BRITISH COLUMBIA

Ministry of Forests

Office of the Minister

MEMORANDUM

File: 280-20

APR 0 1 2003

To: Regional Managers - Interior

From: The Honourable Michael de Jong
Minister of Forests

Re: Amendment No. 4 to the *Interior Appraisal Manual*

I hereby approve Amendment No. 4 to the *Interior Appraisal Manual* and attach a copy for your use. The amendments are shown in the attached highlights.

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

DJW

for: Michael de Jong
Minister of Forests

Attachments

pc: Bill Howard, Director, Revenue Branch

All Subscribers, *Interior Appraisal Manual*

Interior Appraisal Manual – Amendment No. 4 Highlights

The Interior Appraisal Manual Amendment No. 4 includes the following changes

Section 1.2	Housekeeping.
Section 1.3.2	Housekeeping.
Section 2.2	Clarification to include BC Timber Sales as equivalent to a licensee for data submission purposes.
Section 2.3.1	Anniversary date reappraisals have been eliminated for most cutting authorities and have been replaced by reappraisals for changed circumstances.
Section 2.3.2	Road permits and blanket salvage cutting permits will maintain the annual reappraisal requirement.
Section 2.3.3	Housekeeping.
Section 2.3.4	Housekeeping
Section 2.4	Anniversary date reappraisal procedure replaced with changed circumstance reappraisal procedure.
Section 2.4.1	Describes effective date for a changed circumstance reappraisal.
Section 2.4.2	Change to the timing of data submission to 45 days from 30.
Section 2.5(1)	Incorporates the name change for BC Timber Sales.
Section 2.5(2)	Eliminates anniversary date reappraisals for woodlots and provides for a fixed rate option to replace the annual adjusting rate. All current annual adjusting cutting authorities to be grandfathered as fixed stumpage rates.

Section 2.5(3)	Allows district value index stumpage rates to be extended rather than reappraised.
Section 2.5(4)	Housekeeping.
Section 2.7	Housekeeping.
Section 4.1.1	Housekeeping.
Section 4.2	Housekeeping.
Section 4.3	Housekeeping.
Section 4.3.1.1.5	Housekeeping.
Section 4.3.2.3, Table 4-3	Housekeeping to recognize the forest district consolidations.
Section 4.4.2(6)	Housekeeping to recognize the forest region consolidations.
Section 4.4.2(14)	Housekeeping to recognize the forest region consolidations.
Section 4.5.1	Housekeeping.
Section 4.5.2.1	Housekeeping to recognize the forest region consolidations.
Section 4.6, Table 4-7	Housekeeping to recognize the forest region consolidations.
Section 4.8.1	Housekeeping to recognize the forest district consolidations.
Section 5.4.3	Eliminate the target rate reduction used to adjust for the salvage of beetle infested timber.
Section 6.3	Housekeeping.
Section 6.5	Housekeeping.
Section 6.7.1, Table 6-1	Housekeeping to recognize the forest district consolidations.
Section 6.7.2, Table 6.2	Eliminate miscellaneous stumpage rates for timber licenses and require that any outstanding old cutting authorities be appraised.
Section 7.1	Housekeeping
Section 7.2.4	Housekeeping.

BRITISH COLUMBIA Ministry of Forests

MANUAL REVISION TRANSMITTAL

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MANUAL TITLE
Interior Appraisal Manual

REVISION No.	ISSUE DATE
Amendment No.4	April 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	i - vi	After Table of Contents Tab
INSERT	Table of Contents	i - vi	
REMOVE	Chapter 1	3 - 4	After Chapter 1 Tab
INSERT	Chapter 1	3 - 4	
REMOVE	Chapter 2	2 - 16	After Chapter 2 Tab
INSERT	Chapter 2	2 - 16	
REMOVE	Chapter 4	3 - 6 9 - 16 27 - 58	After Chapter 4 Tab
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REMOVE	Chapter 5	5 - 6	After Chapter 5 Tab
INSERT	Chapter 5	5 - 6	
REMOVE	Chapter 6	3 - 6 9 - 11	After Chapter 6 Tab
INSERT	Chapter 6	3 - 6 9 - 12	
REMOVE	Chapter 7	1 - 4	AfterChapter 7 Tab
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1.2 Area of Application

This manual applies to the "Interior", which is defined as that geographic area included within the Northern and Southern Interior Forest Regions, as established by the *Forest Act* and Regulations under the *Forest Act*.

1.3 Cutting Authority

The term "cutting authority" is defined as:

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.

1.3.2 Cutblocks within a Cutting Authority Area

Cutblocks included in a single cutting authority area should constitute a logical unit.

The cutblocks must be:

1. Within the same forest district, and
2. Tributary to a common point of appraisal, and
3. Must not exceed a maximum distance of ten kilometres between the furthest boundaries of the furthest cutblocks, except when required for bark beetle epidemic blanket salvage.

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 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. A cutting authority, other than a road permit or a blanket salvage cutting permit, shall be reappraised if the licensee submits to the district manager a request for a reappraisal stating in the request for reappraisal that a changed circumstance has occurred, or the district manager notifies the licensee in writing that a reappraisal is required because a changed circumstance has occurred. In either instance the regional manager must be satified 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:

i. in the case of appraisals and reappraisals, to the appropriate regional manager, and

ii. in the case of quarterly adjustments, to the director of Revenue Branch,

b. the Notice shall describe the stumpage determination or determinations involved and shall describe the nature and cause of the error to the extent reasonably possible,

c. upon receipt of the Notice, the regional manager or the director of Revenue Branch shall make the appropriate investigation to decide whether or not an error has, in fact, been made,

d. if the regional manager or the director of Revenue Branch decides that an error has not been made, they shall notify the person who sent the Notice of the decision and the reasons for it,

e. if the regional manager or director of Revenue Branch, decides that an error has been made, the following shall occur:

i. the regional manager or the director of Revenue Branch, shall notify the person who sent the Notice of the decision and the reasons for it,

ii. the regional manager or the director of Revenue Branch, shall take reasonable steps to ensure that all licensees who have been affected by the error are informed of the Notice and of the nature and cause of the error,

iii. the cutting authority or authorities under which the error was made shall be reappraised or the quarterly stumpage adjustment recalculated to correct the error unless the cutting authority, the *Interior Appraisal Manual* or the application in tender for a timber sale licence specified that the stumpage rate is fixed, and

iv. the effective date of the redetermined rate shall be the first day of the month following the date on which the Notice was received by the regional manager or the director of Revenue Branch,

f. if an error has occurred and no Notice has been given with respect to it, the Notice shall be deemed to have been given on the date on which the regional manager or the director of Revenue Branch, became aware of the error or probable error,

g. no person who discovers or otherwise becomes aware of a mathematical error in a stumpage determination shall be obliged to send the Notice as required herein if that person, on reasonable grounds, believes that someone else has sent the Notice with respect to the same error,

h. the redetermined rate does not apply to timber scaled before the first of the month following the date upon which the Notice was given. No remedy will be available with respect to timber scaled before the first of the month,

i. in this section, a mathematical error is any of the following:

   i. an error in transcribing or compiling approved cruise field data, or in the application of approved loss factors and taper equations,

   ii. an error in a calculation made as part of the data submission,

   iii. an error in transcribing the data from an approved data submission or in performing the calculation specified in the manual, and

   iv. an error in the application of published appraisal parameters,

A difference between cruise estimates and actual timber quality or quantity does not constitute an error in the appraisal.

A difference between appraisal estimates of selling price or operating cost and the licensee's experience does not constitute an error in the appraisal.

Omission of data by the licensee on an approved data submission does not constitute an error in the appraisal.

2.4 Changed Circumstance Reappraisal Procedure

1. The licensee shall submit to the district manager an interior appraisal data submission 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 notification 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 cutting authority sold through BCTS 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 2.3.1(1)(d) due to sudden and severe damage or under section 2.3.3 because of a minister's direction.

Woodlots

2. a. A stumpage rate for a cutting authority issued under a woodlot licence shall be adjusted quarterly unless a woodlot licensee chooses in accordance with this section, or is grandfathered under section 2.5,(2)(c) to have 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. This choice is a one time irrevocable option that is not retroactive. Where proper notice 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. The only exceptions are if a reappraisal is done under section 2.3.1,(d) or under 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 the list below, which will produce the least total harvesting and delivery cost estimate for the cutting authority area. All species, qualities and sizes of timber must be appraised to a single point of appraisal. The appraiser must estimate the cost of transporting timber to the sawmill which is nearest the point of appraisal and produces the least total harvesting and delivery cost estimate. The appraiser must then assume manufacturing costs and average market values for the zone relative to that point of appraisal.

