated party, the cost of purchase and shipping those materials will be included in the cost estimate. The requirements of section 4.1 still apply.

To determine the unit cost (\$/m³) for reconstruction and replacement, the total approved costs are divided by the total net cruise volume. For reconstruction and replacement projects that occur during the term of the cutting authority, those costs may be applied against the estimated remaining volume at the effective reappraisal.

4.3.1.1 Development Cost Allocation

Where proration is required for sections 4.3.1.1.1, 4.3.1.1.2 and 4.3.1.1.3:

$$\text{Crown share} = \text{Total Estimated Cost} * \frac{\text{Appraised Timber Volume}}{\text{Total Timber Volume}}$$

Where:

Crown share (\$)	=	dollar amount to be allocated to stumpage-bearing timber in the cutting authority being appraised.
Total Estimated Cost (\$)	=	dollar amount of the total development cost estimate.
Appraised Timber Volume (m ³)	=	volume of appraised timber tributary to the project and under the control of the licensee or a company legally associated with the licensee, including volume in all areas contributing to the allowable annual cut determination.
Total Timber Volume (m ³)	=	total volume tributary to the project and under the control of the licensee or a company legally associated with the licensee.

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.

The Crown share is a dollar amount which is included in the appraisal of a tributary cutting authority.

Development cost estimate is allocated according to the outline below (see also Appendix III).

4.3.1.1.1 Development Cost Estimates on Crown Lands

1. Development providing access to appraised timber only:

Total estimated costs are included in the appraisal.

2. Development providing access to non-appraised timber only:

Cost estimates are not included in the appraisal.

3. Development in appraised timber areas providing access to both appraised and non-appraised timber held by the licensee or a company legally associated with the licensee:

All costs are prorated between appraised and non-appraised timber. The appraised timber portion is then included in the appraisal.

4.3.1.1.2 Development Cost Estimates for Full Appraisal on Timber Licence (TL) Cutting Authorities

1. New development will be allocated as in section 4.3.1.1.1.
2. Unamortized development on the TL that is required for access to the cutting authority area will be included in the appraisal of that cutting authority. Unamortized development is defined as:
 - a. the development started after January 1, 1988,
 - b. development cost estimates were not included in any prior appraisal calculation for Crown timber (or were considered as zero), and
 - c. having had no non-appraised timber transported over the development (excluding right-of-way timber).

Costs for this type of existing development are exempt from section 4.3.1.1.4.

Cost estimates for these existing roads will be derived from the nearest appraised cutting authority area by:

1. Establishing the average road cost per kilometre from that appraised estimate, excluding bridges and pertinent structures.
2. Multiply that \$/km by the kilometres of tributary road in the TL cutting authority area.

Cost estimates for bridges or pertinent structures will be determined according to section 4.3.2.2, or from the detailed engineering estimates as defined in section 4.3. At reappraisal, these initial cost estimates for existing development will be trended as provided for in section 4.9, but will not otherwise be revisited.

4.3.1.1.3 Development Cost Estimates on Private Land

When a new or reconstructed road or structure on private land is required for Crown timber extraction, the estimated cost of the road or structure will be included in the appraisal of a tributary cutting authority according to the procedures of section 4.3.1.1 and the following guidelines:

1. Development provides access to appraised timber only.

The total estimated costs are included in the appraisal.

2. Development provides access to non-appraised timber only.

Cost estimates are not included in any appraisal.

3. Development provides access to both non-appraised and appraised timber.

All cost estimates are prorated between non-appraised and appraised timber (section 4.3.1.1) and then the Crown allocation is included in the appraisal.

4.3.1.1.4 Existing Roads and Structures

The following are defined as existing roads for the cutting authority being appraised and are not eligible for inclusion in development cost estimates:

1. Costs of constructed roads that have been previously considered in appraisals of Crown timber within another cutting authority.
2. Roads, drainage and other pertinent structures previously constructed to develop, and used to haul non-appraised timber (excluding right-of-way).
3. Roads previously constructed all or in part for purposes unrelated to logging the cutting authority area being appraised.

4.3.1.1.5 Extended Road Amortization

For new appraisals where the untrended development cost estimate exceeds \$14.00/m³, a written agreement may be made which apportions a development cost estimate to two or more tributary cutting authorities.

The agreement is subject to the following conditions:

1. Each cutting authority area must be in the licensee's approved forest development plan or woodlot licence area.
2. The agreement must be signed by the licensee and the regional manager or the regional manager's designate.
3. The apportionment ratios will not be revisited.
4. The agreement will only be valid under CVP and confers no obligation on the Crown to compensate licensees for any unamortized costs.

4.3.2 Tabular Road and Bridge Cost Estimates

Tabular road cost estimates are based on average logging road construction practices, generally single lane width roads with turnouts and landings. These roads may or may not require placement of additional stabilizing materials.

Weighted averages for each variable (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. The length of bridges and end haul sections (that are appraised under section 4.3.3) occurring in the section are excluded.

4.3.2.1 Subgrade Construction

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 RMC's".

1. Construction category (CC) is determined on the basis of the percent rock in relation to the total volume of all materials.

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

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.

The following table defines the construction categories.

Table 4-1: Construction Categories

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

2. 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.

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.

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.

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.

In all circumstances where a complete interpretation of the rock mass classification system is required, the Piteau & Associates report is to be consulted directly.

3. 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.
- c. All sections with 60 percent or more (by length) of RMC 5 are designated as "hard".
 - d. 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.
 - e. If the roads do not qualify under 'c.' and 'd.' above, then the subgrade construction cost estimate table for other RMC's is applied to all roads in the appraisal.

The subgrade construction cost estimate includes clearing and grubbing, stripping, stump removal, incidental log decking, ditch construction, landing and turnout construction, material costs and installation of pipe culverts (with diameters up to and including 0.9 m) and single log abutment culverts with spans less than 3.5 m. Right-of-way felling and loading is excluded from the road construction phase but included in the tree-to-truck phase.

Table 4-2: Subgrade Construction Cost Estimate

(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

4.3.2.2 Drainage Structures

Cost estimates are made for bridges where their necessity is substantiated by field data.

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.

Input data within table boundaries is rounded to fit; no interpolation of values is permitted.

4.3.2.2.1 Log Bridges

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 4-3. The average crib height is the numerical average of the crib heights on both banks of the water course.

Table 4-3 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.

4.3.2.2.2 Permanent or Portable Bridges

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 4-5. 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.

Table 4-5 is used for estimating costs of permanent or portable bridges with span lengths from 2 to 30.4 m and abutment heights from 0 to 10.4 m.

Table 4-5 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.

Table 4-5 does not apply to:

1. Multi-span bridges: A construction estimate form must be completed.
2. 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.

3. Portable bridges that are reused (see section 4.3.1).

Cost estimates for bridge sizes outside the table limits and pipe culverts greater than the aforementioned sizes require detailed engineering data as shown in section 4.3.3.

4. 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).

Table 4-3: Log Bridge Cost Estimate

Span Length (m)	(Thousands of Dollars)				
	Single Log Sill	Multi-Log Crib Average Crib Height (m)			
	1	2	3	4	5
4	2.7	7.4	12.1	16.7	21.4
5	4.5	9.2	13.9	18.6	23.3
6	6.4	11.1	15.8	20.5	25.2
7	8.3	13.0	17.6	22.3	27.0
8	10.1	14.8	19.5	24.2	28.9
9	12.0	16.7	21.4	26.1	30.8
10	13.9	18.5	23.2	27.9	32.6
11	15.7	20.4	25.1	29.8	34.5
12	17.6	22.3	27.0	31.7	36.4
13	19.5	24.1	28.8	33.5	38.2
14	21.3	26.0	30.7	35.4	40.1
15	23.2	27.9	32.6	37.3	41.9
16	25.0	29.7	34.4	39.1	43.8
17	26.9	31.6	36.3	41.0	45.7
18	28.8	33.5	38.2	42.8	47.5
19	30.6	35.3	40.0	44.7	49.4
20	32.5	37.2	41.9	46.6	51.3

4.3.2.2.3 Culverts

All pipe culverts up to and including 0.9 m diameter and all single log abutment culverts up to 3.4 m span length are included in the subgrade cost estimates.

Costs for culverts 1.0 m diameter to 1.8 m diameter are estimated using Table 4-4. Culverts less than 1.0 m diameter shown in Table 4-4 are for use in detailed engineered estimates only. Culverts greater than 2.0 m diameter require a detailed engineered estimate (see section 4.3.3).

Table 4-4 Culvert Cost Estimate

Diameter (m)	Cost per lineal metre	Diameter (m)	Cost per lineal metre
0.3	\$40.00	0.9	\$110.00
0.4	\$47.00	1.0	\$155.00
0.5	\$63.00	1.2	\$190.00
0.6	\$78.00	1.4	\$233.00
0.7	\$89.00	1.6	\$320.00
0.8	\$99.00	1.8	\$369.00

Table 4-5: Permanent/Portable Bridge Cost Estimates

Span Length (metres)	Abutment Height (metres) Dollars x 1,000										
	0	1	2	3	4	5	6	7	8	9	10
2	9.3	12.4	15.5	18.7	21.8	24.9	28.0	31.1	34.2	37.3	40.4
3	14.0	17.1	20.2	23.3	26.4	29.5	32.6	35.8	38.9	42.0	45.1
4	18.6	21.7	24.8	28.0	31.1	34.2	37.3	40.4	43.5	46.6	49.8
5	23.3	26.4	29.5	32.6	35.7	38.8	42.0	45.1	48.2	51.3	54.4
6	27.9	31.0	34.2	37.3	40.4	43.5	46.6	49.7	52.8	56.0	59.1
7	32.6	35.7	38.8	41.9	45.0	48.1	51.3	54.4	57.5	60.6	63.7
8	37.2	40.3	43.5	46.6	49.7	52.8	55.9	59.0	62.1	65.3	68.4
9	41.9	45.0	48.1	51.2	54.3	57.5	60.6	63.7	66.8	69.9	73.0
10	46.5	49.7	52.8	55.9	59.0	62.1	65.2	68.3	71.5	74.6	77.7
11	51.2	54.3	57.4	60.5	63.7	66.8	69.9	73.0	76.1	79.2	82.3
12	55.8	59.0	62.1	65.2	68.3	71.4	74.5	77.6	80.8	83.9	87.0
13	60.5	63.6	66.7	69.8	73.0	76.1	79.2	82.3	85.4	88.5	91.6
14	65.2	68.3	71.4	74.5	77.6	80.7	83.8	87.0	90.1	93.2	96.3
15	69.8	72.9	76.0	79.2	82.3	85.4	88.5	91.6	94.7	97.8	101.0
16	74.5	77.6	80.7	83.8	86.9	90.0	93.1	96.3	99.4	102.5	105.6
17	79.1	82.2	85.3	88.5	91.6	94.7	97.8	100.9	104.0	107.1	110.3
18	83.8	86.9	90.0	93.1	96.2	99.3	102.5	105.6	108.7	111.8	114.9
19	88.4	91.5	94.7	97.8	100.9	104.0	107.1	110.2	113.3	116.5	119.6
20	93.1	96.2	99.3	102.4	105.5	108.7	111.8	114.9	118.0	121.1	124.2
21	97.7	100.8	104.0	107.1	110.2	113.3	116.4	119.5	122.6	125.8	128.9
22	102.4	105.5	108.6	111.7	114.8	118.0	121.1	124.2	127.3	130.4	133.5
23	107.0	110.2	113.3	116.4	119.5	122.6	125.7	128.8	132.0	135.1	138.2
24	111.7	114.8	117.9	121.0	124.2	127.3	130.4	133.5	136.6	139.7	142.8
25	116.4	119.5	122.6	125.7	128.8	131.9	135.0	138.1	141.3	144.4	147.5
26	121.0	124.1	127.2	130.3	133.5	136.6	139.7	142.8	145.9	149.0	152.1
27	125.7	128.8	131.9	135.0	138.1	141.2	144.3	147.5	150.6	153.7	156.8
28	130.3	133.4	136.5	139.7	142.8	145.9	149.0	152.1	155.2	158.3	161.5
29	135.0	138.1	141.2	144.3	147.4	150.5	153.7	156.8	159.9	163.0	166.1
30	139.6	142.7	145.8	149.0	152.1	155.2	158.3	161.4	164.5	167.6	170.8

4.3.2.3 Additional Stabilizing Material

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 using the road. 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.

1. Stabilizing Cost Estimate

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

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

Where:

- V is the loose volume of additional stabilizing material in cubic metres per kilometre, and
- U is the unit cost estimate for additional stabilizing material in dollars per loose cubic metre.

a. Volume (V)

The volume of rock or gravel in cubic metres required to stabilize one kilometre of roadbed is as follows:

- V is loose volume (VR or VG) of stabilizing material,

Where:

$$V_R = 1000D (W + 1.0D), \text{ using rock}$$

$$V_G = 1000D (W + 1.5D), \text{ using gravel}$$

Where:

- W is stabilized road width in metres = 6.2 (includes turn outs and landings),
- D is loose depth of stabilizing material in metres determined from the following table.

Table 4-6: Additional Loose Stabilizing Material Depths (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

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).

The quantities per kilometre and the depths by construction categories are only used in conjunction with tabular cost estimates.

b. Unit Cost Estimates (U)

The unit cost estimates (\$/m³) for the additional stabilizing materials include:

- borrow pit preparation,
- rock drilling, explosives, loading of explosives and blasting (e.g., compacted or cemented gravel, oversize material, etc.),
- loading gravel trucks when truck haul required, or placement of materials when trucking is not required,
- truck hauling, when required, and
- spreading and compacting material.

The cost estimates assume borrow pits are located adjacent to a road right-of-way. If a new road needs to be constructed to access the borrow pit, then the access road cost estimates are required in addition to the unit cost estimates.

The unit cost estimates are based on two possibilities which are:

i. No trucking of stabilizing material

When a borrow pit is located adjacent to the subgrade to be stabilized and material is to be moved less than 0.1 km, no trucking of stabilizing material is assumed. The unit cost estimates (U) are:

Gravel	$U (\$/m^3) = 5.65$
Soft and Medium Rock	$U (\$/m^3) = 9.03$
Hard Rock	$U (\$/m^3) = 11.86$

Definition: m^3 = cubic metres of stabilizing material

ii. Trucking of stabilizing material

When suitable ballast must be moved a distance of 0.1 km or further, trucking of stabilizing materials is assumed. The unit cost estimates (U) are:

Gravel	$U (\$/m^3) = 7.74 + 0.616 (d)$
Soft and Medium Rock	$U (\$/m^3) = 11.11 + 0.616 (d)$
Hard Rock	$U (\$/m^3) = 13.94 + 0.616 (d)$

Where:

- d is the assumed trucking distance from the source to the mid-point of the road section to be stabilized. The minimum value of d = 0.1 km.

Definitions for in-place and quarry rock RMC (hardness):

"Soft-Medium"	less than 60 percent of the rock from the excavation is RMC 5
"Hard Rock"	60 percent or more of the rock from the excavation is RMC 5

2. Capping

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.

For further information, refer to the surfacing section in the regional manager's standardized methodology (i.e., *Detailed Engineering Estimates for Coast Stumpage Appraisal, Vancouver Forest Region*).

4.3.3 Detailed Engineering Cost Estimates

The cost for any of the detailed engineering projects identified in section 4.3.1 will be estimated by preparing a detailed engineering cost estimate. The regional manager may approve a standardized methodology to estimate the cost for the following projects:

1. End Hauling.
2. Road Reconstruction and Replacement.
3. Permanent Bridge Construction.
4. Bridge Structural Repair.
5. Regional manager approved projects (construction estimate forms).

When development projects require detailed engineering cost estimates, 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.

In addition to the prior-to-construction requirement stated above, all cost data required for appraisals must be submitted according to the lead-time requirements of section 2.2.

For appraisal purposes, the project costs are estimated using site specific data (as defined in section 4.3.3.1) and the equipment and labour rates as specified in Appendix I. Where the equipment required is not recognized in Appendix I then the equipment rate can be attained from the *2000 - 2001 Equipment Rental Rate Guide "The Blue Book"*. All equipment rates are assumed to be for a 3 year old machine using the July 1, 2000 cost base. Some projects will be completed on the basis of arms length competitive bids and may be accepted for costs at the regional manager's discretion.

4.3.3.1 Data Requirements

All detailed engineering design is based on minimizing quantities.

