REVENUE BRANCH

Interior Appraisal Manual

Effective July 1, 2008

BRITISH COLUMBIA
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Introduction 1

1.1 Definitions

In this manual:

"Act" means *Forest Act*,

"Agreement" means a form of agreement granting rights to harvest crown timber referred to in section 12 of the *Act*, or a pulpwood agreement,

"**Applicable Volume**" means:

a. Except as provided in section 2.2.1(d) and 4.3.1(4)(d), and subject to paragraph (b) of this definition, where the harvesting is authorized on a cutting authority area under an agreement other than a BCTS licence, applicable volume means the total net coniferous volume,

b. Where the cutting authority or the agreement under which the cutting authority is issued requires harvesting in deciduous stands and the deciduous timber has not been reserved, applicable volume means the sum of the total net coniferous volume and the total net deciduous volume.

c. Where the harvesting is authorized on a cutting authority area under a BCTS licence, applicable volume means the sum of the total net coniferous volume and the total net deciduous volume.

"**Appraisal Data Submission (ADS)"** means the information required by the person who determines the stumpage rate to determine that rate including the appraisal map, cruise information (including the required reports and the ASCII cruise data files unless otherwise specified by the director of Revenue Branch) and any other information required by the regional manager or district manager, in the form required by the director, signed by a registered professional forester (RPF) or registered forest technologist (RFT), registered with the Association of British Columbia Forest Professionals,

"BCTS" means British Columbia Timber Sales.

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

"BCTS licence" means:

a. a timber sale licence entered into under Section 20 of the *Act* or Section 21 of the former *Act*, or

b. a forestry licence to cut entered into under Section 47.6(3) of the *Act*,

"Bonus Bid" means a bonus bid described in section 103(1)(d) of the *Act*,

"Bonus Offer" means a bonus offer described in section 103(2) of the *Act*,

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

"Cutting Authority" means:

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,
    f. a timber licence,
    g. a community salvage licence,
    h. a master licence to cut, or
    i. a forestry licence to cut.
2. A timber sale licence under which cutting permits have not or will not be issued.
3. All other licences to cut.
4. A road permit.

"Cutting Authority Area" means the area where timber may be harvested under a cutting authority, which has a unique timber mark,

"Deciduous timber" means timber that is not of a coniferous species,

"Decked timber" means timber that has been 100% decked at roadside,

"Director" means director of Revenue Branch Ministry of Forests and Range,

"District Manager" means:

a. Except as provided in paragraph (b) of this definition, the district manager or district manager's designate.

b. Where the cutting authority area being appraised or reappraised is located in a controlled recreation area designated under the *Resort Timber Administration Act*, (RTAA) then district manager means an employee of the Ministry of Tourism,

Culture and the Arts to whom the minister of that ministry has delegated the minister's powers and duties under section 2 of the RTAA.

"Fully Appraised" means stand data (site specific or borrowed) has been used by the general appraisal system to calculate an indicated stumpage rate or has been included in an appraisal for a BCTS cutting authority including appraisals where the upset rate was set at the variable cost to prepare the timber for sale,

"Licensee" means the holder of a cutting authority,

"Manual" means *Interior Appraisal Manual*,

"Minister" means Minister of Forests and Range,

"Ministry" means Ministry of Forests and Range,

"New Construction" means the following construction phases: subgrade construction, placement of additional stabilizing material and the construction and installation of drainage and other pertinent structures,

"Partially Harvested Timber" means timber that has been felled and/or bucked and not yet forwarded to roadside.

"Prescribed Minimum Stumpage Rate" means the minimum stumpage rate prescribed by the minimum stumpage rate regulation (BC Regulation 354/87).

"Reconstruction and Replacement" means replacement or structural repair of a major drainage structure (e.g., replacing stringers, cross ties, or cribbing), or major resurfacing, which means resurfacing sections of more than 0.3 km in length that were initially surfaced but have deteriorated due to long term wear and tear, where stabilizing material was not previously used, or major reconstruction, which means restoring at least 0.1 km of road (per occurrence) that requires complete rebuilding of the subgrade,

"Regional Manager" means regional executive director or regional executive director's designate,

"Regulations" means regulations under the *Act*,

"Remedial Fences and Wing Fences" means fencing that is required to remedy, reduce or manage the impact of timber harvesting activities on range management,

"Revenue Branch" means the Revenue Branch of the Ministry,

"Skidder Swing" means situations where two of the different harvest methods as listed in section 4.4.1 are required to move timber to an existing road or landing where it can be loaded onto a haul truck. Where skidder swing is included in an appraisal the harvest method that moves the felled timber first is the method that is indicated in the appraisal data submission,

"Salvage" except as provided in section 6.4, means a cutting authority area where greater than one-third of the net coniferous cruise volume is attacked by mountain pine beetle or other pests,

"Species Net Volume" is the species net volume reported in the appraisal summary report from the cruise compilation for the cutting authority area,

"Stud Log Percent" means the net volume of 5 m logs with top diameters under 20 cm expressed as a percentage of the total net cruise volume. The stud log percent is rounded to the nearest whole percentage point,

"Stumpage Appraisal Parameter" means:

a. Interior average market price,
b. Interior base rate,
c. Interior mean value index,
d. BC Consumer Price Index,
e. US Dollar Exchange rate,
f. Lumber and Chip Average Market Values,
g. Interior Basic Silviculture Costs by Species.

"Suitable Secondary Structure" means suitable secondary structure as defined in Section 1(4) of the *Forest Planning and Practices Regulation*.

"Timber Sales Manager" means the Timber Sales Manager or the Timber Sales Manager's designate,

"Total Net Coniferous Volume" is the total of the species net volumes for all coniferous species on the cutting authority area,

"Total Net Cruise Volume" means the sum of the species net cruise volumes reported in the appraisal summary report from the cruise compilation for the cutting authority area,

"Total Net Deciduous Volume" is the total of the species net volumes for all deciduous species on the cutting authority area,

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

1.2 Terms of Reference

1. Pursuant to section 105 of the *Forest Act* the provisions of this manual are policies and procedures to be used in the determination, redetermination and variance of stumpage rates in the Northern Interior Forest Region and in the Southern Interior Forest Region and Manning Park.

1.2.1 Responsibility for Stumpage Determination

1. The following employees of the ministry are authorized to determine, redetermine and vary rates of stumpage:

    a. regional managers, regional timber pricing co-ordinators, and employees of the regional revenue sections, and

    b. director and employees of Revenue Branch.

1.3 Numbering and Calculation Conventions

1. The following exemplifies the numbering system used in this manual:

1.	=	Chapter.
1.1 or 1.1.1.	=	Section.
1.1.1 (2)	=	Section with subsection.
Table 4-2	=	Table 2 within chapter 4.

2. The calculation of the Interior Average Market Price must be performed in accordance with the specifications contained in the documents titled: *"Specifications: Calculation of the Interior Average Market Price*" dated July 1, 2006, and "Interior Market Pricing System Update - 2007".

3. The calculation of the stand value index, mean value index and the base rate must be performed in accordance with the specifications in the document titled: "*Specifications: Calculation of Interior Stumpage Rates"* dated July 1, 2006.

4. Where a value is specified as a limit, for example a constraint or a requirement for an equation,

   a. The value will be treated as an absolute value, and

   b. An actual measurement or record will not be rounded before use unless otherwise specified in this manual.

1.4 Cutblocks within a Cutting Authority Area

1. Cutblocks within a cutting authority area must:

    a. Constitute a logical unit,

    b. Be within the same forest district,

    c. Be tributary to a common point of appraisal,

    d. Must not exceed a maximum distance of ten kilometres between the furthest boundaries of the furthest cutblocks, except when required for blanket salvage.

1.5 Appraisal Data Requirements

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

2. Unless otherwise specified by the Director, cruise data must be gathered and compiled according to the approved interior standard timber merchantability specifications in Table 1-1 below and in accordance with the following Ministry publications:

   a. *Cruising Manual* web site:

      http://www.for.gov.bc.ca/hva/manuals/cruising.htm

   b. *Cruise Compilation Manual*.

3. When requested by the district manager, a copy of the original field data must be supplied by the licensee.

Table 1-1 Interior Standard Timber Merchantability Specifications

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

1.5.1 Comparative Cruise Data

1. Comparative cruise data is cruise data from an existing, cutting authority area that is used in the appraisal of a new cutting authority area.

2. Comparative cruise data will be chosen following procedures set out in section 2.1.2.2 of the *Cruising Manual*.

3. If there is time to perform a full cruise, then the timber will be cruised.

4. If there is insufficient time to perform a full cruise then comparative cruise data may be utilized:

    a. For cutting authorities with volumes greater than 5 000 m^3 if:

        i. 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,

        ii. the licensee has previously harvested comparative cutting authority's in a timely manner, and

        iii. the regional manager has determined that the requirement to perform a full operational cruise will delay expeditious harvesting and result in further damage.

    b. When the stumpage rate is determined according to section 6.2(5).

1.5.2 Appraisal Data Submission

The form as required by the director may be found at:

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

1.5.3 Appraisal Map

The appraisal map must be completed in accordance with the requirements of Appendix IV.

Appraisals, Reappraisals and Stumpage Adjustments 2

2.1 Appraisals

1. Except where the sawlog stumpage rate or an upset stumpage rate is determined in chapters 6 or 7:

    a. an appraisal is a process used to determine a stumpage rate for a cutting authority area using the manual in effect on the effective date of the cutting authority.

    b. the appraisal is effective on the issue date of the cutting authority.

2. A licensee or BCTS shall submit an appraisal data submission to the district manager when the licensee or BCTS makes an application for a cutting authority.

3. The district manager may review the appraisal data submission of the licensee or BCTS, and may inform the licensee or BCTS, of any omissions, errors or provisions of the manual that, in the opinion of the district manager, the signing RPF or RFT may not have considered. The licensee or BCTS signing RPF or RFT may consider the district manager's information and may revise the appraisal data submission.

4. The district manager shall give any information supplied by the licensee or BCTS under this section to the person who determines the stumpage rate together with any other information that the district manager considers relevant to the appraisal.

5. The person who determines the stumpage rate may review the appraisal data submission of the licensee or BCTS, and information supplied by the district manager and may inform the licensee or BCTS, of any omissions, errors or provisions of the manual that, in the opinion of the person who determines the stumpage rate, the signing RPF or RFT may not have considered. The licensee or BCTS signing RPF or RFT may consider the notification and may revise the appraisal data submission.

6. The person who determines the stumpage rate shall consider:

    a. the information provided by the licensee or BCTS and the district manager, and

    b. any information available to the person who determines the stumpage rate that is relevant to the appraisal.

7. Regional revenue staff will notify the licensee or BCTS of the stumpage determination.

2.2 Reappraisals

1. Where these policies and procedures require a reappraisal to be performed, the stumpage rate must be redetermined in accordance with the relevant policies and procedures that are or were in effect as the case may be on the effective date of the reappraisal.

2. Except as provided in sections 2.2.1(1)(d), 2.2.2, 2.2.3 and Appendix VI, 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.

2.2.1 Changed Circumstances

1. In this section a changed circumstance means a circumstance where:

    a. (i) The licensee has used or will use a harvest method to harvest at least fifteen percent of the volume of timber in the cutting authority area that is different from the method used in the most recent appraisal or reappraisal of the cutting authority area, and

        (ii) the different harvest method that has been used or will be used when used in the changed circumstance reappraisal will produce the least cost total harvesting, development, and transportation cost estimate, or

    b. There will be a difference of at least fifteen percent between the total appraised development cost estimate in the changed circumstance reappraisal and the total appraised development cost estimate that was used in the most recent appraisal or reappraisal where the change is caused by circumstances other than a change in the manual or a change as a result of a stumpage adjustment.

    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 the *Wildfire Act* or *Wildfire Regulations*. Notwithstanding subsection 2.2(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.

e. a cutting permit authorizing the harvesting of timber on the cutting authority area:

   i. was issued before April 1, 2006, and

   ii. surrendered on or after April 1, 2006, because of the interior log grade change, and

   iii. the volume of timber in cutblocks where harvesting has not started (remaining timber) is greater than twenty-five percent (25 %) of the volume of timber that was on the cutting authority area when the cutting permit was issued (the original timber), and

   iv. the District Manager is satisfied that the remaining timber is significantly different than what has been harvested under the cutting authority.

2. Where a changed circumstance has occurred with respect to a cutting authority area, other than a cutting authority area that is subject of a road permit or a cutting authority area with a non-adjusting stumpage rate, the cutting authority area must be reappraised in accordance with section 2.2.1.1.

3. Where a cutting authority is reappraised because of a changed circumstance, any bonus bid in existence does not change and remains in effect.

2.2.1.1 Changed Circumstance Reappraisal Procedure

1. The licensee must submit to the district manager within thirty days of the completion of log transportation activities on the cutting authority area or thirty days prior to the expiry of the cutting permit whichever comes first, an appraisal data submission if the cutting authority area must be reappraised because of a changed circumstance under section 2.2.1. Thereafter the changed circumstance reappraisal procedure is the same procedure as that required by section 2.1(2) through 2.1(7).

2. Where the district manager believes that a changed circumstance has occurred, and the licensee has failed to provide the district manager with an appraisal data submission on or before the expiry date of the cutting authority, the district manager may initiate a changed circumstance reappraisal using information that is available to the district manager and may notify the licensee of that action. Thereafter the changed circumstance reappraisal procedure is the same procedure as that required by section 2.1(6) through 2.1(7).

2.2.1.2 Effective Date of a Changed Circumstance Reappraisal

1. Except as provided in subsection (2) of this section, a reappraisal because of a changed circumstance is effective on the day after the effective date of the most recent appraisal or reappraisal of the cutting authority area prior to the changed circumstance reappraisal.

2. a. Where the changed circumstance is a result of sudden and severe damage referred to in subsection 2.2.1(1)(d), the effective date of the reappraisal is the first day of the month following the date when the event that caused the sudden and severe damage stopped on the cutting authority area.

   b. Where the most recent reappraisal prior to the changed circumstance reappraisal is due to insect damage under section 2.2.3, a reappraisal because of a changed circumstance is effective on the day after the effective date of the most recent appraisal or reappraisal of the cutting authority area prior to the section 2.2.3 reappraisal.

2.2.2 Minister's Direction

1. The Minister may direct:

   a. a determination, redetermination or variance of a stumpage rate at any time and that,

   b. the determined, redetermined or varied stumpage rate be effective on any future date.

2.2.2.1 Minister's Direction Procedure

1. The licensee shall submit to the district manager an interior appraisal data submission, if requested by the district manager within forty-five days of the minister's direction.

2. Thereafter, the procedure for determining, redetermining or varying a stumpage rate under section 2.2.2 shall be the same procedure as that required by subsections 2.1(3) through 2.1(7) except as may otherwise be directed by the minister.

2.2.3 Reappraisals Due to Insect Damage

1. a. A cutting authority with an adjustable stumpage rate may be reappraised on or after April 1, 2006 only once under this section during the term and all extensions of the cutting authority on the basis of a revised appraisal data submission if the licensee submits a revised appraisal data submission to the District Manager.

   b. The revised appraisal data submission is the appraisal data submission that was used in the most recent appraisal or reappraisal of the cutting authority area prior to the revision, hereinafter referred to in this section as the original ADS, with changes permitted only to the cruise data in the original ADS in accordance with the paragraphs (c) and (d) of this subsection.

   c. The licensee may either:

      i. Update the insect attack code information from the field for each species of timber in the cruise data for codes 1, 2, 3, 5, 6, 7 and 8 as defined in the *Cruising Manual* and recompile the cruise for the cutting authority area by using the cruise data from the cruise in the original ADS for the plots in that part of the cutting authority area where timber has been harvested and combining that with the cruise data with updated insect attack codes for the plots in that part of the cutting authority area where timber has not been harvested, or

      ii. Recompile the cruise data that was in the cruise in the original ADS.

   d. If a cutting authority area is reappraised in accordance with section 2.2.1.1 and the effective date of the changed circumstance reappraisal is prior to a reappraisal for that cutting authority area under section 2.2.3, then cutting authority area shall be reappraised subsequent to the changed circumstance reappraisal using only the same information and effective date as the original reappraisal under section 2.2.3 (except for information that has changed as a result of the changed circumstance reappraisal under section 2.2.1).

   e. Notwithstanding any other paragraph of this section, other data must be changed if it is required by the manual in effect at the time of the reappraisal and was not submitted in the original ADS.

2.2.3.1 Insect Damage Reappraisal Procedure

1. The insect damage reappraisal procedure is the procedure required by section 2.1(2) through 2.1(7).

2.2.3.2 Effective Date of an Insect Damage Reappraisal

1. The effective date of an insect damage reappraisal is the first day of the month following the month in which the District Manager receives the revised appraisal data submission.

2.3 Stumpage Adjustments

1. Unless a cutting authority or a timber sale licence specifies that stumpage rates are fixed for a specified period or for the full term of the cutting authority, stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1, of each year, subject to section 6.6.

2. Each quarterly stumpage adjustment will be calculated using stumpage appraisal parameters.

3. The adjusted stumpage rates reflect changes in estimated selling prices and lumber recovery factor update add-ons (as authorized in this manual since the previous adjustment), and the recalculated logging and silviculture costs based on the appropriate trend factors shown in section 4.11. The manufacturing costs used in the adjustment will be those authorized in this manual since the previous adjustment. In addition, the adjustment reflects changes in the Interior Average Market Price and the Interior Base Rate and the Interior Mean Value Index.

4. Woodlot Adjustable Stumpage Rates:

    a. Except as provided in Appendix VI the stumpage rate for a cutting authority issued under a woodlot licence shall be an adjusting stumpage rate unless:

        (i) the stumpage rate for the cutting authority is changed to a non-adjusting stumpage rate under this subsection, or

        (ii) the cutting authority is a road permit, or blanket salvage cutting permit, or

        (iii) the stumpage rate has been determined under sections 6.1.2, 6.2(1) or 6.6.

    b. A licensee may choose to have an adjusting stumpage rate changed to a non-adjusting stumpage rate under this subsection by giving written notice to the regional timber pricing co-ordinator.

    c. Where the licensee gives written notice to the regional timber pricing co-ordinator of that choice, the adjusting stumpage rate shall become a non-adjusting stumpage rate three (3) weeks after the regional timber pricing co-ordinator receives the notice.

    d. On the date that the stumpage rate becomes a non-adjusting stumpage rate, the stumpage rate for the cutting authority continues to be the stumpage rate that was in effect on that date.

    e. Where a stumpage rate is changed from an adjusting stumpage rate to a non-adjusting stumpage rate, the stumpage rate for the cutting authority shall not change for the term of the cutting authority and all extensions from the date that the stumpage rate is changed to a non-adjusting stumpage rate, except where the cutting authority area is reappraised under section 2.2.1(1)(d) or under section 2.2.2.

2.4 Correctable Errors

1. In this section, a correctable error means:

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

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

    c. an error in transcribing the data from an appraisal data submission or in performing the calculations specified in the manual, or

    d. an error in the application of published appraisal parameters.

2. Where a person believes that a correctable error has been made in a stumpage determination, that person shall give written notice of the correctable error as follows:

    a. in the case of an appraisal or a reappraisal, the notice shall be given to the regional manager, and in the case of a quarterly adjustment, the notice shall be given to the director, and

    b. the notice shall identify the stumpage determination, the correctable error, and the cause of the correctable error to the extent reasonably possible.

3. The regional manager or the director, upon receipt of the notice shall determine whether or not a correctable error was made.

4. Where the regional manager or the director determines that a correctable error has not been made, the person who determined the stumpage rate or director shall notify the person who gave the notice of the correctable error.

5. Where the regional manager or the director determines that a correctable error has been made, then:

    a. the regional manager or the director will notify the person who gave the notice of the correctable error,

    b. the regional manager or the director will take reasonable steps to ensure that all licensees who may have been affected by the error are informed of the decision, and

    c. (i) where the regional manager determines that a correctable error has been made in an appraisal or a reappraisal the cutting authority area shall be reappraised to correct the error by the person who determined the stumpage rate, using the procedure under subsections 2.1(2) to 2.1(7), and,

        (ii) the effective date of the reappraisal shall be the first day of the month following the date on which the notice of the correctable error was

received by the regional manager.

d. (i) where the director has determined that a correctable error has been made in the calculation of a quarterly stumpage adjustment, the adjustment must be correctly recalculated unless the cutting authority, the appraisal manual or the application and tender for a timber sale licence specifies that the stumpage rate is fixed, and

(ii) the effective date of the redetermined rate shall be the first day of the month following the date on which the notice of the correctable error was received by the director.