A sawmill is defined as a conversion facility capable of producing lumber and chips, and includes the log sorting/storage areas and satellite mill yards if applicable. A sawmill does not have to be physically capable of producing lumber and chips from all the wood appraised to that site. A sawmill is considered capable of producing lumber and chips unless it has been damaged by fire or a destructive force of nature. A damaged sawmill will not be considered a location at a point of appraisal if it has not been repaired within three months of the damage. It will be reconsidered as a location at a point of appraisal on the first day of the next stumpage quarter once it is capable of producing lumber and chips again.

The logs are deemed to have reached the point of appraisal once they have entered the site, commonly the weight scale, upon which the sawmill is located. All further log handling costs except scaling (see section 4.8) are deemed to be part of the manufacturing cost estimate.

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.

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 ($/m^3) (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. CVP stumpage rate calculations will be performed according to the methods outlined in the document, entitled *Specifications: Calculating Stumpage Rates for Interior Appraisals*.

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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 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 utilization 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*,
- Regional Publications - (e.g., *Operational Cruising Requirements in a Forest Region*), and
- Forest Service Policies - (e.g., *Timber Utilization Standards, Policies & Procedures for the Interior of the Province*).

Table 4-2 Standard Timber Utilization Requirements

Description	
The following standard timber utilization requirements 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 *Cruising Specifications*.

Each reappraisal uses a cruise volume by species which is the original net cruise volume adjusted on the basis of approved amendments to the cutting authority since the last appraisal (see section 2.3).

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)). Where the cutting authority document requires obligatory utilization of deciduous timber, the deciduous volume must be included in the applicable total net cruise volume.

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.

   Where applicable, these cruised volumes and development cost estimates must be segregated on the basis of legal boundaries.

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.

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

Where the development cost estimate exceeds $4.00/m^3$ a written agreement may be made which apportions the main access road cost estimate to two or more tributary cutting authorities. The main access road ends at the far boundary of the first cutting authority being appraised.

The agreement is subject to the following conditions:

1. Only main access roads serving the tributary cutting authorities (as defined in section 4.3) may be considered.

2. With exception of woodlot licences, each cutting authority must be in the licensee's approved forest development plan.

3. For woodlot licences, each cutting authority to which costs are amortized must be approved and appraised during the ten year period from the signing of the agreement. Reappraisals may continue to carry the costs until the cutting authority expires.

4. The agreement must be reviewed by the regional manager or the regional manager's designate prior to being signed by the licensee and the licensor before it can be included in the appraisal or reappraisal.

5. The amount apportioned will be a fixed lump sum which will be trended to the manual cost base and as provided for in section 4.11 but not otherwise revisited.

6. The term of the agreement must not exceed the terms of the cutting authorities.

7. The agreement will only be valid under CVP and confers no obligation for 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.

- Snow Roads (WINTER): - snow roads are a form of overland construction that uses clean snow and ice as fill. Suitability of materials is not an issue as all are frozen. Stripping is limited to large stumps that cannot be easily covered with snow or ice. Cuts into mineral or organic soil must not exceed 0.3 m in depth for sustained distances or 0.5 m in depth for distances up to 5 m. This road type includes operational and block road categories. Stabilizing costs are not applicable. Snow (winter) roads constructed on side slopes of greater than 15% are appraised as block roads.

3. Uphill Side Slope: (SLOPE %)

   Uphill side slope percent may show a variation (+/- 15% about the average) within any section length and represents the average of all slopes in the section to a maximum of 50%. To derive an average for uphill side slope percent, several representative cross-section measurements are taken along the section length and the sum of one-half of the distance on each side of the measurement is applied as a weight against the measurement at that cross-section. The uphill side slope percent is measured at right angles to the road centreline and is recorded to the nearest integer. Where the road is located on a bench, the uphill side slope of the bench is used.

4. Percent Rock: (ROCK %)

   Rock includes bedrock and large boulders. It may be rippable or may require drilling and blasting. Rock percent may show a variation (+/- 15% about the average) within any section length and represents the average of all rock percents in the section to a maximum of 50%. To derive an average percent rock, several representative cross-section measurements are taken along the section length and the percent rock calculated. The sum of one-half of the distance on each side of where the measurements were taken is applied as a weight against the percent rock calculated at that cross-section. 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 above the bottom of the ditch

   To determine the percent rock for roads not yet constructed, constructed roads on similar land/rock forms are used as a guide. Alternately, where estimates of rock volume from commercial road design programs are available for tabular sections, that information may be used to estimate the rock percent.

5. Soil Moisture Regime (SMR):

   Those biogeoclimatic zones/subzones with site series identified as "M", "VM" or "W" in the shaded area of the table in Appendix IV are considered "Wet" for appraisal purposes.

6. Biogeoclimatic Zones

CWH/MH	-	Coastal Western Hemlock/Mountain Hemlock
BWBS	-	Boreal White and Black Spruce
ICH	-	Interior Cedar Hemlock
SBS	-	Sub Boreal Spruce
SBPS	-	Sub Boreal Pine/Spruce
ESSF	-	Engelmann Spruce - Subalpine Fir
IDF	-	Interior Douglas Fir

4.3.2.3 Subgrade Cost Estimate

For each operational and block road the subgrade cost estimate in $/km is determined from the equation for the appropriate road group.

Road Group	
2	14512 + (101 * SLOPE%) + (135 * ROCK%) + (3100 * SBS) + (3181 * OP)
3	1283 + (545 * SLOPE%) + (9682 * OP) ($2,176/km set as minimum. If equation yields less than $2,176/km then use $2,176/km)
4	5404 + (296 * SLOPE%) + (5556 * SMR) + (5518 * OP)
5	4989 + (159 * SLOPE%) + (171 * ROCK%) + (4831 * SMR) + (4054 * OP)
6	-1218 + (551 * SLOPE%) + (369 * ROCK%) + (8241 * OP) + (3202 * ESSF) ($2,817/km set as minimum. If equation yields less than $2,817/km then use $2,817/km)
7	6093 + (6179*ESSF) + (22592 * ESSF*OP) + (6024 * BWBS*OP) + (14525*SBS*OP)
8	2567 + (6249* OP) - (5547*IDF*OP)
9	2956 + (182 * SLOPE%) + (237 * ROCK%) + (4348 * OP)
10	8429 + (176 * SLOPE%) + (331 * ROCK%)
11	2698 + (474 * SLOPE%) + (371 * ROCK%) + (5329 * OP) + (27430 * CWH/MH) ($5,287/km set as minimum. If equation yields less than $5,287/km then use $5,287/km)
12	7296 + (324 * SLOPE%) + (258 * ROCK%) + (4686 * OP)

Where:

Road groups are defined in Table 4-3.

OP	=	1 if an Operational Road, otherwise = 0
SMR	=	1 if Soil Moisture Regime is "wet". Otherwise SMR = 0.
ESSF	=	1 if road construction is within this biogeoclimatic zone. Otherwise ESSF = 0
ICH	=	1 if road construction is within this biogeoclimatic zone. Otherwise ICH = 0
BWBS	=	1 if road construction is within this biogeoclimatic zone. Otherwise BWBS = 0
SBS	=	1 if road construction is within this biogeoclimatic zone. Otherwise SBS = 0
IDF	=	1 if road construction is within this biogeoclimatic zone. Otherwise IDG = 0
CWH/MH	=	1 if road construction is within this biogeoclimatic zone. Otherwise CWH/MH = 0

Snow roads

The subgrade cost estimate for all new and annual refreezing of snow roads (winter) is $2,718/km.

