BRITISH COLUMBIA
MINISTRY OF FORESTS AND RANGE

Tree Farm Licence 8

held by

International Forest Products Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective April 1, 2009

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Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act* (the Act), of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 8. This document also identifies where I believe new or better information is needed for incorporation into future determinations.

Description of the TFL

TFL 8 is held by International Forest Products Limited ('Interfor' or 'licensee') and consists of 77 480 hectares of Crown land and water. The TFL was transferred from Pope and Talbot Limited to Interfor on May 1, 2008. The TFL is administered from the Arrow Boundary Forest District within the Southern Interior Forest Region of the Ministry of Forests and Range. The TFL consists of two blocks: block 1 (or 'south block') in the Boundary Creek area north of Greenwood, and block 2 (or 'north block') in the Trapping Creek and Carmi Creek drainages north of Beaverdell.

About one-half of the TFL area falls within the Montane Spruce (MS) biogeoclimatic zone, with 29 percent in the Interior Douglas-fir (IDF) zone, 13 percent in the Engelmann Spruce Subalpine Fir (ESSF) zone, and 8 percent in the Interior Cedar Hemlock (ICH) zone. Nearly one-half (49 percent) of the forest stands within the timber harvesting land base are pine leading, with 23 percent Douglas-fir leading, 15 percent larch leading, 7 percent spruce leading, and 6 percent balsam (true fir) leading. Mule deer, white-tailed deer, moose, elk, black bear, and many smaller mammals, birds and reptiles are prevalent either within the TFL or its surrounds.

History of the AAC

TFL 8 was established in 1951 and consisted of the block 1 with an AAC of 35 679 cubic metres. Subsequent AAC increases were made to account for new information. Block 2 (formerly TFL 11) was added to TFL 8 in 1967 and the AAC increased to 141 585 cubic metres with subsequent AAC adjustments. Between 1987 and 1993, the AAC was temporarily increased to permit harvesting and salvage of mountain pine beetle (MPB) infested pine stands; at it's peak the AAC was 312 000 cubic metres. Following the decline of the infestation, the AAC was decreased in 1994 to 145 000 cubic metres. This AAC was slightly reduced in 1998 to 144 720 cubic metres to reflect a deletion from the TFL for a woodlot licence. The previous AAC was determined in 2002 and set at 175 000 cubic metres; the increase was largely due to new site productivity estimates for the entire TFL area that indicated site index for managed stands had previously been underestimated.

New AAC determination

Effective April 1, 2009, the new AAC for TFL 8 will be 186 000 cubic metres, an increase of about 6 percent from the previous AAC.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 8 includes, but is not limited to the following:

- *Timber Supply Analysis Information Package – Tree Farm Licence 8 – TSR 3*; prepared for Pope & Talbot Ltd. by Timberline Forest Inventory Consultants Ltd. December 2006; and associated references on pp. 54-55 in that document;
- *Timber Supply Analysis - Tree Farm Licence 8 – TSR 3;* prepared for Pope & Talbot Ltd. by Timberline Forest Inventory Consultants Ltd. June 2007; and associated references on p. 76 in that document;
- *Summary of Dead Potential Volume Estimates for Management Units within the Northern and Southern Interior Forest Regions;* Ministry of Forests and Range, March 2006;
- *Order for the Establishment of Visual Quality Objectives and Scenic Areas for the Arrow Boundary Forest District;* Ministry of Forests and Range, December 31, 2005;
- *Tree Farm Licence 8 Rationale for Allowable Annual Cut (AAC) Determination*; Ken Baker, Deputy Chief Forester, Effective December 1, 2002;
- Letter from the Minister of Forests and Range to the chief forester, dated July 4, 2006, stating the Crown's economic and social objectives for the province (see Appendix 3);
- *Guidance on the Design and Implementation of Stand-Level Retention for Cutblocks in Large-Scale Salvage Operations;* Jim Snetsinger, Chief Forester, Ministry of Forests and Range, 2005;
- Review of TFL 8 operating conditions through discussions with Interfor staff and the deputy chief forester on January 27, 2009;
- Technical review and evaluation of current operating conditions through comprehensive discussions with Arrow Boundary Forest District staff, including the AAC determination meeting held in Victoria, BC on January 28, 2009;
- *Forest and Range Practices Act* and *Forest Planning and Practices Regulation;*
- First Nations Consultation Summary; Pope & Talbot, TFL 8 Management Plan 10 Extension; Ministry of Forests' letter September 14, 2006;
- Consultation Summary regarding TFL 8 Management Plan 10 extension process; September 22, 2006;

- Ministry of Forests and Range consultation letters to First Nations regarding TFL 8 TSR Information Package and Analysis Report; May 6, 2008;
- Ministry of Forests and Range consultation letters to First Nations regarding end of review and comment period; June 9, 2008; and
- First Nations Consultation Summary – TFL 8 TSR3 AAC Determination; Arrow Boundary Forest District; December 4, 2008 and January 20, 2009.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester or his designate to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with management practices and biophysical factors, such as the rate of timber growth and definition of the land base considered available for timber harvesting.