1. The data that may be required for “excavation and fill” cost estimates are:
 - plans, profiles, cross-sections showing the ground and design grade lines,
 - volume summary sheets giving quantities by various soil types,
 - time and materials, equipment and labour, repairs, drainage structures and surfacing where required, and
 - a cost estimate for the project.
2. The data that may be required for reconstruction and replacement cost estimates are:
 - a map showing details of the project including stations, drainage’s, and other information important to the project,
 - time and materials, equipment and labour, estimate for excavation, repairs, drainage structures, reditching, and resurfacing where required, and
 - a cost estimate for the project.
3. The information and data that may be required for bridge and culvert construction cost estimates are:
 - 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,
 - for permanent structures of 20.4 m span or less: an economic comparison between a log structure and the permanent structure, and
 - for pipe culverts greater than 1.8 m in diameter: the same information as required for permanent structures of 30.4 span or greater.

4.4 Tree To Truck

The cost estimate for the tree-to-truck phase includes falling, bucking, skidding/yarding, and loading.

All pertinent labour and equipment costs are accounted for. The costs include time lost by fallers due to adverse weather conditions, contractual requirements for falling non-merchantable trees, streambank-management yarding, right-of-way logging, and construction of back spar trails, or rigging of back spars, or cost of the mobile back spar unit.

4.4.1 Conventional Logging

Conventional logging means all logging methods other than helicopter logging and those specified operations listed in section 4.1.1.

The cost estimate for the tree-to-truck (TTT) phase for both isolated and accessible cutting authorities is:

$$(\$/\text{m}^3) = 21.55$$

4.4.2 Helicopter Logging

The cost estimate given below applies to the net cruise volume that requires helicopter yarding.

Costs include falling and bucking, helicopter yarding, logging truck loading, landing construction, choker chasing, rental/lease/depreciation costs of a barge (if required), bag booming, towing of bag boomed logs to local tie up or sorting area, crew transportation (by air, water, or land), and camp mobilization/demobilization (including barge movement). Costs for these activities may be borne by the licensee or the contractor.

In addition, the following phases, when applicable, are estimated as detailed elsewhere in this manual:

- Development (section 4.3),
- Truck Hauling (section 4.5.1),
- Dump, Sort, Boom and Scale (section 4.5.2.2),
- Towing or Barging (section 4.5.2.3),
- Routine Maintenance (section 4.5.3),

- Road Use Charges (section 4.5.4),
- Specified Operations (section 4.1.1),
- Overhead (section 4.6.1), and
- Accommodation (section 4.6.3).

A cost estimate for the crew transportation phase (section 4.6.2) is not applicable.

4.4.2.1 Helicopter Logging

The tree-to-truck cost estimate for helicopter logging other than the method described in section 4.4.2.2 is:

$$$/m^3 = 66.60$$

4.4.2.2 Helicopter Single Tree Selection - Standing Stem

In addition to the costs identified in section 4.4.2, single tree selection includes the cost of tree preparation for harvest (i.e., marking, climbing, limbing, undercuts, wedging, etc.).

The partial harvest specified operation cost estimate does not apply.

The tree-to-truck cost estimate for helicopter single tree selection is:

$$$/m^3 = 100.40/m^3$$

4.5 Log Transportation

4.5.1 Truck Hauling

The truck hauling phase cost estimate is for the movement of logs from the roadside or landing in the woods to the appraisal final off-loading destination selected for the cutting authority. This cost estimate includes all rehaul situations except those involving lake transportation. Both on-highway and off-highway hauling are calculated with the same formula and variable.

1. Distance: The variable used to determine the truck hauling phase cost estimate is distance (km). This is the weighted average one-way haul distance from the centre of the cutting authority to the appraisal log dump where trucks are off-loaded. The weighted average haul distance (D) is estimated by:
 - a. establishing the geographical centre point of each block or cutting area and projecting this point to the nearest road for measurement purposes,
 - b. from this point determining the haul distance to the nearest junction serving all blocks or cutting areas,
 - c. weighting the distance for each block by the volume on the block and determining the average weighted distance to the junction, and
 - d. measuring the haul distance from the junction to the final appraised place of unloading and adding this to the average weighted distance to the junction as outlined above.
2. Formula: Where truck hauling is required, the cost estimate formula for the truck hauling phase for both isolated and accessible operations is:

$$(\$/\text{m}^3) = 3.564 + 0.098 (D)$$

Where:

D is the weighted average one-way haul distance in kilometres, rounded to the nearest 0.1 km.

When:

D = 0, then the truck hauling cost estimate is equal to zero.

The appraisal log dump selected for trucks to off load is also the point of origin for the towing or barging phase (section 4.5.2.2).

4.5.2 Water Transportation

This phase covers all operating cost elements from the local tie-up ground to the point of appraisal.

4.5.2.1 Point of Appraisal

1. The point of appraisal that produces the least total operating cost estimate shall be used when calculating the least total operating cost estimate.
2. The Points of Appraisal are:

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

4.5.2.2 Dump, Sort, Boom and Scale

Cost estimates for this phase are based on two log transportation systems:

- towing logs, and
- barging logs.

Barge transportation is recognized where part of the route from local tie-up grounds at the appraised point of origin to point of appraisal is exposed to the open ocean swell.

Only points on the west coast of Vancouver Island north of Port Renfrew, (except those routes totally east of a line drawn from Cape Beale to Amphitrite Point, including Ucluelet Harbour), and all points north of Cape Caution on the mainland are considered to require barge transportation.

Where barge transportation is not recognized, towing of sorted logs or camp-run logs from the local tie-up ground at the appraised point of origin to point of appraisal is assumed.

All on-site and central sort costs related to dump, sort, boom, scale and re-load from dryland sorts where required, are included for the system as follows. Local towing of up to 10 km is also included.

Condition	Cost Estimate for all Operations
Towing	\$8.73/m ³
Barging	\$10.46/m ³

This cost estimate is also applied when neither towing nor barging is required (i.e., when point of origin and point of appraisal are the same location).

4.5.2.3 Towing or Barging

The following tables list the towing and barging cost estimates from specific points of origin. For unlisted points of origin the cost estimates from two adjacent points of origin may be averaged.

Table 4-7: Towing Cost Estimates

Code	Point of Origin	P/A	\$/m3	Code	Point of Origin	P/A	\$/m3
ALBE	ALBERNI	A	0.00	BUIM	M. OF BUTE INLET	G	1.69
CHCK	CHINA CREEK	A	0.73	KIIM	M. OF KINGCOME INLET	G	2.66
COCK	COLEMAN CREEK	A	0.82	KNIM	M. OF KNIGHT INLET	G	2.36
SARV	SARITA RIVER	A	0.95	LOUM	M. OF LOUGHBOROUGH	G	1.89
SPCK	SPENCER CREEK	A	0.85	TOIM	M. OF TOBA	G	1.71
TOBY	TOQUART BAY	A	1.09	NACK	NAKA CREEK	G	2.24
UCHU	UCHUCKLESIT	A	0.90	NOBY	NORTHWEST BAY	G	1.14
UCLU	UCLUELET	A	1.15	PHAR	PHILLIPS ARM	G	1.84
CHEM	CHEMAINUS	C	0.00	PTEB	PORT ELIZABETH	G	2.39
COBY	COWICHAN BAY	C	0.85	PTHD	PORT HARDY	G	2.75
JORV	JORDAN RIVER	C	2.31	PTHV	PORT HARVEY	G	2.23
LADY	LADYSMITH	C	0.75	PTMN	PORT McNEILL	G	2.53
NANA	NANAIMO	C	0.87	PTNE	PORT NEVILLE	G	2.18
SOOK	SOOKE	C	1.39	PORV	POWELL RIVER	G	1.32
VICT	VICTORIA	C	1.19	SENA	SECOND NARROWS	G	0.92
AGAM	AGAMEMNON	G	1.12	SYIN	SEYMOUR INLET	G	3.54
BECV	BEAVER COVE	G	2.45	SEBY	SOUTHWEST BAY	G	2.14
COUR	COURTENAY	G	1.45	SQUA	SQUAMISH	G	0.90
DRIN	DRURY INLET	G	2.85	STIL	STILLWATER	G	1.19
EVRV	EVE RIVER	G	2.18	TEAR	TEAKERNE ARM	G	1.57
FOHA	FORWARD HARBOUR	G	2.01	THIN	THEODOSIA INLET	G	1.57
FRAR	FREDERICK ARM	G	1.79	THSO	THOMPSON SOUND	G	2.51
BUIH	H. OF BUTE INLET	G	2.08	WASA	WAKEMAN SOUND	G	2.81
JEIH	H. OF JERVIS INLET	G	1.52	GAMB	GAMBIER ISLAND	G	0.00
KIIH	H. OF KINGCOME INLET	G	2.86	CHWK	CHILLIWACK	P	1.40
KNIH	H. OF KNIGHT INLET	G	2.86	HALF	FOOT HARRISON LAKE	P	2.22
LOUH	H. LOUGHBOROUGH	G	2.06	PILF	FOOT OF PITT LAKE	P	0.35
SEIH	H. OF SECHELT INLET	G	1.40	HABY	HARRISON BAY	P	1.62
TOIH	H. OF TOBA INLET	G	1.91	HATZ	HATZIC	P	1.03
INAR	INDIAN ARM	G	1.05	HALH	HEAD HARRISON LAKE	P	3.69
KLBY	KELSEY BAY	G	2.04	PILH	HEAD OF PITT LAKE	P	0.95
MNCK	McNAB CREEK	G	0.82	HALM	MID HARRISON LAKE	P	3.04
MEBY	MENZIES BAY	G	1.91	PIRV	PITT RIVER BRIDGE	P	0.00
MESD	MEREWORTH SOUND	G	3.20	SICK	SILVERHOPE CREEK	P	3.74
JEIM	MOUTH JERVIS INLET	G	1.15	WHON	WHONNOCK	P	0.58

P/A = Point of Appraisal as follows:

A = ALBE - ALBERNI
 C = CHEM - CHEMAINUS
 G = GAMB - GAMBIER ISLAND
 P = PIRV - PITT RIVER BRIDGE

Table 4-8: Barging Cost Estimates

Code	Point of Origin	P/A	\$/m3	Code	Point of Origin	P/A	\$/m3
BACK	BARR CREEK	A	5.32	BOIN	BOSWELL INLET /SECURITY BAY	G	6.77
BLBY	BLOWHOLE BAY	A	5.01	CAIS	CAMPBELL ISLAND	G	7.62
CLCK	CLEAGH CREEK	A	6.18	DIBY	DINAN BAY	G	11.85
COHA	COAL HARBOUR	A	6.39	ELHA	ELCHO HARBOUR	G	7.77
CYRV	CYPRE RIVER	A	4.36	FEBY	FERGUSON BAY	G	11.72
EAIV	EASY INLET	A	5.58	RIIH	HEAD OF RIVERS INLET	G	7.08
ESIN	ESPINOSA INLET	A	5.35	SBEH	HEAD OF SOUTH BENTINCK ARM	G	8.28
GORV	GOLD RIVER	A	5.06	HNRV	HONNA RIVER	G	10.75
HEBY	HEAD BAY	A	4.98	KMBY	KEMANO BAY	G	9.79
BESH	HEAD OF BEDWELL SOUND	A	4.46	KHIN	KHUTZEYMATEEN INLET	G	10.99
HENO	HECATE CHANNEL - NOOTKA	A	5.02				
HOLB	HOLBERG	A	6.65	KIMS	KIMSQUIT	G	8.39
HORV	HOUSTON RIVER	A	4.93	KLEM	KLEMTU	G	8.06
HUCK	HUSHAMU	A	6.49	KUIN	KUMEALON INLET	G	9.88
INGE	INGERSOLL	A	6.21	KWBY	KWATNA BAY/MINERVA CREEK	G	7.66
JELA	JEUNE LANDING	A	6.36	KWRV	KWINAMASS RIVER	G	10.94
KEIN	KENDRICK INLET	A	4.88	MCBY	McCLINTON BAY	G	11.90
KOHA	KOPRINO HARBOUR	A	6.08	MOIN	MOSES INLET/INRIG BAY	G	7.11
KUCV	KULTUS COVE	A	6.26	NAHA	NADEN HARBOUR	G	11.56
MCCK	McCURDY CREEK	A	5.04	NABY	NASS BAY	G	11.20
MORV	MOOYAH RIVER	A	4.88	NORV	NOOTUM RIVER	G	7.27
OUIV	OUOUKINSH INLET	A	5.66	OCFA	OCEAN FALLS	G	7.66
PLHA	PLUMPER HARBOUR	A	4.83	POIS	PORCHER ISLAND	G	10.16
PTLH	PORT ELIZA	A	5.19	PRRU	PRINCE RUPERT	G	10.29
RACV	RANKIN COVE	A	4.59	RESO	RENNELL SOUND	G	10.81
STCV	STEAMER COVE	A	4.49	REPA	RENNERS PASSAGE	G	10.78
TLRV	TLUPANA RIVER	A	4.96	SCRV	SCOTIA RIVER	G	*11.42
TSRV	TSOWWIN	A	4.93	SWIN	SEWELL INLET	G	10.26
WIHA	WINTER HARBOUR	A	6.08	SKIN	SKIDEGATE INLET	G	10.73
ZEBA	ZEBALLOS	A	5.43	SOBY	SOUTH BAY	G	10.81
ALAR	ALICE ARM	G	11.69	STEW	STEWART	G	12.03
ALBY	ALLIFORD BAY	G	10.73	TASU	TASU SOUND	G	10.23
BEAN	BEATTIE ANCHORAGE	G	10.21	TUIN	TUCK INLET	G	10.39
BECO	BELLA COOLA	G	8.05	WECK	WEEWANIE CREEK	G	9.40
BIBY	BISHOP BAY	G	9.04	WOCH	WORK CHANNEL	G	10.99

Note: P/A = Point of Appraisal as described on the previous page.

* Includes river towing.

4.5.3 Routine Maintenance and Deactivation

Routine maintenance includes grading, brush control, minor surfacing repairs, sanding, snowplowing, ditch maintenance and repair, replacement of culverts ≤ 0.9 m on active roads, slough removal and all deactivation costs.

Routine maintenance also includes minor repairs to roads due to slides, erosion and flood damage. All road use charges except those recognized in section 4.5.4 are also included.

The cost estimate for all routine maintenance carried out on logging operations, including roads required for basic silviculture and protection, depends on the geographic location of the cutting authority area. Cost estimates do not apply where there are no roads to be maintained.

The routine maintenance and deactivation cost estimates (\$/m³) by forest district are:

Zone 1 (North)

Queen Charlotte Mid Coast	North Coast Port McNeill
<hr/>	
Total Cost Estimate =	\$2.35/m ³

Zone 2 (South)

Sunshine Coast Campbell River South Island	Squamish Chilliwack
<hr/>	
Total Cost Estimate =	\$2.27/m ³

4.5.4 Road Use Charges

Prior to a stumpage appraisal cost estimate being used in any appraisal, the licensee must:

- submit a completed *Request for Approval of a Road Use Charge Form* with the coast appraisal data submission,
- submit a complete copy of the fully executed road use agreement document,
- ensure the term of the road use agreement is fully within the appraisal period,

- retain copies of transactions, as only auditable monetary transactions for road use will be considered,
- receive written confirmation from the regional manager that the road use charge specified in the application, or an amount to be specified by the regional manager, is approved.

1. Charges as a Share of Road Maintenance

No recognition is made of such charges. The routine road maintenance cost estimate (section 4.5.3) includes all relevant costs whether incurred directly by the licensee or by payment to another party for services performed.

2. Charges for Other than Road Maintenance

There are three main categories of road status:

a. Forest Service Roads

A road that is declared, determined, built, maintained or modified by the ministry, as defined in forest legislation. No road use charges will be considered in appraisals;

b. Permitted Roads

Roads built on Crown land, authorized by road permit or other cutting authority documents. No road use charges will be considered in appraisals;

c. Other Roads

Road use charges for roads on indian reserves or on private land owned by an arm's length third party and not subject to a lease held by the licensee, their affiliate or agent of either, may be considered in appraisals provided there is no lower cost route capable of development through Crown land.

The charges recognized must be reasonable, must not exceed compensation that might be determined under the forest legislation, and must be proven through the presentation of auditable documents.

3. Land Use Charges

No land use charges will be considered in appraisals. These costs are included in section 4.6.1 corporate and forestry overhead.

4.6 Administration and Other Costs

4.6.1 Corporate and Forestry Overhead

Corporate general and administrative overhead cost estimates are compiled from surveyed expenses at the corporate licensee level and include all aspects of executive and administrative support functions at the head office attributable to logging operations, operating and support costs of the logging and log supply departments, all right-of-way easements, foreshore and other land leases necessary for the logging function.

