BRITISH COLUMBIA

Ministry of Forests

Office of the Minister

MEMORANDUM

File: 280-20

October 31, 2003

To: Regional Managers - Interior

From: The Honourable Michael de Jong
Minister of Forests

Re: Amendment No. 8 to the *Interior Appraisal Manual*

I hereby approve Amendment No. 8 to the *Interior Appraisal Manual* and attach a copy for your use. The changes are shown in the attached highlights.

This amendment will come into force on November 1, 2003. Further amendments or revisions to this manual require my approval.

Michael de Jong
Minister of Forests

Attachment

pc: Bill Howard, Director, Revenue Branch

All Subscribers, *Interior Appraisal Manual*

VANCOUVER 2010

BRITISH COLUMBIA Ministry of Forests

MANUAL REVISION TRANSMITTAL

FOR FURTHER INFORMATION CONTACT:

John Cook
Sr. Timber Pricing Forester (Interior)

Revenue Branch
Ministry of Forests
PO Box 9511 Stn Prov Govt
Victoria, B.C. V8W 9C2

Phone: 356-7675
PROFS userid: John.Cook@gems2.gov.bc.ca
FAX: 387-5670

MANUAL TITLE
Interior Appraisal Manual

REVISION No.	ISSUE DATE
Amendment No. 8	November 1, 2003

MANUAL CO-ORDINATOR
Judy Laton
Revenue Branch

AUTHORIZATION (Name, Title)
W. Howard
Director, Revenue Branch

Please make the following changes to your copy of the above Ministry manual. Please insert the following specified pages and **file this notice** immediately after the Amendments Tab.

ACTION (Remove/Insert)	(VOL.) CHAPTER-SECTION-SUBJECT TABLE OF CONTENTS	PAGE(S)	COMMENTS
REMOVE	Table of Contents	iii - vi	After Table of Contents Tab
INSERT	Table of Contents	iii - vi	
REMOVE	Chapter 2	3 - 6 9 - 14	After Chapter 2 Tab
INSERT	Chapter 2	3 - 6 9 - 14	
REMOVE	Chapter 4	3 - 6 9 - 12 21 - 26 51 - 52	After Chapter 4 Tab
INSERT	Chapter 4	3 - 6 9 - 12 21 - 26 51 - 52	
REMOVE	Chapter 6	5 - 6	After Chapter 6 Tab
INSERT	Chapter 6	5 - 6	
REMOVE	Chapter 7	3 - 4	After Chapter 7 Tab
INSERT	Chapter 7	3 - 4	
REMOVE	Appendix	3 - 10	After Appendix Tab
INSERT	Appendix	3 - 10	
INSERT	Minister's Letter and Manual Revision Transmittal		After Amendments Tab

4.8.1 Overhead 4-45
4.8.2 Isolated Cutting Authority Areas 4-46
4.8.3 Low Volume Cost Estimate 4-46
4.9 Basic Silviculture Cost Estimate 4-48
4.10 Manufacturing Cost Estimates 4-52
4.11 Cost Trend 4-55

5 Stumpage Rate Determination

5.1 Indicated Stumpage Rate (ISR) 5-2
5.2 Value Index 5-3
5.3 Interior Mean Value Index 5-4
5.4 Market Value Indexing 5-5
5.4.1 Converting Indexes From 1997=100 Base to 1992=100 Base 5-5
5.4.2 Calculating the Interior Composite Index (ICI) 5-5
5.4.3 Calculating the Interior Target Rate 5-5
5.5 Interior Base Rate (IBR) 5-7
5.6 Calculation of Stumpage Rate 5-8
5.6.1 Calculation of Indicated Stumpage Rate 5-8
5.6.2 Prescribed Minimum Stumpage Rate 5-8
5.6.3 Reserve Stumpage Rate 5-8
5.6.4 Upset Stumpage Rate 5-8
5.6.5 Total Stumpage Rate 5-8

6 Miscellaneous Timber Pricing Policies

6.1 Average Value Indexes by District and Species 6-2
6.2 Cutting Authorities With 5 000 m^3 or Less Volume 6-3
6.3 Right-of-way Cutting Authorities 6-4
6.4 Partially Harvested Timber 6-5
6.5 BC Timber Sales (BCTS) 6-6
6.6 Levies (CVP only) 6-7
6.7 Miscellaneous Stumpage Rates 6-8
6.7.1 Special Forest Products and Other Miscellaneous Rates 6-8
6.7.2 Miscellaneous Stumpage Rates for Timber Licences 6-11

7 Market Pricing System

7.1 MPS Introduction 7-2
7.2 MPS Principles and Procedures 7-3
7.2.1 MPS Appraisals 7-3
7.2.2 MPS Stumpage Adjustments 7-3
7.2.3 Reappraisals for MPS Appraisals 7-3

7.2.4 Methodology 7-3
7.3 MPS Selling Prices 7-5
7.3.1 MPS Lumber Average Market Values 7-5
7.3.2 Calculation of Species Lumber Selling Price 7-5
7.4 Market Stumpage Price Calculation 7-7
7.4.1 Market Stumpage Price Variables 7-7
7.4.2 Market Stumpage Price Equation 7-9
7.5 MPS Stumpage Rate 7-10
7.5.1 MPS Upset Stumpage Rate 7-10
7.5.2 Upset Stumpage Rate Calculation 7-10
7.5.3 Prescribed Minimum Stumpage Rate 7-10
7.5.4 Total MPS Stumpage Rate 7-11
7.6 Deciduous and Miscellaneous Forest Products 7-12

Appendices

Appendix I Equipment and Labour Rates A-2
Appendix II Development Cost Allocation A-4
Appendix III Relative Soil Moisture to Absolute Soil Moisture Conversion Table A-5
Appendix IV Map Content A-10

Index

Tables

Table 2-1 Points of Appraisal....2-13
Table 3-1 LRF Update Add-ons and Combined Product Recovery Factors....3-7
Table 3-2 Chip Yield Factors....3-9
Table 3-3 Shipping Differentials....3-10
Table 3-4 Manufacturing Cost Differential....3-10
Table 4-1 Specified Operations....4-3
Table 4-2 Standard Timber Merchantability Specifications....4-4
Table 4-3 Road Groups....4-16
Table 4-4 Culvert Cost Estimates....4-18
Table 4-5 Trend Factors for ECE Costs....4-24
Table 4-6 BC Rail Log Transportation....4-40
Table 4-7 Road Management Cost Estimates....4-42
Table 4-8 Overhead Cost Estimates....4-45
Table 4-9 BGC Silviculture Cost Estimates....4-49
Table 4-10 Untrended Manufacturing Cost Estimates....4-53
Table 6-1 Miscellaneous Stumpage Rates....6-9
Table 7-1 LRF Update Add-ons for MPS....7-6

This page is intentionally left blank.

2.2 Appraisal Procedure

1. An appraisal is a process used to determine a stumpage rate for a cutting authority area using the *Interior Appraisal Manual* in effect on the effective date of the cutting authority.

2. A licensee or BC Timber Sales (BCTS) shall submit an interior appraisal data submission and map (Appendix IV) to the district manager when the licensee or BCTS makes an application for a cutting authority.

3. The licensee or BCTS 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 (2) and (3) of this section must be signed and sealed by a professional forester registered in the Province of British Columbia.