Table 4-3 Road Groups

Road Group #	Districts Included	Within the Geographic Boundary of a TSA, SB and TFL
1	Forest districts in this group have been redistributed, Kispiox to group 2 and Kalum to group 11	
2	Skeena Stikine (Bulkley/Cassiar Kispiox)	Lillooet TSA
3	Nadina (Lakes, Morice)	
4		Williams Lake TSA, SBs J, K & L Prince George TSA, SBs G & H, TFLs 30, 53 Quesnel TSA, SBs E, F, G, H & I, TFL52 100 Mile House TSA, SBs, G & H
5	Vanderhoof	Prince George TSA, SBs C, E, F & I, TFL5, TFL 42
6		Mackenzie TSA, SBs G through P, Prince George TSA SB's A & B
7	Peace (Dawson Creek Fort St. John) Fort Nelson	Mackenzie TSA, SBs A through F
8	Chilcotin	Williams Lake TSA, SBs F, G, H, I and P Quesnel TSA, SBs A, B, C & D, 100 Mile House TSA, SBs A, B, C, D, E, F
9	Kamloops	Merritt TSA, TFL 15, 49 Okanagan TSA, SBs 1, 2, 3, 4, 5
10	Rocky Mountain (Cranbrook Invermere)	Boundary TSA, TFL 8
11	Columbia (Golden, Revelstoke) Kalum Kootenay Lake	Arrow TSA, TFL 23, 3
12	Headwaters (Clearwater Robson Valley)	Williams Lake TSA, SBs M & N Okanagan TSA, SBs, 6,7,8,9, TFL 33

Woodlot and Timber Licence cutting authorities are assigned to the road group for the area in which they are geographically located.

The percent partial cut is determined as:

$$PCUT = \frac{\text{Net cruise volume required to be removed using a partial cut system}}{\text{Total net cruise volume on the area where Partial Cutting is required}} * 100\%$$

(except if partial cut percent > = 90% then PCUT = 0).

b. Partial cut dummy variable (DPCUT)

DPCUT = 1 if partial cut percent is greater than 0 and less than 90, otherwise DPCUT = 0.

6. Distance to Support Centre (DS)

Accessible cutting authorities: (see section 4.8.2), the one-way distance to support centre is the distance over continuous road access from the geographic centre of the cutting authority to the main post office (or other location designated by the regional appraisal coordinator) in a community from the following list. The distance to support centre includes the distance covered by a daily barge or ferry service. Where there is more than one block in the cutting authority, the weighted average distance to support centre must be calculated using the individual distances and the individual block volumes. Where more than one alternative is possible, the least cost alternative is used. The distance is measured to the nearest kilometre. The following is a list of communities by forest region.

Northern Interior Forest Region

Burns Lake	Kitwanga	Smithers	Terrace
Houston	New Hazelton	Stewart	Prince George
Kitimat	Fort St. James	Fraser Lake	Fort St. John
Chetwynd	Fort Nelson	Mackenzie	Dawson Creek
			Vanderhoof

Southern Interior Forest Region

Boston Bar	Kamloops	Merritt	Salmon Arm
Clearwater	Kelowna	Pemberton	Vernon
Hope	Lillooet	Penticton	Nakusp
Canal Flats	Creston	Grand Forks	Nelson
Castlegar	Fernie	Greenwood	Revelstoke
Cranbrook	Golden	Invermere	100 Mile House
McBride	Valemount	Princeton	Quesnel
Williams Lake			

For isolated cutting authorities (see section 4.8.2), the distance to support centre is the one-way road distance from the geographic centre of the cutting authority to the isolated camp or where there is no isolated camp, to a community from the list above. Where more than one alternative is possible, the least cost alternative is used. The distance is measured to the nearest kilometre.

The following distance variables are included:

- NEWDIST200 = 0 IF DS<= 100 km
  = (DS-100) if DS>100 km and <= 200 km
  = 100 if DS>200 km
- NEWDIST250 = 0 if DS<= 100 km
  = (DS-100) if DS>100 km and <=250 km
  = 150 if DS>250 km
- DIST200S150 = 0 if DS<=150 km
  = (DS-150) if DS>150 km and <=200 km
  = 50 if DS>200 km

7. Volume per Tree (VOLTREE)

   The average net cruise volume per tree (m^3), rounded to two decimals. For partial cutting, it is based on the trees to be harvested.

8. Gross Volume per Tree (GVOL)

   Gross volume per tree (m^3) is computed as: VOLTREE/(1 - defect %/100).

   Where:

   Defect is the estimate of decay, waste and breakage (DWB) percent of the coniferous gross volume from the cruise summary for the trees to be harvested. Where utilization of deciduous volume is mandatory under the licence, defect percent is taken from the stand volume of the cruise summary. Defect percent is recorded to the nearest whole percentage point for appraisal calculation purposes.

9. Small Tree Volume (SMALL TREEVOL)

   SMALLTREEVOL = Average net merchantable volume (m^3) per tree if <0.34 m^3/tree. If >= 0.34 m^3/tree SMALLTREEVOL = 0.

10. Small Tree Dummy Variable (SMALLTREED)

    SMALLTREED = 1 if average net merchantable volume per tree <0.34 m^3/tree, otherwise = 0.

11. Heli Yarding Distance (HELIYARD)

    The average loaded horizontal yarding distance (in kilometres) flown by helicopter measured to the nearest 0.1 km.

12. Skyline Yarding Distance (SKYYARD)

    Average skyline slope distance (m).

13. Species Percent

    Where a phase cost estimate includes a specific species variable, the appropriate species volume (from the Harvest Method Summary of the Cruise Compilation) should be entered on the appraisal data submission. The percent will be calculated automatically.

He	- Hemlock	Sp	- Spruce
Fi	- Fir	Pl	- Lodgepole Pine
La	- Larch	Ba	- Balsam
Ce	- Cedar		

14. Region Definition for Constants

FNP	=	Fort Nelson & Peace (Fort St. John, Dawson Creek) Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, Vanderhoof and Robson Valley Forest Districts
Prince Rupert	=	Kalum, Nadine (Lakes, Morice), Skeena, and Stikine (Kispiox, Bulkley/Cassiar) Forest Districts
Kamloops	=	Cascades (Merritt, Lillooet), Kamloops, Clearwater and Okanagan Shushwap (Penticton, Vernon, Salmon Arm) Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo (Horsefly, Williams Lake) and Quesnel Forest Districts
Nelson	=	Arrow Boundary (Arrow, Boundary), Columbia, Kootenay Lake and Rocky Mountain (Cranbrook, Invermere) Forest Districts

15. Biogeoclimatic Zones

CWH/MH	-	Coastal Western Hemlock/Mountain Hemlock
ICH	-	Interior Cedar Hemlock
SBS	-	Sub Boreal Spruce
SBPS	-	Sub Boreal Pine/Spruce
ESSF	-	Engelmann Spruce – Subalpine Fir
MS	-	Montane Spruce
IDF	-	Interior Douglas Fir

4.4.3 Tree-to-truck Cost Estimate

Tree-to-truck costs estimates are determined for each harvesting method as follows:

1. Helicopter Logging

$/m^3 = CONSTANT - (5.51*SLOPE%/100) + (14.43*BD%/100) + (3.96*DPCUT) + (14.25*DIST200S150/100) + (4.92*HELIYARD)

> If yarding uphill, slope percent is set to 0.

Where CONSTANT =

	Biogeoclimatic Zone	
REGION	**ICH**	**OTHER**
Nelson	61.33	65.03
Other	57.73	61.43

2. Horse Logging

No variables are recognized for this method. The cost estimates are applied to the volume of timber to be clear cut or partial cut.

$/m^3 = 25.95

3. Ground Skidding

   The ground skidding equipment options include, but are not limited to, rubber tired skidder, crawler tractor, soft track skidder, small cat skidding, hoe chucking, long line skidding, clambunk forwarders, low ground pressure skidders, harvester forwarders and cut-to-length processors. A system does not have to skid wood all the way from the stump to the landing to be included. Some wood may be moved part way by longlining or hoe chucking before being skidded by some other system to the landing. Two variations are recognized:

   a. Clear Cut,

   b. Partial Cut

The tree-to-truck cost estimate for both variations is determined from the equation as follows:

$$\$/m^3 = \text{CONSTANT} + (6.68 * \text{SLOPE\%}/100) - (4.67 * \text{VOLHA}/1000) + (3.45 * \text{BD\%}/100) + (6.96 * \text{DEFECT\%}/100) + (2.59 * \text{DPCUT}) + (6.57 * \text{SMALLTREED}) - (19.28 * \text{SMALLTREEVOL}) + (1.71 * \text{NEWDIST200}/100)$$

Where CONSTANT =

REGION	Biogeoclimatic Zone					
	SBS	**ICH**	**IDF**	**ESSF**	**SBPS**	**Other**
Cariboo	16.20	20.10	18.66	19.02	14.69	17.41
FNP	15.47	19.37	17.93	18.29	13.96	16.68
Kamloops	15.05	18.95	17.51	17.87	13.54	16.26
Prince George*	14.58	18.48	17.04	17.40	13.07	15.79
Prince Rupert	13.96	17.86	16.42	16.78	12.45	15.17
Other	17.29	21.19	19.75	20.11	15.78	18.50

* Excluding FNP.