Corporate forestry and engineering is compiled from the surveyed harvesting operations and includes supervisory, administrative and vehicle support functions; it also includes cruising, environmental protection measures (including hydro and other seeding) and the cost of performing residue and waste surveys. Silviculture overheads are also included in this phase. Any costs that will be reimbursed through the *Forest Act*, section 110, or by funding from any Crown agency are excluded except as noted in section 6.5.

The cost estimates are:

Corporate, General and Administrative Overhead	(\$/m ³) =	7.18
Corporate Forestry and Engineering	(\$/m ³) =	5.53
Total Corporate and Forestry Overhead	(\$/m ³) =	12.71

4.6.2 Crew Transportation (Labour)

Crew transportation refers to the labour costs associated with moving logging crews by vehicles from the appraisal marshalling area to the centre of the work area in the cutting authority being appraised, and return.

The appraisal marshalling area is defined as follows:

1. In situations where the cutting authority area being appraised is accessible (as determined in section 4.6.3), the licensees' contractually binding designated marshalling area, or in the absence of one, the nearest of (a) a contractually binding designated marshalling area, (b) the camp, (c) the crew vehicle storage area, or (d) centre of the nearest community.
2. In a situation where the cutting authority area being appraised is isolated (as determined in section 4.6.3), the licensees' contractually binding designated marshalling area, or in the absence of one, the nearest of (a) a contractually binding designated marshalling area, (b) the camp or (c) the vehicle storage area.

The appraisal marshalling area need not be the location actually used by a given licensee.

Where more than one appraisal marshalling area or route is reasonable, the area or route chosen for appraisal purposes will be the one that yields the least total operating cost estimate according to this manual.

For the purposes of this section, a "vehicle" may be a motor vehicle or a boat. When "vehicle" is taken to mean boat, the "vehicle storage area" may be a boat dock or wharf where the crew can embark and disembark.

The formula for crew transportation is:

$$$/m^3 = 1.665 + 0.0546 (D)$$

Where: D is the weighted average one way distance in kilometres (rounded to the nearest 0.1 km) from the centre of the appraisal marshalling area to the centre of the work area in the cutting authority area being appraised. In situations where the appraisal marshalling area is a community, D will be measured from the post office of that community.

Where: D=0, the crew transportation cost estimate is equal to zero.

The crew transportation cost estimate includes both crew travel time costs and crew vehicle operator time costs.

The cost of vehicle ownership, lease, rental, maintenance and operations are included in section 4.6.3, camp overhead.

4.6.3 Camp Operations and Overhead

4.6.3.1 General Camp Overhead

The general camp overhead phase cost estimate recognizes two types of logging operations according to the mode of access for logging crews to the highway system:

1. Accessible Cutting Authority

An accessible cutting authority or cut block is one where the cutting authority or cut block is connected by a road suitable for crew buses, to the centre of the nearest community. The nearest community must be a city, district municipality, town or village and must have retail food and gasoline services located nearby.

The cost estimate covers the depreciation, maintenance and operating costs of camp and crew marshalling area facilities non-recoverable costs for cookhouses, freight by air or water, shop and office and other pertinent buildings; and provides for daily and/or periodical commuting costs.

The cost estimate for accessible cutting authorities is: $\$9.57/\text{m}^3$

2. Isolated Cutting Authority

An isolated cutting authority is one which is not "accessible". This includes all cutting authorities where a portion of the access is by water or air only and is not serviced by public ferries.

The cost estimate covers the depreciation, maintenance and operating costs of camp and marshalling area facilities; the non-recoverable costs incurred for cookhouses, bunkhouse, shop and office and other pertinent buildings; daily and/or periodical commuting cost from the camp to residential facilities; and camp and equipment moves of less than 10 km by water.

The cost estimate for isolated cutting authorities is: $\$15.55/\text{m}^3$

4.6.4 Low Volume Cost Estimate Additive

All fully appraised cutting authorities may be eligible for a low volume cost estimate additive.

The cost estimate additive is: $\$/\text{m}^3 = 7.38 - [0.00246 (V - 2\ 000)]$

Where:

- V is the lesser of the cutting authority net cruise volume or the licence's allowable annual cut of Crown timber (if applicable),

- V must be less than or equal to 5 000 m³,
- The licence, under which the cutting authority has been issued, has an allowable annual cut of Crown timber not exceeding 10 000 m³,
- The maximum cost estimate is \$7.38/m³.

4.6.5 Clayoquot Sound

A cost estimate of \$19.52/m³ will be included in appraisals of cutting authorities in the Clayoquot Sound area (as defined below).

The Clayoquot Sound area is defined as Hesquiat Peninsula, Esowista Peninsula, the Islands, sea and all lands and waters draining into the Pacific Ocean from the height of land between Escalante Point in the north and Quisitis Point in the south.

4.7 Total Logging Cost Estimate

The total logging cost estimate is the sum of all phase cost estimates identified in chapter 4 for the cutting authority being appraised, including specified operations and least cost methods. Subsequently, basic silviculture costs are added and a trend factor applied to derive a total weighted logging cost.

4.8 Basic Silviculture

Basic silviculture cost estimates are made for all appraised cutting authority areas where basic silviculture is required.

The cost used for basic silviculture treatment carried out on land on which the licensee is required to establish a free-growing crop of trees, as specified in the *Forest Act*, depends on the geographic location of the appraised cutting authority area.

Basic silviculture treatment may not be required on some cutting authorities (e.g., right-of-way, licence-to-cut, commercial-thinning). A basic silviculture cost estimate is not included in the appraisal where this intent has been specified in the licence document, cutting authority or by applicant's agreement. Nor is a basic silviculture cost estimate included in the appraisal if the work is funded through the *Forest Act*, section 110, or by any Crown agency, except as noted in section 6.5.

Table 4-9: District Silviculture Cost Estimates

Forest District	\$/m ³ *	Forest District	\$/m ³ *
Mid Coast	1.70	South Island	2.24
Queen Charlotte Isl.	2.64	Campbell River	1.80
Chilliwack	2.27	Port McNeill	1.78
Squamish	2.62	North Coast	2.05
Sunshine Coast	2.48		

* The dollar per cubic metre (\$/m³) cost estimates are net of overhead.

4.9 Cost Trend

A cost trend factor is separately applied to the total logging cost estimate and the basic silviculture cost estimate at the effective appraisal date and at the date of each stumpage rate adjustment. The factors cover the period from the effective date of the cost base to the effective date of the stumpage rate calculation. Cost trends are shown in the following table.

Table 4-10: Trend Factor by Effective Date

***APPRAISAL EFFECTIVE DATES FROM APRIL 1, 2000
AND BEFORE APRIL 1, 2001 (cost base July 1, 1998)***

All Stumpage Adjustment Dates (or Appraisal Effective Date)	Trend Factor
April 1 to June 30, 2002	1.000
July 1 to September 30, 2002	1.000
October 1 to December 31, 2002	1.000
January to March 31, 2003	1.000

***APPRAISAL EFFECTIVE DATES FROM APRIL 1, 2001
AND BEFORE APRIL 1, 2002 (cost base July 1, 1999)***

All Stumpage Adjustment Dates (or Appraisal Effective Date)	Trend Factor
April 1 to June 30, 2002	1.000
July 1 to September 30, 2002	1.000
October 1 to December 31, 2002	1.000
January 1 to March 31, 2003	1.000

***APPRAISAL EFFECTIVE DATES FROM APRIL 1, 2002
(cost base July 1, 2000)***

All Stumpage Adjustment Dates (or Appraisal Effective Date)	Trend Factor
April 1 to June 30, 2002	1.000
July 1 to September 30, 2002	1.000
October 1 to December 31, 2002	1.000
January to March 31, 2003	1.000

This page is intentionally left blank.

Stumpage Rate Determination

5

5.1 Indicated Stumpage Rate

The indicated stumpage rate is determined by comparing the value index of the stand being appraised to the value index of other stands, as explained in the following sections.

5.2 Value Index

The stumpage rate charged on each cutting authority area is keyed to the estimated value index of the stand to be harvested. The value index is the difference between the selling price estimate and the operating cost estimate, both of which are estimates expected of an average operator in that stand. The formula to be used is:

$$VI = SP - OC$$

Where:

- VI = value index for the cutting authority.
- SP = estimated stand selling price determined in accordance with chapter 3.
- OC = estimated operating cost applicable to the timber being appraised, and determined in accordance with chapter 4.

5.3 Coast Mean Value Index

The coast mean value index is the benchmark against which individual stands of timber are compared. The coast mean value index is calculated in accordance with Appendix VI and is published by Revenue Branch at the time of each quarterly stumpage adjustment.

5.4 Market Value Indexing

1. The coast composite index and coast target rate are each calculated effective January 1, April 1, July 1 and October 1 of each year to reflect changes in the value of softwood lumber and wood chips as indicated by Statistics Canada.
2. Statistics Canada has replaced the 1992=100 based price series with new series that have a base of 1997=100. For the January 1, 2002, and all subsequent target rates, the 1997=100 price series must be converted to a 1992=100 base before beginning calculation of the coast composite index.

Converting Indexes From 1997=100 Base to 1992=100 Base

3. Coastal softwood lumber is represented by Statistics Canada price index P4799 (1997=100) which replaces P2460 (1992=100). To convert P4799 to a 1992=100 base, multiply by a link factor of 1.546.
4. Wood chips are represented by Statistics Canada price index P4856 (1997=100) which replaces P2513 (1992=100). To convert P4856 to a 1992=100 base, multiply by a link factor of 1.138.

Calculating the Coast Composite Index

5. To calculate the coast target rate for each date in column A of Table 5-1 the average lumber and chip indexes from each corresponding three-month period in column B of Table 5-1 are totaled, with lumber receiving a weighting factor of 90.3% and chips receiving a weighting factor of 9.7%. The total index is then multiplied by a normalization factor of 1.763. The product of the total index multiplied by the normalization factor is rounded to one decimal place. The rounded product is the coast composite index. The coast composite index is then used to calculate the coast target rate.

Calculating the Coast Target Rate

6. The coast target rate is expressed in dollars per cubic metre and is calculated as follows:
 - a. If the coast composite index is less than or equal to 188.8 then the coast target rate is the product of the coast composite index multiplied by 10.59, divided by 138.5.

Expressed as an equation:

$$\text{Coast Target Rate} = \frac{\text{Coast Composite Index}}{138.5} * 10.59$$

- b. If the coast composite index is greater than 188.8 then, the coast target rate is the sum of 14.43 plus the product of 7.45 multiplied by the quotient of the difference between the coast composite index and 188.8 divided by 49.

Expressed as an equation:

$$\text{Coast Target Rate} = 14.43 + \left[\frac{(\text{Coast Composite Index} - 188.8)}{49} * 7.45 \right]$$

Table 5-1 Coast Target Rate Date

Column A	Column B
Coast Target Rate Date for:	Coast Composite Index is based on Statistics Canada price indexes for the months of the:
January 1	Preceding August, September, October
April 1	Preceding November, December, January
July 1	Preceding February, March, April
October 1	Preceding May, June, July

7. The coast composite index and coast target rate are each published by Revenue Branch at the time of each quarterly stumpage adjustment.

5.5 Coast Base Rate

The coast base rate is calculated effective January 1, April 1, July 1 and October 1 of each year in accordance with Appendix VI. The coast base rate is published by Revenue Branch at the time of each quarterly stumpage rate adjustment.

5.6 Calculation of Stumpage Rate

Calculation of Indicated Stumpage Rate

1. The indicated stumpage rate for a cutting authority is calculated as follows:

$$\text{ISR} = \text{CBR} + (\text{VI} - \text{CMVI})$$

Where:

ISR = indicated stumpage rate

CBR = coast base rate referred to in section 5.5

VI = value index for the cutting authority as calculated under section 5.2

CMVI = coast mean value index, referred to in section 5.3

Prescribed Minimum Stumpage Rate

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

Reserve Stumpage Rate

3. For each cutting authority area, the reserve stumpage rate is determined by selecting the greater of:
 - a. the indicated stumpage rate, or
 - b. the prescribed minimum stumpage rate.

Upset Stumpage Rate

4. The upset stumpage rate is the total of the reserve stumpage rate plus any silviculture and development levies which may be charged as defined in section 6.5.

Total Stumpage Rate

5. The total stumpage rate is the total of the upset stumpage rate plus any bonus bid.

Misc. Timber Pricing Policies

6

6.1 Coast Value Indexes

1. Tables of coast value indexes are produced by Revenue Branch and each table is effective on the effective date of the table.
2. The table of coast value indexes may be used by the person who determines the stumpage rate to determine the value index for a cutting authority area which has less than 2 000 m³ of timber as provided in section 6.2.

6.2 Cutting Authorities With 5 000 m³ or Less Volume

1. Where a cutting authority area has less than 2 000 m³ of timber:
 - a. A stumpage rate may be determined by estimating the species volumes and using the relevant coast value indexes to determine the stand value index. For a cutting authority where the licensee is not required to establish a free growing crop of trees, the value index must be adjusted by adding a basic silviculture cost estimate. The total stumpage rate is not adjusted quarterly.
2. Where a cutting authority area has less than 5 000 m³ of timber:

The appraisal data used to determine the stumpage rate may be based on the characteristics of the cutting authority area or may be based on data obtained from one or more cutting authority areas with similar terrain and stand characteristics as determined by the person who determines the stumpage rate.

6.3 Partially Harvested 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, a full cost estimate appraisal is completed on an "as is, where is" basis.

6.4 Small Business Forest Enterprise Program (SBFEP) Sales

For appraisal purposes, the SBFEP includes:

- a. all timber sale licences issued under the *Forest Act*, sections 20 and 21, and
- b. all timber sale licences issued under the *Forest Act*, section 23 except 23(1)(a) and 23(1)(b).

Fixed/Adjustable Stumpage Rates for SBFEP Cutting Authorities

The adjustable rate option can be provided to a licensee only if the upset rate has been determined by means of a full appraisal. The data for the full appraisal may be site-specific or may be obtained from one or more comparable cutting authority areas. Once a selection has been made, it remains in effect for the term and all extensions. If the district value index method is used, the upset and hence the total stumpage rate is fixed for the term of the cutting authority and all extensions. The only exceptions are if a reappraisal is done under section 2.3.2, sudden and severe damage or section 2.3.4 minister's direction.

A licensee's election of fixed stumpage rates precludes any correction to the upset stumpage rate determination that would otherwise be warranted because of an error in the appraisal.

For sections 20 and 21 timber sale licences (on and after January 1, 1999) refer to chapter 7.

6.5 Levies

The amount of any levy may be redetermined at reappraisals only.

1. Basic Silviculture Levy

A basic silviculture cost estimate is made for every cutting authority that will require basic silviculture, including those with a volume of less than 2 000 m³.

A basic silviculture levy may be added to the reserve stumpage rate. The levy is \$0.00/m³ if no Crown expenditures are anticipated for basic silviculture, or the district manager may set the levy at \$0.00/m³ if the sale is offered under the *Forest Act*, section 20, and the district manager is satisfied that there will be competition for the sale. Otherwise the silviculture levy is equal to the appraisal estimate of basic silviculture costs provided by the Crown (trended at the time of the appraisal).

2. Development Levy

A development levy may be added to the reserve stumpage rate. The levy is \$0.00/m³ if no Crown expenditures are anticipated for road construction and other services, or the district manager may set the levy at \$0.00/m³ if the sale is offered under the *Forest Act*, section 20, and the district manager is satisfied that there will be competition for the sale. Otherwise, the development levy is equal to the appraisal cost estimate of road construction and other extraordinary services provided by the Crown as determined by the regional manager (trended at the time of the appraisal).

The amount of any levy may be re-determined at reappraisal only.

6.6 Miscellaneous Stumpage Rates

Unless otherwise specified in a cutting authority certain special forest products, including deciduous species, low grade logs and timber in specified areas listed in Table 6-1, the miscellaneous stumpage rates in Table 6-1 shall apply.

6.6.1 Special Forest Products and Other Miscellaneous Rates

Table 6-1 is to be used for determining stumpage rates for the specified products when scaled.

6.6.2 Salvage Logging Rates

The qualifying criteria and methodology for developing salvage logging rates for round logs will be specified by the regional manager. The source of salvaged timber is:

1. Post Harvest Material:
 - a. Wooden culverts and bridges, and
 - b. Post logging residue.
2. Damaged Timber:
 - a. Blowdown green and aged timber, and
 - b. Fire, disease, snow press and insect damaged timber.