The analytical techniques used to assess timber supply necessarily are simplifications of the real world. Many of the factors used as inputs to timber supply analysis are uncertain, due in part to variation in physical, biological and social conditions. Ongoing scientific studies of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis; therefore, do not necessarily provide the complete answers or solutions to forest management decisions such as AAC determinations. Such information does provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information I must consider in AAC determinations.

In determining the AAC for TFL 8, I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for timber supply areas (TSAs) and TFLs. Section 8 of the Act is reproduced in full as Appendix 1 of this document.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester, which include those required under Section 8 of the *Forest Act*.

Guiding principles for AAC determinations

The chief forester has expressed the importance of consistency of judgement in making AAC determinations. I also recognize the need for consistency of approach, and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 8.

Rapid changes in social values and in our understanding and management of complex forest ecosystems may affect our interpretation or weighing of the information used in AAC determinations. In making the large number of periodic determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and associated uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. In any specific circumstance where I may consider it necessary to deviate from these principles, I will explain my reasoning in detail.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which, in making AAC determinations, I consider particular uncertainties associated with the information before me, and attempt to assess and address the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge — a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the following guiding principles.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I intend to reflect as closely as possible those operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to *increase* the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to *reduce* the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest and Range Practices Act.*

In many areas, the timber supply implications of some legislative provisions, such as those for landscape-level biodiversity, remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 8, as deputy chief forester, I have followed the same approach.

As British Columbia progresses toward completion of strategic land-use plans, in some cases the eventual timber supply impacts associated with the land-use decisions resulting from the various regional and sub-regional planning processes remain subject to some uncertainty before formal approval by government. In determining AACs, I will not speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government.

In some cases, even where government has made a formal land-use decision, it is not necessarily possible to analyze and account for the full timber supply impact in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions, as has been the case with the Kootenay-Boundary Higher Level Plan Order. Until such implementation decisions are made it would be impossible to assess in full the overall impacts of land-use decisions. In such cases, the legislated requirement for frequent AAC reviews will ensure that future determinations address ongoing plan implementation decisions. Whenever specific protected areas have been designated by legislation or order-in-council, these areas are deducted from the timber harvesting land base and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting resource management objectives such as biodiversity.

In TFL 8, much clarification of land and resource use has been provided by government's Kootenay-Boundary Higher Level Plan Order, and orders under the *Government Actions Regulation* of the *Forest and Range Practices Act*, which guide many aspects of current management.

When appropriate, I will consider information on the types and extent of planned and implemented intensive silviculture activities as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of their timber supply effects.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to re-determine many outdated AACs. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester or I should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or me must be the result of applying our individual judgements to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no AAC determination can responsibly be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from decisions in recent years made by the Supreme Court of Canada. I am aware of the Crown's legal obligation to consult with First Nations regarding asserted rights and title in a manner proportional to the strength of their claimed interests and the degree to which the decision may impact these interests. In this regard, I will consider any information brought forward respecting First Nations' aboriginal interests, including operational plans that describe forest practices that are meant to address First Nations' interests.

The AAC that I determine should not be construed as limiting the Crown's obligations under the Court's decisions in any way, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 8. It is also independent of any decisions by the Minister of Forests and Range with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests and Range as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest and Range Practices Act*.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in this AAC determination, I am assisted by timber supply forecasts provided to me by the licensee as part of the Ministry of Forest and Range's Timber Supply Review program.

For each AAC determination a timber supply analysis is carried out using an information package including data and information from three categories: land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced. These include sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the 'base case' forecast.

The base case forecast may incorporate information about which there is some uncertainty. Its validity, as with all the other forecasts provided, depends on the reliability of the data and assumptions incorporated into the computer model used to generate it. Therefore, much of what follows is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and of the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgment, using current information available about forest management, which may well have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may in part be based on uncertain information are essentially qualitative in nature and, as such, subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The timber supply analysis ('analysis' or '2007 analysis') for TFL 8 was completed in 2007 by Timberline Forest Inventory Consultants Ltd. ('Timberline') under the direction of licensee staff[1]. Timberline used its proprietary model Critical Analysis by Simulation of Harvesting version 6.21 ('CASH 6') to conduct the analysis and prepare the 20-year plan using spatial modelling. Based on my staff's experience examining results from this model, I am satisfied that it is capable of providing a reasonable projection of timber supply.

The starting year for the harvest forecasts modelled in the timber supply analysis was 2006. The harvest was projected for the first 20 years using spatial adjacency as reflected in the licensee's 20-year plan. For the remaining 230 years of the forecast, adjacency was modelled aspatially. The harvest flow objective applied in the base case was a maximum non-declining harvest forecast. The harvest rule was oldest first but respecting forest cover objectives.

The licensee's base case, entitled 'Current Practice with Endemic MPB', indicated that an initial harvest level of 186 000 cubic metres per year could be maintained for 110 years before increasing to a long-term annual harvest level of 209 000 cubic metres which could be sustained over the remaining 250-year planning horizon. The initial annual harvest level was 11 000 cubic metres (6.3 percent) higher than the previous AAC.

