Province of British Columbia

Ministry of Forests

MEMORANDUM

File: 195-30/IAPP

December 30, 1998

To: Regional Managers

From: The Honourable David Zirnhelt
Minister of Forests

I hereby approve Amendment No. 5 to the *Interior Appraisal Manual*, and attach a copy of it for your use. The following sections are amended:

Section 1.5	Market pricing system.
Section 1.6 and 1.7	Renumbered and market pricing system.
Section 2.1 (5)	Market pricing system.
Section 3.1 (3)	Stud lumber and trim lumber.
Section 4.4.3(4)(b)	Skyline and intermediate support skyline logging slope distance.
Section 5.3	Timber licence cutting authority appraisals and the mean value index and base rate calculation.
	Burnt timber from 1998 fires and the mean value index and base rate calculation.
Section 6.2	Small Scale Salvage Initiative.
Section 6.5	Market pricing system.
Chapter 7	Market pricing system.

Section 11 (3) (b) of the *British Columbia Forest Renewal Act* applies to the amendments to Section 5.3, above.

This amendment will come into force on January 1, 1999. Further amendments or revisions to this manual require my approval.

David Zirnhelt
Minister

Attachment

pc: Bill Howard, Director, Revenue Branch
All Subscribers, *Interior Appraisal Manual*

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BRITISH COLUMBIA Ministry of Forests

MANUAL REVISION TRANSMITTAL

FOR FURTHER INFORMATION CONTACT:

John Cook
Sr. Timber Pricing Forester (Interior)

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

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

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

ACTION (Remove/Insert)	(VOL.) CHAPTER-SECTION-SUBJECT TABLE OF CONTENTS	PAGE(S)	COMMENTS
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REMOVE	Chapter 6	3 - 6	
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REVENUE BRANCH

Interior Appraisal Manual

Effective September 1, 1998

Cost Base
Woods: July 1, 1996
Manufacturing: July 1, 1996

BRITISH COLUMBIA

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1.4 Responsibility for Stumpage

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

- Regional Managers, Regional Appraisal Coordinators and other employees authorized by the Regional Manager, and
- Director, Revenue Branch, and employees of Revenue Branch.

1.5 Market Pricing System

The Market Pricing System (MPS), subject to a minimum stumpage rate, is the basis for determining stumpage rates for Timber Sale Licences awarded under Sections 20 and 21 of the *Forest Act* after January 1, 1999.

1.6 Comparative Value Timber Pricing

Comparative Value Pricing (CVP), subject to a minimum stumpage rate, is the basis for determining stumpage rates for all cutting authorities except those specified under Section 1.5. Sections 2.1 (2), (3) and (4) provide the methods that are used for specific products and extraordinary situations.

One component of CVP is the determination of the average stumpage rate for the interior. The stumpage rate for a given stand of timber is more or less than the pre-set average rate (Interior Target Rate) (see Chapter 5) depending upon whether the stand is more or less valuable than the average stand. To assess the value of the stand and hence to determine a stumpage rate, the forest officer will typically:

1. Estimate the selling price of the products that can be recovered from the timber stand (see Chapter 3).

2. Estimate the least total cost necessary to harvest and deliver timber to a point of appraisal then add the manufacturing cost for that point of appraisal (see Chapter 2 and 4).

3. Determine the Value Index (see Chapter 5) of the timber stand by subtracting the estimated operating cost from the estimated selling price.

4. Determine the indicated stumpage rate by comparing the Value Index for the timber stand with the Interior Mean Value Index and adding the Interior Base Rate (see Chapter 5).

5. Determine the reserve stumpage rate (see Chapter 5) by selecting:

    a. the greater of the indicated stumpage rate or the prescribed minimum stumpage rate, or

    b. for an appraised cutting authority area containing timber licence volume, the greater of the adjusted indicated stumpage rate or the prescribed minimum stumpage rate.

6. Determine the upset stumpage rate by adding any development and silviculture levies (see Section 6.6) to the reserve stumpage rate.

7. Determine the total stumpage rate by adding any bonus bid to the upset stumpage rate.

One stumpage rate is determined for all appraised timber in each cutting authority area with the exception of miscellaneous stumpage rates as specified under Section 6.7.

The average stumpage rate for the interior is indexed to lumber market values as explained in Chapter 5.

1.7 Stumpage Adjustments

Unless a cutting authority or the application and tender for a timber sale licence specifies that stumpage rates are fixed for a specified period or for the full term of the cutting authority, stumpage rates are adjusted quarterly on January 1, April 1, July 1, and October 1, of each year subject to Section 6.5.