4. Overhead Cable Logging

   Overhead cable logging cost estimates will be recognized when required. The method includes both highlead (spar) mobile (grapple) yarders and skyline yarders, but variations in machine size, spar/boom height, winch line capacity and yarding technique are not recognized.

Variations recognized within the method are:

a. Highlead and Grapple

The tree-to-truck cost estimate for clear cut and partial cut is determined from the equation as follows:

$\$/m^3$ = CONSTANT + (13.21 * SLOPE%/100) - (8.05 * VOLHA/1000) - (3.59 * GVOL) + (0.52 * GVOLSQR) + (5.45 * BD%/100) + (4.73 * DPCUT) + (3.26 * NEWDIST250/100) + (2.91 * PL%/100)

Where CONSTANT =

	Biogeoclimatic Zone				
REGION	**CWH/MH**	**ICH**	**MS**	**ESSF**	**OTHER**
Cariboo	31.86	28.28	28.81	29.30	26.16
Kamloops	33.36	29.78	30.31	30.80	27.66
Nelson	36.06	32.48	33.01	33.50	30.36
Other	34.75	31.17	31.70	32.19	29.05

b. Skyline and Intermediate Support Skyline

Skyline yarding estimates will be recognized where the average yarding distance is greater than 300 m, or intermediate supports are required.

The average yarding distance is determined by:

1. Drawing a series of transects (minimum four) with their origin at the landing, being equi-angle apart and measured to the back-line. This is done for each block; blocks will not be amalgamated for the purpose of average yarding distance calculation. The volume for the system is the sum of the volumes of qualifying blocks.

2. Yarding distance will be measured as slope distance from the centre of the landing to the falling boundary.

3. The sum of transect lengths divided by the number of transects equals the average yarding distance.

4. The exception to the above; where the ministry and the licensee agree that Forest and Land Management is better served by the use of a skyline system in a particular logging chance, then the average yarding distance greater than 300 meters requirement is waived.

The tree-to-truck cost estimate is determined from the equation as follows:

$\$/m^3 =$ CONSTANT + (16.04 * SLOPE%/100) - (7.20 * GVOL) + (2.19 * GVOLSQR) + (1.52 * SKYYARD/100)

Where CONSTANT =

	Biogeoclimatic Zone	
Region	**ICH**	**Other**
Kamloops	30.67	33.97
Nelson	27.52	30.82
Other	22.70	26.00

4.4.4 Tree-to-Truck Additive for Damaged Timber

The following cost estimate additives are recognized for heavy fire damage (HFD), and dead/live useless snags (DUS). The data is collected as specified by the *Cruising Manual*. The additional costs incurred to harvest blowdown timber are recognized in the tree-to-truck ground skidding and overhead cable logging equations (sections 4.4 (3), 4.4 (4)).

The following additive is determined for all cable and ground skidding harvesting methods and is added to the tree-to-truck cost estimate.

$$\$/m^3 = 0.04 * (DT - 15)$$

Where: DT is the Damaged Timber percent

$$DT = HFD + DUS$$

If: DT is less than 15 percent, DT = 15

If: DT is more than 100 percent, DT = 100

$$\text{Heavy Fire Damage \%} = \frac{\text{Conifer HFD Volume}(m^3) * 100}{\text{Total Net Conifer Volume}(m^3)}$$

$$\text{Dead / Live Useless Snags \%} = \frac{\text{Conifer DUS Snags / ha} * 100}{\text{Net Merchantable Conifer Stems / ha} + \text{Conifer DUS Snags / ha}}$$

4.4.5 Prorating Tree-to-Truck Cost Estimates

Where more than one harvesting method is required, a proration of costs is necessary.

The variables for each required harvesting method must be based on a cruise compilation of only those plots located within the area to be harvested by the method.

The additive for damaged timber is also determined for each applicable method.

The final prorated tree-to-truck cost estimate is determined according to the following equation where each component is rounded to the nearest cent before totalling:

$$\$/m^3 = \frac{(^{Cost}\text{Heli}(C)(^{V}\text{Heli}(C)}{(TNCV)} + \frac{(^{Cost}\text{Heli}(P)(^{V}\text{Heli}(P)}{(TNCV)} + \frac{(^{Cost}\text{Horse})(^{V}\text{Horse})}{(TNCV)} + \frac{(^{Cost}\text{OC}(C))(^{V}\text{OC}(C))}{(TNCV)} +$$

$$\frac{(^{Cost}\text{OC}(P))(^{V}\text{OC}(P))}{(TNCV)} + \frac{(^{Cost}\text{GS}(C))(^{V}\text{GS}(C))}{(TNCV)} + \frac{(^{Cost}\text{GS}(P))(^{V}\text{GS}(P))}{(TNCV)} + \frac{(^{Cost}\text{SK})(^{V}\text{SK})}{(TNCV)}$$

Where:

Cost	=	cost estimate ($/m3) including any damaged timber additive
V	=	volume (m3) required to be logged by each system
Heli (C)	=	helicopter logging (clear cut)
Heli (P)	=	helicopter logging (partial cut)
Horse	=	horse logging
GS (C)	=	ground skidding (clear cut)
GS (P)	=	ground skidding (partial cut)
OC(C)	=	overhead cable logging (clear cut)
OC(P)	=	overhead cable logging (partial cut)
SK	=	skyline logging
TNCV	=	total net cruise volume (m^3)

4.5 Log Transportation

The log transportation phase covers all aspects of log movement from the place of initial loading to the point of appraisal, including truck haul, rail, water and other specialized transportation. The use of section 4.5.1, 1., c. does not affect any other provision that requires the use of the least cost point of appraisal.

4.5.1 Truck Haul Variables

1. Cycle Time:

   For appraisal purposes, weighted average Cycle Time (CT) is the estimated time in hours (rounded to the nearest 0.1 hour) for transporting logs from the centre of a cutting authority area to:

   a. the least cost point of appraisal,

   b. the appraisal place of unloading in the case of water or rail transport, or

   c. where the harvest transfer to control a bark beetle infestation has passed the economic test specified by the Ministry of Forests, and;

      i. if the Minister of Forests or regional manager has given approval for the temporary transfer of cutting rights from one timber supply area to another timber supply area in order to control a bark beetle infestation, the place that would have been the point of appraisal if the timber had been harvested in the timber supply area from which the cutting rights have been transferred, or

      ii. if the regional manager has given approval for the temporary transfer of cutting rights within a timber supply area in order to control a bark beetle infestation, the place that would have been the point of appraisal if the transfer of cutting rights had not taken place.

2. To determine weighted average cycle time:

   a. establish the geographical centre point of each cutblock and project this point to the nearest road for measurement purposes,

   b. from this centre point, determine the cycle time to the nearest junction serving all cutblocks,

   c. weight the cycle time for each cutblock by the volume on the cutblock and determine the average weighted cycle time to the junction. If the cutblock volume is not available, the cutblock area is used, and

   d. determine the cycle time from the junction to:

      i. the least cost point of appraisal,

      ii. the appraisal place of unloading,

iii. if the economic test is passed and the Minister of Forests, or regional manager has given approval for the temporary transfer of cutting rights from one timber supply area to another timber supply area in order to control a bark beetle infestation, the place that would have been the point of appraisal if the timber had been harvested in the timber supply area from which the cutting rights have been transferred, or

iv. if the economic test is passed and the regional manager has given approval for the temporary transfer of cutting rights within a timber supply area in order to control a bark beetle infestation, the place that would have been the point of appraisal if the transfer of cutting rights had not taken place.

and add this to the average weighted cycle time from 'c.' above.

The cycle consists of loading, hauling, weighing, unloading, return time, and unavoidable delays. The cycle time will normally be determined by taking into consideration all the factors that may affect it: distance, expected rate of speed, necessary delays, expected standard of roads and their maintenance, traffic density, and seasonal weather conditions.

In many cases standard cycle time schedules from specific road junctions to the point of appraisal have been developed and should be used (Sector times).

Unavoidable delays are periods when the truck is on the job but not operating due to unpredictable delays such as; tightening binder chains, minor repairs made by driver, checking and adjusting brakes, minor delays prior to loading and unloading, refuelling, etc. Unavoidable delay time does not include any breakdown which requires shop repair, the services of a skilled mechanic, or a spilled load of logs. The time for load, unload and unavoidable delay is set at 75 minutes for cable yarding systems (see section 4.4.3 (4)) and 60 minutes for all other systems (see section 4.4.3 (1), (2), & (3)).