The base case assumptions supporting the 2007 analysis differ from those assumed in the previous 2002 analysis in several respects, thereby, making comparisons difficult, including:

- mule deer and moose winter ranges, and visual quality objectives, are based on recent orders under the *Government Actions Regulation*;
- more recent terrain stability and terrestrial ecosystem mapping is used;
- forest inventory was aged to 2006 and known harvests not shown in the inventory layer were accounted for;

[1] 'Licensee staff' refers to either Interfor or previously Pope & Talbot staff who supported the analysis.

- recent site index adjustment results were applied;
- 35 percent of the harvest level is directed into potentially affected MPB stands and planned harvests are scheduled;
- no attempt was made to aggregate stands to approximate the typical size of operational blocks;
- spatial adjacency was modelled for 20 years; and
- natural disturbance was modelled on the non-timber harvesting land base.

As discussed and quantified throughout this rationale, and in consideration of the items described above, I am satisfied that the base case provides a suitable reference point from which to assess the timber supply for this determination.

Where I have concluded that an assumption for a particular factor was appropriately modelled in the base case, I will not discuss my considerations of it in this document. I will explain below my consideration of any assumption for a factor that concerns me for any reason, such as apparent divergence from current management practices and high level of uncertainty for key factors.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area

Land base contributing to timber harvesting

- *general comments*

The total Crown land and water area of TFL 8 is approximately 77 480 hectares, of which 72 393 hectares are considered productive forest land. As part of the process used to define the timber harvesting land base (i.e. the land base estimated to be economically and biologically available for harvesting), a series of deductions were made from the productive forest land base. After the deductions were applied, the current timber harvesting land base was estimated to be 64 605 hectares.

I accept the assumptions applied in the analysis for non-forested areas; non-productive forest; roads, trails and landings; non-commercial cover; environmentally sensitive areas; unstable terrain; problem forest types (low productivity, deciduous and non-merchantable); and the Trans-Canada Trail. As I am satisfied with the accounting in the analysis, I will not discuss these factors further in this document. However, I do have

comments on the accounting of three factors: riparian management, dense pine and not-satisfactorily restocked (NSR) stands which I address below.

- riparian management

In the base case, the licensee applied a 25-percent reduction to the timber harvesting land base area within riparian management zones associated with streams, lakes and wetlands to account for basal area retention. This reduction was in addition to removing all lands in the riparian reserve zone from the timber harvesting land base. The widths used to define the riparian management zones were consistent with those specified in the *Forest Planning and Practices Regulation.*

The total area deducted from the land base to account for riparian management zone retention along S1 to S6 streams was 1860 hectares. Additional deductions were made for riparian management zone retention for lakes and wetlands.

In discussions with district staff, the amount of retention assumed in the base case for the riparian management zone likely exceeds current practice requirements for S4, S5 and S6 streams. Further, some of the retention that does occur is designed to overlap with the retention of wildlife tree patches. In the base case additional reductions to available volumes were made to account for wildlife tree patches and no overlap with riparian management zone retention was assumed. District staff also note that harvest practices in riparian management zones in the TFL appear to be more than adequate to maintain riparian ecosystems. The area deducted for S4, S5 and S6 streams was about 700 hectares and likely represents an overestimation of the area required for buffering these smaller streams.

In reviewing this factor with district staff, I conclude that up to a 700 hectare area – or about 1 percent of the timber harvesting land base – deducted from the land base in the base case should contribute to the timber supply since deductions for the riparian management zones were overestimated. I have reflected this upward pressure on short-term timber supply in my “Reasons for Decision”.

- dense pine stands

It was assumed in the base case that all dense pine stands are potentially merchantable and therefore contribute to the timber harvesting land base. In the previous 2002 determination, it was noted that there was significant uncertainty about 8558 hectares of dense pine stands contributing to the timber supply. Therefore, it was requested at the last determination that the actual area harvested in these stands be tracked and reported.

The licensee followed-up this request by overlaying these stands with a map that identified recently harvested areas. This showed that about 14 percent of the stands were harvested during a recent six year time period. Based on this review, the licensee assumed in the current base case that all of these stands should continue to be included in the timber harvesting land base.

In discussions with district staff, it was noted that the licensee recently made a concerted effort to harvest in dense pine stands by testing in a pilot operation some of the more economically operable areas. The feedback district staff received from the licensee was that the pilot operations were not very economic and that the licensee would not likely be harvesting in remaining dense pine stands in the near future.

I recognize there remains considerable uncertainty regarding the potential contribution of these dense pine stands to the timber supply. The contribution of 8558 hectares of these stands, net the volume recently harvested of 1198 hectares — or a total of 7360 hectares is now of concern. Therefore, I am accounting for up to a 7360-hectares overestimation in the timber harvesting land base in my "Reasons for Decision".