2.5 Redetermination of Stumpage Rate by Agreement

1. Where, within twenty-one days of the date of a Stumpage Advisory Notice, the person to whom the Notice has been sent and an employee of the Ministry of Forests and Range authorized to redetermine a stumpage rate under section 1.2.1 of this manual agree, the stumpage rate set out in the Notice, hereinafter referred to as the original stumpage rate, may be redetermined by the employee, and the redetermined stumpage rate shall be effective on the effective date of the original stumpage rate.

2. The twenty-one day period referred to in subsection (1) of this section may be extended by agreement between the person to whom the Notice has been sent and the employee.

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Interior Selling Prices 3

3.1 Lumber Average Market Values

1. Monthly market value information for the interior is obtained, and compiled by Revenue Branch from lumber producers located in each of the recognized average market value zones and once published become an integral part of this manual. Average market values (AMV) for each species are compiled by dividing total sales value by total sales volume for each zone. When there is inadequate data to provide a reasonable average for a species in one zone, the data is adjusted and combined with other species in other zones. Separate AMVs are derived for small log cutting authorities, small log licences, stud lumber, random lumber and Grade 4 hemlock.

2. The volume that is manufactured to Canadian Lumber Standard/American Lumber Standard (CLS/ALS) sizes is reported in footboard measure (fbm). Lumber manufactured in non-CLS/ALS sizes is adjusted to equivalent CLS/ALS sizes. The total volume for each species includes all sizes and grades of rough and dressed lumber in the green and dried state. Also included are railroad ties, trim blocks, finger jointed CLS/ALS lumber and machine stress rated (MSR) lumber.

3. The total net sales value for each species is reported in Canadian dollars, after freight, actual sales expenses incurred to a maximum of 5%, cash discounts, duty and entry charges and leased rail car costs have been deducted from the selling price.

4. AMVs for Small Log Cutting Authorities

    a. Small log AMVs are based on dimension lumber products capable of being produced from small trees.

    b. Small log AMVs are used for cutting authorities with an average net volume per tree (conifers only) of less than 0.20 m^3 where the governing licence document does not restrict harvesting to stands of timber having a net average cruise volume per tree of less than 0.20 m^3/tree. Cutting authorities meeting this criteria will use lumber AMVs listed under “AMVs for Small Logs” which is included in the quarterly stumpage parameters published by Revenue Branch.

    c. The selection of a small log AMV zone (Zones 15, 16, 17, 18 and 19) will only affect AMVs and will be made at the time of appraisal or reappraisal. Lumber recovery factors (LRF) and manufacturing costs will continue to be determined by zonation based on point of appraisal.

5. AMVs for Small Log Licences

    a. AMVs for licences which restrict harvesting to stands of timber having a net average cruise volume per tree of less than 0.20 m^3/tree, are based on dimension lumber products capable of being produced from trees smaller than standard timber merchantability specifications. Removing the effect of the LRF add-on

(section 3.1 (1)) from "AMVs for Small Log Cutting Authorities" creates these AMVs.

b. These AMVs are used for all cutting authorities where the governing licence document restricts harvesting to stands of timber having a net average cruise volume per tree of less than 0.20 m^3/tree. Other similarly restricted licences may also use these AMVs at the regional manager's discretion. Cutting authorities meeting this criteria and having a net average cruise volume/tree of less than 0.20 m^3/tree will use lumber AMVs listed under "AMVs for Small Log Licences" (Zone 25) which is included in the quarterly stumpage parameters published by Revenue Branch.

c. The selection of AMV Zone 25 will only affect AMVs and will be made at the time of appraisal or reappraisal. Lumber recovery factors and manufacturing costs will continue to be determined by zonation based on point of appraisal.

6. Stud Lumber AMVs

Stud AMVs are compiled for two species groups; Lodgepole Pine/Douglas-fir/Larch and Spruce/Balsam. No other species are recognized as "stud species".

7. Random Lumber AMVs

Random AMVs are compiled for all species.

8. Grade 4 Hemlock AMVs

a. Grade 4 hemlock AMVs will be used by all cutting authorities, where the district manager required or where the licensee elected utilization of Grade 4 hemlock prior to November 4, 2003, unless otherwise specified by the Director of Revenue Branch under section 1.5 of this manual. Cutting authorities meeting this criteria will use lumber AMVs listed under "AMVs for Grade 4 Hemlock Logs" which are included in the quarterly stumpage parameters published by Revenue Branch.

b. The selection of a Grade 4 hemlock AMV zone (Zones 35, 36, 37 or 38) will only affect AMVs and will be made at the time of appraisal or reappraisal. Lumber recovery factors and manufacturing costs will continue to be determined by zonation based on the point of appraisal.

c. Grade 4 Hemlock AMVs cannot be used in an appraisal where the cruise data was compiled using a version of the compilation program which contained the most recent hemlock algorithm.

3.1.1 Application of Lumber Average Market Values

Application of the small log cutting authorities, small log licences, stud lumber, random lumber and grade 4 hemlock AMVs in appraisals for all cutting authorities are made according to the formulae in section 3.3.

3.1.2 Lumber Average Market Value Zones

Refer to section 4.1.1 for a list of points of appraisal by lumber AMV zones.

3.2 Chip Average Market Values

1. Revenue Branch shall determine and publish an average market value (AMV) for each of whitewood chips and cedar chips for each lumber average market value zone.

2. A chip AMV determined under subsection (1) of this section becomes a part of this manual when it is published.

3.3 Calculation of Species End Product Selling Price

1. The total end product selling price in $\$/m^3$ is determined for each species using lumber recovery factors from the cruise compilation summary, LRF update add-ons, current applicable average market values for the species and zone and species chip yield factors. Lumber and chip prices are each calculated to the nearest cent before being totalled.

2. In the case of burned timber, the burn percent is used to reduce the selling price of the stand by assigning a zero value to the estimated chip recovery of the burned wood. This is to compensate for an increased manufacturing cost, lower lumber and chip recovery and lower lumber and chip average market values associated with processing burned timber.

$$\text{Burn Percent} = \frac{\text{BT } m^3}{\text{Total } m^3} * 100$$

   where

   BT m^3 = volume of light, moderate and heavily fire-damaged timber
   Total m^3 = total volume *inclusive* of burned wood

3. The only other adjustment to the appraisal is for heavily fire-damaged timber and is covered under section 4.4.4 (Tree to Truck Additive for Damaged Timber).

4. The LRF are determined from the following formulas and tables:

    a. Zonal LRF Update Add-ons and Combined Product Recovery Factors

Table 3-1 LRF Update Add-ons and Combined Product Recovery Factors

Zone	Species	LRF Update Add-ons	Combined Product Recovery Factors
Northern Interior (Zone 5)	Lodgepole Pine	101	454
	Spruce	122	454
	Balsam	114	454
	Douglas Fir	91	454
	Larch	87	454
	Cedar	66	454
	Hemlock	68	454
	White Pine	85	454
Skeena (Zone 6)	Lodgepole Pine	74	425
	Spruce	100	425
	Balsam	94	425
	Cedar	45	425
	Hemlock	48	425
Southern Interior (Zone 7)	Lodgepole Pine	95	439
	Spruce	119	439
	Balsam	108	439
	Douglas Fir	82	439
	Larch	82	439
	Cedar	64	439
	Hemlock	67	439
	White Pine	80	439
	Yellow Pine	83	439

Zone	Species	LRF Update Add-ons	Combined Product Recovery Factors
Southern Cariboo (Zone 8)	Lodgepole Pine	108	458
	Spruce	129	458
	Balsam	122	458
	Douglas Fir	98	458
	Larch	98	458
	Cedar	74	458
	Hemlock	79	458
	White Pine	94	458
	Yellow Pine	102	458

Fort Nelson-Peace (Zone 9)	Lodgepole Pine	93	451
	Spruce	111	451
	Balsam	102	451

Example: (Zone 5) Lodgepole Pine	Cruise LRF		LRF Update Add-on		Appraisal LRF
All Logs	190	+	100	=	290

5. Chip Yield Derivation

   a.. Chip Yield (BDU/m^3) = (Combined Product Recovery Factor - Appraisal LRF) * Species Chip Yield Factor

   b. Chip Yield Factors

Table 3-2 Chip Yield Factors

Species	Factor (BDU/fbm)
Balsam	.00072
Cedar	.00067
Fir	.00098
Hemlock	.00089
Larch	.00119
Lodgepole Pine	.00087
Spruce	.00076
White Pine	.00078
Yellow Pine	.00095

c. Percent (%) Stud AMV

The percent stud AMV is determined as follows:

i. If the stud log percent is 45 or greater and less than or equal to 65:

the percent stud AMV = (5 ∗ stud log %) - 225,

ii. If the stud log percent is less than 45, the percent stud AMV = 0.

iii. If the stud log percent is more than 65, the percent stud AMV = 100.

6. Shipping Differential

a. The Shipping Differential for the following points of appraisal are:

Table 3-3 Shipping Differentials

$0.58/m^3	$1.01/m^3	$5.80/m^3
Bear Lake Fort St. James Mackenzie Quesnel Strathnaver	Adams Lake Clear Lake Louis Creek Merritt Midway Okanagan Falls Princeton Slocan Thrums Westbank Ymir	Fort Nelson

b. Manufacturing Cost Differential

Table 3-4 Manufacturing Cost Differential

$5.95/m^3
Fort Nelson

c. Calculation of Total Species End Product Selling Price

Lumber AMV = (% Stud AMV/100) ∗ (Stud AMV/1000)
+ (1.0 - (% Stud AMV/100)) ∗ (Random AMV/1000),

Lumber SP = Lumber AMV ∗ Appraisal LRF,

Chip SP = Chip AMV ∗ Chip Yield, and

Total Species SP = Lumber SP + Chip SP - D.

Where:

SP	=	Selling Price in $/m^3.
AMV	=	Average Market Value (of the appropriate species in the appropriate zone).
Appraisal LRF	=	The LRF for all logs from Section 3.3(4).
Chip Yield	=	The Chip Yield for all logs from section 3.3(5).
D	=	The Differentials for the appropriate points of appraisal from section 3.3(6).

Operating Cost Estimation 4

4.1 Operating Cost Estimates

1. In this chapter:

   a. “development” means road development.

   b. "road" includes a bridge, drainage and any other pertinent structure that is part of the road.

2. Except as provided in chapter 6 or 7 of this manual, the licensee must submit an appraisal data submission that is capable of being used by the employee of the ministry who determines or redetermines the stumpage rate to determine a least total harvesting, development and transportation cost estimate.

3. The harvesting cost estimate must be determined in accordance with this manual for the method of harvesting referred to in this manual which will produce the least total harvesting, development and transportation cost estimate unless that particular method of harvesting is not permitted by the cutting authority.

4. The development cost estimate must be determined in accordance with this manual and must produce the least total harvesting, development and transportation cost estimate.

5. The transportation cost estimate must be determined in accordance with this manual for the method of transportation referred to in this manual to the point of appraisal which will produce the least total harvesting, development and transportation cost estimate unless that particular method of transportation is prohibited by the cutting authority.

6. In the determination of whether or not a particular method of harvesting or transportation is prohibited by the cutting authority, the following shall not be taken into consideration, namely:

   a. any enactment other than this section,

   b. any document other than the cutting authority,

   c. any destination referred to in the cutting authority, and

   d. any other fact.

4.1.1 Point of Appraisal

1. The points of appraisal that may be considered for use in the determination of the operating cost estimate are set out in Table 4-1.

2. The point of appraisal that when used in the calculation of the operating cost estimate produces the least cost total development, harvesting and transportation determination of the operating cost estimate unless:

   a. five years have passed from the date that a milling facility was permanently rendered incapable of producing lumber and chips, and

   b. it was the only milling facility associated with that point of appraisal.

3. Where a point of appraisal cannot be selected under subsection (2) of this section because of the conditions of paragraphs (a) and (b) of that subsection, the point of appraisal that produces the next lowest total development, harvesting and transportation estimate must be used in the determination of the operating cost estimate in accordance with the requirements of subsection (2) of this section.

4. The process in subsection (3) of this section is continued until a point of appraisal can be selected without being excluded by the conditions of paragraphs (2)(a) and (b).

5. For the purposes of determining the least cost total harvesting, development and transportation estimate, the locations that were used in measurement of cycle time for each point of appraisal in Table 4-1 as of October 1, 2003 will be used.

6. The manufacturing costs and average market values for the selling price zone in Table 4-1 for the least cost point of appraisal selected under paragraphs 2, 3 or 4 must be used in the appraisal.

Table 4-1 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	Vanderhoof
Engen	Isle Pierre		

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	Princeton	Westbank
Castlegar	Lavington	Radium	Ymir
Craigellachie	Lumby	Revelstoke	
Creston	McBride	Slocan	
Elko			

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

7. The following Points of Appraisal will expire on the dates indicated: Carnaby (February 24, 2010), Boston Bar (June 30, 2009), Fort Nelson (October 31, 2010).

4.2 Specified Operations

1. Specified operations are those situations listed in Table 4-2 that require special cost estimating that can be included in an appraisal.

2. The cost estimates are determined on the basis of information at hand using the procedures approved by the region or Revenue Branch.

3. Other phase costs in this manual are combined with the specified operations cost estimates to determine the total operating cost. Where appropriate, specified operations are weighted according to the applicable net cruise volume.

4. A specified operation will only be used in an appraisal when the treatment is required in a Site Plan, is indicated on the appraisal map or meets the requirements in this manual.

Table 4-2 Specified Operations

Specified Operations	Affected Phase
Root Disease Control	Silviculture (section 4.9).
Skidder Swing	Tree-to Truck (section 4.4).
Suitable Secondary Structure Survey	Silviculture (section 4.9).

4.3 Development

1. A total cost ($) is calculated for each category of section 4.3.1, and 4.3.1.1. These category costs are summed and divided by the applicable volume to provide a total development cost estimate ($/m^3).

2. Subject to section 4.3.1.1.4, the costs for new development occurring under the authority of a road permit or cutting permit may only be used in the appraisal of the licensee's first fully appraised tributary cutting authority area, that is authorized for harvest under the licence under which that road permit or cutting permit has been issued.

3. There are two methods of estimating development as follows:

    a. Tabular cost estimates are made for construction of roads and drainage structures using the applicable equations or tables 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.

    b. 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(5).

4.3.1 Development Cost Categories

1. Development costs are estimated for each of two categories namely:

    a. New construction.

    b. Reconstruction and replacement.

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

3. New construction costs are allocated to the licensee's first fully appraised tributary cutting authority area (subject to section 4.3.1.1.4).

    a. Road Cost Estimates

        i. Tabular cost estimates

        Each road section cost estimate is determined from the appropriate equations and tables (section 4.3.2). These section costs are totalled to give a road cost estimate for each road. The road costs for all roads are then totalled to give a total cost for tabular roads.

ii. Detailed engineering cost estimates

Each project cost is estimated according to section 4.3.3. The total of the estimated costs for each project is summed to give a total cost ($) for engineered roads.

b. Drainage Structure Cost Estimates

i. Each drainage structure cost estimate is determined either from the appropriate table (section 4.3.2.4) or as a detailed engineering cost estimate (section 4.3.3).

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

iii. Where used bridge materials are purchased from a legally non-associated party, the cost of purchase and shipping those materials will be included in the cost estimate.

4. Reconstruction and Replacement:

a. The costs approved under this subsection are not road management costs as described in section 4.6.

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

c. Where a Ministry of Transportation (public) road requires reconstruction or upgrade to forest service standards for hauling Crown timber, the project must be approved in advance by the director of Revenue Branch before it can be included in an appraisal of tributary timber. The detailed engineering cost estimate for each project must be based on arms length competitive bids. The approved project costs may be apportioned to multiple users as per section 4.3.1.1.4.

d. Reconstruction and replacement cost estimates are determined as detailed engineering cost estimates (section 4.3.3). The cost estimates may be applied to remaining tributary timber (i.e., applicable volume) provided the project was not known of or planned for at the time of appraisal. If the cost estimate is not applied to the remaining tributary volume, it must be applied to the licensee's first tributary cutting authority appraised over the reconstruction or replacement. Section 4.3.1.1.4 may be applicable for main roads. Cost estimates for reconstruction and replacement are not to exceed the tabular costs for new construction under similar conditions.

e. Costs will not be recognized if the licensee has been negligent or has not followed approved plans or standards as defined under legislation.

4.3.1.1 Development Cost Allocation

Where proration is required for section 4.3.1.1.1 and 4.3.1.1.2:

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

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 4.3.1.1.4.

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

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 on Private Land

1. 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:

   a. If development provides access to appraised timber only, the total estimated costs are included in the appraisal.

   b. If development provides access to non-appraised timber only, cost estimates are not included in any appraisal.

   c. If 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.

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

6. 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.

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.

4.3.1.1.4 Extended Road Amortization

1. Except as provided in subsection (3), for new appraisals where the development occurring under the authority of a road permit or cutting permit for roads accessing more than one tributary cutting authority exceeds $4.00 per cubic metre, a written agreement may be made between the licensee and the regional manager, which distributes a portion of the development cost estimate to two or more tributary cutting authorities that are issued under the licence that entitled the licensee to apply for the road permit or cutting permit.

2. The agreement is subject to the following conditions:

    a. Future tributary timber included in the extended road amortization agreement must be either within the woodlot licence or an approved cutting permit or cutblocks shown in the licensee's forest development plan, woodlot licence plan or forest stewardship plan in effect on the appraisal effective date.

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

    c. The agreement must indicate the cost estimate that is being distributed to each existing or future cutting authority in the agreement.

    d. The agreement must be signed by the licensee and the regional manager.

    e. The costs apportioned to each cutting authority under the agreement may be adjusted once, in conjunction with this section, at reappraisal using the same ratio for distributing the costs as in the original agreement provided harvesting has not commenced on any of the cutting authority areas included in the agreement.

    f. Previously apportioned costs are not used to exceed the $4.00/$m^3$ in subsection (1) of this section.

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

3. New extended road amortization agreements for cutting permits issued for a woodlot licence with an effective date after November 30, 2008 will not be approved.

4.3.2 Tabular Cost Estimates

Tabular costs are determined using the procedures and criteria in this section for the total length of road that the submitting professional certifies is required to remove the timber from the cutting authority area.

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)

    a. Each section should be representative of a single moisture class. Section lengths are recorded to the nearest 0.1 km. Each section should be 1 km or longer, although some individual section lengths less than 1 km but greater than or equal to 0.100 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.

    b. All road segments less than 0.100 km, excluding short ground skidding spurs less than 0.100 km, are to be aggregated with other adjacent road segments, making appropriate adjustments to average site conditions using the distance-weighted averages for the site variables for that section.

    c. A short spur road less than 0.100 km that does not access a single landing may be aggregated with a similar stand-alone non-adjacent road section.

2. Road Types :

   - Snow/Ice Road (WINTER): - A single lane seasonal road including turnouts, with a flat road profile that is built with a combination of snow, ice and dirt, on a surface that may or may not have been stumped. The driving surface is built up using multiple layers of snow and ice such that extra stabilizing material costs are not applicable. A flat road profile means the side slope is less than or equal to 15% and there is minimal side cut. Minimal means, cuts into mineral or organic soil must not exceed 0.5 m in depth for distances up to 0.1 km. Seismic lines being used for roads, that have not previously been used as roads, will be considered as new construction and qualify as snow/ice roads provided they fall within the above criteria.

   - Long Term (LT) - A long term road is a road that will be used for more than two years for harvesting or hauling and has a ditch line and raised subgrade. A road within a cutblock is not considered long term unless the road will be extended beyond the cutblock to provide access to additional tributary cutblocks within the cutting authority area.

   - Short Term (S) - A short term road is a road that is neither temporary or long term.

   - Temporary (T) - A temporary road is a road that is planned to be used for harvesting and/or hauling for less than one year.

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 (each greater than 1.5m in diameter) . 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, 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 III are considered "Wet" for appraisal purposes.

6. Biogeoclimatic Zones

SBPS	-	Sub-Boreal Pine-Spruce
SBS	-	Sub-Boreal Spruce

4.3.2.3 Subgrade Cost Estimate

For each road type, except snow/ice roads, the subgrade cost estimate in $/km is determined from the equation for the appropriate road group.