Table 6-1: Miscellaneous Stumpage Rates*Vancouver Forest Region and North Coast Forest District*

Coniferous Species	Product	Reserve Rate
Cedar & other	Shake and Shingle Bolts and Blocks	\$ 5.30/m ³
Cedar	Shakes - Handsplit	\$ 6.00/m ³
Cedar	Shakes - Blanks	\$ 7.20/m ³
Cedar	Fence Posts and Fence Rails	\$ 3.00/m ³
Cedar	Sticks and Stakes (round or split)	\$ 2.00/m ³
Cedar	Hop Poles	\$ 1.30/m ³
Cedar & other	Cants *	\$ 9.60/m ³
Cypress	Cants *	\$ 9.60/m ³
Yew	All	\$ 0.25/m ³
<i>Deciduous Species</i>		
Alder & Cottonwood	Where Alder and Cottonwood are appraised in the stand as a whole reserve rate, then the lesser of the reserve rate reduced if applicable (CVP only), or \$1.00.	\$1.00/m ³
All other Deciduous Species	The reserve rate is	\$1.00/m ³
<i>All Species</i>		
All Species	Grade Y	\$ 0.25/m ³
All Species	Firewood	\$ 1.00/m ³
All Species	Christmas Trees: less than 3m	\$ 0.20 each
	3 to 5m	\$ 1.00 each
	More than 5m	\$ 1.50 each
All Species	Logs salvaged in the Vancouver log salvage district under the <i>Forest Act</i> , Part 9, and stray logs salvaged elsewhere in coastal waters below the high tide mark (unless logs are salvaged from an area while it is under closure under the <i>Forest Act</i> , Section 126).	\$ 0.70/m ³
All Species	Logs salvaged at Wahleach Island catchment basin operated by B.C. Debris Control Board.	\$ 0.25/m ³

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

6.6.3 Miscellaneous Stumpage Rates for Timber Licences

The stumpage rates in Table 6-3 apply only to timber licence cutting authority areas that are not appraised and have a cutting authority term that began before May 1, 1995.

For each species of timber in column 1 of Table 6-3, the stumpage rate immediately opposite that species in columns 2, 3 and 4 respectively, apply to sawlogs scaled in the indicated forest regions on and after April 1, 2002.

Table 6-3: Miscellaneous Stumpage Rates for Timber Licences

Column 1 Species of timber	Forest Region		
	Column 2 Vancouver except the Mid-Coast and Queen Charlotte forest districts (that part west of the Cascades Mountains) \$/cubic metre	Column 3 Prince Rupert and the Mid-Coast and Queen Charlotte forest districts (that part west of the Cascades Mountains) \$/cubic metre	Column 4 All forest regions and those parts of regions east of the Cascade Mountains \$/cubic metre
Fir	30.50	25.00	22.80
Spruce	26.40	22.30	20.20
Balsam	15.80	12.70	17.80
Cedar	30.30	24.90	34.20
Hemlock	15.50	12.90	18.40
Cypress	34.60	29.40	24.60
White pine	20.70	19.00	34.60
Yellow pine	20.70	19.00	17.30
Larch	20.70	19.00	22.80
Lodgepole pine	10.50	8.70	19.50
Other conifers	20.70	19.00	24.60
All non-conifers	1.00	1.00	0.50
All species Grades 3, 4, 5, and 6	N/A	N/A	0.25
All species Firmwood reject	Nil	Nil	Nil
All species grade Y	0.25	0.25	N/A

This page is intentionally left blank.

Market Pricing System

7

This chapter contains policies and procedures for determining stumpage rates for the market pricing system (MPS).

7.1 Introduction

MPS is a method of estimating the stumpage value of a cutting authority area, based on the bids for other cutting authority areas that were sold at auction.

MPS can only be used where complete appraisal data, as specified in section 4.2, has been submitted for the cutting authority area.

The total MPS stumpage rate only applies to coniferous sawlogs. Stumpage rates for deciduous species, special forest products and Y grade logs are determined under section 6.6.

7.2 Principles and Procedures

7.2.1 Appraisals

The total stumpage rate will be calculated using the policies and procedures in this chapter and monthly parameters (log selling prices and consumer price index (CPI)) in effect on the appraisal effective date. This rate remains in effect until the next quarterly adjustment.

7.2.2 Stumpage Adjustments

1. Unless a cutting authority or the application and tender for a timber sale licence specifies that stumpage rates are fixed for a specified period or for the full term of the cutting authority, stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1 of each year.
2. At the time of the quarterly adjustment, the upset rate will be recalculated based on the equations applicable for the appraisal effective date and the cutting authority area specific data. The monthly parameters (log selling prices and CPI) effective for the month of the adjustment will be used in the calculation instead of the original values. All other data (including the estimated number of bidders) remain unchanged.

This process is repeated quarterly until the cutting authority area is reappraised.

7.2.3 Reappraisals

Reappraisals will be done using the policies and procedures in sections 2.3 and 2.4.

Revised data and revised monthly parameters will be used with the MPS equations in effect on the reappraisal date to calculate a new upset rate. The original bonus bid remains in effect.

7.2.4 Methodology

Subject to sections 7.3 through section 7.5, the calculation of the total stumpage rate is done using the following general procedure:

1. Calculate a preliminary market stumpage price using the equation in section 7.4.2 with the variables as defined and the average number of bidders. Apply the discount factor to the preliminary market stumpage price to calculate the preliminary upset stumpage rate.

2. Calculate the estimated number of bidders using the equation in section 7.4.3 with the variables for the cutting authority area.
3. Calculate the market stumpage price using the equation in section 7.4.4, the variables for the cutting authority area and the estimated number of bidders calculated in section 7.4.3.
4. Calculate the indicated stumpage rate using the equation in section 7.4.6, incorporating the total obligation adjustment and discount factor.
5. Calculate the reserve rate and upset stumpage rate according to sections 7.4.8 and 7.4.9.
6. Calculate the total stumpage rate according to section 7.4.10 by adding the bonus bid, if any.

7.3 Log Selling Prices

Invoiced (f.o.b.) log market values are compiled from prime, domestic, arms-length sales reported to occur in areas adjacent to the Strait of Georgia; the Strait of Juan de Fuca and the Alberni Inlet east of a line drawn south from Amphitrite Point; Johnstone Strait; the Queen Charlotte Strait south of a line drawn west from Cape Caution; and the Fraser River west of the bridge at the confluence of the Pitt River. The cut off date for the collected log market value input is approximately forty-five (45) days prior to the stumpage rate adjustment date.

For the market pricing system a set of average log market values by species and log grade is developed using sales data for each three-month reporting period. The three-month sales data is used to produce a schedule of average market values by species and log grade for mature timber stumpage rate determinations published monthly by Revenue Branch for stumpage rate calculations.

The same three-month schedule is adjusted on a species grade level to create a schedule for MPS second growth average log market values to be used for second growth MPS stumpage rate determinations. See section 2.7 for the definition of second growth.

The second growth schedule adjustment table will be reviewed and/or updated as determined by the director, Revenue Branch.

7.3.1 Log Grade Percentage

To calculate log grade percentages, use the procedures in section 3.2. However, section 3.3.1, low volume cypress exception, does not apply to MPS.

7.3.2 Calculation of Stand Selling Price

To calculate the stand selling price, use the procedures in section 3.3. Note that for the calculation of stand selling price under MPS the volumes and prices of alder, birch, maple, and cottonwood are omitted from the calculation.

Section 3.3.1, low volume cypress exception, does not apply to MPS.

7.4 Stumpage Calculations

7.4.1 List of MPS Variables

MARKET STUMPAGE PRICE	Market stumpage price for the cutting authority in \$/m ³ .
ALP	Average log selling price estimate (\$/m ³) based upon log grades and species for the cutting authority area, and schedules of log market values collected and published by Revenue Branch.
VPH	Volume per hectare in m ³ /ha. Calculated by dividing the total net coniferous cruise volume (m ³) by the total merchantable area (ha).
HP	Fraction of coniferous volume that will be helicopter logged. This is calculated by dividing the coniferous volume to be harvested by helicopter by the cutting authority area's total net cruise volume.
SOR	The untrended specified operation cost estimate (\$/m ³) as determined by the regional appraisal coordinator. For the list of specified operations refer to section 4.1.1.
HD	Truck haul distance (km). This is calculated using the procedures in section 4.5.1.
ln (NB)	The natural logarithm of the number of bidders competing for the cutting authority.
VOL	Total net cruise volume of coniferous timber (m ³).
CPIF	BC Consumer Price Index (P110000) for current month divided by the base CPI of 109.3.

7.4.2 Preliminary Upset Stumpage Rate (Step 1)

Use the following equation to calculate the preliminary upset stumpage rate.

$$\begin{aligned} \text{Preliminary Market Stumpage Price} = & [-56.1836 + 0.9916 (\text{ALP}/\text{CPIF}) + 14.6050 \\ & (\text{VPH}/1000) - 36.8188 (\text{HP}) - 6.4322 (\text{RS}) - \\ & 0.7053 (\text{SOR}/\text{CPIF}) - 0.1232 (\text{HD}) + \\ & 10.4944 * \ln (\text{NB}) - \text{FD}] * \text{CPIF} \end{aligned}$$

Where:

RS = 1, where the cutting authority area is accessible only by air or water and is not serviced by public ferries.
Otherwise RS = 0.

FD = 9.2977 (North Coast Forest District)
16.1047 (Port McNeill Forest District)
19.1108 (Mid Coast Forest District)
15.6639 (Queen Charlotte Islands Forest District)

Otherwise FD = 0

NB = 5.3 (Coastal average number of bidders)

Preliminary upset stumpage rate (\$/m³) = Preliminary market stumpage price
* (1-Discout Factor)

Where:

Discount factor = 0.0 if cutting authority areas are not under timber sale
licences under sections 20 or 21 of the *Forest Act*.
or
0.3 if cutting authority areas are under timber sale licences
under sections 20 or 21 of the *Forest Act*.
or
DCDF See Section 7.4.6.1.

7.4.3 Number of Bidders (Step 2)

Use the equation below to calculate the estimated number of bidders.

Number of Bidders = $2.4176 + 0.03876 (\text{Margin/CPIF}) + 0.09650 (\Delta \text{ ALP/CPIF}) +$
 $0.1760 (\text{VOL}/1000) - 0.00247 (\text{VOL}/1000)^2 - 2.2607 (\text{HP}) -$
 $2.0634 (\text{BARGEDUM}) - 2.5571 (\text{CTDUM}) - 2.2939$
 $(\text{SKYDUM}) - 2.9484 (\text{ADUM}) - 2.5990 (\text{BLOWD}) + \text{FD}$

If VOL is greater than 35 000, then VOL = 35 000.

If the calculated number of bidders is less than 2, then the number of bidders = 2.

Where:

Margin = average log price current month - preliminary upset stumpage rate

Δ ALP = ALP current month minus ALP previous month (\$/m³)

FD = 1.0440 (South Island Forest District)

Otherwise FD = 0

The following variables take a value of 1 if the cutting authority area requires these operations, otherwise they are set to zero.

BARGEDUM BARGEDUM = 1, where part of the route from local tie-up grounds at the appraised point of origin to point of appraisal is exposed to the open ocean swell. Otherwise BARGEDUM = 0.

Only points on the west coast of Vancouver Island north of Port Renfrew, (except those routes totally east of a line drawn from Cape Beale to Amphitrite Point, including Ucluelet Harbour), and all points north of Cape Caution on the mainland are considered to require barge transportation.

CTDUM CTDUM = 1, where the volume harvested from the cutting authority area is by commercial thinning. Otherwise CTDUM = 0.

Commercial thinning is a silviculture treatment that "thins" out overstocked second growth stands by removing trees that are large enough to be manufactured into lumber, post or pole products. It is carried out to improve the health and growth rate of the remaining crop trees. The cut is from "below" for the entire even-aged stand.

SKYDUM SKYDUM = 1, where the cutting authority is harvested using a skyline system. Otherwise SKYDUM = 0.

Skyline logging includes any logging method that has short span, long span, or multispan systems using standing or running lines.

Logs must be a suspended clear of the ground to qualify as a skyline system and the average yarding distance must be greater than 300 m measured from the landing.

ADUM	ADUM = 1, where an A-frame is used to yard timber on the cutting authority area. Otherwise ADUM = 0. A-frame logging uses an A-frame spar with a yarder mounted on a large log float. The float is positioned along the shoreline and logs are yarded directly from the stump to the shore.
BLOWD	BLOWD = 1, where 50% or more of the net cruise volume in a cut block is blowdown. Otherwise BLOWD = 0.

7.4.4 Market Stumpage Price (Step 3)

Calculate the market stumpage price using the equation below and the number of bidders (NB) calculated from Step 2. If number of bidders (NB) is less than 2, NB = 2.

$$\text{Market stumpage price} = [-56.1836 + 0.9916 (\text{ALP/CPIF}) + 14.6050 (\text{VPH}/1000) - 36.8188 (\text{HP}) - 6.4322 (\text{RS}) - 0.7053 (\text{SOR/CPIF}) - 0.1232 (\text{HD}) + 10.4944 * \ln (\text{NB}) - \text{FD}] * \text{CPIF}$$

Where:

FD =	9.2977	(North Coast Forest District)
	16.1047	(Port McNeill Forest District)
	19.1108	(Mid Coast Forest District)
	15.6639	(Queen Charlotte Islands Forest District)
Otherwise FD = 0		

7.4.5 Total Obligation Adjustment

This section does not apply to cutting authority areas under timber sale licences under sections 20 or 21 of the *Forest Act*. The total obligation adjustment for those cutting authority areas is zero (\$0.00m³).

The total obligation adjustment is the sum of the following:

- Overhead: the total corporate and forestry overhead cost estimate, from section 4.6.1,
- road construction: the development cost estimate, from section 4.3,
- market logger road cost: - \$3.10/m³,
- road maintenance: the routine maintenance and deactivation cost estimate, from section 4.5.3,
- road and land use charges: the road use charges estimate, from section 4.5.4,
- silviculture: the basic silviculture cost estimate, from section 4.8,
- camp costs; dump, sort and boom: \$6.42/m³, and
- market logger overhead: - \$4.00/m³.

These adjustments are untrended and updated only at reappraisal.

7.4.6 Indicated Stumpage Rate

The indicated stumpage rate is calculated using the following equation:

$$IR = (MSP * (1 - DF)) - TOA$$

Where:

IR	=	Indicated stumpage rate
MSP	=	Market stumpage price (as calculated in section 7.4.4)
DF	=	Discount factor (as calculated in section 7.4.6.1)
TOA	=	Total obligation adjustment (as calculated in section 7.4.5)

7.4.6.1 High Development Cost Discount Factor

For cutting authorities under section 20 or 21 of the *Forest Act* and appraised with MPS where some or all of the development is the responsibility of the timber sale licence holder, a revised discount factor will be used where the test for high development cost discount factor (DCDF) is proven below.

Where:

$$\text{DCDF} = (\text{DC}-3.10)/\text{MSP}$$

DC = Estimated development costs borne by the licensee, calculated using the procedures in section 4.3

MSP = Undiscounted market stumpage price from section 7.4.4.

If DCDF is greater than 0.30, the indicated stumpage rate is recalculated by performing the calculations in sections 7.4.2, 7.4.3, 7.4.4, and 7.4.6, using the DCDF as the discount factor.

7.4.7 Prescribed Minimum Stumpage Rate

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

7.4.8 Reserve Stumpage Rate

For each timber mark in a cutting authority area, except those for timber licences, the reserve stumpage rate is the greater of:

- the indicated stumpage rate, or
- the prescribed minimum stumpage rate.

For each timber mark in a cutting authority area, for a timber licence the reserve stumpage rate is the greater of:

- the indicated stumpage rate reduced according to section 105 of the *Forest Act*, or
- the prescribed minimum stumpage rate.

7.4.9 Upset Stumpage Rate

The upset stumpage rate is equal to the reserve stumpage rate.

Where a timber sale licence with stumpage rates calculated using MPS does not receive any bids and is subsequently awarded directly under section 23 (1)(e) of the *Forest Act*, the advertised upset stumpage rate applies.

7.4.10 Total Stumpage Rate

The total stumpage rate is the upset stumpage rate plus any bonus bid.

7.5 Deciduous and Miscellaneous Forest Products

The stumpage rate for deciduous sawlogs, all species grade “Y” and other miscellaneous forest products are found in section 6.6.

This page is intentionally left blank.