Under "Implementation", I request that the licensee continue to track and record harvesting in dense pine stands and to make an assessment of which dense pine stands are economically operable, so that this information can be considered in future determinations. If these stands are not harvested, then they should be partitioned or excluded from the timber harvesting land base in the next timber supply analysis. That said, I recognize that should the mountain pine beetle infestation increase in the TFL in the near future as projected, the priority should be to harvest the larger diameter pine stands that are more susceptible to attack relative to the smaller diameter dense pine stands.

- *not-satisfactorily restocked areas*

In the base case, 2679 hectares of current not-satisfactorily restocked (NSR) area was deducted from the timber harvesting land base. The base case should have used the same assumptions as used in the 2002 analysis where all current NSR areas were assumed to be fully stocked within the first five years of the planning horizon and assigned to managed stand yield tables. Discussions with district staff confirmed that the 2002 analysis assumptions are more reflective of current reforestation practices.

The base case timber harvesting land base is increased by 4 percent by assuming that the 2679-hectare current NSR area is fully stocked within five years as noted above. A sensitivity analysis was performed which indicates that had current NSR area been appropriately modelled, harvest levels would increase by 1.6 percent for the first 110 years, and increase by 3.8 percent over the long term. I have accounted for this upward pressure on timber supply in my "Reasons for Decision".

<u>Existing forest inventory and unmanaged stand yields</u>

I reviewed the forest inventory and natural (unmanaged) stand yields, and I am satisfied that these represents the best available information for use in support of this determination. I will not discuss these factors further in this document. I do have comments on recent changes to the log grade system and how these impact the timber supply.

- *log grades*

New log grades were implemented for British Columbia's Interior on April 1, 2006. Under the previous log grade system, a log was assessed according to whether the tree it came from was alive or dead at the time of harvest. In the previous system, grade 3 and grade 5 logs from dead trees at time of harvest were not charged to the AAC. Under the new system, grades are now based on the log's size and quality at the time it is scaled regardless of whether the tree it came from was alive or dead at time of harvest. To better account for all harvested volumes in AAC cut-control, logs that were previously considered grade 3 and 5 will now be charged to the AAC. Therefore, this volume should be taken into account in the AAC determination.

The timber supply analysis did not include volumes from dead trees in the base case that could potentially be used as sawlogs (or 'dead potential'). Inventory audit plots for TFL 8 indicate that the dead potential volume is about 9.9 percent of the green (live) volume for the forested land base over 60 years of age. Ministry of Forests and Range analysis staff expect the sampling error around dead potential volumes estimated using audit plots to be at least 15 percent – that is it could range from about 8.4 to 11.4 percent. As discussed later under 'unsalvaged losses', some of the small scale salvage occurring in the TFL may be harvesting some of this dead potential volume.

A sensitivity analysis was performed that examined the impact of increasing natural stand yields by 10 percent. The harvest level for the first 110 years is only 1 percent higher than the base case, and 3 percent higher in the long term. Ministry of Forests and Range analysts noted that short-term harvest levels may be limited by a growing stock shortage during the transition from harvesting existing stands to harvesting managed stands given the steady harvest flow assumption in the base case.

I recognize the need to account for dead potential volumes in my determination given the log grade changes, and in discussions with BC Forest Service staff, I am satisfied the audit plots provide the best available estimates on these volumes for this TFL. I am also mindful of the limited impact that an 8.4 to 11.4 percent increase in assumed harvest volumes would have on the base case timber supply as demonstrated by the results of the sensitivity analysis. I therefore recognize in my "Reasons for Decision" a 1-percent upward pressure in short- to mid-term timber supply and 3 percent in the long term to account for dead potential volumes.

(ii) the expected time that it will take the forest to become re-established on the area following denudation

<u>Expected time for re-establishment and rate of growth</u>

I accept the assumptions applied in the analysis for site index, minimum harvest ages, and regeneration delays. I will not discuss these factors further in this document. I do have comments on assumptions made regarding managed stands and aggregation procedures related to block size that I will address below.

- *managed stands*

It was assumed in the base case that existing and future managed stands would be planted with a density of between 420 and 1388 stems per hectare. These relatively low densities were modelled to reflect the licensee's operational reliance on ingress by way of natural regeneration to increase densities. The managed stand yield tables used in the analysis; however, only account for stems planted using the "Table Interpolation Program for Stand Yields" (TIPSY). Existing stands younger than 31 years of age and future harvested stands are assigned to managed stand yield tables. Genetic gains were applied to managed stands as shown in the TIPSY tables in the licensee's Information Package.

District staff observe that about one-third of harvested stands are not planted where natural regeneration is relied on. Also, in other stands, the licensee normally fills in with planted trees following natural regeneration to obtain desired stem densities. It was also noted that stocking densities at the time of planting may be higher than when the stand is declared free-growing due to factors such as livestock grazing that can impact stocking densities.

For planted stands, regeneration delays of up to 3 years are assumed in the base case, which are reflective of current practices and are therefore appropriate. However, 3 years may not reflect delays associated with stands where natural regeneration occurs.