3. Haul Method

Cost estimates do not recognize different types of logging trucks. The estimate is based upon the possible haul method, either highway or off-highway and not specifically on the licensee's particular method.

Highway hauling is assumed when loaded logging trucks must travel in part over roads administered under the *Highway Act*, without truck-to-truck transfer, to the point of appraisal, or on roads administered under the *Highway (Industrial) Act* where prolonged known road restrictions prevent the use of oversize loads, or in all instances where the volume per tree is less than 0.20 m^3.

Off-highway hauling is assumed when loaded logging trucks can travel over roads administered under the *Highway (Industrial) Act* to the point of appraisal, or to a recognized reload. Where prolonged known restrictions (e.g., bridge load limit, narrow road, through rock cut, WCB Regulations, etc.) prevent the use of oversize loads, highway haul is assumed.

4.5.2 Truck Haul Cost Estimates

4.5.2.1 Primary Haul

The primary truck haul cost estimate is determined from the following equation.

1. Highway Haul

   For all highway haul equations if the CT is greater than 0 then the minimum is $\$0.12/m^3$. If CT = 0 then $\$/m^3 = 0$.

   $\$/m^3 =$ CONSTANT + (2.02 * CT) - (1.46 * CE%/100) + (0.24 * FI%/100) + (1.92 * HE%/100) – (2.24 * WH%/100) – (0.63 * SP%/100)

   Where:

REGION	:	Nelson	Prince George *	Other
CONSTANT	=	0.35	-0.44	0.08

   * Excluding FNP

2. Off-Highway Haul

   For all off-highway haul equations if CT is greater than 0 then the minimum is $\$0.02/m^3$. If CT = 0 then $\$/m^3 = 0$.

   $\$/m^3 =$ CONSTANT + (1.39 * CT) – (2.48 * CE%/100) + (1.42 * HE%/100) – (0.81 * SP%/100)

Where:

REGION	:	Cariboo	FNP	Kamloops	Nelson	Other
CONSTANT	=	1.26	1.05	1.11	1.32	0.56

For both highway and off-highway.

CT = Cycle time to the nearest 0.1 hours

CE =	Cedar	LA =	Larch
HE =	Hemlock	SP =	Spruce
PL =	Lodgepole Pine	PW =	White Pine

FNP	=	Fort Nelson & Peace (Fort St. John, Dawson Creek) Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, Vanderhoof and Robson Valley Forest Districts
Prince Rupert	=	Kalum, Nadine (Lakes, Morice), Skeena, and Stikine (Kispiox, Bulkley/Cassiar) Forest Districts
Kamloops	=	Cascades (Merritt, Lillooet), Kamloops, Clearwater and Okanagan Shushwap (Penticton, Vernon, Salmon Arm) Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo (Horsefly, Williams Lake) and Quesnel Forest Districts
Nelson	=	Arrow Boundary (Arrow, Boundary), Columbia, Kootenay Lake and Rocky Mountain (Cranbrook, Invermere) Forest Districts

For both hauling equations, the species listed are the species percents taken from the appraisal data submission to the nearest 1.0 percent.

4.5.2.2 Secondary Haul

The secondary haul cost estimate is made when logs must be truck hauled between the dewater and reload site to the appraisal point.

$$\$/m^3 = 1.763 * CT$$

CT for the secondary haul is determined using the method described in section 4.5.1(2).

4.5.3 Water Transportation Cost Estimate

A water transportation cost estimate is made when logs must be transported by water between the cutting authority and the point of appraisal or reload. The estimate includes the costs of strapping logs on the truck, dumping, booming, developing and operating dumping and booming grounds, and towing. The cost estimate for reservoir lakes applies to all marine appraisals and to Arrow, Kinbasket, Ootsa, Revelstoke and Williston Lakes. All other lakes receive the natural lake cost estimate.

1. Dump and Boom:

   Reservoir Lakes and Marine: $\$/m^3 = \$3.77$

   Natural Lakes: $\$/m^3 = \$1.90$

2. Tow:

   All $\$/m^3 = 0.8208 + 0.005490 * d$

   Where; d = one-way tow distance in kilometres

3. Dewater and Reload:

   All $\$/m^3 = \$2.30$

   Only considered if the mill infeed is not located on the same lake, or a dam transfer is required. Otherwise dewatering is part of the manufacturing cost estimate.

4.5.4 Special Transportation Systems

A special transportation system is recognized in the appraisal where geographic conditions dictate its use.

The cost estimates include all costs associated with servicing the appropriate cutting authorities, excluding all on-site costs of owning and operating a camp facility.

The recognized special transportation systems are as follows:

1. Railway

   a. Truck-to-Rail Transfer

      When logs are appraised by railway for part of the way between the cutting authority and the point of appraisal, the cost estimate for the truck-to-rail transfer part of the phase is:

      B.C. Rail - Dease Lake Extension: $\$/m^3 = \$4.01$

      All Other Railways: $\$/m^3 = \$3.43$

b. Railway Transportation

The railway transportation cost estimate is based on the following table for the points of origin shown. Otherwise, the best information on hand is used.

Table 4-6 BC Rail Log Transportation

Origin	Cost Estimate ($/m^3)	Point of Appraisal
Leo Creek	8.15	Fort St. James
Lovell	10.92	Fort St. James
Bear Lake	15.71	Fort St. James
Minaret Creek	17.17	Fort St. James
Niteal	14.89	Fort St. John

2. Barge/Ferry Used for Truck Haul (Private)

When a truck haul road is interrupted by a body of water and the operation of a barge system is feasible to provide the road link for logging trucks, the cost estimate for this phase, regardless of ownership is:

Reservoir Lakes $/m^3 = $3.84

Natural Lakes $/m^3 = $2.00

3. Barge/Ferry Not Used for Truck Haul (Private)

The cost estimate includes all costs associated with the operation of the systems and includes bubble systems where applicable.

When a cutting authority can be served only by water, and daily (operating days only) ferry/barge services are feasible for crew transportation, the cost estimate for this phase, regardless of ownership is:

All lakes $/m^3 = $0.74

4. Francois Lake Ferry (Private/Public)

When the least cost truck haul includes using the Francois Lake Ferry crossing, the cost estimate for the ferry phase is:

Francois Ferry $/m^3 = $0.31

4.6 Road Management

Where the licensee is obliged to carry out road management, it includes but is not limited to, the following:

- grading
- snowplowing and freezing in
- sanding
- spot gravelling (< 0.3 km distance)
- culvert repairs and thawing
- culvert removal (< 950 mm)
- culvert replacement (< 950 mm)
- non-structural maintenance of bridges
- bridge re-decking/wearing surface replacement
- ditching
- road use charges paid to other licensees
- all access management
- seasonal erosion control
- roadside treatments
- sign maintenance
- dust control
- brushing
- minor flood and storm damage repair
- slough removal
- water bar construction (seasonal)
- road ripping
- cross ditch construction
- grass seeding
- all deactivation

The cost estimate for all routine maintenance carried out on logging operations depends on the geographic location of the cutting authority area (refer to Table 4-7).

Cutting authorities issued under forms of tenure not located administratively within a tree farm licence area or timber supply area will be assigned the routine road maintenance cost estimate for the TFL or TSA/supply block in which the cutting authority is geographically located.

The geographic location is recognized by forest region, timber supply area and supply block, and tree farm licence as follows.

Table 4-7 Road Management Cost Estimates

Region	TFL #	TSA	TSA #	Supply Block	$/m3
Northern Interior		Bulkley	3	All	2.37
		Cassiar	4	All	2.37
		Cranberry	42	All	2.37
		Kalum	10	All	2.37
		Kispiox	12	All	2.37
		Lakes	14	All	1.51
		Morice	20	All	1.49
		Nass	43	All	2.37
		Dawson Creek	41	All	2.23
		Fort Nelson	8	All	2.23
		Fort St. John	40	All	2.23
		Mackenzie	16	All	1.80
		Prince George	24	A, B, C	1.80
		Prince George	24	D	1.54
		Prince George	24	E, F, I	1.46
		Prince George	24	G, H	2.48
	1				2.37
	41				2.37
	48				2.23
	30				2.48
	53				2.48
	42				1.80
Southern Interior		Kamloops	11	1	2.15
		Kamloops	11	2, 3, 4	1.32
		Lillooet	15	All	2.37
		Merritt	18	All	0.96
		Okanagan	22	1, 2, 3	2.56
		Okanagan	22	4, 5	2.00
		Okanagan	22	6, 7, 8, 9	2.74
		Robson Valley	17	All	2.15
		Arrow	1	All	3.02
		Boundary	2	C,D,G	3.02

Region	TFL #	TSA	TSA #	Supply Block	$/m3
Southern Interior (cont'd)		Boundary	2	E,F	2.56
		Cranbrook	5	All	1.90
		Golden	7	All	4.53
		Invermere	9	All	1.90
		Kootenay Lake	13	All	2.75
		Revelstoke	27	All	4.53
		Quesnel	26	A, B, C, D	0.54
		Quesnel	26	E, F, G, H, I	2.48
		Williams Lake	29	A, B, C, D, E, I	1.08
		Williams Lake	29	F, G, H, J	1.15
		Williams Lake	29	K, L	1.27
		Williams Lake	29	M, N	2.51
		100 Mile House	23	All	1.24
	15				2.56
	18				2.15
	33				2.74
	35				1.32
	49				2.00
	3				3.02
	23				3.02
	8				2.56
	14				1.90
	55				4.53
	56				4.53
	5				1.46
	52				2.48

Note: TFL 13 has been rolled into a forest licence and therefore dropped from the table.