5. The district manager or their designate may review the licensee or BCTS submission and will notify the licensee or BCTS, in writing, of any omissions, errors or provisions of the *Interior Appraisal Manual* that, in the opinion of the district manager or their designate, the signing professional forester may not have considered. The licensees or BCTS 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 or BCTS 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.

7. The person who determines the stumpage rate may review the licensee or BCTS submission and information supplied by the district manager or their designate, and will notify the licensee or BCTS, in writing, of any omissions, errors or provisions of the *Interior Appraisal Manual* that, in the opinion of the person who determines the stumpage rate, the signing professional forester may not have considered. The licensee or BCTS signing professional forester will consider the notification and may revise the submission.

8. The person who determines the stumpage rate shall consider, when determining the stumpage rate:

    a. the information provided by the licensee or BCTS 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 by way of a stumpage advisory notice. Regional staff will notify BCTS of the upset sumpage rate by way of a stumpage advisory notice. Regional staff will provide the licensee or BCTS with a summary of the information used to determine the stumpage rate or upset stumpage 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 request for 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 that notification.

2.3 Reappraisals

1. A reappraisal is a process used to redetermine a stumpage rate for a cutting authority area using the *Interior 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 Changed Circumstances

1. An adjustable stumpage rate cutting authority shall be reappraised when a changed circumstance has occurred. The licensee will make a request (including a revised appraisal data submission and map) to the district manager to carry out a reappraisal stating in the request the changed circumstance that has occurred. If the district manager determines that a changed circumstance has occurred and a licensee has not requested a reappraisal, the district manager will notify the licensee in writing that a reappraisal is required, stating the changed circumstance that has occurred. The regional manager must be satisfied that any of the following changed circumstances have occurred:

    a. (i) The licensee plans to use a method of harvest to harvest at least fifteen percent of the volume of timber in the cutting authority area that is different from the method planned to be used for that timber prior to the appraisal of the cutting authority area, and

        (ii) the method of harvesting that will produce the appraisal least total operating cost estimate in the reappraisal is different from the method of harvesting that was used to produce the appraisal least total operating cost estimate in the appraisal, or

    b. there will be at least a fifteen percent change in the total appraised development cost estimate due to changed site conditions upon reappraisal, or

    c. land containing merchantable timber has been either added to or deleted from the cutting authority area since the most recent cruise compilation or recompilation was used in an appraisal or reappraisal that exceeds the lesser of

        i. fifteen hectares, or

ii. fifteen percent of the area of the cutting authority area as it was prior to the addition or deletion of the land, or

d. at least fifteen percent of the volume of the appraised timber in a cutting authority area has been suddenly and severely damaged, unless the timber was damaged by a fire for which the licensee was responsible and the licensee failed to comply with any of section 75 through 95 of the *Forest Practices Code of British Columbia Act* or the *Forest Fire Prevention and Suppression Regulation*. Despite subsection 2.3(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 of timber already removed from the cutting authority area. This subsection is applicable to cutting authorities with either a non-adjusting (fixed) stumpage rate or a quarterly adjusted stumpage rate.

2. Where a cutting authority is reappraised under this section, any existing bonus bid remains in effect despite a redetermination of the upset rate.

2.3.2 Annual Reappraisal for Road Permits and Blanket Salvage Cutting Permits

1. A road permit must be appraised or reappraised effective June 1 of each year. The stumpage rate determined at the appraisal or reappraisal is fixed for one year.

2. A blanket salvage cutting permit must be reappraised at the anniversary date of the cutting authority using the procedures provided by the director of Revenue Branch.

2.3.3 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, lumber recovery factor, or selling price, or any combination of these, as may be direct by the Minister of Forests.

2.3.4 Mathematical Error

a. If a government employee or contractor in the Ministry of Forests or a licensee (or employee or contractor of a licensee) becomes aware of what is or probably is a mathematical error in a stumpage determination, that person shall give written notice of the error ("the Notice") as follows:

2.4 Changed Circumstance Reappraisal Procedure

1. The licensee shall submit to the district manager an interior appraisal data submission and map if the cutting authority area must be reappraised because of a changed circumstance under section 2.3.1.

2. 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.

3. The submissions under subsections (1) and (2) of this section must be signed by a professional forester registered in the Province of British Columbia.

4. 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 *Interior 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.

5. 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.

6. 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 *Interior 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.

7. The person who determines the stumpage rate shall consider, when determing the stumpage rate:

    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 reappraisal.

8. 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.

9. 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).

10. 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 that notification.

2.4.1 Effective Date of Changed Circumstance Reappraisal

1. The effective date of the reappraisal under section 2.3.1 is the first day of the month following the date of the licensee's written request to the district manager or the district manager's notification to the licensee that a changed circumstance has occurred unless the reappraisal is because of:

    a. amendments to the cutting authority exhibit A area under subsection 2.3.1(1)(c), in which case the reappraisal is effective on the first day of the month following the date that the district manager notifies the licensee of the amendment approval, or

    b. sudden and severe damage to the appraised timber under subsection 2.3.1(1)(d), in which case the effective date of the reappraisal is the first day of the month following the date of the occurrence of the damage, unless otherwise specified by the regional manager.

2.4.2 Minister Directed Reappraisal Procedure

1. The licensee shall submit to the district manager an interior appraisal data submission, if requested by the district manager or their designate, within forty-five 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 (8).

2.5 Fixed Stumpage Rate and Extension of Term

BC Timber Sales (BCTS)

1. A fixed stumpage rate for a BCTS cutting authority means that the reserve stumpage rate, levies and bonus bids will not change during the term of the cutting authority and all extensions. Except where:

   a. a reappraisal is done under section 2.3.1(1)(d) due to sudden and severe damage, or

   b. a reappraisal is done under section 2.3.3 because of a minister's direction.

Woodlots

2. a. An appraised or reappraised stumpage rate for a cutting authority, other than a road permit, issued under a woodlot licence shall be adjusted quarterly unless a woodlot licensee chooses in accordance with this section, to have, or the woodlot licence has under section 2.5,(2)(c) a fixed stumpage rate for the term of the cutting authority and all extensions.

   b. A licensee may choose to change the adjusting stumpage rate to a fixed stumpage rate at any time upon giving three (3) weeks prior written notice of that choice to the regional appraisal coordinator. Once the choice has been made by the licencee, it is irrevocable and is not retroactive. Where the proper notice above, is given, the stumpage rate will be fixed.

   c. Where a woodlot licence cutting authority has a stumpage rate that is not adjusted quarterly as of April 1, 2003, that stumpage rate shall remain fixed for the term of the cutting authority and all extensions.

   d. Where a woodlot licence cutting authority has a stumpage rate that is fixed by section 2.5,(2)(b) or 2.5,(2)(c) that cutting authority shall only be reappraised under section 2.3.1,(1),(d), section 2.3.2, or section 2.3.3.

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 stumpage rate shall continue unchanged during the term of the cutting authority.

Miscellaneous Stumpage Rates

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

2.6 Point of Appraisal

The appraiser must select the point of appraisal, from Table 2-1, which will produce the least cost total harvesting and transportation estimate for the timber on the cutting authority area. All species, qualities and sizes of timber must be appraised to a single point of appraisal. For the purposes of determining the least cost total harvesting and transportation estimate, the specific locations that were used in measurement of cycle time for each point of appraisal in Table 2-1 as of October 1,2003, will continue to be used. The appraiser must then assume the manufacturing costs and average market values for the Zone relative to that point of appraisal.