In the base case, not accounting for the volume contributions of natural regeneration in yield models suggests forecasted harvest levels have been underestimated. Also the base case assumes all managed stands were planted, which is not always the case. This suggests an underestimation of regeneration delays in the analysis since naturally regenerated stands will have regeneration delays greater than assumed in the analysis.

Operational adjustment factors (OAFs) reduce the volume expectations from TIPSY where ideal conditions are assumed. OAF 1 accounts for less than full site occupancy due to factors affecting yields across all ages such as small stand openings and endemic pests. OAF 2 accounts for decay, waste and breakage affecting managed stands. The standard OAF adjustments of 15 percent for OAF1 and 5 percent for OAF2 were applied in the base case.

District staff note that root diseases, such as *Armillaria ostoyae*, and other pests that occur in the TFL that impact managed stands suggest higher OAF reductions may be more appropriate than the standard adjustments assumed in the base case. I note that in the previous 2002 analysis that higher non-standard OAFs were applied.

I recognize there is some uncertainty regarding managed stand yields assumed in the base case that exert both upward and downward pressures on timber supply. For this determination, I have no information to suggest that I should make specific adjustments to account for this factor. However under "Implementation", I request that the licensee assess the assumptions regarding managed stands in support of the next timber supply analysis. These include accounting for: (i) regeneration practices including reliance on natural regeneration, regeneration delay and stem density at time of planting and free-growing; (ii) quantity and quality of planting stock with genetic worth; and

(iii) appropriate OAF reductions given root diseases and other pests in the TFL that impact managed stands.

- *aggregation procedures – block size*

In the base case, stands were not aggregated to approximate the typical size of operational harvest blocks during modelling. Instead the individual stands as they were listed in the model data were allowed to be selected for harvest. There is some concern about this approach because over 50 percent of the timber harvesting land base available in the timber supply model was represented as harvest blocks less than one hectare in size. This data structure typically gives the timber supply model more flexibility when selecting areas to harvest, particularly during periods at which timber supply is most constrained. This is not a reasonable representation of current practice since operational harvesting in such small block size is typically very limited.

At the last determination, the deputy chief forester requested that the licensee "provide an operations-based estimate of residual uneconomic small patches that will be left across the landscape". This was in response to the previous 2002 analysis where a large 7785 hectare area in blocks (patches) less than 3 hectares in size were forecasted in the 20-year plan. Although the licensee did not provide that estimate, district staff indicated that operational practices in the TFL have not resulted in isolated small blocks being left following harvesting. Based on the observations provided by district staff that isolated small patches are not being left in the TFL, on this account I do not believe the timber harvesting land base needs to be adjusted.

However, I do recognize that the lack of a minimum block size in the timber supply model has likely resulted in unrealistic projections about future harvest block sizes and as a consequence may have resulted in an overly optimistic harvest flow forecast. Under "Implementation", I request that in the next timber supply analysis stands are aggregated and selected for harvest based on criteria that reasonably represents the size of harvest blocks in current practice. I urge that the licensee work with appropriate Forest Analysis and Inventory Branch staff to cooperatively determine a suitable approach.

(iii) silvicultural treatments to be applied to the area:

Silvicultural treatments

I have reviewed the information regarding the assumptions made for silvicultural treatments and incremental silviculture (e.g. fertilization, spacing and thinning) in the analysis for TFL 8, and I have identified no issues that would impact this determination.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area:

Timber harvesting

I have reviewed the information regarding the utilization standards and decay, waste and breakage assumptions in the analysis for TFL 8, and I identify no issues that would impact this determination.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production:

Integrated resource management objectives

I have reviewed the information regarding recreation, community watershed considerations, wildlife considerations (including caribou, grizzly bears, mule deer winter range and moose winter range), visual quality management, stand-level biodiversity (wildlife tree patches), and disturbances in the inoperable land base (since these areas can contribute to meeting non-timber resource objectives), and I identify no issues that would impact this determination. I address three factors below for which I do have comments: adjacency and green-up; identified wildlife; and landscape-level biodiversity.

- *adjacency and green-up*

In the timber supply analysis, spatial adjacency was modelled for the first 20 years of the planning period. During this period, spatial adjacency is enforced by not allowing a block to be selected for harvest until all adjacent areas reached a 2.5 metre green-up height. No adjacency approximation rule was applied after 20 years although adjacency in practice continues to apply. Sensitivity analyses that adjusted green-up height by an increase or decrease of one metre indicate the spatial adjacency rule does not have a consequential impact on timber supply because the most constrained points in the timber supply forecasts are not projected to occur within the first 20-years.

Another sensitivity analysis applied an aspatial adjacency approximation rule that enforced a maximum of 25 percent of each landscape unit within the TFL to be occupied by stands below 2.5 metres in height. However in this sensitivity, the 20-year spatial adjacency rule was not applied. This sensitivity analysis resulted in a minor 1000 cubic metres per year lower level than the base case initial harvest level representing about a 0.5-percent decrease in timber supply – with no effect in the long term.

The small harvest blocks assumed in the base case (as discussed above under "Aggregation procedures – block size") may have resulted in increased flexibility to find available timber supply thus lessening the impacts associated with adjacency and green-up indicated in the sensitivity analysis.