4.7 Road and Land Use Charges

Prior to a road or land use charge being included in an appraisal, the licensee must:

a. submit a "Request for Approval of a Road Use Charge" form with the appraisal data submission; and

b. receive written approval of the road or land use charge from the regional manager.

1. Charges as a Share of Road Maintenance

   a. No recognition is made of such charges. The routine road maintenance cost estimate, section 4.6, includes all relevant costs whether incurred directly by the licensee or by payment to another party for services performed.

2. Charges Other Than for 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. This category also includes foreshore leases, camp areas and dryland sorts. 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 an 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 forest legislation and must be proven through the presentation of auditable documents.

3. Other Land Use Charges

   Only non-governmental land use charges will be considered in appraisals.

4.8 Administration and Other Costs

4.8.1 Overhead

Overhead cost estimates are for the related administration and supervisory activities attributed to development, tree-to-truck, transportation and basic silviculture that occur at the head office, branch office and camp or operation.

Overhead costs include:

- Office Operations,
- Scaling,
- Cruising,
- Environmental Protection,
- Consultants fees (section 4.3.3),
- Archaeological surveys,
- Waste and Residue surveys,
- Right-of-way easements,
- Foreshore and other land leases,
- Tree marking Beetle probing & Pheromone baiting,
- Engineering (road layout, survey including geotechnical surveys, and design, other than those applicable as engineered cost estimate).

Cost estimates by forest district are shown in the following table:

Table 4-8 Overhead Cost Estimates

District	$/m^3	District	$/m^3
100 Mile House	7.70	Kootenay Lake	9.60
Arrow Boundary (Arrow Boundary)	8.67	Mackenzie	6.58
Cascades (Merritt, Lillooet)	8.04	Nadina (Lakes, Morice)	6.46
Central Cariboo (Horsefly, Williams Lake)	7.57	Okanagan Shushwap (Penticton, Salmon Arm, Vernon)	7.68
Chilcotin	7.03	Peace (Ft. St. John, Dawson Creek)	6.89
Columbia	10.46	Prince George	6.82
Fort Nelson	6.06	Quesnel	6.89
Fort St. James	6.12	Rocky Mountain (Cranbrook, Invermere)	8.76
Headwaters (Clearwater, Robson Valley)	8.77	Skeena Stikine (Bulkley/Cassiar, Kispiox)	6.67
Kalum	9.47	Vanderhoof	6.87
Kamloops	7.57		

4.8.2 Isolated Cutting Authority Areas

An isolated cutting authority area has no continuous road access to the nearest support centre (listed in section 4.4.2(6)). The exception is where there is continuous road access, but the route is not routinely used to transport people, equipment or supplies to the cutting authority area. Continuous road access includes public ferry service, private daily ferry and daily barge service.

For isolated cutting authorities not serviced by camps the isolation cost estimate covers, the costs of moving people, equipment and supplies to and across the non-road portions of the route to the cutting authority area whether by crew boat, periodic barge service, air, or rail.

For isolated cutting authorities serviced by camps, the isolation cost estimate includes the depreciation, maintenance and operating costs of any camp facilities and the non-recoverable costs incurred for a cookhouse, family quarters, bunk houses, shop, office and other pertinent buildings. However, the costs of moving people, equipment or supplies by road from the isolated camp location to the cutting authority are covered by the distance variable in the tree-to-truck equation.

The cost estimates for isolated cutting authorities with the following access are:

Rail access:	$\$/m^3 = 8.14$
Water access:	$\$/m^3 = 6.06$

4.8.3 Low Volume Cost Estimate

All fully appraised cutting authorities are eligible for a specific low volume cost estimate in addition to all other phase cost estimates.

1. Where the licence to which the cutting authority belongs has an allowable annual cut of Crown timber greater than 0 m^3 and less than 3 000 m^3;

   $\$/m^3 = 8.35$

   In a case where the AAC of a licence has been temporarily increased through a determination made by either a district manager or a regional manager under section 8(6) of the *Forest Act*, the AAC, as it was prior to the temporary increase, will be used to determine whether or not the licensee is entitled to receive this cost estimate in the appraisal.

2. Where the licence to which cutting authority belongs has an AAC of 3 000 m^3 or greater and the net cruise volume for the cutting authority is less than 3 000 m^3;

The cost estimate is:	Ground Skidding	$\$0.87/m^3$
(prorated by volume)	Highlead & Grapple	$\$0.98/m^3$
	All Other	$\$0.00/m^3$

3. Where the licence to which cutting authority belongs has no AAC and the cutting authority net cruise volume is less than 3 000 m^3;

$$\$/m^3 = 0.00$$

4.9 Basic Silviculture Cost Estimate

Basic silviculture cost estimates are made for all cutting authorities where basic silviculture is required.

Basic silviculture treatment cost estimates include all treatment costs that are required to achieve the free-growing stocking standards, as referred to in the *Timber Harvesting and Silviculture Practices Regulation* (B.C. Reg. 352/2002).

Basic silviculture treatment may not be required on some cutting authorities where:

1. this intent has been specified in the licence, cutting authority, or by applicants agreement, or,

2. basic silviculture work is funded by any Crown agency.

When any of these circumstances exist the basic silviculture cost estimate is not included in the appraisal, except as noted in section 6.6 of this manual.

The Table 4-9 lists the associated cost estimates ($/m^3) for each BioGeoClimatic (BGC) zone, subzone, and variant across the interior.

Where a cutting authority area includes more than one BGC/subzone/variant, the predominant BGC/subzone/variant by area shall be used for the cost estimate in the appraisal of the cutting authority.

Table 4-9 BGC Silviculture Cost Estimates*

BGC Zone	Subzone	Variant	$/m^3
BWBS	dk	1	3.98
BWBS	dk	2	3.98
BWBS	mw	1	7.70
BWBS	mw	2	7.70
BWBS	un		6.69
BWBS	vk		6.69
BWBS	wk	1	4.50
BWBS	wk	2	4.50
BWBS	wk	3	4.50
CWH	un		3.26
CWH	vh	1	3.26
CWH	vh	2	3.26
CWH	vm		3.26
CWH	vm	1	3.26

BGC	Subzone	Variant	$/m^3
ICH	mc	2	5.37
ICH	mk	1	3.98
ICH	mk	2	3.83
ICH	mk	3	5.51
ICH	mm		5.39
ICH	mw	1	5.78
ICH	mw	2	4.99
ICH	mw	3	6.95
ICH	un		5.39
ICH	vc		5.39
ICH	vk	1	6.97
ICH	vk	2	6.52
ICH	wc		5.39
ICH	wk	1	5.96

BGC Zone	Subzone	Variant	$/m^3
CWH	vm	2	3.26
CWH	vm	3	3.26
CWH	wh	1	3.26
CWH	wh	2	3.26
CWH	wm		3.26
CWH	ws	1	3.26
CWH	ws	2	3.26
CWH	xm	1	3.26
CWH	xm	2	3.26
ESSF	dc	1	5.65
ESSF	dc	2	4.55
ESSF	dcp	1	5.08
ESSF	dcp	2	5.08
ESSF	dk		4.00
ESSF	dkp		5.08
ESSF	dku		5.08
ESSF	dv		5.32
ESSF	dvp		5.08
ESSF	mc		5.08
ESSF	mcp		5.08
ESSF	mk		5.08
ESSF	mkp		5.08
ESSF	mm	1	6.50
ESSF	mm	2	6.50
ESSF	mmp	1	5.08
ESSF	mmp	2	5.08
ESSF	mv	1	4.36
ESSF	mv	2	4.53
ESSF	mv	3	3.81
ESSF	mv	4	4.44
ESSF	mvp	1	5.08
ESSF	mvp	2	5.08
ESSF	mvp	3	5.08
ESSF	mvp	4	5.08
ESSF	mw		4.05
ESSF	mwp		5.08
ESSF	un		5.08
ESSF	vc		7.41