Road Group	Equation
1	Refer to subsection 4.3.3(5)(n)
2	10257 + (141 * SLOPE%)
3	5553 + (130 * ROCK %) – (2003 * T)
4	6290 + (79 * SLOPE%) + (1453 * SMR) – (1283 * T) – (1638 * SBPS)
5	5939 + (80 * SLOPE%) + (1220 * SMR) + (3168 * LT) – (920 * T)
6	4989 + (98 * SLOPE%) + (2366 * LT) - (1260 * T)
7	8185 + (160 * ROCK%) + (3829 * LT) + (4432 * SBS)
8	5422 + (1820 * LT) - (2275 * T) + (1440 * SBS)
9	8896 + (136 * SLOPE%) + (160 * ROCK%) - (5568 * T)
10	5243 + (309 * SLOPE%) + (277 * ROCK%) + (2842 * LT) – (4281 * T) ($2239/km set as minimum, if equation yields less than $2239 then use $2239)
11	20832 + (323 * SLOPE%) + (424 * ROCK%) – (11764 * T)
12	8171 + (376 * SLOPE%) + (142 * ROCK%) - (8705 * T) ($1630/km set as minimum. If equation yields less than $1630 then use $1630)

Where:

Road groups are defined in Table 4-3.

LT	=	1 if a long term road, otherwise = 0
T	=	1 if a temporary road, otherwise = 0
SMR	=	1 if Soil Moisture Regime is “wet”. Otherwise SMR = 0
SBPS	=	1 if road construction is within this biogeoclimatic zone. Otherwise SBPS = 0
SBS	=	1 if road construction is within this biogeoclimatic zone. Otherwise SBS = 0

Snow and Ice Roads (winter)

The subgrade cost estimate for new snow and ice roads (winter) is $4419/km.

Table 4-3 Road Groups

Road Group #	Districts Included	Within the Geographic Boundary of a TSA, SB and TFL
1	Kalum	
2	Skeena Stikine	
3	Nadina	
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 Fort Nelson	Mackenzie TSA, SBs A through F
8	Chilcotin	Williams Lake TSA, SBs E, F, G, H, and I Quesnel TSA, SBs A, B, C & D 100 Mile House TSA, SBs A, B, C, D, E, F
9	Kamloops Cascades	TFL 15, 49 Okanagan TSA, SBs 1, 2, 3, 4, 5
10	Rocky Mountain	Boundary TSA, TFL 8
11	Columbia Kootenay Lake	Arrow TSA, TFL 23, 3
12	Headwaters	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.

4.3.2.4 Drainage Structures

An appraisal may include a cost estimate for large drainage structures only where their requirement is substantiated by field data. Such structures shall be placed so as to maintain the natural drainage pattern of the area crossed by the proposed road. All pipe culverts under 950 mm in diameter and all single log abutment culverts under 3.5 m span length are included in the subgrade cost estimates (see section 4.3.2.1).

See page 37 of the *Forest Road Engineering Guidebook* (June 2002) for a detailed description.

See pages 104 (Pipe Culverts) and 106 (Log Culverts) of the *Forest Road Engineering Guidebook* (June 2002) for detailed description.

An electronic version of the above guidebook can be accessed at:

http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/Guidetoc.htm

1. Culverts

   The cost estimates for the supply and installation of culverts from 0.3 m to 1.8 m in diameter are determined from Table 4-4 that follows. Culverts smaller than 0.95 m are included in the subgrade cost estimates in section 4.3.2.3.

   Costs for culverts smaller than 0.95 m are included in Table 4-4 for use where a detailed engineering cost estimate in section 4.3.3 requires the use of culverts smaller than 0.95m. Detailed engineering cost estimates are required for culverts larger than 1.8m, no interpolation of values is permitted. Total installation cost for culverts includes all costs of transporting the culvert to the jobsite and all costs of installation of the culvert to the final subgrade stage.

Table 4-4 Culvert Appraisal Cost Estimates

INSTALLED CULVERT COST ESTIMATE ($)														
	Equivalent Round Diameter (m)													
Culvert	0.3	0.4	0.45	0.5	0.6	0.7	0.8	0.9	.95	1.0	1.2	1.4	1.6	1.8 m
Length	X-Section Area (m^2)													
(m)	0.07	0.13	0.16	0.20	0.28	0.38	0.50	0.64	0.71	0.79	1.13	1.54	2.01	2.54 m^2
9	407	500	556	619	765	937	1136	1362	1484	1614	2197	2886	3681	4583
10	420	524	586	656	818	1010	1231	1481	1617	1761	2409	3175	4058	5060
11	434	547	616	693	871	1082	1325	1600	1750	1908	2621	3463	4436	5537
12	447	571	646	730	924	1154	1419	1720	1883	2055	2833	3752	4813	6014
13	460	594	676	767	977	1226	1513	1839	2016	2203	3045	4041	5190	6492
14	474	618	705	803	1030	1298	1608	1958	2149	2350	3257	4329	5567	6969
15	487	641	735	840	1083	1370	1702	2077	2282	2497	3469	4618	5944	7446
16	500	665	765	877	1136	1443	1796	2197	2415	2645	3681	4907	6321	7923
17	513	689	795	914	1189	1515	1890	2316	2548	2792	3893	5196	6698	8400
18	527	712	825	951	1242	1587	1985	2435	2681	2939	4106	5484	7075	8878
19	540	736	855	988	1295	1659	2079	2555	2814	3086	4318	5773	7452	9355
20	553	759	884	1024	1348	1731	2173	2674	2946	3234	4530	6062	7829	9832
21	566	783	914	1061	1401	1804	2267	2793	3079	3381	4742	6350	8206	10309
22	580	806	944	1098	1454	1876	2362	2913	3212	3528	4954	6639	8583	10786
23	593	830	974	1135	1507	1948	2456	3032	3345	3676	5166`	6928	8960	11264
24	606	854	1004	1172	1560	2020	2550	3151	3478	3823	5378	7216	9337	11741
25	619	877	1034	1208	1614	2092	2645	3270	3611	3970	5590	7505	9714	12218
26	633	901	1063	1245	1667	2164	2739	3390	3744	4117	5802	7794	10091	12695
27	646	924	1093	1282	1720	2237	2833	3509	3877	4265	6014	8082	10468	13172
28	659	948	1123	1319	1773	2309	2927	3628	4010	4412	6227	8371	10845	13650
29	672	971	1153	1356	1826	2381	3022	3748	4143	4559	6439	8660	11222	14127
30	686	995	1183	1393	1879	2453	3116	3867	4276	4707	6651	8948	11599	14604

2. Bridges

   Cost estimates for both log bridges and non-log bridges, where required and not included in subgrade cost estimates, are made as detailed engineering cost estimates (section 4.3.3).

   Bridge costs include:

   - crib back-fills to a maximum distance of 15 m on either end,
   - site preparation,
   - protection features such as rip rap,
   - material and equipment supply and delivery,
   - installation.

4.3.2.5 Additional Stabilizing Material

Road stabilization is the placement of gravel or broken rock on the road subgrade to provide stable support and a running surface for logging equipment using the road during the harvesting of tributary timber (see section 4.3.3(5)(l) for cost estimates pertaining to the use of special materials). Where stabilizing material developed during the subgrade or ditch construction is insufficient, a cost estimate for additional stabilizing material to be trucked in from selected borrow pits may be included in the appraisal.

Unit Cost Estimate

The unit cost estimate ($/km) for the additional stabilizing material includes:

- borrow pit preparation,
- rock drilling, explosives, loading of explosives and blasting,
- loosening and/or pushing materials in borrow pits when required (e.g., compacted or cemented gravel, oversize material, etc.),
- loading gravel trucks,
- truck hauling, and
- spreading and compacting the material.

The cost estimates assume borrow pits are located adjacent to the road side and are not part of the subgrade excavation. If a new road needs to be constructed to access the borrow pit, then an access road cost estimate is required in addition to the in-place unit cost estimates.

For each road, the additional stabilizing material cost estimate ($/km) is determined from the equation for the appropriate road group.

Road Groups	Equation
1	Refer to section 4.3.3(5)(n)
2	8897
3	7336 + (1334 * D) + (13331 * QROCK) + (3939 * LT)
4	11913
5	9121
6	10631 + (205 * D)
7	10631 + (205 * D)
8	3153 + (370 * D)
9	4375 + (3108 * D)
10	16630
11	16630
12	16630

Where:

Road groups are defined in Table 4-3.

D = Distance in kilometres from source of ballast to the centre of the section that requires ballast (rounded to the nearest 0.1 km)

LT = 1 if a long term road, otherwise = 0

QROCK = 1 if road is stabilized with quarry rock that requires drilling and blasting. Otherwise QROCK = 0

No cost estimate for additional stabilizing material is allowed for any snow and ice roads.

4.3.2.6 Cattle Guards, Remedial Fences and Pipeline Crossings

1. Where the installation of cattle guards, remedial fences, wing fences or pipeline crossings are required, the following cost estimates apply:

a.	Cattle Guards	$5754 each
b.	Remedial Fences and Wing Fences	$987 per 100 m
c.	Pipeline Crossings	$3400 single pipe crossing $2046 (each) multiple pipe crossing (where 2 or more pipes are crossed within the same right-of-way)

2. The cost estimates include new or recycled materials, transportation and installation.

4.3.3 Detailed Engineering Cost Estimates

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

2. Where specific development projects involve detailed engineering cost estimates, the district manager shall be advised of project details no later than 60 days before the start of work on the project.

3. For appraisal purposes, the estimated development project costs are made on the basis of the site-specific data using the definitions found in section 4.3.2.2 for common subgrade construction variables, the culvert costs included in Table 4-4, and the equipment and labour rates specified in Appendix I. Due consideration is given to arm's length competitive bids for any specific project. The appraisal estimate is not constrained in any way by a licensee's actual costs.

4. If the ECE is re-estimated once after construction as provided in section 2.2(3) (using more accurate on site information) the new detailed engineering cost estimate replaces the original (used in the initial appraisal). Apportionment agreement or bid tender cost estimates are not re-estimated only trended. ECE’s are not re-estimated due to labour and/or equipment rates being updated periodically in Appendix I.

5. Where road sections estimated as a detailed engineered cost estimate are contiguous with tabular cost estimates, costs for mobilization and demobilization will only be allowed for special equipment not required for the construction of the tabular roads. The costs for replacement or addition of stabilizing material must be determined using section 4.3.2.5 unless the material is placed in conjunction with geo fabric, geo

grids, corduroy or where the stabilizing material requires processing such as screening or crushing.

The following specific situations are considered for detailed engineering cost estimates:

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

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

c. When rock percent as calculated in section 4.3.2.2(4) is greater than 50 percent, or terrain class 4 and 5.

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

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

f. For log bridges and non-log bridges (including ice bridges) that are not included in the subgrade cost estimates, eligible costs include site planning and the same phases as listed in section 4.3.2.4(2).

g. Structural maintenance of bridges, substructure and cribwork.

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

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

j. i. Replacement or addition of stabilizing material to the existing road running surface or where stabilizing material was not previously used, for uninterrupted road lengths of 0.3 km, or greater.

   ii. Road lengths less than 0.3 km are included in the road management cost estimate.

k. Culverts greater than 1.8 m in diameter, or culverts greater than 30 m in length regardless of diameter. The cost estimate includes all costs of transporting the

culvert to the jobsite and all costs of installation of the culvert to the final subgrade stage.

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

m. Retaining walls, railway crossings and other special structures (may include multiple culverts, baffled culverts, arched culverts and other structures determined by the timber pricing co-ordinator).

n. Subgrade and ballast cost estimate in road group 1, Kalum District. The subgrade and ballast cost estimate will be determined using the detailed engineering cost methodology specified by the Northern Interior Forest Region.

o. The costs of designing and constructing a forwarding road, where the timber pricing co-ordinator is satisfied that it will produce the least cost total development, harvesting and transportation estimate in the appraisal. A forwarding road is not a trail but a road built to a designed standard which includes stripping, grubbing, stumping and primary excavation to establish subgrade that is used for transporting crews and equipment and forwarding timber but not for hauling logs.

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

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

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

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

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

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

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

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

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

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

   a. Freight (for materials).

   b. Provincial sales tax (for materials).

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

   d. Bridge certification by a professional engineer (maximum of three field trips) unless otherwise approved by the regional timber pricing co-ordinator (the costs for professional engineers are permitted whether they are on the licensees staff or hired under contract).

   e. Site plans, designs and layouts.

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

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

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

11. In some cases, the detailed engineering cost estimates may be apportioned to two or more licensees' tributary cutting authorities, as described under section 4.3.1.1.4.

4.3.3.1 Trending of Detailed Engineering Costs

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

2. ECE Cost Year means:

   a. For ECEs (or portion(s) thereof) which are calculated using this manual, the ECE Cost Year is 2006.

   b. For ECEs (or portions(s) thereof) which are calculated using tenders, materials costs, design and survey costs, etc. the year the costs are based on or incurred is the ECE Cost Year.

c. Where all components of an ECE have a common ECE Cost Year, the trend factor can be directly determined from Table 4-5.

d. For new or re-estimated (section 2.2(3)) ECEs where components of an ECE have different ECE Cost Years, it is necessary to trend all components to the Cost Base Year of the manual in effect at the time (based on the effective date of the cutting authority). The Cost Base Year then becomes the ECE Cost Year for future trending.

Table 4-5 Trend Factors for ECE Costs

ECE Cost Year	Multiply by this Trend Factor to Match the 2006 Cost Base
1995	0.925
1996	0.872
1997	0.811
1998	0.856
1999	0.899
2000	0.879
2001	0.894
2002	0.904
2003	0.978
2004	0.978
2005	1.0
2006	1.0
2007	1.0
2008	1.0

4.4 Tree-to-Truck

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

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

4.4.1 Harvesting Methods

Each of the following harvesting methods is recognized only when it is identified on the map submitted with the appraisal data submission.

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

4.4.2 Tree-to-Truck Variables

1. a. The variables identified in subsections 2 to 15 of this section will be used in appraisals based on all compiled cruise plots segregated by logging method where applicable (see section 4.4.5).

   b. Where:

      i. The cutting authority area being appraised is authorized for harvest under an agreement other than a BCTS licence,

      ii. The holder of the cutting authority is required to harvest in deciduous stands,

      iii. The deciduous timber has not been reserved from harvest, and

      iv. The calculation of a variable listed in this section requires the use of a volume,

      the volume must include the total net deciduous volume and the total net coniferous volume.

   c. Where the cutting authority area being appraised is authorized for harvest under an agreement other than a BCTS licence, and

      i. the holder of the cutting authority is not required to harvest in deciduous stands, or the deciduous timber has been reserved from harvest, and

      ii. The calculation of a variable listed in this section requires the use of a volume,

      the volume shall only include the total net coniferous volume.

2. Biogeoclimatic Ecosystem Classification (BEC) Zones

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

ICH	-	Interior Cedar Hemlock
CWH	-	Coastal Western Hemlock
SBS	-	Sub Boreal Spruce
ESSF	-	Engelmann Spruce – Subalpine Fir
IDF	-	Interior Douglas Fir

Where a harvest method area occupies more than one biogeoclimatic zone, the constant for the zone that occupies the greatest net merchantable area in the harvest method area shall be used in the calculation of the cost estimate.

3. Slope (SLOPE%)

   The harvest method slope percent from the cruise appraisal summary report.

4. Volume per Hectare (VOLHA)

   The harvest method net cruise volume per hectare (m3/ha), rounded to the nearest cubic metre. For partial cutting, it is based on the actual volume per hectare being harvested.

5. Percent Blowdown (BD%)

   The percentage of the harvest method net cruise volume classified as blowdown.

6. Partial Cut Variables (PCUT, DPCUT)

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

   Clear cutting is defined as those areas with block opening sizes equal to or greater than 1 hectare and where the volume removal is equal to or greater than 90 percent based on the net volume measured to the Standard Timber Merchantability Specifications (section 1.5).

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

   a. PCUT

      Where a partial cut is comprised of openings of less than 1 hectare in size, the PCUT percent is based on the cumulative volume of these openings divided by the volume of the block area surrounding them.

      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.

7. Distance to Support Centre (DS)

The one-way, road distance from the geographic centre of the cutting authority to the main post office (or other location designated by the regional timber pricing co-ordinator) 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 cutting authorities serviced by a camp (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 (including that covered by the non-road portions of the route). 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
- DIST200S150 = 0 if DS<=150 km
  = (DS-150) if DS>150 km and <=200 km
  = 50 if DS>200 km

8. Volume per Tree (VOLTREE)

   The harvest method net cruise volume per tree (m3), rounded to two decimals. For partial cutting, it is based on the trees to be harvested.

9. Defect Percent

   Harvest method stand defect from the cruise appraisal summary report. Defect percent is the estimate of decay, waste and breakage (DWB) of the gross merchantable volume from the cruise appraisal summary for the trees to be harvested. Defect percent is recorded to the nearest whole percentage point for appraisal calculation purposes.

   a. Gross volume per tree (m^3) (GVOL)
      GVOL = VOLTREE/(1 - Defect %/100).
   b. GVOLSQR = $(GVOL)^2$

10. Small Tree Volume (SMALL TREEVOL)

    SMALLTREEVOL = harvest method net volume (m^3) per tree if <0.35 m^3/tree. If >= 0.35 m^3/tree SMALLTREEVOL = 0.

11. Small Tree Dummy Variable (SMALLTREED)

    SMALLTREED = 1 if the harvest method net volume per tree <0.35 m^3/tree, otherwise = 0.

12. Heli Yarding Distance (HELIYARD)

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

13. Skyline Yarding Distance (SKYYARD)

    The average skyline slope distance measured to the nearest metre (m).

14. Species Percent

    The species percent data used in the tree-to-truck and hauling equations is calculated as:

    Harvest method species volume (m^3) / (Total Net Coniferous Volume (m^3) + Total Net Deciduous Volume (m^3))

HE	- Hemlock	SP	- Spruce
FI	- Fir	LO	- Lodgepole Pine
LA	- Larch	BA	- Balsam
CE	- Cedar		

15. Region Constants [1]

FNP	=	Fort Nelson & Peace Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, and Vanderhoof Forest Districts
Prince Rupert	=	Kalum, Nadina, and Skeena Stikine Forest Districts
Kamloops	=	Cascades, Kamloops, Headwaters and Okanagan Shushwap Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo and Quesnel Forest Districts
Nelson	=	Arrow Boundary, Columbia, Kootenay Lake and Rocky Mountain Forest Districts

4.4.3 Tree-to-truck Cost Estimates

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

1. Helicopter Logging

$$\$/m^3 = 46.15 + (18.96 * SLOPE\ \%/100) + (5.98 * DS/100) + (5.72 * HELIYARD) - (6.68 * LO\%/100)$$

2. Horse Logging

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

$$\$/m^3 = 26.09$$

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:

$$\$/m^3 = \text{CONSTANT} + (6.13 * \text{SLOPE\%}/100) - (3.06 * \text{VOLHA}/1000) + (1.65 * \text{BD\%}/100) + (9.78 * \text{Defect\%}/100) + (1.64 * \text{DPCUT}) + (7.45 * \text{SMALLTREED}) - (21.52 * \text{SMALLTREEVOL}) + (2.05 * \text{NEWDIST200}/100)$$

Where CONSTANT =

	BEC ZONE				
REGION	**BWBS**	**ICH**	**IDF**	**ESSF**	**Other**
Cariboo	15.89	16.56	16.07	16.07	14.79
FNP	15.70	16.37	15.88	15.88	14.60
Kamloops	15.78	16.45	15.96	15.96	14.68
Prince George*	15.35	16.02	15.53	15.53	14.25
Prince Rupert	16.65	17.32	16.83	16.83	15.55
Other	19.73	20.40	19.91	19.91	18.63

Excluding FNP

4. Overhead Cable Logging

   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 + (10.71 * SLOPE%/100) + (2.08 * NEWDIST200/100)

Where CONSTANT =

REGION	SBS	CWH	Other
Kamloops	25.30	30.01	27.13
Other	23.69	28.40	25.52

b. Skyline and Intermediate Support Skyline

Skyline yarding estimates will be recognized for each block 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:

$\$/m^3 =$ 42.12 - (6.47 * GVOL) + (1.27 * GVOLSQ)

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(3), 4.4.3(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

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

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 and include the deciduous volume if the licence requires harvesting in deciduous stands.