In the previous 2002 analysis, there was an aspatial adjacency approximation rule that no more than 25 percent of each landscape unit could be less than 2.5 metres in height. Although this was somewhat addressed in the 2007 analysis over the first 20-years with a spatial adjacency rule, it was not applied over the rest of the planning horizon which has become a recent standard for current timber supply analysis in TFLs. Under "Implementation", I request that in the next analysis that meaningful spatial adjacency rules be applied for as long as possible and the remaining planning horizon have an aspatial approximation rule applied. This along with my previous request to apply a blocking layer should help provide a better representation of current practice in support of the next determination.

- *identified wildlife*

Identified wildlife are endangered, threatened, vulnerable or regionally significant species that have been designated as requiring special management. Wildlife habitat areas (WHAs) can be established to protect identified wildlife. No WHAs have been established in the TFL and the base case did not account for potential WHAs that may be established in the future.

Draft WHAs for Williamson's Sapsucker exist but have not yet been formally established. A sensitivity analysis assessed the impact of removing 338 hectares (about 0.5 percent of the timber harvesting land base) of the proposed WHAs. The sensitivity analysis indicated about a 1-percent reduction in the short- and mid-term timber supply with no impact in the long term.

Many other identified wildlife species exist in the TFL and district staff indicate that other WHA proposals exist in the surrounding Boundary TSA but not yet in TFL 8.

Government policy has provided a 1-percent timber supply budget for WHAs; no allocation has been made to specific TSAs or TFLs. The Ministry of Environment is working on designating more WHAs in many areas of the province. For management units where existing and potential WHAs have not been accounted for in timber supply analysis, an up to 1-percent impact to timber supply has been recognized in determinations. In reviewing this factor, I have accounted for up to 1-percent overestimation of timber supply for this TFL and I have reflected this in my "Reasons for Decision".

- *landscape-level biodiversity*

The Kootenay-Boundary Higher Level Plan Order establishes old seral stage forest cover retention requirements for landscape units within TFL 8 based on biodiversity emphasis option, biogeoclimatic unit and natural disturbance type. For areas with a low biodiversity emphasis, the Order allows the application of a two-thirds drawdown to forest retention requirements. This enables the target to be reached without unduly impacting short-term timber supply so that a socio-economic and environmental balance can be achieved consistent with the approved land-use plan. The Order also notes that a recruitment strategy must be developed that describes how the full target will be achieved by the end of three harvest rotations.

In the analysis, all the requirements in the Order were modelled except the need to achieve the full target in low biodiversity emphasis areas by the end of the third rotation.

Proposed old growth management areas (OGMAs) were identified by the Integrated Land Management Bureau (ILMB) in 2006. There is still discussion between ILMB and the licensee on the proposed OGMAs. If OGMAs are established by ILMB, they can replace the old seral stage requirements in the existing Higher Level Plan Order.

The licensee undertook a sensitivity analysis to examine the timber supply impacts of employing the proposed OGMAs. Applying the proposed OGMAs reduced the timber harvesting land base by 4979 hectares (7.7 percent), and resulted in a 7-percent reduction

in harvest levels over the first 110 years and a 2.4 percent reduction in harvest level after 110 years.

A table was prepared that showed that if the proposed OGMAs were established, the area in the OGMAs plus the area outside the timber harvesting land base would in combination meet or exceed full retention targets.

The intent of employing the two-third drawdown in the Higher Level Plan Order is to reduce impacts on short-term timber supply associated with achieving old seral stage targets. The sensitivity analysis that assessed the impacts of no harvesting in the proposed OGMAs indicates a significant impact in the short term beyond the level intended in government policy on landscape-level biodiversity (such as the Landscape Unit Planning Guidebook).

In keeping with the principles of drawdown in the short term, I accept that there may be up to a 7 and 2.4 percent impact on timber supply in the mid- and long-term, respectively, in order to achieve the full old seral stage target in low biodiversity emphasis areas by the end of the third rotation. However, based on the information provided, I am uncertain what impacts may, or may not, occur in the short term associated with the assumptions in the analysis. Under "Implementation", I request that in the next analysis, the licensee either model attainment of the full target by the end of the third rotation or apply OGMAs if established at that time.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber;

Other information

I have reviewed the information regarding the 20-year plan and cut control/harvest performance, and I identify no issues that would impact this determination.

First Nations considerations

Five First Nations with asserted traditional territory overlapping the TFL, and two tribal councils were contacted regarding the timber supply analysis. They include the Lower Similkameen, Osoyoos Indian Band, Penticton Indian Band, Westbank First Nation, Splatsin First Nation, Okanagan Nation Alliance and the Shuswap Nation Tribal Council. The Ministry of Forests and Range have entered into either a Forest and Range Agreement (FRA) or Forest and Range Opportunity (FRO) with the Lower Similkameen Indian Band, the Osoyoos Indian Band, the Westbank First Nation, and the Splatsin First Nation. The Penticton Indian Band is currently negotiating a FRO with the Ministry. The FRAs/FROs contain provisions for consultation on administrative decisions including AAC determinations, which were followed by district staff.