Each quarter the adjusted stumpage rates reflect changes in estimated selling prices (as authorized in this manual since the previous adjustment), and the recalculated operating cost based on the appropriate trend factors shown in Section 4.12. In addition, the adjustment reflects changes in the Statistics Canada Interior Softwood Lumber Index, the Statistics Canada Pulpwood Chip Index for British Columbia, the Interior Base Rate and the Interior Mean Value Index.

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Appraisal Principles and Procedures 2

2.1 Types of Determination

Stumpage rates are determined by one of the following methods:

1. An appraisal or reappraisal under Chapters 3 and 4 of this manual.
2. An Order-in-Council directive setting rates under the *Forest Act,* Section 105.
3. Pricing under Chapter 6 of this manual.
4. The use of stumpage rates developed by regional revenue staff, and approved by the Regional Manager or Regional Manager's designate.
5. An appraisal under Chapter 7 for timber sale licences awarded under Sections 20 or 21 of the *Forest Act* on or after January 1, 1999.

2. AMVs for Licences which Require Utilization of Small Logs

   AMVs for licences which require utilization of small logs are based on dimension lumber products capable of being produced from trees smaller than normal utilization requirements. These AMVs are created by removing the effect of the LRF add-on (Section 3.1 (1)) from "Small Log AMVs."

   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 will use lumber AMVs listed under "AMVs for Licences which Require Utilization of Small Logs" (Zone 25) which is included in the quarterly stumpage parameters published by Revenue Branch.

   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.

3. 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".

4. Random Lumber AMVs

   Random AMVs are compiled for all species.

5. Mandatory Grade 4 Hemlock AMVs

   Mandatory grade 4 hemlock AMVs are used for cutting authorities where the optional utilization of grade code 4 is not provided by the cutting authority. Cutting authorities meeting this criteria will use lumber AMVs listed under "AMVs for Mandatory Grade 4 Hemlock Log Utilization" which are included in the quarterly stumpage parameters published by Revenue Branch.

   The selection of a mandatory grade 4 hemlock AMV zone (Zones 35, 36, 37 and 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.

3.1.1 Application of Lumber Average Market Values

Application of the small log, licences which require utilization of small logs, stud and random lumber and mandatory grade 4 hemlock AMVs in appraisals for all cutting authorities are made according to the formula in Section 3.3.

3.1.2 Lumber Average Market Value Zones

Refer to Section 2.5 for a list of points of appraisal by lumber AMV zones.

4. Overhead Cable Logging

Overhead cable logging cost estimates will be recognized when required in the cutting authority document. 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. All overhead cable is appraised as clear cut.

Variations recognized within the method are:

a. Highlead and Grapple

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

$/m^3$= Constant + (9.31 * SLOPE%/100) - (5.96 * VOLHA/1000) - (2.10 * VOLTREE) - (3.54 * DEFECT%/100) + (3.38 * BD%/100) + (7.45 * (DS - 150)/100)

Where CONSTANT =

	Biogeoclimatic Zone	
Region/District	**SBS**	**Other**
Cariboo	28.44	28.08
Nelson	30.36	32.64
FNP	32.77	35.05
Other	28.44	30.72

For the above equation:

- if DS is less than or equal to 150 km, then (DS-150) = 0.

b. Skyline and Intermediate Support Skyline

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

The Average Yarding Distance is determined by:

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

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

3. The sum of transect lengths divided by the number of transects equals the Average Yarding Distance.

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

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

$\$/m^3$= Constant - (14.59 * VOLHA/1000) - (0.34 * VOLTREE) - (16.53 * DEFECT%/100) + (9.11 * BD%/100)

Where CONSTANT =

	Biogeoclimatic Zone		
Region	**CWH/MH**	**ICH**	**Other**
Nelson	59.00	51.60	48.64
Other	52.54	45.14	42.18

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 Mean Value Index

The interior mean value index (MVI) 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.

Effective with the January 1, 1999 stumpage adjustment all appraised timber licence cutting authorities will be included in the MVI calculation.

Effective with the January 1, 1999 stumpage adjustment, cutting authorities that contain predominately burnt timber originating from the large fires of 1998, in the Kamloops and Nelson Regions, will not be included in the MVI calculation.