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:

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

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 (CT):

   For appraisal purposes, weighted average Cycle Time 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 regional manager is satisfied that a transfer of current cutting rights to address a bark beetle infestation will result in:

      i. equal or higher sawlog stumpage rates for the timber to which the current cutting rights are transferred to, when compared to the sawlog stumpage rates for the timber where the current cutting rights are transferred from, and

      ii. an increase in milling consumption of beetle infested timber by the licensee whose current cutting rights are transferred, then

   the place that would have been the point of appraisal if the timber had been harvested in the area from which the current cutting rights are transferred from.

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 conditions under 4.5.1 (1)(c) are met, then

the place that would have been the point of appraisal if the timber had been harvested in the area from which the current cutting rights are transferred from.

e. add this to the average weighted cycle time from paragraph '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 *Industrial Road Act* and Forest Service Roads as defined in *Forest 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 *Industrial Road Act* and Forest Service Roads as defined in *Forest 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 $\$0.17/m^3$. If CT = 0 then $\$/m^3 = 0$.

   $\$/m^3 =$ CONSTANT + (2.05 * CT) - (1.30 * CE%/100) + (2.18 * DE%/100) + (1.18 * FI%/100) + (2.29 * HE%/100) + (1.85 * WH%/100)

Where:

REGION	:	Cariboo	Nelson	FNP	Other
CONSTANT	=	0.62	0.99	2.81	0.41

2. Off-Highway Haul

   For all off-highway haul equations if CT is greater than 0 then the minimum is $\$2.15/m^3$. If CT = 0 then $\$/m^3 = 0$.

   $\$/m^3 =$ CONSTANT + (1.51* CT)

Where:

REGION	:	Prince George[1]	Prince Rupert	Other
CONSTANT	=	0.64	0.91	1.80

[1] Excludes FNP

For highway, off-highway and secondary transportation:

CT =	Cycle time to the nearest 0.1 hours		
CE =	Cedar	HE =	Hemlock
DE =	Deciduous Species (all)	WH =	White Pine
FI =	Fir		

Region constants:

FNP	=	Fort Nelson & Peace Forest Districts
Prince George	=	Fort St. James, Mackenzie, Prince George, and Vanderhoof Forest Districts
Prince Rupert	=	Kalum, Nadina and Skeena Stikine Forest Districts
Kamloops	=	Cascades, Kamloops, Headwaters and Okanagan Shushwap Forest Districts
Cariboo	=	Chilcotin, 100 Mile House, Central Cariboo and Quesnel Forest Districts
Nelson	=	Arrow Boundary, Columbia, Kootenay Lake and Rocky Mountain Forest Districts

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.

$$\$/m^3 = 2.002 * CT$$

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: $\$/m^3 = 4.07$

   Natural Lakes: $\$/m^3 = 1.81$

2. Tow:

   All $\$/m^3 = 1.8125 + 0.00218 * d$

   Where d = one way tow distance in kilometres.

3. Dewater and Reload:

   All $\$/m^3 = 1.96$

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) and operation of bubble systems where applicable.

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:

      All $/m^3 = 4.82

   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 Rail Log Transportation

Origin	Cost Estimate ($/m^3)	Point of Appraisal
Leo Creek	$12.73	Fort St. James
Lovell	$16.73	Fort St. James
Bear Lake	$23.64	Fort St. James
Minaret Creek	$25.75	Fort St. James
Niteal	$22.45	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	$\$/m^3 = 6.66$
Natural Lakes	$\$/m^3 = 5.01$

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

   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	$\$/m^3 = 1.25$

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 refreezing
- 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
- cattle guard cleanout
- 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 road management 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 road management 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	2.97
		Cassiar	4	All	2.97
		Cranberry	42	All	2.97
		Dawson Creek	41	All	2.76
		Fort Nelson	8	All	3.76
		Fort St. John	40	All	2.76
		Kalum	10	All	2.97
		Kispiox	12	All	2.97
		Lakes	14	All	1.92
		Mackenzie	16	All	1.30
		Morice	20	All	1.92
		Nass	43	All	2.97
		Prince George	24	A, B, C	1.30
		Prince George	24	D	1.78
		Prince George	24	E, F, I	1.02
		Prince George	24	G, H	1.28
	1				2.97
	30				1.28
	41				2.97
	42				1.30
	48				2.76
	53				1.28
Southern Interior		100 Mile House	23	A, B, C, D	.80
		100 Mile House	23	E, F, G. H	.71
		Arrow	1	All	3.11
		Boundary	2	C, D, G	3.11
		Boundary	2	E, F	2.10
		Cranbrook	5	All	2.11
		Golden	7	All	3.76
		Invermere	9	All	2.11
		Kamloops	11	1	1.75
		Kamloops	11	2, 3, 4	1.27
		Kootenay Lake	13	All	2.29

Region	TFL #	TSA	TSA #	Supply Block	$/m3
Southern Interior		Lillooet	15	All	2.97
		Merritt	18	All	1.11
		Okanagan	22	1, 2, 3	2.10
		Okanagan	22	4, 5, 6, 7	1.77
		Okanagan	22	8, 9	3.76
		Quesnel	26	A, B, C, D	1.00
		Quesnel	26	E, F, G, H, I	1.28
		Revelstoke	27	All	3.76
		Robson Valley	17	All	1.75
		Williams Lake	29	A, B, C, D, E, I	.74
		Williams Lake	29	F, G, H, J	.80
		Williams Lake	29	K, L	.71
		Williams Lake	29	M, N	1.59
	3				3.11
	5				1.02
	8				2.10
	14				2.11
	15				2.10
	18				1.75
	23				3.11
	33				3.76
	35				1.27
	49				1.77
	52				1.28
	55				3.76
	56				3.76

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 Management

   a. No recognition is made of such charges. The road management cost estimate in 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 Management

   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 Forest Management Administration

Forest management administration costs are those costs directly related to supervision and administration of the activities listed below:

- 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).

The forest management administration cost estimate in an appraisal is determined as follows:

$\$/m^3 = 2.01345 + (0.19721 * CPSlope\%)$

Where:

$\$2.15/m^3$ is set as the minimum. If equation yields less than $\$2.15/m^3$ then use $\$2.15/m^3$.

$\$17.06/m^3$ is set as the maximum. If equation yields more than $\$17.06/m^3$ then use $\$17.06/m^3$.

CP Slope % - is the cutting permit average slope from the cruise appraisal summary report.

4.8.2 Camp Costs

1. A camp cost estimate may be included in an appraisal if the workers who work on cutting authority area, reside in the camp, and travel on each day of work during timber harvesting operations from the camp to the cutting authority area.

2. A camp must:

   a. be a permanent structure,

   b. have a cookhouse and a bunkhouse,

   c. have been established through the expenditure of capital costs,

   d. have full time camp staff, and

e. be outside of a support centre listed in section 4.4.2(7).

3. Where a cutting authority area, serviced by a camp, may be accessed only by rail, the camp cost estimate for that cutting authority area is $5.00/m^3, otherwise the cost estimate is $2.51/m^3.

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:

$$\$/m^3 = 8.35$$

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	$0.63/m^3
(prorated by volume)	Highlead & Grapple	$0.81/m^3
	All Other	$0.00/m^3

4.9 Basic Silviculture Cost Estimate

1. The basic silviculture cost estimates includes the cost of every treatment that is required to achieve a licensee's free-growing stand obligations.

    a. Except as provided in section 5.6.4 of this manual, a treatment may not be included in basic silviculture cost estimate in the appraisal unless:

        i. the licensee is obligated by law to carry out the treatment,

        ii. the licensee carries out the treatment, and

        iii. the treatment is not funded by the Crown or an agent of the Crown.

2. The area of land where a treatment is to be applied that may be considered in the basic silviculture cost estimate is the net area to be reforested (NAR) for which the licensee has an obligation to establish a free-growing stand. The NAR includes the net merchantable area (NMA) from the cruise.

3. Table 4-9 lists the associated cost estimates ($/ha) for Biogeoclimatic Ecosystem Classification (BEC) zone, subzone, and variant combinations across the interior. Where the subzone/variant combination is not listed in the table, the BEC undifferentiated subzone "un" cost estimate is used.

4. Where a cutting authority area includes more than one BEC/zone/subzone/variant combination, a prorated BEC zone/subzone/variant cost estimate will be determined by prorating the cost estimates from Table 4-9 for the primary and secondary BEC combination identified in the appraisal data submission based on their respective percent by net merchantable area identified in the appraisal data submission. -

5. The cutting authority basic silviculture cost estimate is calculated as follows:

$$\$/m^3 = \frac{\lfloor NMA * Cost * (CAPCUT\% / 100) * 1.25 \rfloor + \lfloor (NAR - NMA) * Cost \rfloor}{NMV}$$

Where:

NMA	=	Net Merchantable area (ha) from the cruise appraisal summary report. This area must be the same area directly attributed to the appraised net merchantable volume for the cutting authority. Where the licence requires harvesting in deciduous stands the NMA includes the area for the deciduous volume.
Cost	=	Prorated BECzone/subzone/variant cost ($/ha) using Table 4-9.
NAR	=	Net area to reforest (ha) within the cutting authority area for which the licensee has free-growing obligations (ha) and has not yet received a basic silviculture cost estimate in any appraisal. For the purpose of this section the NAR can not be less than the NMA.
NMV	=	Net merchantable volume (m^3) for the cutting authority area from the cruise appraisal summary report.
CAPCUT	=	Cutting Authority (CA) partial cut % calculated under section 4.4.2(6). If CAPCUT%>80% CAPCUT% = 80, otherwise: CAPCUT% = (CANMV/CA Gross NMV) * 100

CA Gross NMV(m^3) = ^{V}GS(C) + (^{V}GS(P) / GS(PCUT/100)) + ^{V}OC(C) + (^{V}OC(P) / OC(PCUT/100)) + ^{V}SK(C) + ^{V}Horse(C) + ^{V}Heli(C) + (^{V}Heli(P) / Heli(PCUT/100))

Where:

PCUT	=	Logging method PCUT (%) from section 4.4.2,(6)
CAPCUT	=	Cutting Authority (CA) partial cut percent
^{V}	=	Net merchantable volume (m3) required to be logged by each system
Heli (C)	=	helicopter logging (clear cut)
Heli (P)	=	helicopter logging (partial cut)
Horse(C)	=	horse logging (clear cut)
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(C)	=	skyline logging (clear cut)

Table 4-9 BEC Silviculture Cost Estimates*

BEC Zone	Subzone	Variant	$/ha
BWBS	dk	1	1736
BWBS	dk	2	1736
BWBS	mw	1	1719
BWBS	mw	2	1875
BWBS	un		1736
BWBS	vk		1736
BWBS	wk	1	1179
BWBS	wk	2	1736
BWBS	wk	3	1736
CWH	un		1690
CWH	vh	1	1690
CWH	vh	2	1690
CWH	vm		1690
CWH	vm	1	1690
CWH	vm	2	1690
CWH	vm	3	1690
CWH	wh	1	1690
CWH	wh	2	1690
CWH	wm		1690
CWH	ws	1	1690
CWH	ws	2	1690
CWH	xm	1	1690
CWH	xm	2	1690
ESSF	dc	1	1355
ESSF	dc	2	1189
ESSF	dcp	1	1355
ESSF	dcp	2	1355
ESSF	dk		1355
ESSF	dkp		1355
ESSF	dku		1355
ESSF	dv		1355
ESSF	dvp		1355
ESSF	mc		1350
ESSF	mcp		1355
ESSF	mk		1355
ESSF	mkp		1355
ESSF	mm	1	1355

BEC Zone	Subzone	Variant	$/ha
ESSF	mm	2	1355
ESSF	mmp	1	1355
ESSF	mmp	2	1355
ESSF	mv	1	1355
ESSF	mv	2	1432
ESSF	mv	3	801
ESSF	mv	4	1453
ESSF	mvp	1	1355
ESSF	mvp	2	1355
ESSF	mvp	3	1355
ESSF	mvp	4	1355
ESSF	mw		1487
ESSF	mwp		1355
ESSF	un		1355
ESSF	vc		2765
ESSF	vcp		1355
ESSF	vv		2116
ESSF	vvp		1355
ESSF	wc	1	1789
ESSF	wc	2	1840
ESSF	wc	3	1025
ESSF	wc	4	1642
ESSF	wcp	2	1355
ESSF	wcp	3	1355
ESSF	wcp	4	1355
ESSF	wk	1	1639
ESSF	wk	2	1626
ESSF	wm		1906
ESSF	wmp		1355
ESSF	wv		1746
ESSF	wvp		1355
ESSF	xc		912
ESSF	xcp		1355
ESSF	xv	1	1355
ESSF	xv	2	1355
ESSF	xvp	2	1355
ICH	dk		1674

BEC Zone	Subzone	Variant	$/ha
ICH	dm		1674
ICH	dw		1329
ICH	mc	1	1231
ICH	mc	2	1095
ICH	mk	1	1226
ICH	mk	2	1383
ICH	mk	3	581
ICH	mm		1674
ICH	mw	1	1962
ICH	mw	2	1719
ICH	mw	3	1534
ICH	un		1674
ICH	vc		1674
ICH	vk	1	2491
ICH	vk	2	1674
ICH	wc		1674
ICH	wk	1	2037
ICH	wk	2	1674
ICH	wk	3	1674
ICH	wk	4	1674
ICH	xw		1674
IDF	dk	1	908
IDF	dk	2	1118
IDF	dk	3	564
IDF	dk	4	830
IDF	dm	1	830
IDF	dm	2	693
IDF	dw		830
IDF	mw	1	830
IDF	mw	2	1590
IDF	un		830
IDF	ww		830
IDF	xh	1	830
IDF	xh	2	1521
IDF	xm		830
IDF	xw		830
MH	un		1690

BEC	Subzone	Variant	$/ha
MS	dc	1	914
MS	dc	2	914
MS	dk		868
MS	dm	1	914
MS	dm	2	1113
MS	dv		914
MS	un		914
MS	xk		764
MS	xv		740
PP	dh	1	28
PP	dh	2	28
PP	un		28
PP	xh	1	28
PP	xh	2	28
SBPS	dc		793
SBPS	mc		771
SBPS	mk		769
SBPS	un		771
SBPS	xc		771
SBS	dh		1102
SBS	dh	1	1102
SBS	dh	2	1102
SBS	dk		1081
SBS	dw	1	934
SBS	dw	2	824
SBS	dw	3	892
SBS	mc	1	742
SBS	mc	2	1195
SBS	mc	3	1102
SBS	mh		1102
SBS	mk	1	1137
SBS	mk	2	992
SBS	mm		1339
SBS	mw		1207
SBS	un		1102
SBS	vk		1610
SBS	wk	1	1241

BEC	Subzone	Variant	$/ha
SBS	wk	2	1315
SBS	wk	3	1082
SWB	dk		1295
SWB	dks		1295
SWB	mk		1295
SWB	mks		1295
SWB	un		1295
SWB	vk		1295
SWB	vks		1295

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

4.9.1 Suitable Secondary Structure Survey Specified Operation (SSSSSO)

1. If the licensee other than a BCTS licence has incurred the cost to complete a survey to determine if an adequate stocking density of suitable secondary structure exists on an area where the *Forest Planning and Practices Regulation* restricts harvesting in targeted pine leading stands, an SSSSSO cost estimate may be included in an appraisal.

2. Except as otherwise provided in this section, the SSSSSO cost estimate is determined as follows:

$$\$/m^3 = \frac{\$20.00 \times \text{the number of 3.99 m radius plots}}{\text{Total Net Cruise Volume } (m^3)}$$

3. No SSSSSO cost estimate may be included in an appraisal or reappraisal unless:

   a. the licensee submits the plot card records for each plot to the district manager with the appraisal data submission,

   b. a sample intensity of greater than one plot per hectare for a survey used to assess secondary stand structure has been approved by the district manager.

4. A plot submitted with an appraisal data submission cannot be submitted with another appraisal data submission and it cannot be considered in another appraisal or reappraisal.

5. This section only comes into effect on July 25, 2008.

4.10 Manufacturing Cost Estimates

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

2. 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.

3. 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.

4. The estimates have an effective cost base date of July 1, 2006, and will be used for all appraisals, reappraisals and adjustments of stumpage rates.

5. Once the least cost point of appraisal has been determined under section 4.1, the cost estimate of manufacturing for that point, as specified in this section, is determined.

Table 4-10 Untrended Manufacturing Cost Estimates

Untrended Manufacturing Cost Estimates ($/m^3) 2006 Cost Survey Base		
	Species	**Manufacturing cost ($/m^3) 0% Decay**
Northern Interior (Zone 5)	LO	35.81
	SP	32.83
	BA	37.41
	FI, LA, WH, YE	51.60
	CE	48.52
	HE	45.41
Skeena (Zone 6)	LO	28.15
	SP	26.66
	BA	29.47
	CE	37.59
	HE	34.41
Southern Interior (Zone 7)	LO	36.00
	SP	31.82
	BA	37.21
	FI, LA, WH, YE	51.98
	CE	48.85
	HE	47.98

Untrended Manufacturing Cost Estimates ($/m^3) 2006 Cost Survey Base		
	Species	**Manufacturing cost ($/m^3) 0% Decay**
Southern Cariboo (Zone 8)	LO	32.59
	SP	29.32
	BA	34.21
	FI, LA, WH, YE	47.85
	CE	41.34
	HE	41.25
Fort Nelson/Peace (Zone 9)	LO	35.53
	SP	32.33
	BA	36.57

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 % ∗ 0.1755 + base value from table.

For a list of points of appraisal by zone, refer to section 4.1.1

4.10.1 Manufacturing Cost Estimate Adjustment

For each species of timber except lodgepole pine:

Adjusted Species MC = Species MC - MCAF

Where:

Species MC	is the species manufacturing cost calculated according to section 4.10.
MCAF	is the manufacturing cost estimate adjustment factor from Table 4-11 for the point of appraisal of the cutting authority area being appraised or reappraised.
Adjusted Species MC	is the adjusted species manufacturing cost estimate for that species of timber.