BGC	Subzone	Variant	$/m^3
ICH	wk	2	6.15
ICH	wk	3	6.15
ICH	wk	4	6.15
ICH	xw		5.39
IDF	dk	1	3.80
IDF	dk	2	4.40
IDF	dk	3	4.22
IDF	dk	4	6.02
IDF	dm	1	8.29
IDF	dm	2	3.93
IDF	dw		4.58
IDF	mw	1	6.38
IDF	mw	2	6.58
IDF	un		4.58
IDF	ww		4.58
IDF	xh	1	4.48
IDF	xh	2	4.94
IDF	xm		6.18
IDF	xw		4.58
MS	dc	1	5.29
MS	dc	2	5.29
MS	dk		4.28
MS	dm	1	5.38
MS	dm	2	3.80
MS	dv		4.35
MS	un		4.35
MS	xk		5.12
MS	xv		4.11
PP	dh	1	0.60
PP	dh	2	0.60
PP	un		0.60
PP	xh	1	0.60
PP	xh	2	0.60
SBPS	dc		3.66
SBPS	mc		3.93
SBPS	mk		4.05
SBPS	un		3.93
SBPS	xc		3.89

BGC Zone	Subzone	Variant	$/m^3
ESSF	vcp		5.08
ESSF	vv		6.92
ESSF	vvp		5.08
ESSF	wc	1	5.97
ESSF	wc	2	6.06
ESSF	wc	3	6.51
ESSF	wc	4	7.05
ESSF	wcp	2	5.08
ESSF	wcp	3	5.08
ESSF	wcp	4	5.08
ESSF	wk	1	6.02
ESSF	wk	2	6.43
ESSF	wm		4.54
ESSF	wmp		5.08
ESSF	wv		5.08
ESSF	wvp		5.08
ESSF	xc		4.91
ESSF	xcp		5.08
ESSF	xv	1	4.67
ESSF	xv	2	4.67
ESSF	xvp	1	5.08
ESSF	xvp	2	5.08
ICH	dk		5.39
ICH	dw		5.42
ICH	mc	1	3.77

BGC	Subzone	Variant	$/m^3
SBS	dh		3.89
SBS	dh	1	3.89
SBS	dh	2	3.89
SBS	dk		3.86
SBS	dw	1	3.88
SBS	dw	2	3.23
SBS	dw	3	3.07
SBS	mc	1	3.31
SBS	mc	2	3.74
SBS	mc	3	4.27
SBS	mh		3.89
SBS	mk	1	3.77
SBS	mk	2	3.93
SBS	mm		3.75
SBS	mw		4.74
SBS	un		3.89
SBS	vk		5.63
SBS	wk	1	4.49
SBS	wk	2	4.64
SBS	wk	3	2.75
SWB	dk		3.89
SWB	dks		3.89
SWB	mk		3.89
SWB	mks		3.89
SWB	un		3.89
SWB	vk		3.89

* The dollar per cubic metre ($/m3) 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 dewatering of logs or unloading of logging trucks at the mill log yard, (land or water or satellite log yards), 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.

Table 4-10 Untrended Manufacturing Cost Estimates

Untrended Manufacturing Cost Estimates ($/m^3) 2000 Cost Survey Base		
	Species	**Manufacturing cost ($/m^3) 0% Decay**
Northern Interior (Zone 5)	LO	34.71
	SP	34.28
	BA	37.39
	FI, LA, WH, YE	52.14
	CE	46.27
	HE	42.93
Skeena (Zone 6)	LO	30.15
	SP	29.62
	BA	33.03
	CE	40.19
	HE	36.99
Southern Interior (Zone 7)	LO	38.56
	SP	37.31
	BA	41.06
	FI, LA, WH, YE	56.72
	CE	50.38
	HE	49.40

Untrended Manufacturing Cost Estimates ($/m^3) 2000 Cost Survey Base		
	Species	**Manufacturing cost ($/m^3) 0% Decay**
Southern Cariboo (Zone 8)	LO	37.68
	SP	36.83
	BA	40.37
	FI, LA, WH, YE	55.52
	CE	46.37
	HE	45.02
Fort Nelson/Peace (Zone 9)	LO	31.77
	SP	31.29
	BA	33.72

To derive the manufacturing cost estimate for decay % from 1 to 50, use the above table values in the following equation:

The cost estimate is calculated to four decimal places, then rounded to the nearest cent. Where decay exceeds 50 percent, the manufacturing cost estimate for 50 percent decay is used.

Manufacturing cost ($/m^3) = decay % ∗ 0.1783 + base value from table.

For a list of points of appraisal by zone, refer to section 2.6.

4.11 Cost Trend

Cost trend factors are separately applied to the total logging, silviculture and manufacturing cost estimates. The factors cover the period from the effective date of the cost base to the effective date of the rate calculation. Cost trend factors are applied at the appraisal effective date and at the date of each stumpage adjustment.

For trend factors applicable prior to November 1, 2002, refer to earlier *Interior Appraisal Manuals.*

Appraisal Effective Dates From October 1, 1994 to July 31, 1995

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.154	1.0
January 1 to March 31, 2003	1.154	1.0
April 1 to June 30, 2003	1.154	1.0
July 1 to September 30, 2003	1.154	1.0

Appraisal Effective Dates From August 1, 1995 to July 31, 1996

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.045	1.0
January 1 to March 31, 2003	1.045	1.0
April 1 to June 30, 2003	1.045	1.0
July 1 to September 30, 2003	1.045	1.0

Appraisal Effective Dates From August 1, 1996 to November 30, 1997

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	0.986	1.0
January 1 to March 31, 2003	0.986	1.0
April 1 to June 30, 2003	0.986	1.0
July 1 to September 30, 2003	0.986	1.0

Appraisal Effective Dates From December 1, 1997 to August 31, 1998

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	0.917	1.0
January 1 to March 31, 2003	0.917	1.0
April 1 to June 30, 2003	0.917	1.0
July 1 to September 30, 2003	0.917	1.0

Appraisal Effective Dates From September 1, 1998 to September 30, 1999

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	0.968	1.0
January 1 to March 31, 2003	0.968	1.0
April 1 to June 30, 2003	0.968	1.0
July 1 to September 30, 2003	0.968	1.0

Appraisal Effective Dates From October 1, 1999 to August 31, 2000

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.017	1.0
January 1 to March 31, 2003	1.017	1.0
April 1 to June 30, 2003	1.017	1.0
July 1 to September 30, 2003	1.017	1.0

Appraisal Effective Dates From September 1, 2000 to June 30, 2001

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.0	1.0
January 1 to March 31, 2003	1.0	1.0
April 1 to June 30, 2003	1.0	1.0
July 1 to September 30, 2003	1.0	1.0

Appraisal Effective Dates From July 1, 2001 to October 31, 2002

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.0	1.0
January 1 to March 31, 2003	1.0	1.0
April 1 to June 30, 2003	1.0	1.0
July 1 to September 30, 2003	1.0	1.0

Appraisal Effective Dates On or After November 1, 2002

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
November 1 to December 31, 2002	1.0	1.0
January 1 to March 31, 2003	1.0	1.0
April 1 to June 30, 2003	1.0	1.0
July 1 to September 30, 2003	1.0	1.0

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5.4 Market Value Indexing

At the times specified in section 1.7, target rates are adjusted upwards or downwards to reflect changes in the value of softwood lumber and wood chips as indicated by Statistics Canada.

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 composite index described in section 5.4.2.

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

Interior softwood lumber is represented by Statistics Canada price index P4798 (1997=100) which replaces P2459 (1992=100). To convert P4798 to a 1992=100 base, for use in section 5.4.2, multiply by a link factor of 1.752.

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, for use in section 5.4.2, multiply by a link factor of 1.138.