Appendices

Appendix I Equipment and Labour Rates

(Cost Base July 1, 2000)

MACHINE DESCRIPTION	TYPICAL MODEL	\$/HOUR
Crawler Tractor	Cat D9R, Komatsu D275/355	206.46
Crawler Tractor	Cat D9N (years: 1992 thru 1996)	188.52
Crawler Tractor	Cat D8NLGP, Komatsu D135	169.56
Crawler Tractor	Cat D7H, Liebherr PR742, Fiat Allis FD255	149.06
Crawler Tractor	Komatsu D75A, D65EX	132.40
Crawler Tractor	Cat D6, JD 850C	127.53
Rock Drill (includes labour)	Compressor: 750 cfm on tank chassis	196.25
Grader	Cat 14G, Komatsu GD705,725	107.29
Front End Loader (Gravel)	Cat 970F, Komatsu WA45031, Case 921B	133.17
Front End Loader (Logs)	Cat 972G, Komatsu WA500-1, Volvo 4600	144.19
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 235C, Hitachi EX400, Komatsu PC400LC	224.85
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 330B, Case 220B, Link Belt 4300QTL	185.38
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 229D/EL300/330, Komatsu PC300LC	163.68
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 225DLC, Hitachi EX270LC, JD 792D	150.15
Hydraulic Excavator incl. Brush Guard & Thumb	Cat EL240, Komatsu PC200LC-6, JD 790ELC	138.89
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 320BL, Hitachi EX200LC-5, JD 200LC	129.86
Gradall	Gradall G1000, XL5200	149.82
Logging Truck (Highway)	All Triaxle	90.89
Logging Truck (Off Highway)	All	138.21
Self Loading Log Truck	Highway log truck + 4.5 t deck crane	103.86
Gravel Truck	10.7 m ³	75.74
Gravel Truck Articulated (labour included)	25 - 29 tonne: Cat D30C/D, Terex 766/3066	117.28
Lowbed	5 axle unit: tandem tractor and lowbed	81.92
Lowbed	150 tonne (same as Off-Hwy Truck)	138.21
Concrete Mix Truck	6.1 m ³	86.28
Concrete Vibrator (labour not included)	5 m ³	4.10
Concrete Mixer (labour not included)	0.17 m ³	6.49
Crane - Truck Mounted	18 tonne	89.35
Soft Track Skidder	KMC 2100/2400	123.43
Rubber Tired Skidder	Clark Ranger F68, Franklin 595	84.74
Vibrator Compactor	Clark F68 + 2.7 to 3.6 roller	97.04
Tractor and Grid Roller	Clark F68 + grid roller	97.30
Labourer	Includes 40% payroll loading	29.57
Roadman	Includes 40% payroll loading	29.81
Crib/Culvert Maker, Powderman	Includes 40% payroll loading	31.31
Landingman	Includes 40% payroll loading	31.71
Rockdriller & Powderman (for load & blast only)	Includes 40% payroll loading	68.16
Bridgeman	Includes 40% payroll loading	37.60
Powersaw (labour not included)	All	4.61
Faller, including powersaw cost	Includes 40% payroll loading	57.44

Sources:

Cost surveys, Province of British Columbia Hydro and Power Authority and B. C. Rail Equipment Rental Rate Guide, (rates based on a 3 year old machine), and IWA agreement rates including payroll loading.

Notes:

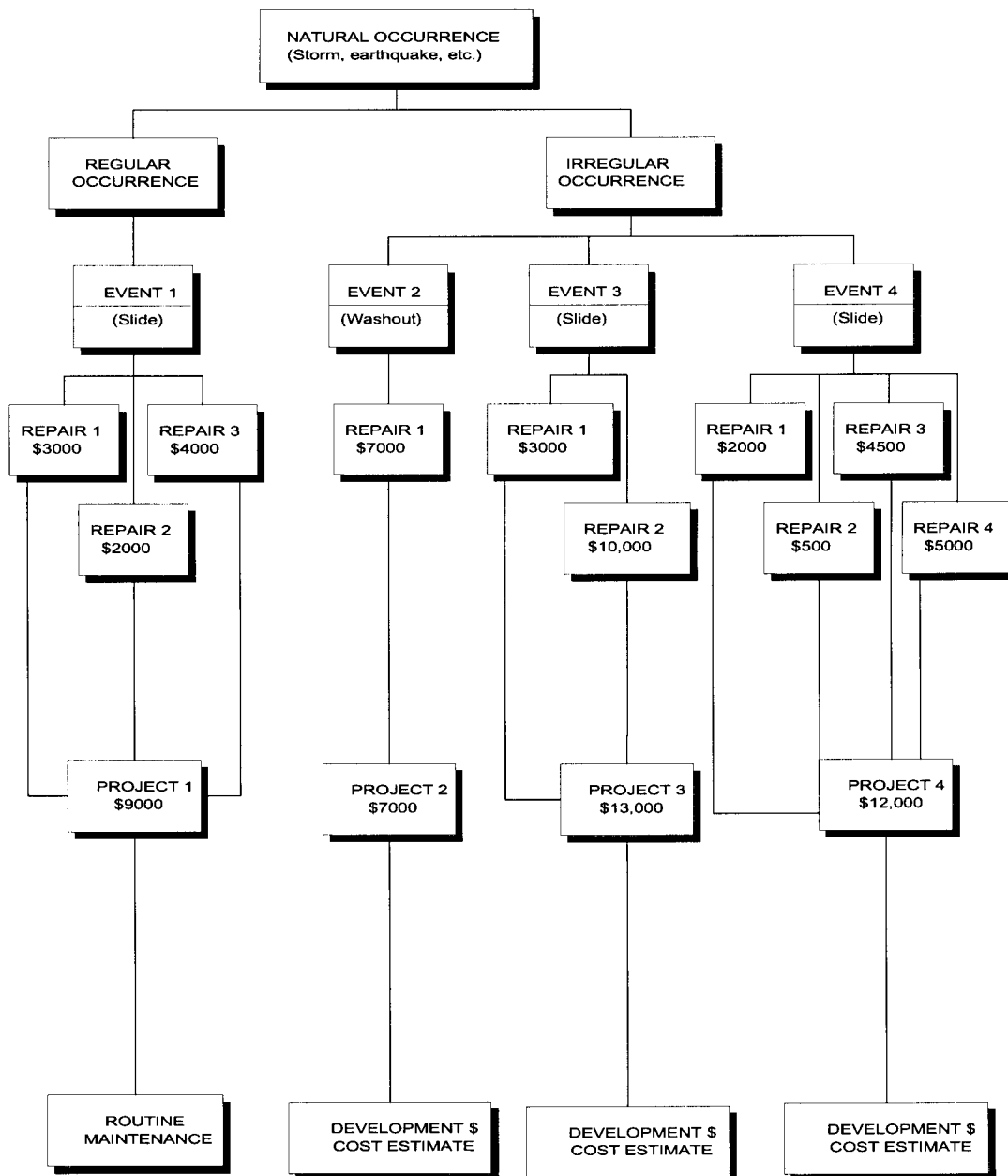
All equipment rates include labour for operators and swampers unless otherwise noted,

Labour components include all payroll loading, and

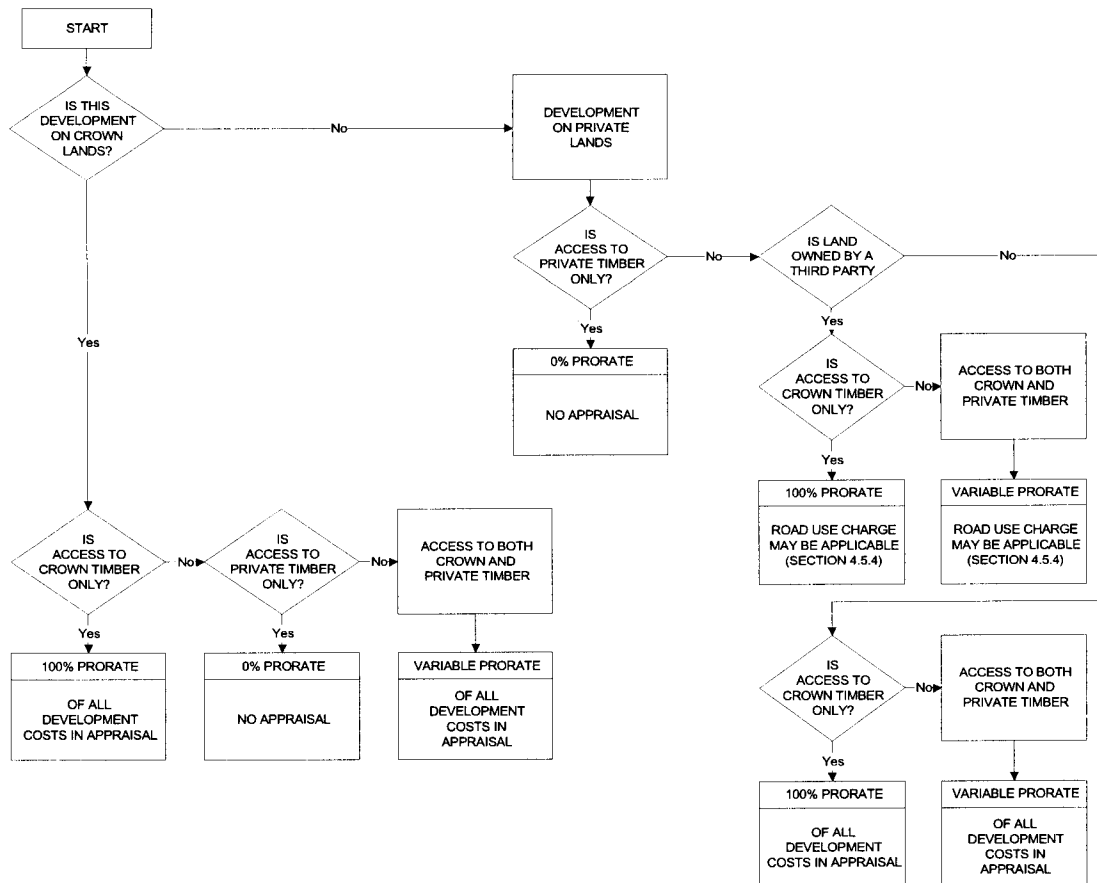
Lowbedding cost estimates for tracked equipment only may be recognized for detailed engineering cost estimates (section 4.3.3).

The degree of recognition of lowbedding costs varies by the estimated number of hours of each machine usage as follows:

1. 1 - 40 hours: to and from the site (mobilization and demobilization),
2. 41 - 80 hours: to the site (mobilization) only, and
3. 81 plus hours: nil.

Appendix II Reconstruction and Replacement

Appendix III Development Cost Allocation



Crown Timber = Appraised timber including appraised Timber Licences

Private Timber = Non-appraised timber

Variable Prorate = A tributary-volume type prorate between appraised and non-appraised timber

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 Specifications: Calculating Stumpage Rates for Coast Appraisals Using the Market Pricing System

Calculation Conventions Used Throughout this Document

Use only single-operation calculations, except in compound additions and subtractions where all operands have the same number of decimal places.

Multiplication:

Compute each product to a number of decimal places equal to the sum of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the product. For example, the calculation to compute the product, to two decimal places, of two numbers, one with no decimal places and the other with three decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 262 * 0.234 &= 61.308 \\ &= 61.31 \text{ rounded to 2 decimal places}\end{aligned}$$

Division:

Compute each quotient to a number of decimal places equal to the number of decimal places specified for the quotient plus one, then round to the number of decimal places specified for the quotient. For example, the calculation to compute the quotient, to two decimal places, of two numbers each with zero decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 234209 / 4671518 &= 62.616 \\ &= 62.62 \text{ rounded to 2 decimal places}\end{aligned}$$

Addition:

Compute each sum to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the sum. For example, the calculation to compute the sum, to two decimal places, of two numbers, each with four decimal places would be done as follows:

$$\begin{aligned}\text{e.g., } 13.5837 + 11.6489 &= 25.2326 \\ &= 25.23 \text{ rounded to 2 decimal places}\end{aligned}$$

Subtraction:

Compute each difference to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the difference. For example, the calculation to compute the difference, to two decimal places, of two numbers, one with five decimal places, and the other with three decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 12.69999 - 9.375 &= 3.32499 \\ &= 3.32 \text{ rounded to 2 decimal places}\end{aligned}$$

Rounding:

Determine the rightmost digit to be retained (e.g., 12.3449).

Determine the leftmost digit to be dropped (e.g., 12.3449).

If the left most digit to be dropped is less than five, then the rightmost digit retained is unchanged (e.g., 12.3449 rounded to 2 decimal places is 12.34).

If the leftmost digit to be dropped is five or greater, then the rightmost digit retained is incremented by one (e.g., 12.3450) rounded to 2 decimal places is 12.35).

General appraisal systems (GAS) table naming conventions used throughout this document are:

T Log	=	log average market values - by species
T Quarter	=	quarterly parameters
T MPS	=	MPS coefficients
T CPI	=	consumer price index

Legend:

In 'Source' column: 'Tnn' refers to Gas table Identity - full descriptions are shown on page A-9.

'Snn' refers to the step number within this example.

'mark' refers to values on the corporate data base for each mark.

1. Compute Stand Selling Price

		Units	Decimal	Maximum Value	Source	Example	Round
1.1	Species grade fraction = species grade % / 100	n/a %	2 0	1.00 100	mark	0.55 55	
1.2	Species grade fraction price = species grade fraction * species grade AMV	\$/m ³ n/a \$/m ³	4 2	9999.9999 9999.99	S 1.1 T Log	33.6160 0.55 61.12	
1.3	Species selling price = sum of species grade fraction prices	\$/m ³ \$/m ³	2	9999.99	S 1.2	77.45 33.6160	yes
1.4	Species value = species selling price * species cruise volume	\$ \$/m ³ m ³	0 0	99999999 9999999	S 1.3 mark	387250 77.45 5000	yes
1.5	Stand value = sum of species values	\$ \$	0	99999999	S 1.4	3688000 387250	
1.6	Stand volume = sum of species cruise volumes	m ³ m ³	0 0	9999999 9999999	mark	50000 5000	
1.7	Average log price = stand value / stand volume	\$/m ³ \$ m ³	2	9999.99	S 1.5 S 1.6	73.76 3655000 50000	yes

2. Compute Other Values

		Units	Decimal	Maximum Value	Source	Example	Round
2.1	CPIF = current CPI / base CPI	n/a n/a n/a	4 1 1	9.9999 999.9 999.9	T CPI T CPI	1.0073 110.1 109.3	yes
2.2	Volume/hectare = net cruise volume / total merchantable area	m ³ /ha m ³ ha	0 0 1	9999 9999999 9999.9	mark mark	586 50000 85.3	yes
2.3	Helicopter fraction = total helicopter volume / net cruise volume	n/a m ³ m ³	2 0 0	1.00 9999999 9999999	mark mark	0.10 5000 50000	yes
2.4	Total specified operation rate = tree-to-truck specified operation rate + transportation specified operation rate + administration specified operation rate	\$/m ³ \$/m ³ \$/m ³ \$/m ³	2 2 2 2	99.99 99.99 99.99 99.99	mark mark mark	2.11 0.00 0.00 2.11	

3. Compute Preliminary Market Stumpage Price

		Units	Decimal	Maximum Value	Source	Example	Round
3.1	Average log price component = average log price * average log price coefficient / CPIF	n/a \$/m ³ n/a n/a	2 4	999.99 99.9999	S 1.7 T MPS S 2.1	72.61 73.76 0.9916 1.0073	yes
3.2	Volume/hectare component = volume/hectare * volume/hectare coefficient / 1000	n/a m ³ /ha n/a	2 0 4	99.99 9999 99.9999	mark T MPS	8.56 586 14.6050	yes
3.3	Helicopter component = helicopter fraction helicopter fraction coefficient	n/a n/a n/a	2 4	99.99 99.9999	S 2.3 T MPS	-3.68 0.10 -36.8188	yes
3.4	Remote site component = remote dummy (if remote then=1,else=0) * remote coefficient	n/a n/a n/a	2 0 4	99.99 1 99.9999	mark T MPS	-6.43 1 -6.4322	yes
3.5	Specified operation component = total specified operation rate * specified operation coefficient / CPIF	n/a \$/m ³ n/a n/a	2 4	99.99 99.9999	S 2.4 T MPS S 2.1	-1.48 2.11 -0.7053 1.0073	yes

Compute Preliminary Market Stumpage Price (continued)