Table 4-11 Manufacturing Cost Estimate Adjustment Factors

Point of Appraisal	BA	CE	FI	HE	LA	Lo	SP	WH	YE
100 Mile	-2.32	-0.02	-0.53	-1.59	0.00	-4.90	-1.25	-9.85	0.00
Adams Lake	-0.83	-0.05	-0.45	-0.06	-0.05	-2.46	-0.56	-0.64	-1.12
Armstrong	-1.06	-0.05	-0.37	-0.09	-0.16	-2.89	-0.17	-0.51	-0.76
Bear Lake	-0.40	-7.05	-0.17	0.00	0.00	-3.61	-0.59	0.00	0.00
Boston Bar	-0.82	0.00	-0.23	-3.55	-0.04	-3.44	-0.37	-6.61	-3.32
Burns Lake	-1.66	0.00	0.00	0.00	0.00	-2.82	-0.66	0.00	0.00
Canal Flats	-0.40	-0.06	-0.11	-0.38	-0.03	-0.70	-0.12	-0.38	-0.06
Canoe	-0.55	-0.06	-0.37	-0.04	-0.12	-2.10	-0.41	-1.77	-0.58
Carnaby	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Castlegar	-1.17	-1.21	-0.50	-0.10	-0.58	-2.60	-0.52	-2.12	-0.41
Chasm	-0.88	-7.16	-0.64	-2.33	-0.24	-3.50	-0.56	-1.54	-6.76
Chetwynd	-0.11	0.00	0.00	0.00	0.00	-0.11	-0.16	0.00	0.00
Clear Lake	-1.05	0.00	-0.18	0.00	0.00	-7.56	-0.45	0.00	0.00
Craigellachie	-1.02	-0.07	-0.17	-0.07	-0.09	-1.58	-0.18	-0.33	-7.65
Cranbrook	-0.21	0.00	-0.09	-0.27	-0.01	-0.90	-0.10	-3.33	-0.02
Creston	-0.95	-0.41	-0.19	-0.15	-0.10	-0.89	-0.15	-1.31	-0.41
Elko	-0.21	0.00	-0.09	-0.27	-0.01	-0.90	-0.10	-3.33	-0.02
Engen	-0.38	0.00	0.00	0.00	0.00	-7.52	-0.95	0.00	0.00
Fort Nelson	-0.61	0.00	0.00	0.00	0.00	-0.44	-0.21	0.00	0.00
Fort St. James	-0.54	0.00	-0.18	0.00	0.00	-2.87	-1.12	0.00	0.00
Fort St. John	-0.49	0.00	0.00	0.00	-2.02	-0.14	-0.14	0.00	0.00
Fraser Lake	-1.69	0.00	0.00	0.00	0.00	-7.61	-0.79	0.00	0.00
Galloway	-1.44	-0.03	-0.23	-0.29	-0.12	-1.01	-0.55	-3.61	-0.10
Grand Forks	-0.93	-0.09	-0.65	-0.09	-0.44	-1.40	-0.26	-1.55	-0.34
Hazelton	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Houston	-0.70	0.00	0.00	-2.88	0.00	-1.72	-0.55	0.00	0.00
Isle Pierre	-0.61	-6.89	-0.21	-0.77	0.00	-7.53	-0.49	0.00	0.00
Kamloops	-0.93	-0.09	-0.62	-0.61	-0.04	-3.62	-0.30	-1.05	-0.72
Kelowna	-0.98	-0.05	-0.21	-0.13	-0.15	-1.44	-0.26	-3.18	-0.61
Kitwanga	-0.33	-0.11	0.00	-0.01	0.00	-0.82	-0.27	0.00	0.00
Lavington	-1.53	-0.66	-0.35	0.00	-0.16	-1.45	-0.31	-0.13	-0.31
Lillooet	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Louis Creek	-3.10	-0.53	-2.31	-0.45	-0.05	-3.80	-1.85	-4.53	-3.71
Lumby	-0.88	-0.15	-0.24	-0.13	-0.33	-2.34	-0.24	-2.38	-0.76
Lytton	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Mackenzie	-0.70	0.00	0.00	0.00	0.00	-0.59	-0.34	0.00	0.00
McBride	-0.55	-0.31	-0.33	0.00	0.00	-1.29	-0.23	-0.38	0.00
Merritt	-0.63	-0.02	-0.14	-0.03	-0.07	-1.71	-0.16	-0.46	-0.75
Midway	-0.86	-0.07	-0.76	-0.02	-0.43	-0.91	-0.21	-0.73	-0.16
O.K. Falls	-0.88	-0.02	-0.33	-0.15	-0.10	-1.63	-0.34	-8.69	-0.41
Park Siding	-1.14	-0.07	-0.52	-0.11	-0.23	-1.49	-0.18	-1.20	-0.20
Prince George	-0.31	-7.03	-0.13	-3.38	0.00	-5.39	-0.39	0.00	0.00
Princeton	-0.57	-0.01	-0.14	0.00	-0.03	-1.09	-0.10	-0.07	-0.60
Quesnel	-1.17	0.00	-0.45	0.00	0.00	-7.06	-0.73	0.00	0.00
Radium	-0.63	-0.13	-0.12	-0.10	-0.03	-1.45	-0.16	-0.36	0.00
Revelstoke	-1.14	-0.35	-0.27	-0.13	-0.27	-2.97	-0.60	-1.20	-4.70

Point of Appraisal	BA	CE	FI	HE	LA	Lo	SP	WH	YE
Slocan	-0.71	-0.17	-0.30	-0.11	-0.32	-2.89	-0.21	-1.66	-0.13
Smithers	-1.53	0.00	0.00	-0.54	0.00	-3.31	-1.36	0.00	0.00
Squamish	-2.18	-0.02	-0.48	-3.18	0.00	-4.31	-1.08	-8.29	-0.68
Strathnaver	-0.60	0.00	-0.32	0.00	0.00	-7.20	-0.52	0.00	0.00
Taylor	-0.25	0.00	0.00	0.00	0.00	-0.11	-0.19	0.00	0.00
Terrace	-0.10	-0.17	0.00	-0.06	0.00	0.00	-0.22	0.00	0.00
Thrums	-1.00	-0.07	-0.29	-0.09	-0.15	-2.39	-0.22	-1.82	-0.11
Upper Fraser	-0.62	-0.62	-0.34	-0.24	0.00	-6.93	-0.48	-9.92	0.00
Valemount	-0.53	-0.12	-0.09	-0.05	-0.03	-1.51	-0.21	-0.64	0.00
Vanderhoof	-0.54	0.00	0.00	0.00	0.00	-5.24	-0.42	0.00	0.00
Vavenby	-1.43	-0.07	-0.29	-0.17	0.00	-2.34	-0.88	-2.66	0.00
Westbank	-0.94	0.00	-0.25	-0.13	-0.28	-0.67	-0.16	-0.34	0.00
Williams Lake	-2.33	-0.03	-0.27	-0.01	0.00	-4.68	-1.21	0.00	0.00
Ymir	-0.80	-0.05	-0.31	-0.08	-0.06	-2.19	-0.22	-0.89	0.00

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 July 1, 2008, refer to earlier *Interior Appraisal Manuals*.

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

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
July 1 to September 30, 2008	0.856	1.0
October 1 to December 31, 2008	0.856	1.0
January 1 to March 31, 2009	0.856	1.0
April 1 to June 30, 2009	0.856	1.0
July 1 to September 30, 2009	0.856	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
July 1 to September 30, 2008	0.899	1.0
October 1 to December 31, 2008	0.899	1.0
January 1 to March 31, 2009	0.899	1.0
April 1 to June 30, 2009	0.899	1.0
July 1 to September 30, 2009	0.899	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
July 1 to September 30, 2008	0.884	1.0
October 1 to December 31, 2008	0.884	1.0
January 1 to March 31, 2009	0.884	1.0
April 1 to June 30, 2009	0.884	1.0
July 1 to September 30, 2009	0.884	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
July 1 to September 30, 2008	0.884	1.0
October 1 to December 31, 2008	0.884	1.0
January 1 to March 31, 2009	0.884	1.0
April 1 to June 30, 2009	0.884	1.0
July 1 to September 30, 2009	0.884	1.0

Appraisal Effective Dates From November 1, 2002 to October 31, 2004

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
July 1 to September 30, 2008	0.921	1.0
October 1 to December 31, 2008	0.921	1.0
January 1 to March 31, 2009	0.921	1.0
April 1 to June 30, 2009	0.921	1.0
July 1 to September 30, 2009	0.921	1.0

Appraisal Effective Dates From November 1, 2004 to June 30, 2007

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
July 1 to September 30, 2008	0.915	1.0
October 1 to December 31, 2008	0.915	1.0
January 1 to March 31, 2009	0.915	1.0
April 1 to June 30, 2009	0.915	1.0
July 1 to September 30, 2009	0.915	1.0

Appraisal Effective From July 1, 2007 to June 30, 2008

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
July 1 to September 30, 2008	1.022	1.0
October 1 to December 31, 2008	1.022	1.0
January 1 to March 31, 2009	1.022	1.0
April 1 to June 30, 2009	1.022	1.0
July 1 to September 30, 2009	1.022	1.0

Appraisal Effective On or After July 1, 2008

Appraisal Effective Date or Stumpage Adjustment Date	Trend Factor	
	Logging and Silviculture	Manufacturing
July 1 to September 30, 2008	1.0	1.0
October 1 to December 31, 2008	1.0	1.0
January 1 to March 31, 2009	1.0	1.0
April 1 to June 30, 2009	1.0	1.0
July 1 to September 30, 2009	1.0	1.0

Stumpage Rate Determination 5

5.1 Indicated Stumpage Rate (ISR)

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

5.2 Value Index

The stumpage rate charged on each cutting authority is tied to the estimated value index of the stand to be harvested. The value index is defined as the selling price less the operating cost, both of which are estimates expected for an average operator in that stand. The formula to be used is:

$$VI = SP - OC$$

Where:

VI = Value index for the cutting authority.

SP = estimated stand selling price determined in accordance with chapter 3.

OC = estimated operating cost applicable to the timber being appraised, and determined in accordance with chapter 4.

5.3 Interior Mean Value Index

The interior mean value index (IMVI) is the benchmark against which individual stands of timber are compared. The interior mean value index is recalculated and published by Revenue Branch at the time of each quarterly stumpage adjustment and becomes an integral part of this manual.

5.4 Interior Average Market Price (IAMP)

The Interior Average Market Price is recalculated and published by Revenue Branch at the time of each quarterly stumpage adjustment and becomes an integral part of this manual.

5.5 Interior Base Rate (IBR)

The Interior Base Rate is recalculated at the time of each quarterly stumpage adjustment and becomes an integral part of this manual.

5.6 Calculation of Stumpage Rate

5.6.1 Calculation of Indicated Stumpage Rate

The indicated stumpage rate for a cutting authority is defined as:

$$ISR = IBR + (VI - IMVI)$$

Where:

ISR = Indicated Stumpage Rate

IBR = Interior Base Rate as defined in Section 5.5

VI = Value Index for the cutting authority as defined in Section 5.2

IMVI = Interior Mean Value Index, as defined in Section 5.3

5.6.2 Prescribed Minimum Stumpage Rate

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

5.6.3 Reserve Stumpage Rate

For each cutting authority area, except those containing timber licence volume, the reserve stumpage rate is determined by selecting the greater of:

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

5.6.4 Levies

1. A silviculture levy may be added to:
   a. the reserve stumpage rate determined under section 5.6.3,
   b. the stumpage rate determined under subsections 6.2(1), 6.2(2), 6.4(5) or section 6.5,
   c. the reserve rate indicated in Table 6-4 for all species grades 4 and 6,
2. The levy is equal to the district manager's cost estimate of silviculture costs to be incurred by the Crown.

3. Development/Administration Levy:

    a. A development levy may be added to the reserve stumpage rate. The development levy is equal to the appraisal cost estimate of road construction provided by the Crown as approved by the regional manager.

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

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

5.6.5 Upset Stumpage Rate

The upset stumpage rate is the total of the reserve stumpage rate plus any development, silviculture and administration levies which may be charged as defined in section 5.6.4.

5.6.6 Total Stumpage Rate

1. Except as provided in subsection (2) of this section the total stumpage rate is the upset stumpage rate plus any bonus bid.

2. If the upset stumpage rate is determined under section 7.5.1(7), the total stumpage rate is equal to the MPS upset stumpage rate determined under that section.

Miscellaneous Policies 6

6.1 Average Stumpage Rates by Forest Zone and Species

1. a. Each of the following forest zones referred to in Tables 6-1, 6-1a, 6-2 and 6-3 is made up of the corresponding forest district areas:

   i. North Central Zone - Fort St. James, Mackenzie, Nadina, Prince George, Quesnel and Vanderhoof Forest Districts.

   ii. North East Zone - Fort Nelson and Peace Forest Districts.

   iii. North West Zone - Kalum and Skeena Stikine Forest Districts.

   iv. South East Zone - Arrow Boundary, Columbia, Headwaters, Kamloops, Kootenay Lake, Okanagan Shuswap and Rocky Mountain Forest Districts.

   v. South West Zone - 100 Mile House, Cascades, Central Cariboo and Chilcotin Forest Districts.

   b. Where a species of coniferous timber is not listed in Table 6-1, 6-1a, 6-2 and 6-3, the rate that shall be used for that species of timber is the rate listed in the column headed as OTHER.

Table 6-1 Coniferous Average Sawlog Stumpage in $/m^3 by Forest Zone and Species

FOREST ZONE	BALSAM	CEDAR	FIR	HEMLOCK	LARCH	L. PINE	SPRUCE	Y. PINE	OTHER
North Central	13.91	-	12.03	13.82	-	12.73	14.01	-	13.13
North East	2.70	-	-	-	-	5.27	6.18	-	5.59
North West	3.84	3.44	-	3.82	-	3.43	4.80	-	3.82
South East	15.39	22.36	14.92	15.54	13.15	14.33	15.70	1.94	15.20
South West	12.98	9.03	12.38	9.87	16.09	11.17	13.04	12.09	11.75

6.1.1 Community Forest Agreements

1. The sawlog stumpage rate for each species of coniferous timber harvested under any cutting authority issued under a Community Forest Agreement is the rate prescribed in Table 6-1a for the forest zone in which the cutting authority area is located.

2. Sections 1.4(d), sections 6.1.2 through 6.5 and section 6.7 of this chapter do not apply to Community Forest Agreement cutting authorities.

3. The stumpage rate determined under this section is redetermined on August 1 of each year in accordance with this section.

4. Notwithstanding any other subsection of this section the stumpage rate determined under this section must not be less than the prescribed minimum stumpage rate.

6.1.2 Woodlot Licences

1. Except as provided in subsection (2) of this section, the sawlog stumpage rate for each species of coniferous timber harvested under a cutting permit issued for a woodlot licence with an effective date after November 30, 2008 is the rate prescribed in Table 6-1a for the forest zone in which the cutting authority area is located.

2. Where a woodlot licence cutting permit has been issued with an effective date after November 30, 2008 for the purpose of using amounts from an eligible extended road amortization agreement in an appraisal, then the stumpage rate will be determined using the procedures in this manual excluding this section.

3. Except as provided in subsection (4) of this section, the sawlog stumpage rate for coniferous timber harvested under a road permit issued for a woodlot licence with an effective date after November 30, 2008 is the rate prescribed in Table 6-1a for the forest zone in which the timber mark applies.

4. Where a woodlot has an eligible extended road amortization agreement before December 1, 2008 the sawlog stumpage rate for a road permit with an effective date on or after December 1, 2008 is calculated using the procedures in section 6.3.

5. The sawlog stumpage rate for each species of coniferous timber harvested under a blanket salvage permit issued for a woodlot licence is the rate prescribed in Table 6-1a for the forest zone in which the blanket salvage permit applies.

6. The stumpage rate determined under subsections (1), (3) and (5) of this section is redetermined on August 1, each year in accordance with this section.

7. Except as provided in subsections (2) and (4) of this section, sections 1.4(d), 6.1.1, 6.1.3 through 6.5 and 6.7 do not apply to woodlot licences.

8. Notwithstanding any other subsections of this section the stumpage rate determined under this section must not be less than the prescribed minimum stumpage rate.

Table 6-1a Community Forest Agreements and Woodlot Licences: Coniferous Average Sawlog Stumpage Rates in $/m^3

FOREST ZONE	BALSAM	CEDAR	FIR	HEMLOCK	LARCH	L. PINE	SPRUCE	Y. PINE	OTHER
North Central	2.09	-	1.80	2.07	-	1.91	2.10	-	1.97
North East	0.41	-	-	-	-	0.79	0.93	-	0.84
North West	0.58	0.52	-	0.57	-	0.51	0.72	-	0.57
South East	2.31	3.35	2.24	2.33	1.97	2.15	2.36	0.29	2.28
South West	1.95	1.35	1.86	1.48	2.41	1.68	1.96	1.81	1.76

6.1.3 Incidental Conifer in Deciduous Leading Stands

1. Except as provided in section 7.5.1(5), this section applies to coniferous timber in a cutting authority area where the total volume of all deciduous species to be harvested is greater than 70 percent of the total net cruise volume to be harvested.

2. The stumpage rate for each species of coniferous timber must be determined by using the stumpage rate prescribed in Table 6-1 for the forest zone in which the cutting authority area is located.

3. A stumpage rate determined under subsection 2 shall be redetermined on August 1, of each year in accordance with this section.

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

1. Where the total coniferous volume to be harvested in a cutting authority area is 2 000 m^3 or less, and where the agreement under which the cutting authority authorizing harvesting on the cutting authority area has been issued has a coniferous allowable annual cut of not more than 3 000 cubic metres, or no coniferous annual allowable cut:

    a. The stumpage rate for each species of coniferous timber in the cutting authority area must be determined using the stumpage rate in Table 6-1 for the forest zone in which the cutting authority area is located, except that,

    b. Where the agreement holder is not required to establish a free growing crop of trees on the cutting authority area, the stumpage rate for each species of timber shall be

        i. the sum of the rate determined under paragraph (a) of this subsection and the basic silviculture cost for the species in the forest region, or

        ii. where the Crown has the responsibility for silviculture, the silviculture levy determined under section 5.6.4.

2. Except as provided in subsection 3 of this section, where the total coniferous volume to be harvested on a cutting authority area is 5 000 m^3 or less, and the cutting authority authorizing harvesting on the cutting authority area is a competitively awarded forestry licence to cut, other than a BCTS licence:

    a. Subject to section 5.6.2 and paragraph (d) of this subsection, the upset stumpage rate for each species of coniferous timber in the cutting authority area will be 70 % of the stumpage rate for that species in Table 6-1 for the forest zone in which the cutting authority area is located, except that,

    b. Where applications for a forestry licence to cut have been invited with upset stumpage rates determined under this subsection and no applications have been received, the upset stumpage rate for each species of coniferous timber shall be the rate requested by the district manager and approved by the regional manager.

    c. Where the regional manager does not anticipate that applications for a forestry licence to cut will be received due to market conditions or timber profile, the upset stumpage rate for each species of coniferous timber shall be the rate requested by the district manager and approved by the regional manager.

    d. Where the Crown is responsible for basic silviculture on the cutting authority area, the upset stumpage rate for each species of coniferous timber in the cutting authority area will be the sum of the stumpage rate determined under paragraphs (a), (b) or (c) of this subsection and the basic silviculture levy determined under section 5.6.4.

3. Each upset stumpage rate determined under subsection (2) of this section shall not be less than the district's variable cost per cubic meter to prepare the timber for sale calculated by the district manager.

4. Except as provided in section 2.2.2, where the upset stumpage rate is determined under subsections 1 and 2 of this section, the total stumpage rate is fixed for the term of the cutting authority and all extensions.

5. a. Notwithstanding subsections (1) or (2) of this section, where the total coniferous volume to be harvested on a cutting authority area is 5 000 m^3 or less, the stumpage rate may be determined:

   i. for a cutting authority other than a BCTS licence by an appraisal in accordance with chapters 2, 3, 4, 5, and

   ii. for a BCTS licence by an appraisal in accordance with chapter 7.

   b. Where the stumpage rate is determined in accordance with this subsection:

   i. the cruise data that is used in the appraisal may be from the cruise of the cutting authority area or from the cruise of a comparable cutting authority that has similar stand and terrain characteristics,

   ii. the district manager may require the selection of a comparable cutting authority to be in accordance with procedures set out in section 2.1.2.2 of the *Cruising Manual*, and

   iii. except as provided in sections 2.3(4) and 7.2.1(2) the total stumpage rate is adjustable for the term of the cutting authority and all extensions.

6.2.1 Forestry Licences to Cut for Specific Purposes (No Volume Limit)

1. a. Where the cutting authority is a forestry licence to cut awarded to the highest bidder, other than a BCTS licence and it has been issued:

   i. For the purpose of protecting a community from wildfire as prescribed under section 1 of the *Forestry Licence to Cut Regulation*, or

   ii. For the purpose of removing damaged timber from immature stands or plantations where:

   aa. seventy percent of the timber on the cutting authority area is Pine that has been damaged by mountain pine beetle, and

   bb. at the time of death, the age of the damaged timber was not more than 50 years,

Then, the upset stumpage rate shall be the rate approved by the Regional Manager.

b. Where the invitation for applications for a forestry licence to cut awarded to the highest bidder referred to in paragraph (a) of this subsection requires a bonus offer, and the amount of stumpage payable will be based on a cruise instead of a scale of the timber under section 106 of the *Act*, the upset stumpage rate shall be the rate approved by the Regional Manager.

c. Where the cutting authority is a forestry licence to cut issued for the purpose referred to in paragraph (a)(ii) of this subsection and it is awarded directly to the holder of a Ministry site preparation or site rehabilitation contract that was awarded to the lowest eligible bidder, the stumpage rate for all timber harvested on the cutting authority area will be $\$1.20/m^3$.

d. The upset stumpage rate for a licence to cut awarded to the highest bidder for the utilization of post harvest material where a waste assessment has been made and the material will be chipped or ground at the roadside or the landing, shall be $\$0.25/m^3$.

2. An upset stumpage rate determined under this section must be calculated using the *Interior Appraisal Manual* in effect on the date that the rate is determined.

3. An upset stumpage rate determined under paragraphs (1)(a) or (1)(b) of this section shall not be less than the district's variable cost to prepare the timber for sale.

4. Except as provided in section 2.2.2, where the stumpage rate is determined under this section, the total stumpage rate shall be fixed for the term of the cutting authority and all extensions.

6.3 Road Permits

1. In this section the area of a forest district or the area of a timber supply area does not include the area of a park located within that district or timber supply area.