6.2 Cutting Authorities With 5 000 m³ or Less Volume

1. Total coniferous volume of less than 2 000 m³:

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

      An indicated stumpage rate may be determined by estimating the species volumes, prorating the appropriate average value indexes by district and species according to those volumes, and then using the resulting stand value index in the stumpage rate formula as described under Section 5.6. For cutting authorities where the licensee is not required to establish a free growing crop of trees, the value indexes must be adjusted by adding a basic silviculture cost estimate (district average value indexes are based on full appraisals of areas requiring basic silviculture.). The total stumpage rate is fixed for the term. For extensions of the cutting authority see Section 2.4 (4).

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

   b. Full Appraisal

      Alternatively, an indicated stumpage rate may be determined through a full appraisal. The stand data may be site-specific (i.e., timber cruised or scaled) or obtained from one or more comparable cutting authorities (e.g., similar stand and terrain characteristics, etc.). The total stumpage rate is adjustable for the term of the cutting authority, except as provided in Section 6.5.

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

2. Total coniferous volume of 2 000 m³ to 5 000 m³ except Right-of-way cutting authorities (see Section 6.3).

   An indicated stumpage rate is determined on the basis of full appraisal data. The data may be site-specific or the data may be obtained from comparable cutting authorities, as determined by the Regional Manager.

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

   These cutting authorities are cruised if specified by the Regional Manager in accordance with Section 4.2 of this manual.

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

6.3 Right-of-way Cutting Authorities

A right-of-way cutting authority is defined as any cutting authority issued for the sole purpose of harvesting right-of-way timber, including but not limited to road permits, right-of-way cutting permits, timber sale licences, and licences-to-cut.

Right-of-way cutting authorities are appraised under one of the following scenarios.

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

   The indicated stumpage rate is determined according to Section 6.2 (1) (district average value index method).

2. Total volume of 2 000 m^3 or greater.

   A full appraisal is required. Species distribution, total volume and most phase costs are determined either from site-specific cruise data or from a fully appraised cutting authority of the same inventory type and similar site conditions.

   A cost estimate for development is included in the appraisal, and should be borrowed from the representative cutting authority as defined above.

   Log haul cycle time may be determined from site specific data or the cycle time from a nearby representative cutting authority as defined above.

   The costs of roads constructed under right-of-way cutting authorities are recognized in the appraisal of a tributary cutting authority (i.e., the roads are deemed to be non-existing for the purposes of appraising the tributary cutting authority).

   Basic silviculture estimates are not included in the appraisal of right-of-way cutting authorities.

6.4 Partially Harvested Timber

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

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

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

6.5 Small Business Forest Enterprise Program (SBFEP) Sales

For appraisal purposes, the SBFEP includes:

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

Fixed/Adjustable Stumpage Rates for SBFEP Cutting Authorities

The adjustable stumpage rate option can be provided to a licensee only if the upset rate has been determined by means of a full appraisal. The data for the full appraisal may be site-specific or may be obtained from a comparable cutting authority. Once a selection has been made, it remains in effect for the term and all extensions. If the district average value index method is used, the upset and hence the total stumpage rate must be fixed for the term of the cutting authority and all extensions. The only exceptions are if a reappraisal is done under Section 2.3 (1) or Section 2.3 (5).

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

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

Section 20 Timber Sale Licences (Prior to May 1, 1994)

A licensee who holds a timber sale licence issued under Section 20 of the *Forest Act* that was advertised or awarded prior to May 1, 1994 may elect to have the stumpage rate on that licence fixed at the April 30, 1994 level for the term and all extensions. The election must have been made prior to July 1, 1994.

Section 21 Timber Sale Licences (Prior to May 1, 1994)

For a timber sale licence issued under Section 21 of the *Forest Act*, the licensee may have elected to have the stumpage rate fixed at the April 30, 1994 level until April 30, 1996 on timber marks issued under that licence if:

- the timber sale licence was advertised or awarded prior to May 1, 1994,
- the timber mark was issued prior to May 1, 1994, and
- the election to fix rates was made before July, 1, 1994.

The above timber marks with rates fixed until April 30, 1996, will be reappraised effective May 1, 1996. All subsequent reappraisals for those timber marks will be as per Section 2.3.

Market Pricing System 7

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

Chapters 3, 4, 5 and 6 of this manual are only to be used, for Section 20 and 21 Timber Sale Licences (TSL), where directly referenced in chapter 7

7.1 MPS Introduction

The Market Pricing System is the basis for determining sawlog stumpage rates for timber sale licences issued under Section 20 and 21 of the Forest Act, subject to a minimum stumpage rate. Sections 2.1 (2) and (3) of this manual provide the methods that are used for deriving stumpage rates for specific products and extraordinary situations.