		Units	Decimal	Maximum Value	Source	Example	Round
3.6	Haul distance component	n/a	2	99.99		-2.46	yes
	= haul distance	km	1	9999.9	mark	20.0	
	* haul distance coefficient	n/a	4	99.9999	T MPS	-0.1232	
3.7	Average number of bidders component	n/a	2	99.99		17.50	yes
	= natural logarithm of average # of bidders (average # of bidders = 5.3)	n/a	4	99.9999	T MPS	1.6677	
	* number of bidders component	n/a	4	99.9999	T MPS	10.4944	
3.8	North Coast Forest District component	n/a	2	99.99		0	yes
	= North Coast dummy	n/a	0	1	mark	0	
	(if North Coast then = 1, else = 0)						
	* North Coast coefficient	n/a	4	99.9999	T MPS	-9.2977	
3.9	Port McNeill Fores District component	n/a	2	99.99		0	yes
	= Port McNeill dummy	n/a	0	1	mark	0	
	(if Port McNeill then = 1, else = 0)						
	* Port McNeill coefficient	n/a	4	99.9999	T MPS	-16.1047	
3.10	Mid-Coast Forest District component	n/a	2	99.99		-19.11	yes
	= Mid-Coast dummy	n/a	0	1	mark	1	
	(if Mid-Coast then = 1, else = 0)						
	* Mid-Coast coefficient	n/a	4	99.9999	T MPS	-19.1108	
3.11	QCI Forest District component	n/a	2	99.99		0	yes
	= QCI dummy	n/a	0	1	mark	0	
	(if QCI then = 1, else = 0)						
	* QCI coefficient	n/a	4	99.9999	T MPS	-15.6639	
3.12	Preliminary market stumpage price (1997\$)	\$/m ³	2	999.99		9.33	yes
	= constant	n/a	4	999.9999	T MPS	-56.18	
	+ average log price component	n/a			S 3.1	72.61	
	+ volume/hectare component	n/a			S 3.2	8.56	
	+ helicopter component	n/a			S 3.3	-3.68	
	+ remote site component	n/a			S 3.4	-6.43	
	+ specified operation component	n/a			S 3.5	-1.48	
	+ haul distance component	n/a			S 3.6	-2.46	
	+ average number of bidders component	n/a			S 3.7	17.50	
	+ North Coast District component	n/a			S 3.8	0.00	
	+ Port McNeill District component	n/a			S 3.9	0.00	
	+ Mid-Coast District component	n/a			S 3.10	-19.11	
	+ QCI District component	n/a			S 3.11	0.00	
3.13	Preliminary market stumpage price	\$/m ³	2	999.99		9.40	yes
	= preliminary market stumpage price (1997\$)	\$/m ³			S 3.12	9.33	
	* CPIF	n/a			S 2.1	1.0073	

4 Compute Preliminary Total Stumpage Rate

		Units	Decimal	Maximum Value	Source	Example	Round
4.1	Preliminary discount = prelim. market stumpage price * discount % / 100	$\$/m^3$ $\$/m^3$ %	2 0	999.99 99	 S 3.13 mark	2.82 9.40 30	yes
4.2	Prelim. disc. market stumpage price = prelim. market stumpage price - discount	$\$/m^3$ $\$/m^3$ $\$/m^3$	2	999.99	 S 3.13 S 4.1	6.58 9.40 2.82	
4.3	Preliminary upset stumpage rate = maximum of: prelim. disc. market stumpage price or minimum stumpage rate	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2	999.99 9.99	 S 4.2 T Quarter	6.58 6.58 0.25	
4.4	Preliminary total stumpage rate = preliminary upset stumpage rate	$\$/m^3$ $\$/m^3$	2	999.99	 S 4.3	6.58 0.00	

5. Compute Estimated Number of Bidders

		Units	Decimal	Maximum Value	Source	Example	Round
5.1	Margin = average log price - preliminary upset stumpage rate	$\$/m^3$ $\$/m^3$ $\$/m^3$	2	9999.99	 S 1.7 S 4.3	67.18 73.76 6.58	
5.2	Lagged species grade fraction price = species grade fraction * lagged species grade AMV	$\$/m^3$ n/a $\$/m^3$	4 2	9999.9999 9999.99	 S 1.1 T Log	39.1160 0.55 71.12	
5.3	Lagged species selling price = sum of lagged species grade fraction prices	$\$/m^3$ $\$/m^3$	2	9999.99	 S 5.2	74.75 39.1160	yes
5.4	Lagged ¹ species value = lagged species selling price * species cruise volume	\$ $\$/m^3$ m^3	0 0	99999999 99999999	 S 5.3 mark	373750 74.75 5000	yes

¹ The lagged average log price calculations use prices from the month before that used to calculate the average log price.

Compute Estimated Number of Bidders (continued)

		Units	Decimal	Maximum Value	Source	Example	Round
5.5	Lagged stand value = sum of lagged species values	\$ \$	0	99999999	S 5.4	4186500 373750	
5.6	Lagged average log price = lagged stand value / stand volume	\$/m ³ \$ m ³	2	9999.99	S 5.5 S 1.6	83.73 4186500 50000	yes
5.7	Change in average log price = average log price - lagged average log price	\$/m ³ \$/m ³ \$/m ³	2	9999.99	S 1.7 S 5.6	-9.97 73.76 83.73	
5.8	Volume = stand volume / 1000	'000m ³ m ³	3 0	9999.999	S 1.6	50.000 50000	
5.9	Restricted volume = minimum of: volume or minimum volume	'000m ³ '000m ³ '000m ³	3	999.999	S 5.8 S MPS	35.000 50.000 35.000	
5.10	Margin component = margin * margin coefficient / CPIF	n/a \$/m ³ n/a n/a	2 4	999.99 99.9999	S 5.1 T MPS S 2.1	2.59 67.18 0.0388 1.0073	yes
5.11	Change in avg. log price component = change in average log price * change in avg. log price coefficient / CPIF	n/a \$/m ³ n/a n/a	2 4	99.99 99.9999	S 5.7 T MPS S 2.1	-0.96 -9.97 0.0965 1.0073	yes
5.12	Restricted volume component = restricted volume * volume coefficient	n/a '000m ³ n/a	2 4	99.99 99.9999	S 5.9 T MPS	6.16 35.000 0.1760	yes
5.13	Restricted vol. squared component = restricted volume * restricted volume * restricted vol. Squared coefficient	n/a '000m ³ '000m ³ n/a	2 5	99.99 99.99999	S 5.9 S 5.9 T MPS	6.16 35.000 35.000 -0.00247	yes
5.14	NB helicopter component = helicopter fraction * NB helicopter coefficient	n/a n/a n/a	2 4	99.99 99.9999	S 2.3 T MPS	-0.23 0.10 -2.2607	yes

Compute Estimated Number of Bidders (continued)

		Units	Decimal	Maximum Value	Source	Example	Round
5.15	Barging component	n/a	2	99.99		-2.06	yes
	= barging dummy	n/a	0	1	mark	1	
	(if barging then = 1, else = 0)						
	* barging coefficient	n/a	4	99.9999	T MPS	-2.0634	
5.16	Commercial thinning component	n/a	2	99.99		0	yes
	= commercial thinning dummy	n/a	0	1	mark	0	
	(if comm. thin. then = 1, else = 0)						
	* commercial thinning coefficient	n/a	4	99.9999	T MPS	-2.5571	
5.17	Skyline component	n/a	2	99.99		0	yes
	= skyline dummy	n/a	0	1	mark	0	
	(if skyline then = 1, else = 0)						
	* skyline coefficient	n/a	4	99.9999	T MPS	-2.2939	
5.18	A-frame component	n/a	2	99.99		0	yes
	= A-frame dummy	n/a	0	1	mark	0	
	(if A-frame then = 1, else = 0)						
	* A-frame coefficient	n/a	4	99.9999	T MPS	-2.9484	
5.19	Blowdown component	n/a	2	99.99		0	yes
	= blowdown dummy	n/a	0	1	mark	0	
	(if > 50% b.d. then = 1, else = 0)						
	* blowdown coefficient	n/a	4	99.9999	T MPS	-2.5990	
5.20	South Island District component	n/a	2	99.99		0	yes
	= South Island dummy	n/a	0	1	mark	0	
	(if South Island then = 1, else = 0)						
	* South Island coefficient	n/a	4	99.9999	T MPS	1.0440	
5.21	Estimated number of bidders	n/a	1	99.9		2.6	yes
	= constant	n/a	4	99.9999	T MPS	2.4176	
	+ margin	n/a			S 5.10	2.59	
	+ change in average log price component	n/a			S 5.11	-0.96	
	+volume component	n/a			S 5.12	6.16	
	+ volume squared component	n/a			S 5.13	-3.03	
	+ NB helicopter component	n/a			S 5.14	-0.23	
	+barging component	n/a			S 5.15	-2.06	
	+ commercial thinning component	n/a			S 5.16	0.00	
	+ skyline component	n/a			S 5.17	-2.29	
	+ A-frame component	n/a			S 5.18	0.00	
	+ blowdown component	n/a			S 5.19	0.00	
	+ South Island District component	n/a			S 5.20	0.00	
5.22	Restricted number of bidders	n/a	1	99.9		2.6	
	= the greater of:	n/a					
	estimated number of bidders	n/a			S 5.21	2.6	
	or minimum number of bidders	n/a	1	9.9	T MPS	2.0	

6. Compute Final Stumpage Rate

		Units	Decimal	Maximum Value	Source	Example	Round
6.1	Number of bidders component	n/a	2	99.99		10.03	yes
	= natural logarithm of restricted # of bidders	n/a	4	99.9999	S 5.22	0.9555	
	* number of bidders component	n/a	4	99.9999	T MPS	10.4944	
6.2	Market stumpage price (1997\$)	\$/m ³	2	999.99		1.86	yes
	= constant	n/a	4	999.9999	T MPS	-56.18	
	+ average log price component	n/a			S 3.1	72.61	
	+ volume/hectare component	n/a			S 3.2	8.56	
	+ helicopter component	n/a			S 3.3	-3.68	
	+ remote site component	n/a			S 3.4	-6.43	
	+ specified operation component	n/a			S 3.5	-1.48	
	+ haul distance component	n/a			S 3.6	-2.46	
	+ number of bidders component	n/a			S 6.1	10.03	
	+ North Coast District component	n/a			S 3.8	0.00	
	+ Port McNeill District component	n/a			S 3.9	0.00	
	+ Mid-Coast District component	n/a			S 3.10	-19.11	
	+ QCI District component	n/a			S 3.11	0.00	
6.3	Market stumpage price	\$/m ³	2	999.99		1.87	yes
	= market stumpage price (1997\$)	\$/m ³			S 6.2	1.86	
	* CPIF	n/a			S 2.1	1.0073	
6.4	Discount	\$/m ³	2	999.99		0.56	yes
	= market stumpage price	\$/m ³			S 6.3	1.87	
	* discount %	%	0	99	mark	30	
	/ 100						
6.5	Discounted market stumpage price	\$/m ³	2	999.99		1.31	
	= market stumpage price	\$/m ³			S 6.3	1.87	
	- discount	\$/m ³			S 6.4	0.56	
6.6	Converted market stumpage price	\$/m ³	2	999.99		1.31	
	= discounted market stumpage price	\$/m ³			S 6.5	1.31	
	+ CVP/MPS differential ²	\$/m ³	2	999.99	mark	0.00	

² Applies only to marks converted from CVP to MPS on January 1, 1999. The differential will be used in adjusting rates for these appraisals on April 1, 1999, and subsequent adjustment dates. The adjusted rate will be calculated using the market pricing system with the differential applied as above. The differential is calculated as follows:

CVP/MPS differential = (Jan/01/99 CVP reduced rate) - (Jan/01/99 MPS discounted market stumpage price)

Compute Final Stumpage Rate (continued)

		Units	Decimal	Maximum Value	Source	Example	Round
6.7	Upset stumpage rate	$\$/m^3$	2	999.99		1.31.	
	= maximum of:	$\$/m^3$					
	converted market stumpage price				S 6.6	1.31	
	or minimum stumpage rate	$\$/m^3$	2	99.99	T Quart.	0.25	
6.8	Total stumpage rate	$\$/m^3$	2	999.99		1.31	
	= upset stumpage rate	$\$/m^3$	2		S 6.7	1.31	
	+ bonus bid	$\$/m^3$	2	999.99	mark	0.00	

Appendix VI Specifications: Calculating Stumpage Rates for Coast Appraisals Using the Comparative Value Pricing System

Calculation Conventions Used Throughout this Document

Use only single-operation calculations, except in compound additions and subtractions where all operands have the same number of decimal places.

Multiplication:

Compute each product to a number of decimal places equal to the sum of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the product. For example, the calculation to compute the product, to two decimal places, of two numbers, one with no decimal places, and the other with three decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 262 * 0.234 &= 61.308 \\ &= 61.31 \text{ rounded to 2 decimal places}\end{aligned}$$

Division:

Compute each quotient to a number of decimal places equal to the number of decimal places specified for the quotient plus one, then round to the number of decimal places specified for the quotient. For example, the calculation to compute the quotient, to two decimal places, of two numbers each with zero decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 234209 / 4671518 &= 62.616 \\ &= 62.62 \text{ rounded to 2 decimal places}\end{aligned}$$

Addition:

Compute each sum to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the sum. For example, the calculation to compute the sum, to two decimal places, of two numbers, each with four decimal places would be done as follows:

$$\begin{aligned}\text{e.g., } 13.5837 + 11.6489 &= 25.2326 \\ &= 25.23 \text{ rounded to 2 decimal places}\end{aligned}$$

Subtraction:

Compute each difference to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the difference. For example, the calculation to compute the difference, to two decimal places, of two numbers, one with five decimal places, and the other with three decimal places, would be done as follows:

$$\begin{aligned}\text{e.g., } 12.69999 - 9.375 &= 3.32499 \\ &= 3.32 \text{ rounded to 2 decimal places}\end{aligned}$$

Rounding:

Determine the rightmost digit to be retained (e.g., 12.3449).

Determine the leftmost digit to be dropped (e.g., 12.3449).

If the left most digit to be dropped is less than five, then the rightmost digit retained is unchanged (e.g., 12.3449 rounded to 2 decimal places is 12.34).

If the leftmost digit to be dropped is five or greater, then the rightmost digit retained is incremented by one (e.g., 12.3450 rounded to 2 decimal places is 12.35).

General appraisal systems (GAS) table naming conventions used throughout this document are:

T Log AMV	=	coast log selling prices by species and grade
T Trend	=	cost trend factors
T Quarterly	=	quarterly parameters
T Default	=	region or district default values

Legend:

In 'Source' column: 'Tnn' refers to GAS table identity - full descriptions are shown on Page A-19.

'Snn' refers to the step number within this example.

'mark' refers to values on the corporate data base for each mark.

Bullet (●) indicates variables to be displayed on output.