2. Except as provided in subsections (3) and (7) of this section, the stumpage rate for a road permit shall be the weighted average sawlog stumpage rate for:

   a. all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber in the same forest district in which the road permit cutting authority area is located, and that are issued under the licence that entitles the licensee to apply for the road permit, or

   b. if the licence permitting the granting of the road permit has an allowable annual cut of 3 000 m^3 or more per year, and there are no records from which the weighted average sawlog stumpage rate may be determined under:

      i. paragraph (a), then, except as provided under subsection (6) of this section, all the cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the smaller of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located, or

      ii. paragraphs (a) or (b)(i), then, except as provided under subsection (6) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the larger of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located, or

   c. if the licence permitting the granting of the road permit has an allowable annual cut of less than 3 000 m^3 per year, and there are no records from which the weighted average sawlog stumpage rate may be determined under:

      i. paragraph (a), then, except as provided under subsection (6) of this section, all cutting authorities authorizing harvesting on cutting authority areas that have been fully appraised, that are for licences that have an allowable annual cut of less than 3 000 m^3 in the smaller of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located, or

      ii. paragraphs (a) or (c)(i), then, except as provided under subsection (6) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that are for licences that have an allowable annual cut of less than 3 000 m^3 in the larger of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located, or

iii. paragraphs (a), (c)(i) or (c)(ii) then, except as provided under subsection (6) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised that authorize the harvesting of timber on land located in the smaller of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located, or

iv. paragraphs (a), (c)(i), (c)(ii), or (c)(iii) then, except as provided under subsection (6) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised that authorize the harvesting of timber on land located in the larger of the area of the same forest district or the area of the same timber supply area in which the road permit cutting authority area is located.

3. If there are no records from which the weighted average sawlog stumpage rate may be determined under paragraphs (a), (b) or (c) of subsection (2) of this section, then the stumpage rate, for each species of coniferous timber, is the rate in Table 6-1 for the forest zone in which the road permit cutting authority area is located.

4. a. In paragraph (a) of subsection (2) of this section, the weighted average sawlog stumpage rate that is in effect for the period between June 1 of one year in this subsection hereinafter referred to as the first year, and May 31 of the following year is determined as follows:

$$\$/m^3 = \frac{\text{(sum of Grade 1 value billed) + (sum of Grade 2 value billed)}}{\text{(sum of Grade 1 volume billed) + (sum of Grade 2 volume billed)}}$$

b. Subject to subsection (10) of this section, volumes and values in the formula above are taken from the history billing records for coniferous sawlogs during the 12-month billing period ending on March 31 in the first year, if the volume of those coniferous sawlogs is greater than 500 cubic metres.

5. a. In paragraphs (b) and (c) of subsection (2) of this section, the weighted average sawlog stumpage rate that is in effect for the period between June 1 of one year hereinafter referred in this section to as the first year, and May 31 of the following year is determined as follows:

$$\$/m^3 = \frac{\text{(sum of Grade 1 value billed) + (sum of Grade 2 value billed)}}{\text{(sum of Grade 1 volume billed) + (sum of Grade 2 volume billed)}}$$

b. Subject to subsection (10) of this section, volumes and values in the formula above are taken from the history billing records for coniferous sawlogs during the 12-month billing period ending on March 31 in the first year, if the volume of those coniferous sawlogs is greater than 500 cubic metres.

6. A fully appraised cutting authority issued under a woodlot licence that has a non-adjusting stumpage rate at any time during the twelve-month billing period ending on March 31 in the first year may not be used to determine a stumpage rate under

paragraphs (b) and (c) of subsection (2) of this section for the period between June 1 of the first year and May 31 of the following year.

7. The stumpage rate for a road permit granted to the holder of a timber sale licence entered into under section 20 of the *Forest Act* will be the same as the stumpage rate for the timber sale licence which entitled the licensee to apply for the road permit.

8. Except as provided in Appendix VI, the stumpage rate for a road permit shall be redetermined on June 1 of each year in accordance with the procedure in this section.

9. 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 licensees' first fully appraised tributary cutting authority. These roads will not be considered as existing roads under section 4.3.1.1.3(2).

10. No information from a billing history record may be used in the determination of a weighted average sawlog stumpage rate under this section if the information on the record is in a horizontal line of information that contains a negative number.

6.3.1 Blanket Salvage Cutting Permits

1. In this section the area of a forest district or the area of a timber supply area does not include the area of a park located within that district or timber supply area.

2. Except as provided in subsection (3) or subsection (5) of this section the stumpage rate for a blanket salvage cutting permit shall be the weighted average sawlog stumpage rate for:

   a. all cutting authorities authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber in the same forest district as is the land in which the blanket salvage permit cutting authority area is located, and that have been issued under the same licence, or

   b. if the licence permitting the granting of the blanket salvage permit has an allowable annual cut of 3 000 m^3 or more per year, and there are no records from which the weighted average sawlog stumpage rate may be determined under:

      i. paragraph (a), then, except as provided under subsection (5) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the smaller of the area of the same forest district or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located, or

      ii. paragraphs (a) or (b)(i), then, except as provided under subsection (6) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the larger of the area of the same forest district

or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located, or

c. if the licence permitting the granting of the blanket salvage permit has an allowable annual cut of less than 3 000 m^3 per year, and there are no records from which the weighted average sawlog stumpage rate may be determined under:

i. paragraph (a), then, except as provided under subsection (5) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that are for licences that have an allowable annual cut of less than 3 000 m^3 in the smaller of the area of the same forest district or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located, or

ii. paragraphs (a) or (c)(i), then, except as provided under subsection (5) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that are for licences that have an allowable annual cut of less than 3 000 m^3 in the larger of the area of the same forest district or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located, or

iii. paragraphs (a), (c)(i) or (c)(ii) then, except as provided under subsection (5) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the smaller of the area of the same forest district or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located, or

iv. paragraphs (a), (c)(i), (c)(ii) or (c)(iii) then, except as provided under subsection (5) of this section, all cutting authorities, authorizing harvesting on cutting authority areas that have been fully appraised, that authorize the harvesting of timber on land located in the larger of the area of the same forest district or the area of the same timber supply area in which the blanket salvage permit cutting authority area is located.

3. If there are no records from which the weighted average sawlog stumpage rate may be determined under paragraphs (a), (b) or (c) of subsection (2), then the stumpage rate for each species of coniferous timber must be the determined, using Table 6-1 for the forest zone in which the blanket salvage cutting authority area is located.

4. a. In paragraph (a) of subsection (2) of this section, the weighted average sawlog stumpage rate that is in effect for the period between August 1 of one year hereinafter referred in this section to as the first year, and July 31 of the following year is determined as follows:

$$\$/m^3 = \frac{\text{(sum of Grade 1 value billed) + (sum of Grade 2 value billed)}}{\text{(sum of Grade 1 volume billed) + (sum of Grade 2 volume billed)}}$$

b. Subject to subsection (8) of this section volumes and values in the formula above are taken from the billing history records for coniferous sawlogs during the 12-month billing period ending on March 31 in the first year, if the volume of those coniferous sawlogs is greater than 500 cubic metres.

5. A fully appraised cutting authority issued under a woodlot licence that has a non-adjusting stumpage rate at any time during the twelve-month billing period ending on March 31 in the first year may not be used to determine a stumpage rate under paragraphs (b) and (c) of subsection (2) of this section for the period between August 1 of the first year and July 31 of the following year.

6. a. In paragraphs (b) and (c) of subsection (2) of this section, the weighted average sawlog stumpage rate that is in effect for the period between August 1 of one year in this subsection hereinafter referred to as the first year, and July 31 of the following year is determined as follows:

$$\$/m^3 = \frac{\text{(sum of Grade 1 value billed) + (sum of Grade 2 value billed)}}{\text{(sum of Grade 1 volume billed) + (sum of Grade 2 volume billed)}}$$

b. Subject to subsection (8) of this section, volumes and values in the formula above are taken from the billing history records for coniferous sawlogs during the 12-month billing period ending on March 31 in the first year, if the volume of those coniferous sawlogs is greater than 500 cubic metres.

7. Except as provided in Appendix VI, the stumpage rate for a blanket salvage cutting permit shall be redetermined on August 1 each year in accordance with the procedure in this section.

8. No information from a billing history record may be used in the determination of a weighted average sawlog stumpage rate under this section if the information on the record is in a horizontal line of information that contains a negative number.

6.4 Salvage Timber Stumpage Rates

1. This section applies to cutting authorities issued under licences which do not have an allowable annual cut. Salvaged timber is either post harvest material or damaged timber:

2. Post Harvest Material is either:

    a. wooden culverts and bridges, or

    b. post logging residue.

3. Damaged Timber is timber that:

    a. Has been blown down,

    b. Has been damaged by fire, disease, snow press, or

    c. Will die within one year, as determined by the district manager, as a result of the affects of the mountain pine beetle, or other forest pests.

4. The criteria and methodology for the calculation of salvaged timber stumpage rates are:

    a. Post harvest material may not be combined in the same cutting authority area with damaged timber.

    b. Except where damage to adjacent or contiguous timber occurs after harvesting is completed on the adjacent primary logging cutting permit area and the harvesting equipment has been demobilized from the area, damaged timber salvage cutting authority areas must be scattered, and not be adjacent to or contiguous with an existing cutting authority area.

    c. Except as provided in subsection (4)(d) of this section the total area of a clearcut salvage harvesting area shall not exceed 5 hectares.

    d. Where salvage of only damaged stems through partial cutting will leave a stand that meets minimum stocking standards, the area harvested may be larger than 5 hectares.

    e. Salvage logging stumpage rates may only be determined for a cutting authority where more than one-third of the volume of coniferous timber to be harvested in the cutting authority area is damaged timber.

    f. Post harvest salvage may only occur after primary logging has been satisfactorily completed and residue and waste assessments have been submitted to and accepted by the Ministry.

g. Salvage cannot occur on a road right-of-way which has an active timber mark associated with it.

h. Except as provided in section 2.2.2, a stumpage rate determined under this section is fixed for the term of the cutting authority and all extensions.

5. Where salvaged timber is damaged timber,

   a. the stumpage rate for each species of the salvaged timber will be determined using the schedule of Sawlog Stumpage Rates for Salvage of Damaged Timber by Forest Zone and Species found in Table 6-2.

   b. effective April 1, 2007, where the licensee is not required to establish a free growing crop of trees on the cutting authority area, the stumpage rate for each species of timber shall be the sum of rate determined under paragraph (a) of this subsection and the silviculture levy determined under section 5.6.4.

6. Where the source of the salvaged timber is post harvest material, the stumpage rate for each species of timber will be determined using the schedule of Sawlog Stumpage Rates of Post Harvest Material by Forest Zone and Species found in Table 6-3.

Table 6-2 Coniferous Average Sawlog Stumpage Rates for Salvage of Damaged Timber by Forest Zone and Species in $/m^3

FOREST ZONE	BALSAM	CEDAR	FIR	HEMLOCK	LARCH	L. PINE	SPRUCE	Y. PINE	OTHER
North Central	8.35	-	10.83	8.29	-	9.55	12.61	-	7.88
North East	1.62	-	-	-	-	3.95	5.57	-	3.35
North West	2.30	3.09	-	2.29	-	2.57	4.32	-	2.29
South East	9.23	20.12	13.43	9.32	11.84	10.74	14.13	1.46	9.12
South West	7.79	8.13	11.14	5.92	14.48	8.37	11.74	9.07	7.05

Table 6-3 Coniferous Average Sawlog Stumpage Rates for Salvage of Post Harvest Material by Forest Zone and Species in $/m^3

FOREST ZONE	BALSAM	CEDAR	FIR	HEMLOCK	LARCH	L. PINE	SPRUCE	Y. PINE	OTHER
North Central	3.48	-	6.02	3.45	-	6.37	7.00	-	3.28
North East	0.68	-	-	-	-	2.63	3.09	-	1.40
North West	0.96	2.75	-	0.95	-	1.71	2.40	-	0.96
South East	3.85	17.89	7.46	3.89	6.58	7.16	7.85	0.97	3.80
South West	3.24	7.22	6.19	2.47	8.04	5.58	6.52	6.05	2.94

6.5 Decked and Partially Harvested Timber

1. When decked timber only is advertised for sale to the highest bidder, the upset stumpage rate for the timber shall be the total of the silviculture levy determined under section 5.6.4 and:

    a. The prescribed minimum stumpage rate if the timber has been decked for over three years, or

    b. Seventy percent of the stumpage rate from Table 6-2 for the applicable species and forest zone if the timber has been decked for three years or less.

2. When decked timber only is sold directly without the use of the competitive bidding process, the stumpage rate for the timber shall be the total of the silviculture levy determined under section 5.6.4 and:

    a. The district's variable cost to prepare the timber for sale if the timber has been decked for over three years, or

    b. The stumpage rate from Table 6-2 for the applicable species and forest zone if the timber has been decked for three years or less.

3. When partially harvested timber only is advertised for sale to the highest bidder the upset stumpage rate for the timber shall be the total of the silviculture levy determined under section 5.6.4 and:

    a. The prescribed minimum stumpage rate, if three years or more have passed since the timber was felled, or

    b. Seventy percent of the stumpage rate for the applicable species and forest zone from Table 6-3 if less than three years have passed since the timber was felled.

4. When partially harvested timber only is sold directly without the use of the competitive bidding process, the stumpage rate for the timber shall be the total of the silviculture levy determined under section 5.6.4 and:

    a. The district's variable cost to prepare the timber for sale if three years or more have past since the timber was felled, or

    b. The stumpage rate from Table 6-3 for the applicable species and forest zone if less than three years have passed since the timber was felled.

5. a. Where applications for decked timber or partially harvested timber being sold to the highest bidder have been invited with an upset stumpage rate determined under subsections 1(b), 3(b) and 6(a) of this section and no applications have been received, the upset stumpage rate shall be the rate approved by the Regional Manager.

b. Where the Regional Manager does not anticipate that applications will be received for decked timber or partially harvested timber being sold to the highest bidder due to market conditions or timber profile, the upset stumpage rate determined under subsections 1(b), 3(b) and 6(a) of this section shall be the rate approved by the Regional Manager.

c. An upset stumpage rate determined under paragraphs (a) or (b) of this subsection shall not be less than the District's variable cost to prepare the timber for sale.

6. a. Where applications for a forestry licence to cut that applies to both decked timber and partially harvested timber have been invited, the upset stumpage rate shall be the total of the rate determined using the procedures in subsections (1) of this section, as if the timber was all decked timber and the silviculture levy determined under section 5.6.4.

b. Where a forestry licence to cut that applies to both decked timber and partially harvested timber is entered into directly without the use of the competitive bidding process the stumpage rate shall be the total of the rate determined using the procedure in subsection 2 of this section as if the timber was all decked timber and the silviculture levy determined under section 5.6.4.

7. Where the upset stumpage rate or the stumpage rate has been determined using this section the total stumpage rate shall be fixed for the term of the cutting authority and all extensions.

8. An upset stumpage rate calculated under this section must be calculated using the *Interior Appraisal Manual* in effect on the date that the rate is determined (appraisal effective date).

9. Not withstanding any other paragraph of this section the stumpage rate shall not be less than the minimum stumpage rate.

6.6 Miscellaneous Stumpage Rates

1. The stumpage rates, at the time of scale for timber harvested for the purposes described, in the districts listed, in the forest district specific section of Table 6-4 are as prescribed in that table.

Table 6-4 Miscellaneous Stumpage Rates

All Interior Forest Regions

Species	Code	Product	Reserve Stumpage Rate
All Species	SB	Shake & Shingle Bolts, Blocks and Blanks.	$5.30/m^3
All Species	SK	Shakes	$6.00/m^3
Cedar	PR	Posts & Rails (Split and Round)	$3.00/m^3
All other Species	PR	Posts & Rails (Split and Round)	$1.20/m^3
All Species	MT	Mining Timbers	$3.00/m^3
All Species	FW	Firewood	$0.50/m^3
Yew		All	$0.25/m^3
All Species		All post harvest material where a waste assessment has been made and the material will be chipped or ground at the roadside or the landing	$0.25/m^3
All Species		Grades 4 and 6, except where the upset stumpage rate is determined under section 6.2.1(1)(b),(c) and 7.5.1(7)	$0.25/m^3
Deciduous Species		All, except grades 4 and 6 and except where the upset stumpage rate is calculated under section 6.2.1(1)(b),(c) and 7.5.1(7)	$0.50/m^3
All Species		Stakes & Sticks.	$1.20/m^3
All Species	XM	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		Marine Beachcomb	$0.70/m^3
All Species		Trees classified as "Dead Potential" on Cruise-based cutting authorities (except where the MPS upset stumpage rate is calculated under Section 7.5.1(7))	$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 of Activity	Forest District	Reserve Stumpage Rate
New Crown land area disturbed for mining exploration trails, seismic lines[1], gas or oil well sites and right-of-way to well sites. [2]	Rocky Mountain Peace Ft. Nelson Mackenzie	$2,771/ha $1,284/ha $773/ha $1,404/ha

[1] The corresponding district reserve stumpage rate from the above table is adjusted according to the category of line clearing as follows:

Category 1 - no adjustment
Category 2 - 1/2 of the reserve stumpage rate
Category 3 - 1/3 of the reserve stumpage rate

The gross area for each category reported as new line on either; the Oil and Gas Commission's Geophysical Final Plan cover sheet or an As Cleared Plan is multiplied by the reserve stumpage rate as adjusted above (refer to Appendix V for category definitions).

[2] For pipe line rights-of-way a stumpage rate must be determined by using the above rates for cutting authorities containing 2 000 m^3 or less, of merchantable coniferous volume. For pipe line rights-of-way cutting authorities greater than 2 000 m^3 see section 6.7.

6.6.1 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.

6.7 Linear Tenures

1. For this section:

   "Linear tenures" means a licence to cut issued for:

   - A right-of-way to a mine site, or
   - A pipeline right-of-way where the volume of timber on the cutting authority area is greater than 2 000 cubic metres, or
   - A pipeline right-of-way where the volume is 2 000 m3 or less in a district other than Fort Nelson, Peace, Mackenzie, or Rocky Mountain, or
   - A hydro transmission line,
   - A highway right-of-way for a road administered by the *Ministry of Transportation*, or
   - A fence line or protection of a fence line on Crown range administered by the ministry under the *Range Act*.

   "Licensee" means the licensee who has been issued a linear tenure.

   "Weighted average sawlog stumpage rate" means the weighted average sawlog stumpage rate determined in accordance with section 6.3(4).

2. The stumpage rate for a linear tenure shall be:

   a. The weighted average sawlog stumpage rate for all cutting authorities in the smaller of the same forest district, timber supply area or region in which the entire cutting authority area for the linear tenure is located, or

   b. If a weighted average sawlog stumpage rate is not available for the area in paragraph (a) above, then the weighted average sawlog stumpage rate for the next largest area.

3. The cost of roads constructed on the cutting authority area for a linear tenure are only eligible for inclusion as part of the development cost estimate in the licensee's first fully appraised tributary cutting authority area if those cost were not used in a full appraisal under paragraph (4) of this section.

4. Notwithstanding any other paragraph in this section the stumpage rate for a linear tenure may be determined through a full appraisal using the best information available to the person who determines the stumpage rate.

5. A stumpage rate determined under this section shall be fixed for the term of the linear tenure and all extensions.

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Market Pricing System - BCTS 7

7.1 MPS Introduction

1. The Market Pricing System (the MPS) for BCTS is the basis for determining sawlog stumpage rates for timber sale licences and forestry licences to cut entered into under section 20 and 47.6 (3) of the *Act* or section 21 of the former *Act*, subject to the prescribed minimum stumpage rate.

2. a. The MPS for BCTS can only be used in the appraisal of a BCTS cutting authority area where data is available to do a full appraisal.

   b. Where the data is not available to do a full appraisal of a cutting authority area, the appraisal must use the procedures outlined in chapter 6 of this manual.

7.2 MPS Principles and Procedures

7.2.1 MPS Appraisals

1. The MPS upset stumpage rate must be calculated using the *Interior Appraisal Manual* in effect on the date that the rate is determined (appraisal effective date).

2. Except as provided in Appendix VI, all MPS upset stumpage rates on Section 20 timber sale licences advertised on or after November 1, 2003 and Forestry Licences to Cut entered into under section 47.6(3) of the *Forest Act* are fixed for the term of the timber sale and all extensions except where:

   a. a reappraisal is done under section 2.2.1(1)(d) due to sudden and severe damage, or

   b. a Minister's directed reappraisal is done under section 2.2.2.