Table 2-1 Points of Appraisal

Northern Interior (Zone 5, 15, 25 & 35)			
Bear Lake	Fort St. James	Mackenzie	Smithers
Burns Lake	Fraser Lake	Prince George	Strathnaver
Clear Lake	Houston	Quesnel	Upper Fraser
Engen	Isle Pierre		Vanderhoof

Skeena (Zone 6, 16, 25 & 36)			
Terrace	Carnaby	Hazelton	Kitwanga

Southern Interior (Zone 7, 17, 25 & 37)			
Adams Lake	Galloway	Merritt	Thrums
Armstrong	Grand Forks	Midway	Valemount
Canal Flats	Kamloops	Okanagan Falls	Vavenby
Canoe	Kelowna	Park Siding	Westbank
Castlegar	Lavington	Princeton	Ymir
Craigellachie	Louis Creek	Radium	
Creston	Lumby	Revelstoke	
Elko	McBride	Slocan	

South Cariboo (Zone 8, 18, 25 & 38)					
100 Mile House	Chasm	Lytton	Squamish	Williams Lake	Boston Bar

Fort Nelson - Peace (Zone 9, 19 & 25)			
Chetwynd	Fort Nelson	Fort St. John	Taylor

2.6.1 Method of Transportation to be Used in Determining Point of Appraisal

The estimate of transportation costs for a cutting authority area must be determined by using the criteria for determining the transportation cost estimate as set out in this manual for the method of transportation referred in this manual to the point of appraisal that will produce the least total harvesting and transportation cost estimate unless:

a. that particular method of transportation is not permitted by the cutting authority, or

b. as provided in section 4.5.1(1).

In considering whether or not a particular method of transportation is not permitted by the cutting authority, the appraisal coordinator must not consider, nor take into account, nor have regard for:

1. Any destination referred to in the cutting authority.

2. Any enactment.

3. Any document other than the cutting authority.

4. Any other fact.

4.1.1 Specified Operations

In addition to the logging methods and phase costs that are covered by this manual, there are specified operations which require special cost estimating. Table 4-1 contains a complete list of specified operations for which certain phase cost estimates are based on the information on hand rather than on the tables and formulas in this manual. Other phase cost estimates in this manual are combined with the specified operation cost estimate to determine the total operating cost. Where appropriate, specified operations are weighted according to the applicable net cruise volume.

Specified operations shall be recognised only when the treatment is required within the Silviculture Prescription, Site Plan, Cutting Authority Document or the Forest Development Plan as dictated by site conditions. Where a specific treatment is not required based on these conditions, the conventional cost estimate shall apply.

Further information on specified operations may be obtained from the regional appraisal coordinators.

Table 4-1 Specified Operations

Specified Operations	Affected Phase
Salvage of small patches of damaged or diseased timber dispersed over a large area[1]	Tree-to-Truck (section 4.4), Transportation (section 4.5.1 and 4.5.2), Road Management (section 4.6), Overhead (section 4.8.1).
Root Disease Control	Silviculture (section 4.9).
Skidder Swinging (includes all ground skidding methods)[2]	Tree-to Truck (section 4.4).

1. The regional manager or their designate will determine which of the affected phases listed in the table apply.

2. Skidder swing will only be considered between harvest methods listed in section 4.4.1 (four methods), in order to deliver logs to an existing road/landing.

4.2 Appraisal Data Requirements

The cruise and all other pertinent information required for the appraisal must be submitted by the licensee or BC Timber Sales with the appropriate interior appraisal data submission and map to the district manager.

Unless otherwise specified by the director, Revenue Branch, cruise data must be gathered and compiled according to the approved interior standard timber merchantability specifications in Table 4-2 below and in accordance with the following Ministry of Forests publications:

- *Cruising Manual* (*Cruising Manual* web site: http://www.for.gov.bc.ca/revenue/manuals/cruising/),
- *Cruise Compilation Manual*.

Table 4-2 Interior Standard Timber Merchantability Specifications

Description	
The following standard timber merchantability specifications must be used for all appraisals.	
Stumps (Measured on the side of the stump adjacent to the highest ground.)	
• no higher than	30.0 cm
Diameter (outside bark) at stump height	
• lodgepole pine: all timber that meets or exceeds	15.0 cm
• all other species: all timber that meets or exceeds	20.0 cm
Top diameter (inside bark or slab thickness)	
• for all species and ages, except cedar older than 141 years, all timber that meets or exceeds	10.0 cm
Top diameter (inside bark or slab thickness)	
• for cedar older than 141 years, all timber that meets or exceeds	15.0 cm
Minimum length	
• log or slab	3.0 m

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 data list in a format prescribed by the regional manager.

The net cruise volume (m^3) is the gross volume (m^3) less decay, waste and breakage by species. The cutting authority total net cruise volume is calculated by multiplying the net cruise volume per hectare (m^3/ha) by the total merchantable timbered area (ha) to be harvested, net cruise volume is rounded to the nearest cubic metre as required in the *Cruise Compilation Manual*.

Each reappraisal uses a cruise volume by species which is the original net cruise volume adjusted for amendments to the cutting authority since the last appraisal.

4.2.1 Comparative Cruising

Comparative cruising is defined as the borrowing of cruise data from an existing, appropriately comparable, cutting authority in place of site specific data for an appraisal of a new cutting authority. If there is time to perform a full cruise, then the timber will be cruised. However, comparative cruise data may be utilized for cutting authorities with volumes greater than 5 000 m^3 if:

- the regional manager has determined that the timber is in imminent danger of being destroyed,
- the area is in an approved Emergency Bark Beetle Management Area (EBBMA) as designated by the Minister of Forests and within an approved Emergency Management Unit (EMU) as designated by the beetle management coordinator,
- the licensee has previously harvested comparative cutting authority's in a timely manner, and
- the regional manager has determined that the requirement to perform a full operational cruise will delay expeditious harvesting and result in further damage.

Comparative cruise data will be chosen following procedures set out in section 2.1.2.3 of the *Cruising Manual*.

For cutting authorities with volumes of 5 000 m^3 or less refer to section 6.2.

4.3 Development

Development costs are estimated for each of two categories:

1. New construction.

2. Reconstruction and replacement.

Throughout this section the term "roads" includes roads, drainage and other pertinent structures.

a. A total cost ($) is calculated for each category of section 4.3.1, and 4.3.1.1. These category costs are summed to provide a total development cost estimate.

b. In order to calculate a unit ($/$m^3$) cost by category, the applicable volume will be the total net cruise volume (as defined in section 4.2) or the remaining volume (section 4.3.1(2)). The applicable volume includes the deciduous volume where the licence requires harvesting in deciduous stands.

Tributary Volume

The costs for development works may only be allocated to the first tributary cutting authority, subject to section 4.3.1.1.5. A cutting authority is considered to be tributary:

1. If timber from the cutting authority is appraised over the development works in question, or

2. If 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 being appraised. To qualify, a main service road must be used on a regular basis for transportation of bulk fuels, supplies, equipment and the harvesting crew.

Development Cost Estimating

1. Tabular cost estimates are made for construction of roads and drainage structures using the applicable equations in section 4.3.2 of this manual. Tabular estimates must be 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. A detailed engineering estimate is made according to section 4.3.3. Projects eligible for this costing method are listed in section 4.3.3.