An initial consultation letter was sent by Arrow Boundary Forest District staff about the timber supply review for TFL 8 on May 6th, 2008 to the First Nations listed above.

Follow-up e-mails and phone messages were sent by district staff to these First Nations on May 26th and May 29th, 2008. Follow-up consultation letters were sent by district staff on June 9th, 2008, and subsequent follow-up letters were sent to First Nations on July 9th, 2008. District staff prepared a consultation summary on January 20th, 2009.

There were responses from three of the First Nations consulted about the following matters:

- A June 12, 2008 phone message to district staff from a representative of the Penticton Indian Band indicated the letters received were not proper consultation and that the Band does not have the capacity to respond given the nature of the consultation process. The message expressed the need to have a better process. On June 16, 2008 district staff followed up with the Penticton Indian Band asking for more specific information regarding TFL 8 TSR. No response was received.

- A June 23, 2008 letter to district staff from the Westbank First Nation expressed concerns regarding decision-making within their area of asserted rights and title, and stated that there must be meaningful consultation and accommodation.

- On July 17, 2008, the Shuswap Nation Tribal Council requested a copy of the analysis report and district staff followed-up on this request.

I have reviewed the above comments from First Nations and note that there was no specific feedback about the timber supply analysis and the appropriateness of the assumption employed in the base case. I have no known traditional use information for the area covering TFL 8.

I am aware that some bands in TFL 8 were involved in the activities which led to the litigation case *British Columbia vs. Chief Dan Wilson*. I am also knowledgeable of the aboriginal interests and uses asserted in the affidavits relevant to this litigation; however, TFL 8 does not overlap with the area in litigation.

I am satisfied that district staff consulted with First Nations, who have asserted traditional territories in all or part of the TFL, to enable me to consider First Nations interests in my determination. After considering the information available to me, including that provided by the consultation process, I am not aware of any information that indicates that First Nations' interests require adjustments to the base case timber supply in my AAC determination for TFL 8. If further information on First Nations' interests becomes available during the term of this determination, it will be considered in the next determination.

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area;

Alternative harvest rates

As part of the timber supply analysis, the licensee provided several different alternative harvest flows. I have considered the information provided in the various alternative flows, and it has informed my decision.

Community dependence

Communities of Grand Forks, Greenwood, Midway, Rock Creek and Beaverdell are located within the vicinity of TFL 8. The licensee operates a sawmill located in Grand Forks. Employment levels based on two shifts per day, five days a week operation are 135 person-years at the sawmill and 26 person-years of additional staff for a total direct employment of 161 person-years. Other mills and communities in the Kootenays are also very dependent on the licensee's mill operations. Several small mills sell wood to the licensee and the pulp mill in Castlegar also buys a large quantity of chips from the licensee. I am aware that the harvest from TFL 8 and the licensee's associated mill operations contribute significantly to the local economy of nearby communities, and I have considered this information in my determination.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia; and

Minister's letter

The Minister of Forests and Range has expressed the economic and social objectives of the Crown for the province in a letter dated July 4, 2006 to the chief forester (attached as Appendix 3). The letter stresses the importance of a stable timber supply while being mindful of other forest values. The letter also highlights objectives in the BC's Mountain Pine Beetle (MPB) Action Plan, that are applicable for areas of the interior including TFL 8, such as encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land-use plans. The minister also asks in the letter that a realistic assessment of timber volumes that can be utilized economically in MPB-affected areas is needed and that I examine factors that affect the demand for timber and products manufactured from it, the time period over which it can be utilized, and consider ways to maintain or enhance the mid-term timber supply.

With respect to conserving forest values as stated in land-use plans, the direction provided by the Kootenay-Boundary Higher Level Plan Order was used in the analysis when accounting for values in TFL 8, such as landscape-level biodiversity. Also regarding MPB, the 'Current Practice with MPB Epidemic' scenario provided for my consideration, as described below under *mountain pine beetle*, addresses shelf-life assumptions that are integral to the economic recovery of dead pine volumes should the MPB reach epidemic levels in the TFL.

Local objectives

The Minister's letter of July 4, 2006, also asks that I consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Local objectives for land and resource use in TFL 8 include those captured in the Kootenay-Boundary Higher Level Plan Order and in orders under the *Government Actions Regulation* of the *Forest and Range Practices Act*. The base case assumptions applied the direction in these orders.

The TFL 8 Management Plan 10 was distributed for public review during the previous 2002 timber supply analysis. At that time there were no comments from the public during the review period. Management Plan 10 was extended on September 4, 2007 and remains in effect until August 31, 2012 or until a new management plan is approved.

The consultation process for First Nations, and the feedback received, is addressed above under 'First Nations considerations'.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Mountain pine beetle

At present, MPB populations are at endemic levels; TFL 8 is not experiencing a severe mountain pine beetle (MPB) infestation, at this time. The licensee's base case 'Current Practice with Endemic MPB', as the title suggests, assumed that endemic levels of infestation would continue to occur into the future. About 30 percent of the timber harvesting land base is covered with stands that have more than 70 percent pine. The base case directs 35 percent of the harvest to stands that are most susceptible to attack by the MPB.