5.4.2 Calculating the Interior Composite Index (ICI)

The average lumber and chip indexes from the appropriate three-month period (shown below) are combined, with lumber receiving a weight of 88.0 percent and chips 12.0 percent. The combined index is then multiplied by a normalization factor of 1.520. This factor equates the new lumber/chip composite index (1992=100) with the Statistics Canada lumber index (1981=100) at April 1, 1998. During the calculations described above, no rounding is done. The final composite index (INDEX) is rounded to one decimal place before being entered into the appropriate formula below.

5.4.3 Calculating the Interior Target Rate

Interior Target Rate (ITR) Calculation

1. If the ICI is less than or equal to 161 then,

$$ITR = \frac{INDEX}{139.0} * 8.59$$

2. If the ICI is greater than 161, but less than or equal to 169.9 then,

$$ITR = 9.95 + \left| \frac{(INDEX - 161)}{25} * 9.35 \right|$$

3. If the ICI is greater than 169.9 then,

$$ITR = 13.28 + \left| \frac{(INDEX - 169.9)}{49} * 6.74 \right|$$

Where: ITR = Target Rate ($/m^3)

Quarterly Stumpage Rate Adjustment Date	ICI based on Statistics Canada price indexes for the months of:
January 1	Preceding August, September, October
April 1	Preceding November, December, January
July 1	Preceding February, March, April
October 1	Preceding May, June, July

The applicable index is published by Revenue Branch at the time of each quarterly stumpage adjustment and becomes an integral part of this manual.

6.2 Cutting Authorities With 5 000 m^3 or Less Volume

1. Total coniferous volume of less than 2 000 m^3:

   a. Average Value Indexes by District and Species (DVI)

      An indicated stumpage rate may be determined by estimating the species volumes, prorating the appropriate average value indexes by district and species according to those volumes, and then using the resulting stand value index in the stumpage rate formula as described under section 5.6. For cutting authorities where the licensee is not required to establish a free growing crop of trees, the value indexes must be adjusted by adding a basic silviculture cost estimate (district average value indexes are based on full appraisals of areas requiring basic silviculture). The total stumpage rate is fixed for the term. For extensions of the cutting authority see section 2.5 (3).

      The upset stumpage rate for cutting authorities with 500 m^3 or less volume, awarded under the small scale salvage program (SSSP), will be one-half of the DVI calculated stumpage rate.

   b. Full Appraisal

      Alternatively, an indicated stumpage rate may be determined through a full appraisal. The stand data may be site-specific (i.e., timber cruised or scaled) or obtained from one or more comparable cutting authorities (e.g., similar stand and terrain characteristics, etc.). When choosing the comparative cruise data, the district manager may require that procedures in section 2.1.2.3 of the *Cruising Manual* be followed. The total stumpage rate is adjustable for the term of the cutting authority, except as provided in section 6.5.

      Each full appraisal is made as described in chapters 3, 4 and 5.

2. Total coniferous volume of 2 000 m^3 to 5 000 m^3.

   An indicated stumpage rate is determined on the basis of full appraisal data. The data may be site-specific or the data may be obtained from comparable cutting authorities, as per section 2.1.2.3 of the *Cruising Manual*.

   Each appraisal is made as described in chapters 3, 4 and 5.

   These cutting authorities are cruised if specified by the regional manager in accordance with section 4.2 of this manual.

   The total stumpage rate is adjustable for the term of the cutting authority, except as provided in section 6.5.

6.3 Right-of-way Cutting Authorities

1. The stumpage rate for a road permit will be determined using Ministry of Forests stumpage billing records.

2. The stumpage rate for a road permit is the weighted average sawlog stumpage rate for:

    a. cutting authorities, other than a road permit, that are located in the same forest district as the area to which the road permit applies, and that are issued under the licence that entitles the licensee to apply for the road permit,

    b. a licence to cut or a timber sale licence under which cutting permits have not or will not be issued, that entitles the licensee to apply for the road permit,

    c. if there are no records from which the stumpage rate may be determined under (a) or (b),

        i. all the cutting authorities, other than road permits, that are for areas located in the same forest district as the area to which the road permit applies, or

        ii. if the licence that the cutting authority is issued under has an annual allowable cut of Crown timber less than 3 000 m^3 per year, all the cutting authorities, other than road permits, that are for licences that have an annual allowable cut of less than 3 000 m^3 in the same forest district as the area to which the road permit applies.

3. The weighted average sawlog stumpage rate is the sum of the stumpage billed for sawlogs of grade code ( ) blank during the billing period referred in subsection 4, divided by the sum of the volume of those sawlogs.

4. The billing period referred to in subsection 3 for a road permit appraisal or reappraisal, with an effective date between June 1 of one year (the first year) and May 31 of the following year, is the twelve-month billing period ending March 31 in the first year.

The costs of roads constructed under road permits are eligible for inclusion as development cost estimates under section 4.3 in the appraisal of the first tributary cutting authority. These roads will not be considered as existing roads under section 4.3.1.1.4 (2).

All road permits will be reappraised in accordance with section 2.3.2.

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)

For appraisal purposes, the BCTS includes:

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

Fixed/Adjustable Stumpage Rates for BCTS Cutting Authorities

The adjustable stumpage 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 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*.

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.

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

Table 6-1 Miscellaneous Stumpage Rates

All Forest Regions

Species	Product	Reserve Stumpage Rate
Cedar	Shakes	$6.00/$m^3$
Cedar	Blanks	$7.20/$m^3$
Cedar	Fence Posts	$3.00/$m^3$
Cedar	Mining Timbers & Fence Rails	$3.00/$m^3$
All Species	Firewood	$0.50/$m^3$
All Species	Bolts/Blocks	$5.30/$m^3$
Yew	All	$0.25/$m^3$
All Species	Grades: 3, 4, 5 and 6	$0.25/$m^3$
All Deciduous	All (except grades 3, 4, 5 and 6)	$0.50/$m^3$
All Species (except Cedar)	Fence Rails, Mining Timbers, Fence Posts	$1.20/$m^3$
All Species	Pickets & Palings, Mine Cribbing, Car Stakes, Round Stakes & Sticks, Rails (Split), Lagging (Split), Orchard Props	$1.20/$m^3$
All Species	Christmas Tree: under 3m 3-5 m over 5 m	$0.20/each $1.00/each $1.50/each
All Species	Logs salvaged below the high water levels of Reservoir Lakes and the Slocan, Kootenay, Mineral, Babine and Ootsa Lakes	$0.25/$m^3$
All Species	Trees classified as "Dead Potential" on Cruise-based cutting authorities	$0.25/$m^3$
All Coniferous	For logs harvested from the Alex Fraser (UBC), Aleza Lake (UBC and UNBC) and Fort St. James (UNBC) Research Forests	$0.25/$m^3$
All Species	Firmwood Reject	NIL

Forest District Specific

Description	District	Reserve Stumpage Rate
Gross area cleared for seismic lines, gas or oil well sites and right-of-way to well sites	Cranbrook Peace Ft. Nelson	$3,009/ha $1,644/ha $1,644/ha

* For pipe line rights-of-way a stumpage rate may be determined by using the above rates for cutting authorities containing less than 1 000 m^3, of merchantable volume. For cutting authorities of 1 000 m^3 and over see section 6.2.

6.7.2 Miscellaneous Stumpage Rates for Timber Licences

Timber licence cutting authority areas that have not been appraised and have a cutting authority term that began before May 1, 1995, must be appraised effective April 1, 2003.

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Market Pricing System 7

The market pricing system (MPS) policy provided in this chapter is to be used only for timber sale licences awarded under section 20 and 21 of the *Forest Act* on or after January 1, 1999.

Chapters 3, 4, 5 and 6 of this manual are only to be used, for section 20 and 21 timber sale licences (TSL), where directly referenced in chapter 7.

7.1 MPS Introduction

The market pricing system is the basis for determining sawlog stumpage rates for timber sale licences issued under section 20 and 21 of the *Forest Act*, subject to a minimum stumpage rate. Sections 2.1 (4) and (3) of this manual provide the methods that are used for deriving stumpage rates for specific products and extraordinary situations.

MPS is a method of estimating the stumpage value of a stand of timber based on the results of previous similar timber stands that were sold competitively.

MPS can only be used where complete appraisal data as per section 4.2 is available for the cutting authority area. Where data is not available see section 6.2 of this manual.

The MPS upset rate and bonus bid applies to coniferous sawlogs only. All deciduous species, special forest products and grade 3, 4, 5 or 6 logs have a default price listed under section 6.7.

7.2 MPS Principles and Procedures

7.2.1 MPS Appraisals

The initial 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 next quarterly adjustment.

7.2.2 MPS Stumpage Adjustments

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.

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. 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.

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