4.3.1.1 Development Cost Allocation

Where proration is required for section 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 Crown timber that is 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 of Crown and private timber that is 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, subject to section 4.3.1.1.5.

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

New development will be allocated as in section 4.3.1.1.1.

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 portion 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 previously constructed 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. Roads previously constructed, repaired or reconstructed on private land before August 1,1996.

Winter roads over muskeg or organic soils that use snow and ice for a driving surface are not considered as existing roads.

5. If the existing road requires reconstruction or replacement after August 1, 1996, the cost estimate is made as described in section 4.3.1. If the existing road is on private land, road and land use charges may be recognized as described in section 4.7.

   A road on private land that has previously been included in an appraisal because it was required for only short term timber extraction (as per previous policy) shall continue to be included upon reappraisal.

4.3.1.1.5 Extended Road Amortization

For new appraisals, where the development cost estimate for roads accessing more than one tributary cutting authority exceeds $\$4.00/m^3$, a written agreement may be made which distributes a portion of the 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, site plan or woodlot licence area.

2. The road portion that may be included in the agreement ends at the far boundary of the first cutting authority being appraised

3. The agreement must be signed by the licensee and the regional manager or the regional manager's designate.

4. The total lump sum costs may be adjusted once at reappraisal provided no harvest has ocurred on any cutting authority included in the agreement

5. The costs apportioned to each cutting authority under the agreement may be adjusted once, in conjunction with section 4.3.1.1.5,(4), at reappraisal using the same ratio for distributing the costs as in the original agreement. The adjustment can only be made where no harvest has ocurred on any cutting authority included in the agreement.

6. The agreement confers no obligation on the Crown to compensate licensees for any unamortized costs.

4.3.2 Tabular Cost Estimates

These roads are generally a single lane width with turnouts. These roads may or may not be stabilized (ballasted or surfaced) with additional materials.

4.3.2.1 Subgrade Construction

The subgrade construction cost estimate includes:

- clearing,
- grubbing,
- stripping,
- debris disposal,
- stump removal,
- ditch construction,
- turnout construction (not landings),
- material costs, and
- installation of culverts with diameters up to 950 mm or the equivalent cross-section area or single log abutment culverts up to 3.4 m span.

Right-of-way felling and logging is excluded.

4.3.2.2 Subgrade Construction Variables

For appraisal purposes the following subgrade construction variables are recognized:

1. Section length: (L)

   Road sections are recorded in multiples of 0.1 km. Each section should be representative of a single moisture class. Each section should be 1 km or longer, although some individual section lengths less than 1 km but greater than 0.1 km are acceptable for extreme variations of slope or percent rock. The section length includes that portion traversing through landings. For ground skidding, short roads (up to and including 100 m long) that access single landings are included in the tree-to-truck cost estimates (section 4.4) and are not eligible for development cost estimates.

2. Road Type:

   - Operational Roads (OP): - are generally built under the authority of a road permit but portions may be constructed under the cutting authority. An operational road exists within a cutblock when the road accesses timber beyond the cutblock or is intended to access timber beyond the block as shown on a forest development plan, and there is a physical separation of the blocks or cutting authorities. Blocks or cutting authorities that share a common boundary are not considered separate for the purposes of defining the road type.

   - Block Roads (BLOCK): - are generally built under the cutting authority and include roads which are located completely within the cutblock, continuous to the edge of a cutblock, which access separate portions of a cutblock covered under the same silviculture prescription, or access a series of cutblocks that share a common boundary. Those cutblocks that share boundaries may be included in the cutting authority being appraised or a different cutting authority.

4.3.2.6 Cattle Guards, Remedial Fences and Pipeline Crossings

Where the cutting authority specifies the installation of cattle guards, wing fences or pipeline cossings, the installed cost using new or recycled material is estimated as follows:

1.	Cattle Guards	$3177 each
2.	Remedial Fences and Wing Fences[1]	$685 per 100 m
3.	Pipeline Crossings	$3400 each

All costs include materials, transportation and installation.

4.3.3 Detailed Engineering Cost Estimates

Where the tabular cost estimating procedures of this manual cannot be used due to their physical limitations, the cost of a project shall be estimated by preparing a detailed engineering cost estimate. The regional manager may approve standardized procedures to generate cost estimates for use in projects as listed below.

Where specific development projects involve detailed engineering cost estimates, based on approved road layout and design plans, the district manager shall be advised of project details no later than 60 days before the start of work on the project.

For appraisal purposes, the estimated development project costs are made on the basis of the site-specific data including the definitions found in section 4.3.2.2 for common subgrade construction variables and the equipment and labour rates specified in Appendix I. Due consideration is given to arm's length competitive bids for any specific project. The appraisal estimate is not constrained in any way by a licensee's actual costs.

If the ECE is re-estimated once after construction as provided in section 2.3 (using more accurate on site information) the new detailed engineering cost estimate replaces the original (used in the initial appraisal). Apportionment agreement or bid tender cost estimates are not re-estimated only trended. ECE’s are not re-estimated due to labour and/or equipment rates being updated periodically in Appendix I.

Where road sections estimated as a detailed engineered cost estimate are contiguous with tabular cost estimates, costs for mobilization and demobilization will only be allowed for

[1] Fencing that is required to remedy, reduce, or manage the impact of timber harvesting activities on range management.

special equipment not required for the construction of the tabular roads. The following specific situations are considered for detailed engineering cost estimates:

1. New construction of long term, primary access road sections, that will have 300,000 cubic metres of harvested crown timber hauled over them annually for at least ten years.

2. Road construction on uphill side slopes greater than 50 percent.

3. When rock percent exceeds 50 percent, or terrain class 4 and 5.

4. End haul construction (of roads and landings) requiring removal by truck of excavated material to a separate area to avoid side casting on steep and/or sensitive sites.

5. Overland construction to provide a roadbed by trucking in material for extensive filling; see page 81 of Forest Road Engineering Guidebook for a more detailed description.

6. For log bridges and non-log bridges that are not included in the subgrade cost estimates, eligible costs include site planning and the same phases as listed in section 4.3.2.4(2). All ice bridge construction including construction for additional logging seasons.

7. Structural maintenance of bridges, substructure and cribwork.

8. Reconstruction of roads and pertinent structures. Cost estimates for reconstruction are not to exceed the tabular cost for new construction under similar conditions.

9. Upgrade of roads and pertinent structures. Road upgrade resulting in a change in the standard of the road and structure or where the licensee was not obligated to carry out road maintenance prior to the appraisal. Where road maintenance obligations exist, road upgrade is limited to widening the running surface, vertical and horizontal realignment, and additional culverts.

10. Replacement of road running surfaces for uninterrupted lengths over 0.3 km. Lengths less than 0.3 km are included in road maintenance (section 4.6).

11. Metal culverts greater than 1.8 m in diameter when specified in the cutting authority, or road permit. Metal culverts greater than 30 m in length regardless of diameter also qualify. The cost estimate includes all costs of transporting the culvert to the jobsite and all costs of installation of the culvert to the final subgrade stage.

12. Placement of additional stabilizing material where geo-tech fabric, corduroy, crushed and/or screened rock/gravel are used.

13. Retaining walls, railway crossings and other special structures (may include multiple culverts, baffled culverts, arched culverts and other structures determined by the appraisal coordinator).