	Compute Species Selling Price	Units	Decimal	Maximum Value	Source	Example	Rounded
1.	Grade fraction ● = species grade percent/100	n/a n/a	2 0	1.00 100	Mark	.07 07	
2.	Grade fraction price = grade AMV ● * grade fraction	\$/m ³ \$/m ³ n/a	4 2 2	999.9999 999.99 1.00	T Log AMV S01	4.5661 65.23 .07	
3.	Grade fraction price sum = sum of grade fraction prices (all grades)	\$/m ³ \$/m ³	4 4	999.9999 999.9999	S02	45.4074 4.5661	
4.	Species selling price ● = grade fraction price sum	\$/m ³ \$/m ³	2 4	999.99 999.9999	S03	45.41 45.4074	yes
Compute Operating Costs							
5.	Trended logging cost ● = untrended logging cost ● * logging trend factor ●	\$/m ³ \$/m ³ n/a	2 2 3	999.99 999.99 9.999	mark T Trend	44.36 43.07 1.030	yes
6.	Trended silviculture cost ● = untrended silviculture cost ● * silviculture trend factor ●	\$/m ³ \$/m ³ n/a	2 2 3	99.99 99.99 9.999	mark T Trend	1.27 1.23 1.030	yes
Compute Species Selling Price							
7.	Species operating cost ● = trended logging cost ● + trended silviculture cost ●	\$/m ³ \$/m ³ \$/m ³	2 2 2	999.99 999.99 999.99	S05 S06	45.63 44.36 1.27	

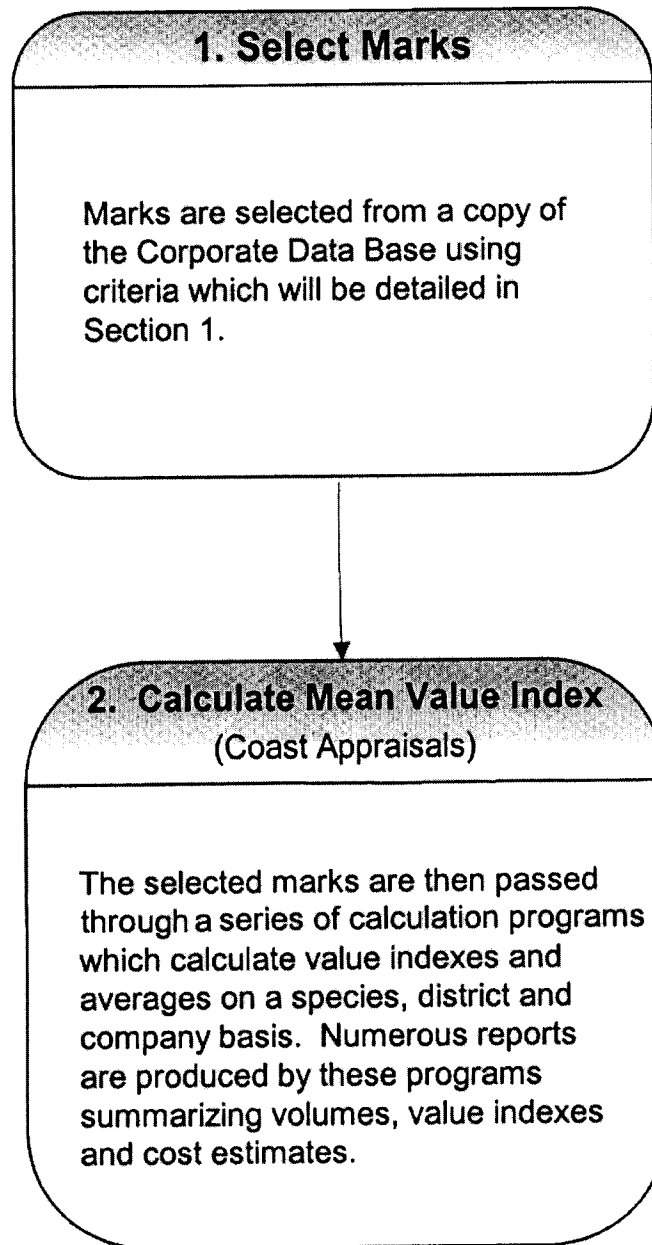
Compute Species Selling Price (continued)

8.	Species value ●	\$	0	99999999		3231285	yes
	= species selling price	\$/m ³	2	999.99	S04	45.41	
	* species cruise volume ●	m ³	0	1000000	mark	71158	
9.	Species cost ●	\$	0	99999999		3246940	yes
	= species operating cost	\$/m ³	2	999.99	S07	45.63	
	* species cruise volume ●	m ³	0	1000000	mark	71158	
10.	Stand value ●	\$	0	999999999		14671518	
	= sum of species values (all species)	\$	0	99999999	S08	3231285	
11.	Stand cost ●	\$	0	999999999		10691520	
	= sum of species costs (all species)	\$	0	99999999	S09	3246940	
12.	Stand volume ●	m ³	0	9000000		234309	
	= sum of cruise volumes (all species)	m ³	0	1000000	mark	71158	

Compute Stand Value Index

13.	Weighted selling price ●	\$/m ³	2	999.99		62.62	yes
	= stand value	\$	0	999999999	S10	14671518	
	/ stand volume	m ³	0	9000000	S11	234309	
14.	Weighted operating cost ●	\$/m ³	2	999.99		45.63	yes
	= stand cost	\$	0	999999999	S11	10691520	
	/ stand volume	m ³	0	9000000	S12	234309	
15.	Stand value index ●	\$/m ³	2	999.99		16.99	
	= weighted selling price	\$/m ³	2	999.99	S13	62.62	
	– weighted operating cost	\$/m ³	2	999.99	S14	45.63	

Overview Flowchart



Calculating Coast Mean Value Index (CMVI)

1. Select Marks

The selection of coast marks is done from the snapshot of the SQLP1 database. Then, the species records for the mark are extracted to ensure only species subject to comparative value pricing, including the deciduous species alder and cottonwood, are used. Volumes billed for all coniferous species over the period (fourteen months prior to stumpage adjustment date to two months before the stumpage adjustment date) are then totalled into two groups; lo-grade sawlogs and hi-grade sawlogs. In subsequent coast base rate calculations, any sawlogs billed at minimum rates will be made revenue neutral. Finally, the mean value index eligible flag that was set by the regional appraisal officers is checked to determine whether a mark can be included in CMVI calculations.

Select Marks Which Meet the Following Criteria:

1. Mark is a stumpage mark.
2. Mark is appraised by the coast method.
3. Mark is not part of the SBFEP.
4. Mark is one of the following tenures:
 - a. Forest licence,
 - b. Tree farm licence,
 - c. Timber sale licence with allowable annual cut exceeding 10 000 m³,
 - d. Other tenures with allowable annual cut exceeding 10 000 m³, or
 - e. Timber licence
5. Mark has valid appraisal data permitting the calculation of a value index.
6. Mark has a total cruise volume of 100 cubic metres or more.
7. Mark has a confirmed worksheet with an appraisal effective date more recent than twenty-two months ago (from the stumpage adjustment date), that has not expired as of the stumpage adjustment date.
8. Mark has information for at least one of the following species: balsam, cedar, fir, cypress, hemlock, lodgepole pine, spruce, white pine, alder or cottonwood.

Calculate the Lo-Grade and Hi-Grade Volume Billed for All Coniferous Sawlog Species

9. Include the volume billed for the coniferous species shown above and the following species: white bark pine (WB), yellow pine and larch. Do not include the volumes of any deciduous species, including alder and cottonwood. Do not include volumes of special forest products. Only normal and cruise-based billings are included. Lo-grade volumes and values are based on the species and grades shown in the species lo-grade sawlog factors table for the applicable date. Hi-grade volumes are based on all volumes except Grade Z and lo-grade volumes.
10. Calculate the total volume billed for each mark by adding the individual species lo-grade and hi-grade volumes.
11. Exclude any mark where the total volume billed is less than 1 000 cubic metres.

Check the MVI Flag Coded by Regional Appraisal Officers

12. Check the mean value index flag set by the regional appraisal officers. Report any conflicts on the rejected marks report:
 - a. the flag indicates rejection but the above criteria indicate acceptance, or
 - b. the flag indicates eligibility but the above criteria indicate rejection.
13. Only selected marks, where the flag indicated eligibility and the above criteria indicate acceptance, are used in subsequent calculations.

2. Calculate Coast Mean Value Index

Legend:

In 'Source' column: 'SVI-Snn' refers to the step number from the STAND VALUE INDEX specification earlier in the document.
 'Snn' refers to the step number within this specification.
 'HH' refers to the sum of volumes from the specified twelve months of harvest history.

In 'Max. Value' column: 9(8) means 99999999.

Bullet (●) indicates variables to be displayed on output.

Calculate Stand Value Index for (Coast) Appraisal (for reference see page A21)

Compute Mean Value Index		Units	Decimal	Maximum Value	Source	Example	Rounded
1.	Stand value cross product ● = stand value index * stand billed volume	\$ \$/m ³ m ³	0 2 0	9(9) 999.99 9(8)	SVI-S15 HH	6015 12.03 500	yes
2.	Cross product total value ● = sum of stand value cross products (all marks)	\$ \$	0 0	9(12) 9(11)	S1	6015	
3.	Total coast billed volume ● = sum of stand billed volumes (all marks)	m ³ m ³	0 0	9(11) 9(10)	HH	500	
4.	Coast mean value index ● = cross product total value / total coast billed volume	\$/m ³ \$ m ³	2 0 0	999.99 9(12) 9(11)	S2 S3	6015 500	

Calculating Base Rate for (Interior and Coast) Appraisals**Legend:**

In 'Source' column: 'Tnn' refers to the GAS table identity - full descriptions are shown on page A-19.
 'Snn' refers to the step number within this example.
 'MVI' refers to the value from the mark VI data file produced in the coast mean value index calculation.

Bullet (●) indicates variables to be displayed on output.

Initialize Trial Base Rate

1. Initialize trial base rate = target rate.

Compute Trial Average Rate

2. Compute trial average rate (steps 2.1 to 2.17 shown on the following pages).
3. Compute new trial base rate = trial base rate + target rate - trial average rate. Repeat steps 2 and 3 until trial average rate = target rate or until number of iterations exceed maximum permitted.

Base Rate Static

4. Final base rate ● = new trial base rate ●.

To Find Other Base Rates that Yield the Same Trial Average Rate

5. Initial value for trial base rate ● + or - \$0.01 depending on whether the base rate exceeds or is less than the target rate.
6. Compute trial average rate (steps 2.1 to 2.17).
7. Compute new trial base rate = trial base rate - 0.01. Repeat steps 6 and 7 until trial average rate is 1 cent less than or greater than target, or until number of iterations exceeds maximum.

Maximum Iterations Reached

8. If number of iterations exceeds ● maximum iterations then print an appropriate message.

Compute Trial Average Rate

	Compute Trial Stand Value for Each Mark	Units	Decimal	Maximum Value	Source
2.1	Relative value index ● = stand value index ● - mean value index ●	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	MVI T Quarterly
2.2	Trial indicated rate ● = trial base rate ● + adjusted relative value index	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	S1 S2.2

		Units	Decimal	Maximum Value	Source
2.3	Trial reserve rate ● = maximum of trial indicated rate	$\$/m^3$	2	999.99	
		$\$/m^3$	2	999.99	S2.3
	= minimum rate ●	$\$/m^3$	2	999.99	T Quarterly
2.4	Trial rate trigger excess	$\$/m^3$	2	999.99	
	= trial reserve rate	$\$/m^3$	2	999.99	S2.3
	- rate reduction trigger	$\$/m^3$	2	999.99	T Quarterly
2.5	Trial rate reduction	$\$/m^3$	2	999.99	
	= trial rate trigger excess	$\$/m^3$	2	999.99	S2.5
	* rate reduction ratio ●	none	2	1.00	T Quarterly
2.6	If trial rate reduction L. T. zero then trial rate reduction = zero	$\$/m^3$	2	999.99	
2.7	Trial reduced reserve rate ●	$\$/m^3$	2	999.99	
	= trial reserve rate	$\$/m^3$	2	999.99	S2.4
	- trial rate reduction	$\$/m^3$	2	999.99	S2.6 or S2.7

If Mark District is NOT Subject to Special Default Rates

2.8	Trial hi-grade rate ●	$\$/m^3$	2	999.99	
	= trial reduced reserve rate	$\$/m^3$	2	999.99	S2.8

If Mark District is Subject to Special Default Rates

2.9	Trial hi-grade rate ●	$\$/m^3$	2	999.99	
	= default rate (e.g., \$1.25)	$\$/m^3$	2	999.99	T Default
2.10	Stand hi-grade billed volume	m^3	0	9(8)	
	= stand billed volume	m^3	0	9(8)	MVI
	- stand lo-grade billed volume	m^3	0	9(8)	MVI
2.11	Stand hi-grade value ●	\$	0	9(10)	
	= stand hi-grade billed volume	m^3	0	9(8)	S2.10
	* trial hi-grade rate	$\$/m^3$	2	999.99	S2.9
2.12	Stand lo-grade value ●	\$	0	9(10)	
	= stand lo-grade billed volume	m^3	0	9(8)	MVI
	* trial lo-grade rate (e.g., \$0.25)	$\$/m^3$	2	999.99	T Default
2.13	Trial stand value ●	\$	0	9(10)	
	= stand hi-grade value	\$	0	9(10)	S2.11
	+ stand lo-grade value	\$	0	9(10)	S2.12

Compute Stand Totals		Units	Decimal	Maximum Value	Source
2.14	Stand net rate ● = trial stand value / stand billed volume	\$/m ³ \$ m ³	2 0 0	999.99 9(10) 9(8)	S2.13 MVI
2.15	Total trial value ● = sum of trial stand values (all marks)	\$ \$	0 0	9(12) 9(10)	S2.13
2.16	Total billed volume ● = sum of stand billed volumes (all marks)	m ³ m ³	0 0	9(10) 9(8)	MVI
Compute Trial Average Rate					
2.17	Trial average rate ● = total trial value / total billed volume	\$/m ³ \$ m ³	4 0 0	999.9999 9(12) 9(10)	S2.15 S2.16

Calculating Stumpage Rate for Appraisals

Legend:

In 'Source' column: 'Mark' refers to the values on the corporate data base for each mark.
'Tnn' refers to GAS table identity - full descriptions are shown on page A-19.
'SVI-Snn' refers to the step number from the STAND VALUE INDEX specifications earlier in this document.
'Snn' refers to the step number within this specification.

In 'Max. Value' column: 9(8) means 99999999.

Bullet (●) indicates variables to be displayed on output reports.

Calculate Stand Value Index for Appraisals (for reference see page A21)

Compute Final Stumpage Rate		Units	Decimal	Maximum Value	Source	Example	Rounded
1.	Relative value index	\$/m ³	2	999.99			7.01
	= stand value index	\$/m ³	2	999.99	SVI-S15		16.99
	- mean value index ●	\$/m ³	2	999.99	T Quarterly		9.98

		Units	Decimal	Maximum Value	Source	Example	Rounded
2.	Indicated Rate ● = base rate ● + relative value index	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	T Quarterly S1	16.91 9.90 7.01	
3.	Stumpage rate trigger excess = indicated stumpage rate - stumpage rate reduction trigger	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	S2 T Quarterly	16.91 16.91 0.00	
4.	Stumpage rate reduction = stumpage rate trigger excess * stumpage rate reduction ratio	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 1.00	T Quarterly	0.00 16.91 0.00	yes
5.	If stumpage rate reduction < 0 then stumpage rate reduction = 0	$\$/m$	2	999.99		0.00	
6.	Reserve rate ● = maximum of indicated stumpage rate - stumpage rate reduction or minimum rate ●	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	S2 - S4 T Quarterly	16.91 16.91 0.25	
7.	Species reserve stumpage rate ● = minimum of district species ceiling stumpage rates or reserve rate (if ceiling applies)	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	T Default S3	1.00 1.00 16.91	
8.	Upset stumpage rate ● = species reserve rate + silviculture levy ● + development levy ●	$\$/m^3$ $\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2 2	999.99 999.99 99.99 99.99	S7 mark mark	6.22 1.00 3.90 1.32	
9.	Total stumpage rate ● = upset stumpage rate + bonus bid ●	$\$/m^3$ $\$/m^3$ $\$/m^3$	2 2 2	999.99 999.99 999.99	S8 mark	7.45 6.22 1.25	

This page is intentionally left blank.