7.2.2 MPS Stumpage Adjustments

1. Cutting authorities issued under Timber Sale licences that were advertised for sale prior to November 1, 2003, that elected to have, or have adjustable stumpage rates, the stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1, of each year.

2. At the time of the quarterly adjustment, the MPS upset stumpage 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. Except as provided in Appendix VI, all other data remain unchanged.

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

7.2.3 Reappraisals for MPS Appraisals

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

7.2.4 Methodology

1. Except as provided in Appendix VI, the following methodology must be used for the calculation of the MPS upset stumpage rate:

    a. 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.

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

    c. Calculate the MPS upset stumpage rate according to section 7.5.

2. Except as provided in section 7.5.3(3) or (4) one stumpage rate is determined for all appraised coniferous sawlogs in each cutting authority area.

3. Where the MPS upset stumpage rate has been calculated under section 7.5.1(5) one stumpage rate is determined for all appraised coniferous and deciduous sawlogs in each cutting authority area.

4. All other products are priced using miscellaneous stumpage rates as prescribed under section 6.6.

7.3 MPS Selling Prices

1. Selling prices for MPS are based on three-month averages of schedules of lumber values collected and published monthly by Revenue Branch. When the MPS values are compiled and distributed they become an integral part of this manual.

7.3.1 MPS Lumber Average Market Values

1. Monthly market value information for the interior is obtained by Revenue Branch from lumber producers located in each average market value zone. The zones are defined by point of appraisal (see section 4.1.1). Average market values (AMV) for each species are compiled by dividing total sales value by total sales volumes for each zone.

2. The volume that is manufactured to Canadian Lumber Standard/American Lumber Standard (CLS/ALS) sizes is reported in foot board measure (fbm). Lumber manufactured in non-CLS/ALS sizes is adjusted to equivalent CLS/ALS sizes. The total volume for each species includes all sizes and grades of rough and dressed lumber in the green and dried state. Also included is finger-jointed lumber and machine stress rated lumber.

3. The total net sales value for each species or species group is reported in Canadian dollars FOB mill. These sales values are rolled up into three-month averages each month. There is approximately a one-month lag in reporting.

7.3.2 Calculation of Species Lumber Selling Price

1. The total lumber selling price (SP) in $\$/m^3$ is determined for each species using lumber recovery factors (LRF) from the cruise compilation summary, LRF update add-ons and current applicable lumber average market values (AMV) for the species and zone.

    a. Zonal LRF update add-ons are found in Table 7-1, by species.

    b. Lumber AMVs as published every month.

    c. Calculation of total species lumber selling price.

        i. Appraisal LRF = Cruise LRF + LRF update add-on

        ii. Species SP ($/m3) = Species AMV($/mbm)/1000 * Appraisal LRF

    d. The stand SP is the volume-prorated sum of the species SP.

e. The real stand SP (RSP) is the stand SP divided by CPIF, as defined in section 7.4.1.

Table 7-1 LRF Update Add-ons for MPS

Species	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Lodgepole Pine	101	74	95	108	93
Spruce	122	100	119	129	111
Balsam	114	94	108	122	102
Douglas Fir	91	-	82	98	-
Larch	87	-	82	98	-
Cedar	66	45	64	74	-
Hemlock	68	48	67	79	-
White Pine	85	-	80	94	-
Yellow Pine	-	-	83	102	-

7.4 Market Price Calculation

The market price must be calculated in accordance with this section

7.4.1 Market Price Variables

The calculation of each market price variable must include the total net deciduous volume unless otherwise indicated in the description of that variable below.

MP	=	Market Price for the cutting authority in ($/$m^3$).
RSP	=	Real Stand Selling Price for coniferous species ($/$m^3$). See section 7.3.
PC	=	Fraction of harvest method volume that is appraised as partial cut. PC = (100 – CAPCUT %)/100. See section 4.9 for definition of CAPCUT %. The 80% limit in section 4.9 does not apply.
FIR	=	Fraction of total net coniferous volume that is Douglas fir.
VOL	=	Total net coniferous volume (m^3).
CY	=	Fraction of total harvest method volume that is appraised as overhead cable yarding.
HP	=	Fraction of total harvest method volume that is appraised as helicopter yarding.
HORSE	=	Fraction of total harvest method volume that is appraised as horse yarding.
FIRE	=	Fraction of total net coniferous volume that is fire damaged.
CYCLE	=	Hauling round trip cycle time (Primary CT (hrs) + Secondary CT (hrs)). See section 4.5.1.
HB	=	Fraction of total net coniferous volume that is hemlock and balsam.
CEDAR	=	Fraction of total net coniferous volume that is cedar.
VPT	=	Cutting permit average volume per tree from cruise (m^3).
DECID	=	Total net deciduous volume (m^3) / (total net deciduous volume (m^3) + total net coniferous volume (m^3)).
SLOPE	=	Cutting permit average slope from cruise (%).

DANB	=	Average number of bidders by district from the auction dataset (see Table 7-2).
DECAY	=	Prorated coniferous species decay (%) from cruise/100.
Z9	=	Fort Nelson - Peace selling price zone variable. Z9 = 1 if cutting authority is appraised with selling price zone 9, otherwise Z9 = 0.
AUC2007	=	2007 Auctions variable. AUC2007 = 1.
DECK	=	DECK_VOL / VOL
DECK_VOL	=	The total net coniferous volume that has been felled and decked in the timber sale (m^3).
HWY	=	1 if primary haul method is Highway, otherwise HWY = 0.
GO	=	Fraction of the total net coniferous volume that is Lodgepole pine green attack plus the fraction of total net coniferous volume that is other attack.
RG	=	Fraction of the total net coniferous volume that is Lodgepole pine red attack plus the fraction of the total net coniferous volume that is Lodgepole pine grey attack.
ER	=	Exchange Rate ($US/$C). Bank of Canada three-month average rate beginning four months prior to the stumpage rate effective date, as published by Revenue Branch.
CD	=	Competitive Deciduous Equals 1 if the upset stumpage rate is determined under section 7.5.1(5), otherwise CD = 0.
CPI	=	Monthly B.C. Consumer Price Index (CANSIM 326-0020, 2002 = 100) x 1.1787.
CPIF	=	Consumer Price Index Factor calculated as CPI/109.3.

Table 7-2 District Average Number of Bidders (DANB)

Forest District	DANB	Forest District	DANB
100 Mile House	4.3	Kootenay Lake	3.9
Arrow Boundary	3.2	Mackenzie	2.3
Cascades	5.0	Nadina	5.1
Central Cariboo	4.8	Okanagan Shuswap	4.2
Chilcotin	2.1	Peace	3.4
Columbia	3.8	Prince George	3.5
Fort Nelson	2.5	Quesnel	4.4
Fort St. James	2.9	Rocky Mountain	3.7
Headwaters	4.8	Skeena Stikine	3.0
Kalum	2.5	Vanderhoof	2.7
Kamloops	4.6		

7.4.2 Market Price Equation

Using the variables defined in section 7.4.1, the selling price calculated in section 7.3.2 and the equation below, calculate the market price (MP).

MP = [50.80 + 0.193 * RSP – 3.88 * PC + 7.34 * FIR + 2.36 * ln (VOL/1000) – 8.21 * CY – 61.08 * HP – 9.21 * HORSE – 16.14 * FIRE – 1.75 * CYCLE – 21.75 * HB + 37.24 * CEDAR – 1.37 * [(1/VPT) * (1 – HB)] – 7.77 * [DECID * (1 – CD)] – 0.0244 * SLOPE + 0.678 * DANB – 19.43 * DECAY – 4.60 * Z9 – 3.86 * AUC2007 + 6.58 * ln (VPT) + 85.18 * DECK + 0.343 * HWY – 6.79 * GO – 9.10 * RG – 22.23 * ER – 16.58 * CD] * CPIF

If MP less than $0.25 then MP = $0.25

7.4.3 Specified Operations

The following only are identified as specified operations. Cost estimates from the current *Interior Appraisal Manual* are used for 1, 2 and 3 below.

1. Rail Haul

   Rail haul including truck to rail transfer and rail transport.

2. Barge/Ferry

   Barge/ferry used for truck haul (private).

   Barge/ferry not used for truck haul (private).

3. Dump, Boom, Tow, Dewater, Reload

   Dump, boom

   Tow

   Dewater and reload.

4. Camp Costs

   Cost estimate is $\$2.69/m^3$.

5. Skyline Yarding

   Cost estimate is $\$8.42/m^3$ for the volume appraised as skyline.

6. High Development Cost

   Where the development cost estimate (DC) determined under chapter 4, is greater than $\$3.51/m^3$ the high development cost specified operations estimate (HDC) is calculated as follows:

   HDC $/m^3 = DC – 1.35

   If DC < = 3.51 HDC = 0

7.5 MPS Stumpage Rate

7.5.1 MPS Upset Stumpage Rate

1. Except as provided in subsections (2), (3), (4), (5), (6) and (7), the MPS upset stumpage rates for a timber sale licence advertised on or after December 2, 2005, shall be determined in accordance with section 7.5.2.

2. Where applications for a timber sale licence with an MPS upset stumpage rate determined in accordance with section 7.5.1(1) have been invited but no applications have been received, the MPS upset stumpage rate shall be the rate requested by the timber sales manager and approved by the Director of Operations, BC Timber Sales.

3. Where the Director of Operations, BC Timber Sales does not anticipate that applications for a timber sale licence will be received due to market conditions or timber profile the MPS upset stumpage rate shall be the rate requested by the timber sales manager and approved by the Director of Operations, BC timber sales.

4. The MPS upset stumpage rate determined under subsections (2), (3), or (7) of this section shall not be less than the variable cost per cubic meter to prepare the timber for sale calculated by the Timber Sales Manager.

5. a. Except as provided in paragraphs (b) and (c) of this subsection, the MPS upset stumpage rate for a timber sale licence where the volume of deciduous timber to be harvested on the cutting authority area is equal to or greater than sixty percent of the total net cruise volume, shall be determined in accordance with section 7.5.2 except that the market price determined under section 7.4.2 shall use CD = 1.

   b. Subject to paragraph (c) of this subsection, where an MPS upset stumpage rate for a timber sale licence has been calculated under paragraph (a) of this subsection and

      i. Applications for the licence have been invited but no applications have been received, or

      ii. The Director of Operations, BC Timber Sales does not anticipate that application for the licence will be received due to market conditions or timber profile,

      then the MPS upset stumpage rate shall be the rate requested by the timber sales manager and approved by the Director of Operations, BC Timber Sales.

   c. i. if the upset stumpage rate calculated under paragraph (a) of this subsection is less than the variable cost to prepare the timber for sale calculated by the Timber Sales Manager, the upset stumpage rate shall be the variable cost to prepare the timber for sale calculated by the Timber Sales Manager,

ii. the rate requested under paragraph (b) of this subsection shall not be less than the variable cost to prepare the timber for sale calculated by the Timber Sales Manager.

6. a. The MPS upset stumpage rate for decked timber or partially harvested timber that is over three years old and is administered by the Timber Sales Manager, shall be the prescribed minimum stumpage rate when that is requested by the Timber Sales Manager.

   b. The MPS upset stumpage rate for decked timber or partially harvested timber that has been decked or felled for three years or less and is administered by the Timber Sales Manager shall be the rate requested by the Timber Sales Manager. The upset stumpage rate requested by the Timber Sales Manager shall not be less than the variable cost to prepare the timber for sale.

7. Where the timber authorized for harvest under a timber sale licence is low quality (including Mountain Pine beetle attacked and pulp quality) timber, and the invitation to tender requires a bonus offer, and where the amount of stumpage payable will be based on a cruise of the timber under section 106 of the *Act*, the MPS upset stumpage rate shall be the rate approved by the Director of Operations, BC Timber Sales. This section will expire on August 15, 2009.

8. Not withstanding anything else in this section the MPS upset stumpage rate must not be lower than the prescribed minimum stumpage rate.

7.5.2 Upset Stumpage Rate Calculation

The upset stumpage rate (USR) is calculated as follows:

USR = (MP – SO) x (1-DF)

Where:

USR	=	Upset stumpage rate
MP	=	Market Price as defined in section 7.4.2
SO	=	Specified operations as defined in section 7.4.3.
DF	=	0.00 if the cutting authority being appraised was entered into under section 47.6(3) of the *Forest Act*, otherwise DF = 0.30

7.5.3 Total MPS Stumpage Rate

1. Except as provided in subsections (2), (3) and (4) of this section, the total MPS stumpage rate is the sum of the MPS upset stumpage rate and the bonus bid.

2. Where the MPS upset stumpage rate is determined under subsections (1), (2), (3), and (6) of section 7.5.1, or section 7.5.2, the total MPS stumpage rate applies to Grade Code 1 and 2 coniferous sawlogs.

3. Where the MPS upset stumpage rate is determined under section 7.5.1(5), the total MPS stumpage rate applies to Grade Code 1 and 2 coniferous and deciduous sawlogs.

4. Where the MPS upset stumpage rate is determined under section 7.5.1(7), the total MPS stumpage rate applies to the timber species and volumes specified by the Director of Operations, BC Timber Sales.

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Appendices

Appendix I Equipment and Labour Rates

(Cost Base July 1, 2006)

MACHINE DESCRIPTION	TYPICAL MODEL	$/HOUR
Crawler Tractor	Cat D9R, Komatsu D275	282.50
Crawler Tractor	Cat D9N (years: 1996 thru 2000)	256.85
Crawler Tractor	Cat D8R, Komatsu D155AX-5	215.40
Crawler Tractor	Cat D7R, Komatsu D65/85	184.35
Crawler Tractor	Cat D6, Dresser TD15, Komatsu D61	146.50
Crawler Tractor	Cat D5, Case 850, Komatsu D39	122.90
Rock Drill (includes labour)	Compressor: 750 cfm on tank chassis	222.02
Grader	Cat 140H, Komatsu GD750	133.25
Front End Loader (Gravel)	Cat 966G, Komatsu WA450-3, Case 921C	152.40
Front End Loader (Logs)	Cat 972G, Kawasaki 90ZV, Volvo L180D	176.75
Hydraulic Excavator incl. Brush Guard & Thumb	Hitachi EX450LC, Komatsu PC400HD	260.04
Hydraulic Excavator incl. Brush Guard & Thumb	Komatsu PC400 LC-6	214.01
Hydraulic Excavator incl. Brush Guard & Thumb	Hitachi EX330LC, Komatsu PC300	188.71
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 325BL, Hitachi EX270LC, Deere 270LC	172.92
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 322CL, Komatsu PC220LC, JD 230LC	159.78
Hydraulic Excavator incl. Brush Guard & Thumb	Cat 320CL, Hitachi EX200LC-5, JD 200CLC	149.22
Gradall	Volvo EW 180	172.75
Logging Truck (Highway)	All Triaxle (6axle unit)r	107.20
Self Loading Log Truck	Highway log truck + 5 tonne deck crane	119.50
Gravel Truck	10.7 m^3 (14 cu. yd.)	92.24
Gravel Truck Articulated (labour included)	25 - 30 tonne: Cat 730, Deere 300C	149.50
Gravel Truck Articulated (labour included)	20 - 25 tonne: Cat 725, Terex TA25	133.05
Lowbed	5 axle unit: tandem tractor and lowbed	96.90
Lowbed	7 axle unit: A or B Train (or triple axle with booster)	123.60
Concrete Mix Truck	6.1 m^3	94.55
Concrete Vibrator (labour not included)	5 m^3	4.78
Concrete Mixer (labour not included)	0.17 m^3	7.25
Crane - Truck Mounted	18 tonne	105.40
Soft Track Skidder	KMC/FMC 2100/2400 (out-of-date model)	140.95
Rubber Tired Skidder	Cat 515, Clark H-66-G (out-of-date model)	99.35
Vibrator Compactor	Cat 515 plus 2.7 t to 3.6 t roller	113.10
Tractor and Grid Roller	Cat 515 plus grid roller	113.90
Labourer	Group I: Includes 40% payroll loading	32.65
Roadman	Group II: Includes 40% payroll loading	32.92
Crib/Culvert Maker, Powderman	Group VII: Includes 40% payroll loading	34.57
Landingman	Group VIII: Includes 40% payroll loading	35.01
Rockdriller & Powderman (for load & blast only)	Group VII & XI: Includes 40% payroll loading	75.27
Bridgeman	Tradesman: Includes 40% payroll loading	41.51
Powersaw (labour not included)	All: one man, 20 inches + bar	3.45
Faller, including powersaw cost	Includes 40% payroll loading	61.73

Sources:

2006 B.C. Road Builders & Heavy Construction Association, Equipment Rental Rate Guide (rates based on a 3-year old machine), and IWA agreement rates including payroll loading.

1. Except as provided in (6), the rates shown in Appendix I will be used for all detailed engineering cost estimates made under section 4.3.3 of this manual.

2. The machine rate includes labour for the operator (all found). There are no additions.

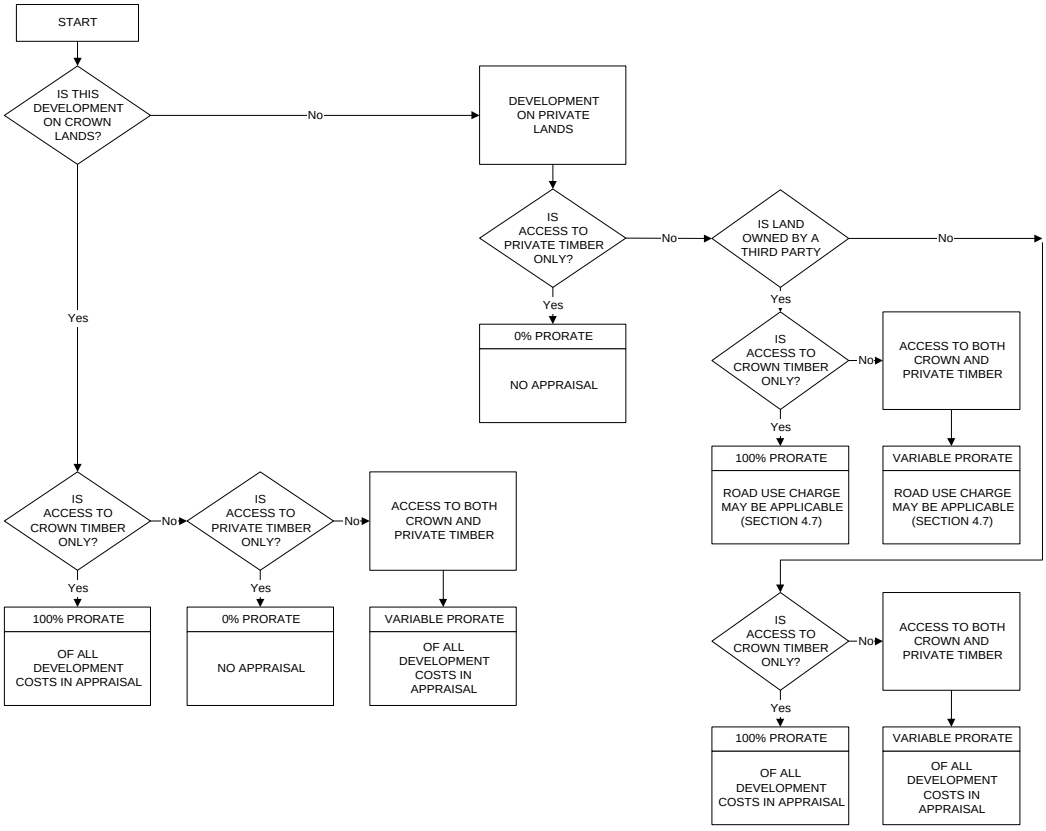
3. Notwithstanding (4) and (5), crew transportation, supervision and camp / cookhouse costs where applicable are included in this manual and no additions are permitted.

4. Licensees that incur camp costs (as defined in section 4.8.2(2)) and recovers the said camp costs from a contractor and credits an account, in the books of the licensee, are permitted $50.00 per person day for staying at the camp.

5. Licensees that incur costs for crew transportation and/or accommodation as part of Detailed Engineering Cost Estimates, which are not included in the standard phase costs of this manual are permitted $50.00 per person day.