The data which may be required for excavation and fill estimates are:

1. Plans, profiles, cross-sections showing the ground and design grade lines.

2. Volume summary sheets showing excavation quantities by various soil types, for subgrade and stabilization.

3. Type of construction equipment and quantity of material to be used, or ministry approved competitive bid costing.

4. Location of borrow and waste areas to calculate material haul distances.

The data required for bridges, culverts and for other unusual structures are:

1. Where the bridge span is 15.4 m or less and the crib height is 5.4 m or less and a permanent structure is proposed, an economic life cycle comparison between a log structure and the permanent proposal is required.

2. Where the bridge span is greater than 15.4 m, and/or the crib height is 5.4 m or more and for pipe culverts greater than 1.8 m in diameter or 30 m in length: plans, specifications and design for the proposed structure; detailed estimate of costs of materials; equipment and labour or ministry approved competitive bid pricing; amount of timber accessed by the structure and the number of years of use for harvesting all timber are required.

3. Where bridge materials are reused the cost estimate will include dismantling, transportation and reinstallation at the new site, but will exclude initial materials purchased and initial delivery costs.

Costs that may be included in the detailed engineered cost estimate are:

1. Freight (for materials).

2. Provincial sales tax (for materials).

3. Supervision of construction of complex structures by a professional engineer.

4. Bridge certification by a professional engineer (maximum of three field trips) unless otherwise approved by the regional appraisal coordinator (the costs for professional engineers are permitted whether they are on the licensees staff or hired under contract).

5. Site plans, designs and layouts.

6. Where equipment is not, or will not be already on site for adjoining tabular road, bridge or culvert construction, then the costs of mob and demob may be included in the engineered cost estimate.

GST and supervision costs other than as stated above, are not to be included in the engineered estimate.

Where different timber volumes are used for separate cost estimates, the unit costs are rounded to the nearest cent before totalling.

In some cases, the detailed engineering cost estimates may be apportioned to two or more licensees' tributary cutting authorities, as described under section 4.3.1.1.5.

4.3.3.1 Trending of Detailed Engineering Costs

All detailed engineering costs must be adjusted to match the cost base of the manual in effect at the time of the appraisal or reappraisal (refer to Table 4-5). This includes development costs in apportionment agreements, ministry approved competitive bid tenders, and ECE's prepared using Appendix I.

Table 4-5 Trend Factors for ECE Costs

ECE Cost Year	Multiply by this Trend Factor to Match the 2000 Cost Base
1992	1.445
1993	1.290
1994	1.154
1995	1.045
1996	0.986
1997	0.917
1998	0.968
1999	1.017
2000	1.000
2001	1.000
2002	1.000

4.4 Tree-to-Truck

Cost estimates included in the tree-to-truck phase of the logging operation include, but are not limited to, expenses incurred for:

- felling
- skidding
- yarding
- bucking
- sorting (bush, dryland, and water)
- loading
- landing construction, rehabilitation and reconstruction (excluding end haul)
- fuel and equipment moves
- pest control
- grass seeding
- all post logging treatments
- crew accommodation for accessible operations
- contractor overhead and profit, fringe benefits
- three metre knockdown
- lop and scatter
- landing burning (includes fireguards)
- roadside debris piling and disposal
- skid and back spar trail construction and rehabilitation/slashing
- slashing
- crew transport
- spur roads for ground skidding of less than or equal to 100 m length (see section 4.3.2.2(1))

4.4.1 Harvesting Methods

Each of the following harvesting methods is recognized only when it is identified on the cutting permit map which is submitted by the licensee with the application for a cutting authority, or with an application for an amendment to a cutting authority. If no harvesting method is identified on the map the method appraised will be the ground skidding clear cut method.

- Helicopter,
- Horse,
- Ground Skidding, and
- Overhead Cable Logging.

4.4.2 Tree-to-Truck Variables

For appraisal purposes the following variables are recognized, based on all compiled cruise plots segregated by logging method where applicable (see section 4.4.5). Where the licence requires harvesting in deciduous stands, applicable variables are to include the deciduous component.

1. Biogeoclimatic Zone

   A separate biogeoclimatic zone may be recognized for each harvest method (section 4.4.1) as part of the regional constant.

2. Slope (SLOPE%)

   The average side slope percent is derived from an area weighted average of the maximum side slope percentage on all cruise plots, rounded to the nearest whole percentage point.

   > If helicopter yarding is uphill the slope is set at 0.

3. Volume per Hectare (VOLHA)

   The average net cruise volume per hectare (m^3/ha), rounded to the nearest cubic metre. For partial cutting, it is based on the actual volume per hectare being harvested.

4. Percent Blowdown (BD%)

   The percentage of the net cruise volume classified as blowdown.

5. Partial Cut Variables (PCUT, DPCUT)

   The term partial cutting includes all forms of harvesting, other than clear cutting.

   Clear cutting is defined as those areas with block opening sizes equal to or greater than 1 hectare and where the volume removal is equal to or greater than 90 percent based on the net volume measured to the Standard Timber Merchantability Specifications (section 4.2)..

   Partial cut areas that have less than 90 percent volume removal are not to be averaged with those areas that are equal to or greater than 90 percent. Clear cut areas are to be stratified out before calculating an overall weighted partial cut percent for the cutting authority.

   a. PCUT

BGC Zone	Subzone	Variant	$/ha
ESSF	vv		1696
ESSF	vvp		1599
ESSF	wc	1	2092
ESSF	wc	2	1743
ESSF	wc	3	1606
ESSF	wc	4	2290
ESSF	wcp	2	1599
ESSF	wcp	3	1599
ESSF	wcp	4	1599
ESSF	wk	1	1945
ESSF	wk	2	1526
ESSF	wm		1636
ESSF	wmp		1599
ESSF	wv		1599
ESSF	wvp		1599
ESSF	xc		1547
ESSF	xcp		1599
ESSF	xv	1	1176
ESSF	xv	2	1108
ESSF	xvp	1	1599
ESSF	xvp	2	1599
ICH	dk		1965
ICH	dw		1717
ICH	mc	1	1372
ICH	mc	2	1969
ICH	mk	1	1351

BGC	Subzone	Variant	$/ha
SBS	dh	2	1234
SBS	dk		1078
SBS	dw	1	1220
SBS	dw	2	908
SBS	dw	3	951
SBS	mc	1	1235
SBS	mc	2	1221
SBS	mc	3	1123
SBS	mh		1234
SBS	mk	1	1290
SBS	mk	2	1268
SBS	mm		1369
SBS	mw		1502
SBS	un		1234
SBS	vk		1557
SBS	wk	1	1534
SBS	wk	2	1555
SBS	wk	3	981
SWB	dk		1505
SWB	dks		1505
SWB	mk		1505
SWB	mks		1505
SWB	un		1505
SWB	vk		1505
SWB	vks		1505

* The dollar per hectare ($/ha) cost estimates are net of overhead.

4.10 Manufacturing Cost Estimates

In the interior, appraisal calculations include estimates of the cost of manufacturing lumber and chips. Manufacturing cost estimates are developed from a survey of sawmills and encompass all phases of manufacturing beginning with the unloading of logging trucks at the mill log yard, (land or water or satellite log yards) or the dewatering of logs in cases when the mill infeed is on the same lake as used for towing the logs, and ending when the lumber and chips have been loaded on rail cars or trucks for transport to market.