Index

A

Accessible Cutting Authority, 4-35
 Accumulated Amendments, 2-6
 Additional Stabilizing Material, 4-19
 Administration and Other Costs, 4-33
 A-frame Logging, 4-3
 Anniversary Date, 2-5
 Anniversary Date Reappraisal Procedure, 2-7
 Appendices, A-1
 Appraisal and Reappraisal Data Requirements, 4-4
 Appraisal Principles & Procedures, 2-1
 Appraisal Procedure, 2-3
 Appraisals, 7-3
 Area of Application, 1-3
 Average Cost Estimates, 4-6
 Average Log Market Value Determination, 3-2

B

Barge Transportation, 4-27
 Barging Cost Estimates, 4-30
 Basic Silviculture, 4-38
 Billing History Record, 3-3
 Blowdown Timber, 4-3
 Bridge Cost Estimates, 4-7

C

Calculating the Coast Composite Index, 5-5
 Calculating the Coast Target Rate, 5-5
 Calculation Conventions, 2-13

Calculation of Indicated Stumpage Rate, 5-8
 Calculation of Stand Selling Price, 7-5
 Calculation of Stumpage Rate, 5-8
 Camp Moves, 4-3
 Camp Operations and Overhead, 4-35
 Capping, 4-22
 Charges as a Share of Road Maintenance, 4-32
 Charges for Other than Road Maintenance, 4-32
 Clayoquot Sound, 4-36
 Coast, 1-3
 Coast Base Rate, 5-7
 Coast Mean Value Index, 5-4
 Coast Value Indexes, 6-2
 Comparative Value Timber Pricing, 1-7
 Coniferous Timber, 2-14
 Conventional Logging, 4-24
 Converting Indexes From 1997=100 Base to 1992=100 Base, 5-5
 Corporate and Forestry Overhead, 4-33
 Corporate Forestry and Engineering, 4-33
 Corporate General and Administrative Overhead, 4-33
 Correctable Error, 2-9
 Cost Estimates, 4-2
 Cost Trend, 4-39
 Crew Transportation(Labour), 4-34
 Cruise Data, 4-4
 Culverts, 4-17
 Cutting Authorities With 5 000 m³ or Less Volume, 6-3
 Cutting Authority, 1-4
 Cutting Authority Area, 1-4

D

Damaged Timber, 3-9
 Data Requirements, 4-23
 Deciduous and Miscellaneous Forest Products, 7-13
 Definitions for In-Place and Quarry Rock RMC (hardness), 4-21
 Destumping, 4-3

Detailed Engineering Cost Estimates, 4-5, 4-6, 4-22
Development, 4-5
Development Cost Allocation, 4-9, A-5
Development Cost Categories, 4-6
Development Cost Estimates for Full Appraisal on Timber Licence (TL) Cutting Authorities, 4-10
Development Cost Estimates on Crown Lands, 4-9
Development Costs on Private Land, 4-10
Development Works, 4-5
Distance, 4-26
District Average Value Index, 2-12
Drainage Structures, 4-16
Dump, Sort, Boom and Scale, 4-27

E

Existing Roads and Structures, 4-11
Extended Road Amortization, 4-11

F

Fixed Stumpage Rate and Extensions of Term, 2-11
Forest Service Roads, 4-32

H

Helicopter Logging, 4-24
High Development Cost Discount Factor, 7-11

I

Indicated Stumpage Rate, 5-2, 7-10
Introduction, 7-2
Isolated Cutting Authority, 4-35

L

Lake Transportation, 4-3
Levy, Development, 6-6
List of MPS Variables, 7-6
Log Bridges, 4-16
Log Grade Percentage, 7-5
Log Grade Percentage Criteria, 3-4

Log Selling Prices, 7-5
Log Transportation, 4-26
Low Volume Cost Estimate Additive, 4-35

M

Main Service Road, 4-5
Market Pricing System, 1-6
Market Stumpage Price (Step 3), 7-9
Market Value Indexing, 5-5
Methodology, 7-3
Minister's Direction, 2-6
Misc. Timber Pricing Policies, 6-1
Miscellaneous Stumpage Rates, 6-7

N

Nearest Community, 4-35
New Construction, 4-6
No Trucking of Stabilizing Material, 4-21
Number of Bidders (Step 2), 7-7

O

Operating Cost Estimation, 4-1
Order-in-Council, 2-2
Other Land Use Charges, 4-32
Other Roads, 4-32

P

Partial Harvesting, 4-3
Partially Harvested Timber, 6-4
Permanent/Portable Bridges, 4-16
Permitted Roads, 4-32
Point of Appraisal, 4-27
Preliminary Upset Stumpage Rate (Step 1), 7-6
Prescribed Minimum Stumpage Rate, 5-8, 7-11
Principles and Procedures, 7-3
Private Land, 4-10

R

Reappraisals, 7-3
Reappraisals, 2-5
Reconstruction and Replacement, 4-7, A-4

Reserve Stumpage Rate, 5-8, 7-11
Responsibility for Stumpage, 1-5
Road Use Charges, 4-31
Roads, 4-5
Rock Mass Classification, 4-13
Routine Maintenance and Deactivation,
4-31

S

Selling Price Estimation, 3-1
Skidder Swinging, 4-3
Skyline Logging, 4-3
Small Business Forest Enterprise Program,
2-11
Small Business Forest Enterprise Program
(SBFEP) Sales, 6-5
Source of Log Grade Percentage for Each
Cutting Authority, 3-6
Special Forest Products, 6-7
Specified Operations, 4-3
Stand Selling Price, 3-10
Stand Selling Price Calculation, 3-10
Stumpage Adjustments, 7-3
Stumpage Calculations, 7-6
Stumpage Rate Adjustments (CVP), 1-8
Stumpage Rate Determination, 5-1
Subgrade Construction, 4-12
Subgrade Cost Estimates, 4-13
Sudden and Severe Damage, 2-5

T

Tabular Cost Estimates, 4-5
Tabular Road and Bridge Cost Estimates,
4-12
Terms of Reference and Conventions, 1-2
Timber Licence, 2-12
Total Corporate and Forestry Overhead,
4-33
Total Logging Cost Estimate, 4-37
Total Obligation Adjustment, 7-10
Total Stumpage Rate, 5-8, 7-12
Total Volume of less than 2 000 m³, 6-3
Towing Cost Estimates, 4-29
Towing or Barging, 4-28

Towing to Tie-up Grounds (over 10 km),
4-3
Tree Crown Modification, 4-3
Tree-To-Truck, 4-24
Tributary, 4-5, 4-11
Truck Hauling, 4-26
Trucking of Stabilizing Material, 4-21
Types of Determination, 2-2

U

Unit Cost Estimates (*U*), 4-20
Upset Stumpage Rate, 5-8, 7-11

V

Value Index, 5-3

W

Water Transportation, 4-27
Woodlot Licence, 2-11, 3-5, 4-11
Woodlots, 2-11

This page is intentionally left blank.

COAST APPRAISAL DATA SUBMISSION

Licence _____ Mark _____ Mark _____ Mark _____

Cutting Permit _____ Mark _____ Mark _____ Mark _____

Licensee: _____

Licensee
Representative
Signature:

E-Mail

Phone ()

Date (ccyy/mm/dd)

Fax ()

ACKNOWLEDGEMENTS

This Appraisal Data Submission is prepared in accordance with the *Coast Appraisal Manual* as of this date with truthful information on the timber to be harvested, site conditions, harvesting, development, and silviculture plans and other information.

Registered Professional Forester

Name: _____ R.P.F. # _____
(Print)

Phone: ()

RPF's Signature and Seal

Fax: ()

E-mail Address:

Date
(ccyy/mm/dd)

☐ I certify that the work described herein fulfils standards acceptable of a Registered Professional Forester and that I did personally supervise the work.

☐ I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been done to standards acceptable of a Registered Professional Forester

*The information contained in this package may be released under the
Freedom of Information and Protection of Privacy Act.*

Reference Information

(must be completed for all appraisal submissions)

Geographic Forest District				Administrative Forest District (Fill-in only if different from Geographic District)				Management Unit type	CP Mark
TSA Name (Mandatory)		Code #	TSB Name (Mandatory except for TFLs)		Code #	Alder		m ³	
						Balsam		m ³	
Appraisal Effective Date (CCYY/MM/DD)		Appraisal Expiry Date (CCYY/MM/DD)		Specified Operation		Yes or No	Cedar	m ³	
				Remote		Yes or No	Cottonwood	m ³	
Appraisal Type		N – New, R – Re-appraisal			Appraisal System		Cypress	m ³	
Mark	Mark Cruise Volume	Mark	Mark Cruise Volume	<div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto;"></div> CVP - Comparative Value Pricing MPS - Market Pricing System		Fir	m ³		
	m ³		m ³			Hemlock	m ³		
	m ³		m ³			Lodgepole	m ³		
	m ³		m ³			Spruce	m ³		
Total Net Cruise Volume			m ³				White Pine	m ³	
Point of Appraisal (See below) ALBE = Alberni PIRV = Pitt River Bridge GAMB = Gambier Isl CHEM = Chemainus				(4) Total Merchantable Area (1 +/- 2) (record to nearest 0.1 ha):			ha		
				(1) Initial Merchantable Area (record to nearest 0.1 ha)			ha		
Amendments Since Initial Appraisal				(2) Net Amendments (absolute value of 3)			ha		
Block	Approval Date	Additions	Deletions	(5) Area Logged *			ha		
		ha	ha						
		ha	ha	Area Unlogged (4 minus 5)			ha		
		ha	ha						
		ha	ha	Net Volume Mature Conifers			m ³		
		ha	ha	Net Volume 2 nd Growth Conifers			m ³		
(3) Totals		ha	ha	Partial Harvest Block Volume **			m ³		
Partial Harvest Cruise Grades?						<input type="text"/>	Yes or No		
Is Second Growth Coniferous Volume ≥ 80% of Total Cutting Permit Net Cruise Volume?						<input type="text"/>	Yes or No		

*Projected estimate as of Reappraisal Date

** Sum where block retention level is ≥ 30%

OPERATING COST INFORMATION

TREE TO TRUCK COSTS ESTIMATES				
CONVENTIONAL LOGGING				
AVERAGE SIDE SLOPE	%	IMMATURE CONIFEROUS STAND		Yes or No
CABLE YARDING	m ³	GROUND SYSTEMS		m ³
HELICOPTER LOGGING				
LAND DROP	m ³	WATER DROP		m ³
SPECIFIED OPERATIONS FOR TREE TO TRUCK (Volumes from this section must be added into the appropriate conventional or helicopter logging method)				
A-FRAME	m ³	\$/m ³	SKYLINE	m ³ \$/m ³
COMMERCIAL THINNING	m ³	\$/m ³	BLOWDOWN	m ³ \$/m ³
OTHER TREE TO TRUCK SPECIFIED OPERATION				
DESCRIPTION				\$/m ³
LOG TRANSPORTATION				
TRUCK HAULING				
TRUCK HAULING		ROAD USE CHARGE		
AVERAGE HAUL DISTANCE (NEAREST 0.1 KM)		TOTAL APPROVED CHARGES		\$/m ³
WATER TRANSPORTATION (Estimate based on Point of Origin)		Attach details and the approved "Request for a Road Use Charge Approval" form must be submitted on Appendix 3.		
1) CODE	<div style="border: 1px solid black; width: 40px; height: 25px; display: inline-block;"></div>	IF	AVERAGING	<div style="border: 1px solid black; width: 40px; height: 25px; display: inline-block;"></div>
NAME (1)			2) CODE	<div style="border: 1px solid black; width: 40px; height: 25px; display: inline-block;"></div>
			NAME (2)	
ROUTINE ROAD MAINTENANCE				
IS MAINTENANCE REQUIRED?		☐ Yes or ☐ No		
LOG TRANSPORTATION SPECIFIED OPERATION				
DESCRIPTION				\$/m ³
ADMINISTRATION AND OTHER COST ESTIMATES				
CREW TRANSPORTATION				
ONE WAY DISTANCE (NEAREST 0.1 KM)	km	Location Description		
IS THE CUTTING PERMIT ACCESSIBLE?		☐ Yes or ☐ No		
DEVELOPMENT				
NEW CONSTRUCTION – TABULAR ROADS				
IS THERE TABULAR ROAD CONSTRUCTION		Yes or No	TOTAL ROAD LENGTH (Sum of all tabular road section lengths)	km
H-LENGTH > 90% OF THE TOTAL ROCK LENGTH		Yes or No	TOTAL LENGTH OF HARD ROCK SECTIONS	km

OPERATING COST INFORMATION

Development – Bridges - (do not include in tabular roads or detailed engineering)

[illegible]

OPERATING COST INFORMATION

* Appraisal Year – First year the cost was put in an appraisal/reappraisal.

Development – Culverts - (compile total length by diameter by appraisal year)

CIRCULAR TYPE		CROWN PORTION		Applicable Volume (m ³) (REGION)	Appraisal Year *	Unit Cost Lineal Metre (\$/m)	Total Cost (\$)	Comments
Diameter (m)	Total Length For Diameter	Percent (%)	Cost (\$)					
0.3								
0.4								
0.5								
0.6								
0.7								
0.8								
0.9								
1.0								
1.2								
1.4								
1.6								
1.8								
Wooden								
0.3								
0.4								
0.5								
0.6								
0.7								
0.8								
0.9								
1.0								
1.2								
1.4								
1.6								
1.8								
Wooden								

Development – Tabular Roads (Exclude road sections with detailed engineering and any bridges)

April 1, 2002

OPERATING COST INFORMATION

Development – Detailed Engineered Costs - (compile by appraisal year and crown portion)

New Construction (attach Construction Estimate Form(s) and Cost Estimate Methodology Form(s))							
Cost Estimate Applicable Attachment #	Total Length of Road (km)	Crown Portion		Total Cost (\$)	Applicable Volume (m ³) (Region)	Appraisal Year *	Comments
		%	\$				

Reconstruction and Replacement (attach Construction Estimate Form(s) and Cost Estimate Methodology Form(s))							
Cost Estimate Applicable Attachment #	Total Length of Road (km)	Crown Portion		Total Cost (\$)	Applicable Volume (m ³) (Region)	Appraisal Year *	Comments
		%	\$				

SILVICULTURE

Is Basic Silviculture Required? ☐ Yes or No

SMALL BUSINESS FOREST ENTERPRISE PROGRAM

Is there development cost incurred by the SBFEP? ☐ Yes or No

Is there development cost incurred by the licensee? ☐ Yes or No

(If either is yes, complete Appendix 1 and attach.)

Appendix 1

SMALL BUSINESS FOREST ENTERPRISE PROGRAM

District to Fill In

SALE DATE (CCYY/MM/DD)

TERM OF SALE (Years)

D – Direct	
BP – Bid Proposal	
ST – Sealed Tender	

Development Levy Applicable (CVP only)	
---	--

Silviculture Levy Applicable (CVP only)	
--	--

Allocated Road Development Cost

Road Name	
-----------	--

TSL Timber Volume in Appraisal		m ³
--------------------------------	--	----------------

Total of All Timber Volume Developed		m ³
--------------------------------------	--	----------------

Comments	Road Length	Total Cost	% Volume Allocation	Allocated Cost

Licensee Developed Road Cost

Total Road Length (Nearest 0.001 km)		km
---	--	----

Road Length Constructed by Licensee (Nearest 0.001 km)		km
---	--	----

Region to Fill In

High Development Cost Discount Factor

Total Development Cost		\$/m ³
------------------------	--	-------------------

Initial Market Stumpage Price		\$/m ³
-------------------------------	--	-------------------

High Development Cost Discount Factor	
---------------------------------------	--

Is the High Development Cost Discount Factor greater than 30 percent?		Yes or No
---	--	-----------

(Page 1)

(CAM Section 4.5.4)

Total (2)

Appendix 2

(Page 2)

Request for Approval of Road Use Charge

(CAM Section 4.5.4)

Determination of Cost Estimates

Provide details of how the per cubic metre charge that will be entered onto page 4 of the Coast Appraisal Data Sheet (CADS) was determined. This calculation must show the steps from the costs agreed to in the Road Use Charge (and entered on page one of this appendix) to the per cubic metre charge that is to entered onto page 4 of CADS.

Attachments	It is mandatory to attach a copy of maps showing the agreement and a copy of the signed agreement.		Map		Agreement for Charges
-------------	--	--	-----	--	-----------------------

Approval

Approved by (Regional Manager or designated official)		Date
---	--	------

Comments

This appendix and a copy of the Road Use Agreement must be submitted in advance of the cutting permit/ appraisal package submission!

Appendix 3

CUTBLOCK BLENDING

[illegible]



SPECIES LOG GRADE & VOLUME INFORMATION

Appraisal Effective Date		Area Un-logged in Appraisal Year		Appraisal Year		Applicable Volume by Appraisal Year	
Appraisal Expiry Date		ha				m ³	
		ha				m ³	
		ha				m ³	
		ha				m ³	

SPECIES GRADE PERCENT																			
Region to Complete Grade % (below)													Licensee		Region				
	Peeler		Lumber				Sawlog			Shingle			Util.		Chip	Total Net Cruise Vol. By Species	Grade Source Level	Cl	
	B	C	D	E	F	G	H	I	J	K	L	M	U	X	Y				
Alder *														100					
Balsam																			
Cedar																			
Cotton wood														100					
Cypress																			
Fir																			
Hemlock																			
Lodge pole																			
Spruce																			
White Pine																			
SP ZONE (Region)	DECIDUOUS VOLUME																TOTAL NET VOLUME		
	Maple			m ³ Birch			m ³												

* Add Maple and Birch Volume to Alder. ** No Deciduous in MPS



COAST APPRAISAL ONE PAGE SUBMISSION

Licence _____	Mark _____	Mark _____	Mark _____
Cutting Permit _____	Mark _____	Mark _____	Mark _____

Licensee: _____

Licensee Representative Signature:	E-Mail _____
	Phone () _____
Date (ccyy/mm/dd)	Fax () _____

ACKNOWLEDGEMENTS

This Appraisal Data Submission is prepared in accordance with the *Coast Appraisal Manual* as of this date with truthful information on the timber to be harvested, site conditions, harvesting, development, and silviculture plans and other information.

Registered Professional Forester

Name: _____	R.P.F. _____	R.P.F. # _____
(Print)		

Phone: () _____	RPF's Signature and Seal
Fax: () _____	
E-mail Address: _____	
Date (ccyy/mm/dd)	

This one page submission means that there has been no changes to the data elements, specified operations , detailed engineering methodology, or amendments since the last appraisal or re-appraisal.

- ☐ I certify that the work described herein fulfils standards acceptable of a Registered Professional Forester and that I did personally supervise the work.
- ☐ I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been done to standards acceptable of a Registered Professional Forester

*The information contained in this package may be released under the
Freedom of Information and Protection of Privacy Act.*