6. Use of equipment rates not listed in this appendix must be approved by the Regional Timber Pricing Co-ordinator.

Appendix II Development Cost Allocation



Crown Timber = Appraised timber including appraised Timber Licences

Private Timber = Non-appraised timber

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

Appendix III Relative Soil Moisture to Absolute Soil Moisture Conversion Table

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
SIR	BG	xh1	ED	ED	ED	ED	ED	SD	M	W
SIR	BG	xh2	ED	ED	ED	ED	ED	SD	M	W
SIR	BG	xh3	ED	ED	ED	ED	ED	SD	M	W
SIR	BG	xw1	ED	ED	ED	ED	ED	SD	M	W
SIR	BG	xw2	ED	ED	ED	ED	ED	SD	M	W
SIR	ESSF	dc1	VD	MD	MD	SD	SD/F	M	VM	W
SIR	ESSF	dc2	VD	MD	MD	SD	SD/F	M	VM	W
SIR	ESSF	dk	VD	MD	MD	SD	SD/F	M	VM	W
SIR	ESSF	dv	VD	MD	MD	SD	SD/F	M	VM	W
SIR	ESSF	mw	VD	MD	MD	SD	F	M	VM	W
SIR	ESSF	vc	MD	SD	SD	F	M	VM	VM	W
SIR	ESSF	vv	MD	SD	SD	F	M	VM	VM	W
SIR	ESSF	wc1	MD	MD	SD	F	M	M	VM	W
SIR	ESSF	wc2	MD	MD	SD	F	M	M	VM	W
SIR	ESSF	wc3	MD	MD	SD	F	M	M	VM	W
SIR	ESSF	wc4	MD	MD	SD	F	M	M	VM	W
SIR	ESSF	wk1	MD	MD	SD	F	M	M	VM	W
SIR	ESSF	wm	MD	MD	SD	F	F	M	VM	W
SIR	ESSF	xc	VD	VD	MD	MD	SD	M	VM	W
SIR	ESSF	xv	VD	VD	MD	MD	SD	F	M	W
SIR	ICH	dk	VD	VD	VD	MD	SD	M	VM	W
SIR	ICH	dw1	VD	VD	MD	SD	F	M	VM	W
SIR	ICH	dw2	ED	ED	VD	MD	SD	M	VM	W
SIR	ICH	mk1	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	mk1	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	mk2	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	mk3	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	mw1	VD	MD	MD	SD	F	M	VM	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
SIR	ICH	mw2	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	mw3	VD	MD	MD	SD	F	M	VM	W
SIR	ICH	vk1	MD	MD	SD	F	M	M	VM	W
SIR	ICH	wk1	VD	MD	SD	F	F	M	VM	W
SIR	ICH	wk2	VD	MD	SD	F	F	M	VM	W
SIR	ICH	wk4	VD	MD	SD	F	F	M	VM	W
SIR	ICH	xw	VD	VD	VD	MD	SD	M	VM	W
SIR	IDF	dk1	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	dk2	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	dk3	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	dk4	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	dm1	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	dm2	ED	VD	VD	VD	MD	F	M	W
SIR	IDF	mw1	VD	VD	VD	MD	SD	F	VM	W
SIR	IDF	mw2	VD	VD	VD	MD	SD	F	VM	W
SIR	IDF	u	ED	VD	VD	MD	MD	F	VM	W
SIR	IDF	ww	VD	VD	VD	MD	SD	F	M	W
SIR	IDF	xh1	ED	ED	VD	VD	MD	SD	M	W
SIR	IDF	xh2	ED	ED	VD	VD	MD	SD	M	W
SIR	IDF	xm	ED	ED	VD	VD	MD	SD	M	W
SIR	IDF	xw	ED	ED	VD	VD	MD	SD	M	W
SIR	MS	dc	VD	VD	VD	MD	SD	M	VM	W
SIR	MS	dk	VD	VD	VD	MD	SD	M	VM	W
SIR	MS	dm1	VD	VD	VD	MD	SD	M	VM	W
SIR	MS	dm2	VD	VD	VD	MD	SD	M	VM	W
SIR	MS	xk	VD	VD	VD	VD	MD	F	M	W
SIR	MS	xv	VD	VD	VD	MD	SD	F	VM	W
SIR	PP	dh1	ED	ED	ED	VD	VD	SD	M	W
SIR	PP	dh2	ED	ED	ED	VD	VD	SD	M	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
SIR	PP	xh1	ED	ED	ED	ED	VD	SD	M	W
SIR	PP	xh2	ED	ED	ED	ED	VD	SD	M	W
SIR	SBPS	dc	ED	ED	VD	MD	SD	F	M-VM	W
SIR	SBPS	mc	VD	VD	VD	MD	SD	F	M-VM	W
SIR	SBPS	mk	ED	VD	VD	MD	SD	F	M-VM	W
SIR	SBPS	xc	ED	ED	VD	VD	MD	SD	M	W
SIR	SBS	dw1	VD	MD	MD	SD	SD	F	M	W
SIR	SBS	dw2	VD	MD	MD	SD	SD	F	M	W
SIR	SBS	mc1	VD	MD	MD	SD	F	M	VM	W
SIR	SBS	mc2	VD	MD	MD	SD	F	M	VM	W
SIR	SBS	mh	VD	MD	MD	SD	SD	M	VM	W
SIR	SBS	mm	VD	MD	MD	SD	F	M	VM	W
SIR	SBS	mw	VD	MD	MD	SD	F	M	VM	W
SIR	SBS	wk1	VD	MD	SD	F	F	M	VM	W
NIR	BWBS	dk1	VD	MD	MD	SD	SD	F	M-VM	W
NIR	BWBS	dk2	VD	MD	MD	SD	SD	F	M-VM	W
NIR	BWBS	mw1	VD	MD	MD	SD	F	M	VM	W
NIR	BWBS	mw2	VD	MD	MD	SD	F	M	VM	W
NIR	BWBS	wk1	VD	MD	SD	SD	F	M	VM	W
NIR	BWBS	wk2	VD	MD	SD	SD	F	M	VM	W
NIR	BWBS	wk3	VD	MD	SD	SD	F	M	VM	W
NIR	CWH	vh2	SD	SD	F	F	M	VM	W	W
NIR	CWH	vm1	MD	SD	SD	F	F	M	VM	W
NIR	CWH	vm2	MD	SD	SD	F	F	M	VM	W
NIR	CWH	wm	SD	SD	SD	F	F	M	VM	W
NIR	CWH	ws1	VD	MD	MD	SD	F	M	VM	W
NIR	CWH	ws2	VD	MD	MD	SD	F	M	VM	W
NIR	ESSF	mc	VD	MD	SD	SD	F	M	VM	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
NIR	ESSF	mk	VD	MD	MD	SD	F	M	VM	W
NIR	ESSF	mm1	VD	MD	MD	SD	F	M	VM	W
NIR	ESSF	mv1	VD	MD	SD	SD	F	M	VM	W
NIR	ESSF	mv2	VD	MD	SD	SD	F	M	VM	W
NIR	ESSF	mv3	VD	MD	SD	SD	F	M	VM	W
NIR	ESSF	mv4	VD	MD	SD	SD	F	M	VM	W
NIR	ESSF	wc2	MD	MD	SD	F	M	M	VM	W
NIR	ESSF	wc3	MD	MD	SD	F	M	M	VM	W
NIR	ESSF	wk1	MD	MD	SD	F	M	M	VM	W
NIR	ESSF	wk2	MD	MD	SD	F	M	M	VM	W
NIR	ESSF	wv	MD	SD	SD	F	F	M	VM	W
NIR	ICH	mc1	VD	MD	SD	SD	F	M	MV	W
NIR	ICH	mc1a	VD	MD	SD	SD	F	M	MV	W
NIR	ICH	mc2	VD	MD	SD	SD	F	M	MV	W
NIR	ICH	mm	VD	MD	MD	SD	F	M	VM	W
NIR	ICH	vc	MD	SD	SD	F	M	M	VM	W
NIR	ICH	vk2	MD	SD	SD	F	M	M	VM	W
NIR	ICH	wc	MD	MD	SD	F	F	M	VM	W
NIR	ICH	wk1	VD	MD	SD	F	F	M	VM	W
NIR	ICH	wk3	VD	MD	SD	F	F	M	VM	W
NIR	ICH	wk4	VD	MD	SD	F	F	M	VM	W
NIR	MH	mm1	SD	SD	F	F	F	M	VM	W
NIR	MH	mm2	SD	SD	F	F	F	M	VM	W
NIR	MH	wh	SD	SD	F	F	F	M	VM	W
NIR	SBPS	mc	VD	VD	VD	MD	SD	F	M-VM	W
NIR	SBS	dh	VD	MD	MD	SD	SD	F	M	W
NIR	SBS	dk	VD	MD	MD	SD	SD	F	M-VM	W
NIR	SBS	dw1	VD	MD	MD	SD	SD	F	M	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
NIR	SBS	dw2	VD	MD	MD	SD	SD	F	M	W
NIR	SBS	dw3	VD	MD	MD	SD	SD	F	M	W
NIR	SBS	mc2	VD	MD	MD	SD	F	M	VM	W
NIR	SBS	mc3	VD	MD	MD	SD	F	M	VM	W
NIR	SBS	mh	VD	MD	MD	SD	SD	M	VM	W
NIR	SBS	mk1	VD	MD	MD	SD	F	M	VM	W
NIR	SBS	mk2	VD	MD	MD	SD	F	M	VM	W
NIR	SBS	mw	VD	MD	MD	SD	F	M	VM	W
NIR	SBS	vk	MD	SD	SD	F	M	M	VM	W
NIR	SBS	wk1	VD	MD	SD	F	F	M	VM	W
NIR	SBS	wk2	VD	MD	SD	F	F	M	VM	W
NIR	SBS	wk3	VD	MD	SD	F	F	M	VM	W
CFR	CDF	mm	VD	VD	MD	MD	MD	SD	F	W
CFR	CWH	dm	VD	MD	MD	SD	F	M	VM	W
CFR	CWH	ds1	VD	MD	MD	SD	F	M	VM	W
CFR	CWH	ds2	VD	MD	MD	SD	F	M	VM	W
CFR	CWH	mm1	MD	SD	SD	F	F	M	VM	W
CFR	CWH	mm2	MD	SD	SD	F	F	M	VM	W
CFR	CWH	ms1	VD	MD	MD	SD	F	M	VM	W
CFR	CWH	ms2	VD	MD	MD	SD	F	M	VM	W
CFR	CWH	vh1	SD	SD	F	F	M	VM	W	W
CFR	CWH	vh2	SD	SD	F	F	M	VM	W	W
CFR	CWH	vm1	MD	SD	SD	F	F	M	VM	W
CFR	CWH	vm2	MD	SD	SD	F	F	M	VM	W
CFR	CWH	wh1	SD	SD	SD	F	F	M	VM	W
CFR	CWH	wh2	SD	SD	SD	F	F	M	VM	W
CFR	CWH	ws2	VD	MD	MD	SD	F	M	VM	W

Region	BEC		Relative Soil Moisture Regime Class (from field guide)							
	Zone	Subzone	0	1	2	3	4	5	6	7
CFR	CWH	xm	VD	MD	MD	SD	F	M	VM	W
CFR	ESSF	mw	VD	MD	MD	SD	F	M	VM	W
CFR	IDF	ww	VD	VD	VD	MD	SD	F	M	W
CFR	MH	mm1	SD	SD	F	F	F	M	VM	W
CFR	MH	mm2	SD	SD	F	F	F	M	VM	W
CFR	MH	wh	SD	SD	F	F	F	M	VM	W

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

Appendix IV Map Content

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

a. Cutting permit block boundaries.

b. Retention areas within the cutting permit blocks.

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

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

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

f. The geographic centre point of each cutblock and common junction of the permit.

g. Existing roads.

h. Roads to be built by type (long term, short term, temporary) and by section, as submitted in the ADS, including sections to be gravelled and or sections that are "wet" (as defined in this manual).

i. Location of roads/structures that are included in detailed engineered estimates.

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

k. Map Scale indicated using a graphic bar scale.

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

For reappraisal data submissions, reference may be made to the original map submitted. Any change to the harvest plan or area of harvest due to a "changed circumstance (section 2.2.1) during the term of the cutting authority must be mapped and submitted to the district with the ADS, for the reappraisal.

Appendix V Geophysical Clearance Line Categories

The following categories of geophysical line clearing apply to Table 6-4. All clearing activity in the categories below must follow the best practices of meandering avoidance, line of site to a maximum of 200 metres, and avoidance of merchantable timber wherever possible. Failure to employ these best practices (as determined by the district manager) will result in the line clearing being billed as Category 1. The categories are defined as follows:

Category 1 - Any line section over 100 metres in length and over 4.25 metres in width.

Category 2 - Any line section over 100 metres in length and between 3.0 metres and 4.25 metres in width.

Category 3 - Any line section over 100 metres in length and less than 3.0 metres in width.

Appendix VI April 1, 2006 Stumpage Rate Adjustments

1. a. The stumpage rates for a cutting authority will be adjusted on April 1, 2006 in accordance with this subsection if that cutting authority:

   i. has an effective date prior to April 1, 2006,

   ii. expires on or after April 1, 2006, and

   iii. has an adjustable stumpage rate.

   b. The total stumpage rate for a cutting authority with an adjustable stumpage rate calculated under the Comparative Value Pricing System (CVP), will be redetermined by recalculating the information used in the most recent appraisal or reappraisal of the cutting authority area prior to April 1, 2006 except that:

   i. the adjusted species manufacturing cost will be determined in accordance with section 4.10.1,

   ii. the adjusted species manufacturing cost will also be calculated for and be applicable to Lodgepole pine, and

   iii. the species manufacturing cost used in the recalculation will be the species manufacturing cost that was used in the most recent appraisal or reappraisal.

   c. i. The total stumpage rate for a cutting authority with an adjustable stumpage rate calculated using the Market Pricing System (MPS) will be redetermined by reappraising the cutting authority effective April 1, 2006, except that the MPS upset stumpage rate used in the reappraisal will be the MPS upset stumpage rate that is calculated in the reappraisal adjusted by the amount in Table A6-2 that applies to that cutting authority.

   ii. where a cutting authority described in subsection 1(c)(i) of this section is not listed in Table A6-2, the stumpage rate for that cutting authority will be redetermined using the procedure outlined in subsection 1(c)(i) of this section except that the MPS upset stumpage rate used in the reappraisal will be the MPS upset stumpage rate that is calculated in the reappraisal adjusted by an amount that is calculated by Revenue Branch.

2. a. The stumpage rate for a cutting authority will be adjusted on April 1, 2006 in accordance with this subsection if that cutting authority:

   i. has an effective date prior to April 1, 2006,

   ii. expires on or after April 1, 2006, and

iii. has a fixed or non-adjusting stumpage rate.

b. Where a timber sale licence was advertised for sale prior to December 2, 2005 and expires on or after April 1, 2006, and where the licensee applies in writing to the Timber Sales Manager for the adjustment, the MPS upset stumpage rate may be adjusted in accordance with the following algorithm:

$$MPS\,Upset_{ADJ} = MPS\,Upset_{OLD} - \left(Total\ Rate_{OLD} \left[1 - \frac{grade\,code\,blank\,(m^3)}{grade\,code\,blank\,(m^3) + grade\,3\,(m^3)}^{*} \right] \right)$$

$$Total\ Rate_{NEW} = Upset\ Rate_{NEW} + Bonus\ Bid$$

Where:

Total Stumpage Rate $_{NEW}$	is the new total stumpage rate effective April 1, 2006 and applicable to sawlog of grade code 1 and 2.
MPS Upset $_{NEW}$	is the greater of the MPS Upset $_{ADJ}$ or the prescribed minimum stumpage rate.
Bonus Bid	is the bonus bid for the TSL prior to April 1, 2006.
MPS Upset $_{ADJ}$	is the adjusted MPS upset stumpage rate.
MPS Upset $_{OLD}$	is the MPS Upset Stumpage rate for the TSL prior to April 1, 2006.
Total Stumpage Rate	is the total stumpage rate for the TSL prior to April 1, 2006.

* Using the best information available as determined by the Timber Sales Manager.

c. Where the stumpage rates for a cutting authority were previously determined using the procedures in chapter 6 or sections 2.3.2.3 or 7.5.1(6) of this manual, or changed to a non-adjusting stumpage rate under section 2.3(5), the reserve stumpage rates for that cutting authority will be adjusted on April 1, 2006 in accordance with the following algorithm:

Adjusted Reserve Stumpage Rate = Old Reserve Stumpage Rate - (1-POA GLF) x Old Total Stumpage Rate

Where:

Old Reserve Stumpage Rate	is the reserve stumpage rate for the cutting authority area.
POA GLF	is the green log fraction from Table A6-1 for the point of appraisal for the cutting authority area.
Old Total Stumpage Rate	is the total stumpage rate for the cutting authority area.

3. Not withstanding anything contained in this appendix, a stumpage rate that is determined under this appendix must not be lower than the prescribed minimum stumpage rate.

Table A6-1 April 1, 2006 Green Log Fraction (GLF)

Point of Appraisal	GLF
100 Mile	0.6595
Adams Lake	0.7713
Armstrong	0.8627
Bear Lake	0.7535
Boston Bar	0.8248
Burns Lake	0.7726
Canal Flats	0.9435
Canoe	0.9336
Carnaby	0.9733
Castlegar	0.8718
Chasm	0.6595
Chetwynd	0.9841
Clear Lake	0.4615
Craigellachie	0.8820
Cranbrook	0.9133
Creston	0.9179
Elko	0.9089
Engen	0.4457
Fort Nelson	0.9211
Fort St. James	0.7672
Fort St. John	0.8805
Fraser Lake	0.6497
Galloway	0.9227
Grand Forks	0.8567
Hazelton	0.9294
Houston	0.8533
Isle Pierre	0.4197
Kamloops	0.7283
Kelowna	0.8856
Kitwanga	0.8981

Point of Appraisal	GLF
Lavington	0.9170
Lillooet	0.9306
Louis Creek	0.4941
Lumby	0.8107
Lytton	0.8248
Mackenzie	0.8732
McBride	0.9131
Merritt	0.8310
Midway	0.8985
O.K. Falls	0.9191
Park Siding	0.9122
Prince George	0.5883
Princeton	0.8238
Quesnel	0.4636
Radium	0.8806
Revelstoke	0.9597
Slocan	0.8156
Smithers	0.7738
Squamish	0.9306
Strathnaver	0.5358
Taylor	0.9891
Terrace	0.9859
Thrums	0.8089
Upper Fraser	0.8231
Valemount	0.8947
Vanderhoof	0.6121
Vavenby	0.8778
Westbank	0.7824
Williams Lake	0.6373
Ymir	0.9599

1. For each Point of Appraisal the Green Log Fraction (GLF) is calculated as:

$$GLF = \frac{\text{Volume}\,(m^3)\ \text{of Sawlogs Grade Code blank}^*}{\text{Volume}\,(m^3)\ \text{of Sawlogs Grade Code Blank}^* + \text{Volume}\ (m^3)\ \text{of Sawlogs Grade Code 3}^*}$$

* For all cutting authorities with fixed or non-adjusting stumpage rates for the twelve-month period ending February 28, 2006 (excluding BCTS auctions, deciduous, waste, reject and Special Forest Products).

Table A6-2 MPS Upset Rate Adjustments for Cutting Authorities Identified by the Respective Timber Marks

Timber Mark	Adjustment
64728	- 3.81
43557A	- 6.95
43557B	- 7.00
43557Q	- 5.97
50797T	- 17.59
50859B	- 0.33
56990J	- 14.76
56990Z	- 16.19
59990F	- 4.99
60255E	- 9.33
60255H	- 13.86
60255J	- 12.13
64535J	- 10.14
64535M	- 9.02
67891E	- 11.37
67891K	- 8.82
69676H	- 14.24
AJ1007	+ 0.15
AJ1008	- 0.15
AJ1014	- 0.47
AJ1015	- 0.23
AJ1016	- 0.24
AJ1017	- 0.15
63900	- 2.47

Timber Mark	Adjustment
66958	- 4.83
69511	- 4.83
71925	- 14.67
52517A	- 2.20
52517B	- 1.56
52517C	- 4.11
53946B	+ 2.01
53946C	- 3.13
58438E	- 21.11
58438G	- 18.90
58438H	- 21.65
66466A	- 13.99
66466B	- 14.99
66466C	- 15.49
66466D	- 13.53
68636A	- 17.11
68636B	- 18.78
68636C	- 16.17
68636D	- 17.49
AB1001	- 5.81
AC100B	- 0.48
AS700B	- 12.24
AS800C	- 11.17

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