The survey collects actual costs to the licensee, including wages, benefits, overtime, depreciation, fuel, supplies, repair, maintenance, applicable licences, insurance, etc. from a representative sample of interior operations.

The cost estimates reflect average conditions, operating practices, and phase accounting allocations experienced in the survey data. Because of this averaging, no additions to or subtractions from these estimates are permitted to reflect operation-specific conditions.

The estimates have an effective cost base date of July 1, 2000, and will be used for all appraisals, reappraisals and adjustments of stumpage rates.

6.4 Partially Harvested Timber

Where decked timber, or timber which has been felled and bucked, such as on right-of-way, is sold without competition; and where the stumpage value is over $3,000 or volume exceeds 300 m^3, a full cost estimate appraisal is completed upon an "as is, where is" basis.

Phase costs may be based on borrowed data from a representative cutting permit, adjusted for partial phase.

If the timber volume is being sold competitively, the timber may be priced according to the procedures in section 6.2.

6.5 BC Timber Sales (BCTS)

1. For appraisal purposes, the BCTS includes:

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

Adjustable Stumpage Rates

2. The adjustable stumpage rate option can only be provided to a licensee if the upset rate has been determined by means of a full appraisal and the timber sale licence was advertised before November 1, 2003. The data for the full appraisal may be site-specific or may be obtained from a comparable cutting authority. For cutting authorities with volumes greater than 5 000 m^3, refer to section 4.2.1. For cutting authorities with 5 000 m^3 or less, comparative cruise data will be chosen following procedures set out in section 2.1.2.3 of the *Cruising Manual*.

Fixed Stumpage Rates

3. All timber sale licences awarded under section 20 of the *Forest Act* that were advertised on or after November 1, 2003 will have fixed stumpage rates.

   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 2.3.1(d) due to sudden and severe damage or section 2.3.3 because of a minister's direction.

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

7.2 MPS Principles and Procedures

7.2.1 MPS Appraisals

The upset stumpage rate will be calculated using the *Interior Appraisal Manual* and monthly parameters (selling prices and consumer price index (CPI)) in effect on the date of calculating (appraisal effective date). This rate plus the bonus bid remains in effect from the date of award of the sale until the sale expires. All MPS stumpage rates on Section 20 timber sale licences advertised on or after November 1, 2003 are fixed for the term of the timber sale and all extensions.

7.2.2 MPS Stumpage Adjustments

For cutting authorities that were advertised prior to November 1, 2003, that elected to have, or have adjustable stumpage rates, the stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1, of each year.

At the time of the quarterly adjustment, the MPS upset rate will be re-calculated based on the equations applicable for the appraisal effective date and the cutting authority data. The monthly parameters effective for the month of the adjustment will be used in the calculation instead of the original values. All other data remain unchanged.

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

7.2.3 Reappraisals for MPS Appraisals

Revised data and revised monthly parameters will be used with the equations in effect on the reappraisal date. Any reappraisal will follow the policy direction of chapter 2 of this manual. The original bonus bid remains in effect.

7.2.4 Methodology

Calculating the upset stumpage rate for BC Timber Sales, issued under section 20 and 21 of the *Forest Act*, will be done using the following methodology:

1. Calculate a selling price (SP) of the products that can be recovered from the stand using sections 7.3.1 and 7.3.2 with the variables as defined.

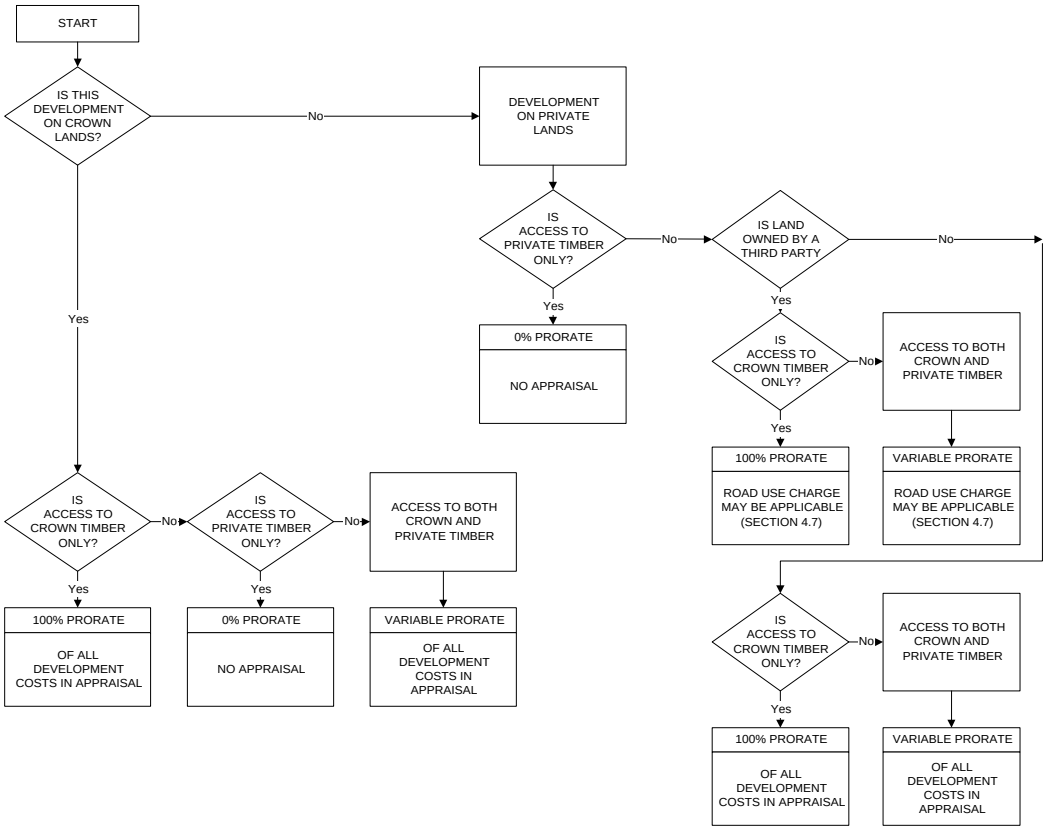
2. Calculate the market stumpage price using the equation in section 7.4.2, the variables for the stand, and the SP calculated in section 7.3.

3. Calculate the upset stumpage rate by discounting the market stumpage price calculated in section 7.4.2 using the discount factor in section 7.5.

One stumpage rate is determined for all appraised coniferous sawlogs in each cutting authority area. Other products and deciduous species are priced using miscellaneous stumpage rates as specified under section 6.7.

- The above rates will be used for all engineered estimates made under this manual,
- The machine rate includes labour for the operator (all found). There are no additions,
- Crew transportation, supervision, and camp/cookhouse costs, where applicable, are included in the standard phase costs of the manual. No additions are required, however, those licensees that incur camp costs (a camp is defined as a permanent structure(s) where capital costs were incurred to establish the camp that must have a cookhouse and a bunkhouse) and recovers the said camp costs from the contractor, and credits an account, in the books of the licensee; is permitted an additive of $50.00 per "person day" for staying at the camp; and
- Use of equipment rates not listed in this appendix must be approved by the Regional Appraisal Co-ordinator.