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

MPS can only be used where complete appraisal data is available for the cutting authority area. Where data is not available see Section 6.2.

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

7.2 MPS Principles and Procedures

7.2.1 Calculation Conventions

Stumpage rate calculations are performed according to the methods specified in the document entitled, *Specification: Calculating Stumpage Rates for Interior Appraisals for the Market Pricing System* approved by the Director of Revenue Branch.

7.2.2 Methodology

Calculating the upset stumpage rate for Small Business Forest Enterprise Program (SBFEP) timber sales, issued under Section 20 and 21 of the Forest Act after January 1, 1999, will be done using the following methodology:

1. Calculate a Selling Price (SP) of the products that can be recovered from the stand using Section 7.3 with the variables as defined.

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

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

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

7.3 MPS Selling Prices

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

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 2.5). Average market values (AMV) for each species are compiled by dividing total sales value by total sales volumes for each zone.

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 are finger jointed lumber and machine stress rated lumber.

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

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.

1. Zonal LRF update add-ons are found in Table 3-1, by species.

2. Lumber AMVs as published every month.

3. Calculation of Total Species Lumber Selling Price.

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

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

4. The stand SP is the volume prorated sum of the species SP.

7.4 Market Stumpage Price Calculation

The market stumpage price is calculated as detailed in this section. It is assumed that the market stumpage price will approximate the final stumpage rate, including the bonus bid, based on the variables used.

7.4.1 Market Stumpage Price Variables

MSP	=	Market Stumpage Price for the cutting authority in ($/m^3).
CPIF	=	B.C. Consumer Price Index (P110000) for current month divided by the base CPI of 109.3.
SP	=	Lumber Selling Price ($/m^3). See section 7.3.
VOL	=	Total net cruise volume of coniferous timber (m^3).
S%	=	Average cruise side slope for ground and cable yarding systems (does not include the area for horses and helicopter yarding systems).
VPT	=	Net cruise coniferous volume per tree (m^3). Does not include the volume for horses and helicopter yarding systems.
VPH	-	Net cruise coniferous volume per hectare (m^3/ha).
BWDN%	=	Blowdown as a percent of net cruise coniferous volume.
CY%	=	Overhead cable yarding coniferous volume (includes skyline) as a percent of VOL.
HP%	=	Helicopter yarding coniferous volume as a percent of VOL.
HORSE%	=	Horse yarding coniferous volume as a percent of VOL.
CYCLE	=	Hauling round trip cycle time from the landing to the point of appraisal or water dump site and return (hrs). See Section 4.5.1
TOW	=	Water towing of logs, distance from dump site to dewatering site. (km).
Z6	=	Skeena selling price zone, dummy variable.
Z9	=	Fort Nelson Peace selling price zone, dummy variable.

7.4.2 Market Stumpage 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 stumpage price (MSP).

MSP = [17.9126 + 0.3043 * SP/CPIF + 0.2564 * (VOL/1000) - 0.3005 * S% + 12.1037 * VPT + .04629 * VPH - 18.0267 * (BWDN%/100) - 16.9130 * (CY%/100) - 43.6800 * (HP%/100) - 8.6777 * (HORSE%/100) - 3.6290 * CYCLE - 0.03966 * TOW - 8.1365 * Z6 - 11.2927 * Z9] * CPIF

For the above equation the following definitions apply:

- if the selling price zone is Skeena (6) then Z6 = 1, otherwise enter 0,
- if the selling price zone is Fort Nelson Peace (9) then Z9 = 1, otherwise enter 0, or
- if VOL is greater than 50 000, then VOL = 50 000.

7.5 Calculation of MPS Stumpage Rate

For each cutting authority area, the MPS upset stumpage rate is determined by selecting the greater of:

- the MPS upset stumpage rate, or
- the prescribed minimum stumpage rate.

7.5.1 Upset Stumpage Rate Calculation

The upset stumpage rate is calculated by taking the MSP result and discounting it by the discount factor (DF).

USR = MSP * (1-DF)

Where:

USR = Upset stumpage rate

MSP = Market Stumpage Price as defined in 7.4.2

DF = 0.30

7.5.2 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.

7.5.3 Total MPS Stumpage Rate

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

7.6 Deciduous and Miscellaneous Forest Products

The stumpage rates for deciduous sawlogs, all species grade 3, 4, 5 and 6 logs and other miscellaneous forest products are found in Section 6.7.

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