Appendix II 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 III Relative Soil Moisture to Absolute Soil Moisture Conversion Table

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
CAR	BG	xh3	ED	ED	ED	ED	ED	SD	M	W
CAR	BG	xw2	ED	ED	ED	ED	ED	SD	M	W
CAR	IDF	xm	ED	ED	VD	VD	MD	SD	M	W
CAR	IDF	xw	ED	ED	VD	VD	MD	SD	M	W
CAR	IDF	dk3	ED	VD	VD	VD	MD	F	M	W
CAR	IDF	dk4	ED	VD	VD	VD	MD	F	M	W
CAR	IDF	u	ED	VD	VD	MD	MD	F	VM	W
CAR	IDF	mw2	VD	VD	VD	MD	SD	F	VM	W
CAR	MS	xk	VD	VD	VD	VD	MD	F	M	W
CAR	MS	xv	VD	VD	VD	MD	SD	F	VM	W
CAR	ICH	dk	VD	VD	VD	MD	SD	M	VM	W
CAR	ICH	mk3	VD	MD	MD	SD	F	M	VM	W
CAR	ICH	wk2	VD	MD	SD	F	F	M	VM	W
CAR	ICH	wk4	VD	MD	SD	F	F	M	VM	W
CAR	SBPS	xc	ED	ED	VD	VD	MD	SD	M	W
CAR	SBPS	dc	ED	ED	VD	MD	SD	F	M-VM	W
CAR	SBPS	mk	ED	VD	VD	MD	SD	F	M-VM	W
CAR	SBPS	mc	VD	VD	VD	MD	SD	F	M-VM	W
CAR	SBS	dw1	VD	MD	MD	SD	SD	F	M	W
CAR	SBS	dw2	VD	MD	MD	SD	SD	F	M	W
CAR	SBS	mh	VD	MD	MD	SD	SD	M	VM	W
CAR	SBS	mw	VD	MD	MD	SD	F	M	VM	W
CAR	SBS	mc1	VD	MD	MD	SD	F	M	VM	W
CAR	SBS	mc2	VD	MD	MD	SD	F	M	VM	W
CAR	SBS	wk1	VD	MD	SD	F	F	M	VM	W
CAR	ESSF	xv	VD	VD	MD	MD	SD	F	M	W
CAR	ESSF	dc2	VD	MD	MD	SD	SD/F	M	VM	W
CAR	ESSF	wc3	MD	MD	SD	F	M	M	VM	W
CAR	ESSF	wk1	MD	MD	SD	F	M	M	VM	W
KAM	BG	xh1	ED	ED	ED	ED	ED	SD	M	W
KAM	BG	xh2	ED	ED	ED	ED	ED	SD	M	W
KAM	BG	xw1	ED	ED	ED	ED	ED	SD	M	W
KAM	PP	xh1	ED	ED	ED	ED	VD	SD	M	W
KAM	PP	xh2	ED	ED	ED	ED	VD	SD	M	W
KAM	IDF	xh1	ED	ED	VD	VD	MD	SD	M	W
KAM	IDF	xh2	ED	ED	VD	VD	MD	SD	M	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
KAM	IDF	xw	ED	ED	VD	VD	MD	SD	M	W
KAM	IDF	dk1	ED	VD	VD	VD	MD	F	M	W
KAM	IDF	dk2	ED	VD	VD	VD	MD	F	M	W
KAM	IDF	dm1	ED	VD	VD	VD	MD	F	M	W
KAM	IDF	mw1	VD	VD	VD	MD	SD	F	VM	W
KAM	IDF	mw2	VD	VD	VD	MD	SD	F	VM	W
KAM	IDF	ww	VD	VD	VD	MD	SD	F	M	W
KAM	MS	xk	VD	VD	VD	VD	MD	F	M	W
KAM	MS	dc	VD	VD	VD	MD	SD	M	VM	W
KAM	MS	dm1	VD	VD	VD	MD	SD	M	VM	W
KAM	MS	dm2	VD	VD	VD	MD	SD	M	VM	W
KAM	ICH	mk1	VD	MD	MD	SD	F	M	VM	W
KAM	ICH	mk2	VD	MD	MD	SD	F	M	VM	W
KAM	ICH	mw2	VD	MD	MD	SD	F	M	VM	W
KAM	ICH	mw3	VD	MD	MD	SD	F	M	VM	W
KAM	ICH	wk1	VD	MD	SD	F	F	M	VM	W
KAM	ICH	vk1	MD	MD	SD	F	M	M	VM	W
KAM	SBS	mm	VD	MD	MD	SD	F	M	VM	W
KAM	ESSF	xc	VD	VD	MD	MD	SD	M	VM	W
KAM	ESSF	dc1	VD	MD	MD	SD	SD/F	M	VM	W
KAM	ESSF	dc2	VD	MD	MD	SD	SD/F	M	VM	W
KAM	ESSF	dv	VD	MD	MD	SD	SD/F	M	VM	W
KAM	ESSF	mw	VD	MD	MD	SD	F	M	VM	W
KAM	ESSF	wc1	MD	MD	SD	F	M	M	VM	W
KAM	ESSF	wc2	MD	MD	SD	F	M	M	VM	W
KAM	ESSF	wc4	MD	MD	SD	F	M	M	VM	W
KAM	ESSF	vc	MD	SD	SD	F	M	VM	VM	W
KAM	ESSF	vv	MD	SD	SD	F	M	VM	VM	W
NEL	PP	dh1	ED	ED	ED	VD	VD	SD	M	W
NEL	PP	dh2	ED	ED	ED	VD	VD	SD	M	W
NEL	IDF	xh1	ED	ED	VD	VD	MD	SD	M	W
NEL	IDF	dm1	ED	VD	VD	VD	MD	F	M	W
NEL	IDF	dm2	ED	VD	VD	VD	MD	F	M	W
NEL	MS	dk	VD	VD	VD	MD	SD	M	VM	W
NEL	MS	dm1	VD	VD	VD	MD	SD	M	VM	W
NEL	ICH	xw	VD	VD	VD	MD	SD	M	VM	W
NEL	ICH	mk1	VD	MD	MD	SD	F	M	VM	W
NEL	ICH	mw1	VD	MD	MD	SD	F	M	VM	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
NEL	ICH	mw2	VD	MD	MD	SD	F	M	VM	W
NEL	ICH	mw3	VD	MD	MD	SD	F	M	VM	W
NEL	ICH	wk1	VD	MD	SD	F	F	M	VM	W
NEL	ICH	vk1	MD	MD	SD	F	M	M	VM	W
NEL	ESSF	dc1	VD	MD	MD	SD	SD/F	M	VM	W
NEL	ESSF	dk	VD	MD	MD	SD	SD/F	M	VM	W
NEL	ESSF	wc1	MD	MD	SD	F	M	M	VM	W
NEL	ESSF	wc2	MD	MD	SD	F	M	M	VM	W
NEL	ESSF	wc4	MD	MD	SD	F	M	M	VM	W
NEL	ESSF	wm	MD	MD	SD	F	F	M	VM	W
NEL	ESSF	vc	MD	SD	SD	F	M	VM	VM	W
PG	ICH	mm	VD	MD	MD	SD	F	M	VM	W
PG	ICH	wk1	VD	MD	SD	F	F	M	VM	W
PG	ICH	wk3	VD	MD	SD	F	F	M	VM	W
PG	ICH	wk4	VD	MD	SD	F	F	M	VM	W
PG	ICH	vk2	MD	SD	SD	F	M	M	VM	W
PG	BWBS	dk1	VD	MD	MD	SD	SD	F	M-VM	W
PG	BWBS	dk2	VD	MD	MD	SD	SD	F	M-VM	W
PG	BWBS	mw1	VD	MD	MD	SD	F	M	VM	W
PG	BWBS	mw2	VD	MD	MD	SD	F	M	VM	W
PG	BWBS	wk1	VD	MD	SD	SD	F	M	VM	W
PG	BWBS	wk2	VD	MD	SD	SD	F	M	VM	W
PG	BWBS	wk3	VD	MD	SD	SD	F	M	VM	W
PG	SBPS	mc	VD	VD	VD	MD	SD	F	M-VM	W
PG	SBS	dw1	VD	MD	MD	SD	SD	F	M	W
PG	SBS	dw2	VD	MD	MD	SD	SD	F	M	W
PG	SBS	dw3	VD	MD	MD	SD	SD	F	M	W
PG	SBS	dh	VD	MD	MD	SD	SD	F	M	W
PG	SBS	dk	VD	MD	MD	SD	SD	F	M-VM	W
PG	SBS	mh	VD	MD	MD	SD	SD	M	VM	W
PG	SBS	mw	VD	MD	MD	SD	F	M	VM	W
PG	SBS	mc2	VD	MD	MD	SD	F	M	VM	W
PG	SBS	mc3	VD	MD	MD	SD	F	M	VM	W
PG	SBS	mk1	VD	MD	MD	SD	F	M	VM	W
PG	SBS	mk2	VD	MD	MD	SD	F	M	VM	W
PG	SBS	wk1	VD	MD	SD	F	F	M	VM	W
PG	SBS	wk2	VD	MD	SD	F	F	M	VM	W
PG	SBS	wk3	VD	MD	SD	F	F	M	VM	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
PG	SBS	vk	MD	SD	SD	F	M	M	VM	W
PG	ESSF	mm1	VD	MD	MD	SD	F	M	VM	W
PG	ESSF	mv1	VD	MD	SD	SD	F	M	VM	W
PG	ESSF	mv2	VD	MD	SD	SD	F	M	VM	W
PG	ESSF	mv3	VD	MD	SD	SD	F	M	VM	W
PG	ESSF	mv4	VD	MD	SD	SD	F	M	VM	W
PG	ESSF	wc2	MD	MD	SD	F	M	M	VM	W
PG	ESSF	wc3	MD	MD	SD	F	M	M	VM	W
PG	ESSF	wk1	MD	MD	SD	F	M	M	VM	W
PG	ESSF	wk2	MD	MD	SD	F	M	M	VM	W
PR	ICH	mc1	VD	MD	SD	SD	F	M	MV	W
PR	ICH	mc1a	VD	MD	SD	SD	F	M	MV	W
PR	ICH	mc2	VD	MD	SD	SD	F	M	MV	W
PR	ICH	wc	MD	MD	SD	F	F	M	VM	W
PR	ICH	vc	MD	SD	SD	F	M	M	VM	W
PR	BWBS	dk1	VD	MD	MD	SD	SD	F	M-VM	W
PR	BWBS	dk2	VD	MD	MD	SD	SD	F	M-VM	W
PR	SBPS	mc	VD	VD	VD	MD	SD	F	M-VM	W
PR	SBS	dk	VD	MD	MD	SD	SD	F	M-VM	W
PR	SBS	mc2	VD	MD	MD	SD	F	M	VM	W
PR	ESSF	mk	VD	MD	MD	SD	F	M	VM	W
PR	ESSF	mc	VD	MD	SD	SD	F	M	VM	W
PR	ESSF	wv	MD	SD	SD	F	F	M	VM	W
PR	CWH	ws1	VD	MD	MD	SD	F	M	VM	W
PR	CWH	ws2	VD	MD	MD	SD	F	M	VM	W
PR	CWH	vm1	MD	SD	SD	F	F	M	VM	W
PR	CWH	vm2	MD	SD	SD	F	F	M	VM	W
PR	CWH	wm	SD	SD	SD	F	F	M	VM	W
PR	CWH	vh2	SD	SD	F	F	M	VM	W	W
PR	MH	mm1	SD	SD	F	F	F	M	VM	W
PR	MH	mm2	SD	SD	F	F	F	M	VM	W
PR	MH	wh	SD	SD	F	F	F	M	VM	W
VAN	IDF	ww	VD	VD	VD	MD	SD	F	M	W
VAN	ESSF	mw	VD	MD	MD	SD	F	M	VM	W
VAN	CDF	mm	VD	VD	MD	MD	MD	SD	F	W
VAN	CWH	xm	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	dm	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	ds1	VD	MD	MD	SD	F	M	VM	W

Region	BEC			Relative Soil Moisture Regime Class (from field guide)						
	Zone	Subzone	0	1	2	3	4	5	6	7
VAN	CWH	ds2	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	ms1	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	ms2	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	ws2	VD	MD	MD	SD	F	M	VM	W
VAN	CWH	mm1	MD	SD	SD	F	F	M	VM	W
VAN	CWH	mm2	MD	SD	SD	F	F	M	VM	W
VAN	CWH	vm1	MD	SD	SD	F	F	M	VM	W
VAN	CWH	vm2	MD	SD	SD	F	F	M	VM	W
VAN	CWH	wh1	SD	SD	SD	F	F	M	VM	W
VAN	CWH	wh2	SD	SD	SD	F	F	M	VM	W
VAN	CWH	vh1	SD	SD	F	F	M	VM	W	W
VAN	CWH	vh2	SD	SD	F	F	M	VM	W	W
VAN	MH	mm1	SD	SD	F	F	F	M	VM	W
VAN	MH	mm2	SD	SD	F	F	F	M	VM	W
VAN	MH	wh	SD	SD	F	F	F	M	VM	W

NOTES: ED = Extremely Dry (0, extreme xeric)
VD = Very Dry (1, xeric)
MD = Moderately Dry (2, sub-xeric)
SD = Slightly Dry (3, sub-mesic)
F = Fresh (4, mesic)
M = Moist (5, sub-hygric)
VM = Very Moist (6, hygric)
W = Wet (7, sub-hydric)

Appendix IV Map Content

The map(s) submitted with the appraisal data submission must be at a scale of 1:5000 or 1:10000. Additional maps at other scales may be included as required. At a minimum the map(s) shall indicate the following information:

a. Cutting permit block boundaries.

b. Retention areas within the cutting permit blocks.

c. Delineation of biogeoclimatic zone, subzone and variant areas.

d. Delineation of areas by harvest method (ground, cable, or helicopter, etc.) and partial cut percent.

e. Delineation of areas that are the subject of specified operations cost estimates (e.g., skidder swing, root disease control).

f. The geographic midpoint and common junction of the permit.

g. Existing roads.

h. Roads to be built by type (operational, block, winter) including sections to be gravelled and or sections that are “wet” (as defined in this manual).

i. Location of roads/structures that are the subject of detailed engineered estimates.

j. Location and type of other development such as remedial fencing, cattleguards and pipeline crossings.

The map may include other information considered relevant to the appraisal.

For reappraisal data submissions, reference may be made to the original map submitted. Any change to the harvest plan or area of harvest due to a “changed circumstance (section 2.3.1) during the term of the cutting authority must be mapped and promptly submitted to the district.

As part of the initial appraisal data submission the map(s) may be submitted in electronic format. At least two copies shall be submitted to the district in paper form prior to the cutting permit being approved.