The licensee also prepared a 'Current Practice with Epidemic MPB' scenario ('epidemic scenario') to examine harvest flow and management implications should the MPB infestation substantially increase beyond current levels.

The Ministry of Forests and Range's Provincial Scale MPB Model predicts the spread of the beetle and projects the severity of stands attacked over time from trace, low, moderate, severe and very severe. Very severely attacked stands are projected to incur greater than 50 percent mortality while severely attacked stands are projected to sustain 31-50 percent mortality. The 2007 version of MPB Model projects that about 7300 hectares on TFL 8 could be very severely attacked by the MPB by 2011 and an additional 2100 hectares could be very severely attacked by 2016. The model's predictions were used in the 'epidemic scenario' as well as the following assumptions:

- for the first 15 years, 35 percent of the harvest is directed at pine-leading stands projected to be very severely attacked by the MPB by 2014;

- a five-year shelf life is assumed after which dead pine is no longer considered to be merchantable;
- spatial adjacency, green-up and visual quality objective requirements in the base case are not applied to the stands predicted to be very severely impacted;
- minimum harvest age is reduced to 40 years of age to allow the salvage or rehabilitation of younger MPB-attacked stands; and
- stand level retention was increased from 7 percent in the base case to 20 percent for wildlife tree retention to account for retention levels recommended by the chief forester in the event of large scale salvage.

In the 'epidemic scenario', harvested stands regenerate as managed stands. Unharvested stands that are projected to be very severely attacked in this scenario are assumed to die after attack and regenerate as natural stands. Severe, moderate and low-level attacked stands that are not harvested receive pine volume reductions according to the severity of the infestation.

Initial harvest levels in the 'epidemic scenario' are set at the base case level of 186 000 cubic metres per year. In this scenario, by year 20 the mid-term harvest level drops to 159 000 cubic metres per year and remains at this level until year 110 where it increases to a long-term harvest level of 209 000 cubic metres, which is similar to the long term in the base case. Of the total 9173 hectares of very severely attacked stands in the timber harvesting land base, 40 percent (3625 hectares) are harvested in this scenario.

The licensee performed several sensitivity analyses to examine both the proportion of the harvest targeted at very severely attacked stands and shelf-life assumptions.

The licensee also examined the impacts of significantly raising initial harvest levels. The results suggest that a substantive AAC uplift directed at the salvage harvesting MPB stands would not help offset impacts to the mid-term harvest levels.

In reviewing the 'epidemic scenario' and the several associated sensitivity analyses, in the event of a MPB epidemic impacting the TFL, it is apparent that targeting stands projected to be very severely attacked more effectively mitigates impacts on mid-term timber supply than a large AAC uplift. However, a substantive uplift does allow a higher percentage of very severely attacked stands to be harvested and increases the total volume harvested. Relative to other units, the high percentage of mixed stands that are not projected to be very severely attacked enables TFL 8 to sustain a relatively robust mid-term timber supply even if the MPB infestation reaches epidemic levels.

In reviewing all of this information, I am satisfied that it is not appropriate at this time for a substantive AAC uplift to address the MPB and note that an uplift was not requested by the licensee. The licensee has directed a substantive amount of its harvesting at pine-leading stands and has indicated that it expects to continue to do so. Currently, pine volumes are more economic to harvest than other species which helps support this focus. The strategy to continue to direct harvest activity at pine-leading stands will likely be the best approach to mitigating timber supply impacts in the mid term should the MPB infestation reach epidemic levels in the TFL.

As noted under "Implementation", the next timber supply analysis will be better informed by how the MPB infestation either expands or collapses in the TFL over the next few years and this information will help support the next determination in 5 years. However, I am prepared to make a determination sooner than 5 years should circumstances regarding this important factor change significantly from what I have considered in this determination, including my expectation that the licensee will continue to direct a substantive portion of their harvesting at pine-leading stands.

Unsalvaged losses

Endemic losses due to fire, wind, insects, diseases and other pests that are not projected to be salvage harvested are accounted for in the base case by subtracting those volume losses from the harvest forecast. Total estimated unsalvaged losses are assumed to be 984 cubic metres per year. The licensee increased the estimated losses due to wildfire and the mountain pine beetle relative to the previous 2002 analysis. Estimated losses are relatively low compared to other units due to the good road access throughout the TFL which enables timely detection and provides access for salvage harvesting.

The analysis did not address how small scale salvage by other operators, which is about 4000 cubic metres per year, might be recovering some of the estimated unsalvaged losses. Small scale salvage may also be addressing some of the dead potential volumes discussed previously under 'log grades'.

I have considered this information, in the context of discussions above, should the MPB infestation expand and become epidemic in the TFL, and I am satisfied that the modelling of unsalvaged losses adequately reflects the historical endemic unsalvaged losses on the TFL for the purposes of this determination. Given the potential increases in MPB attack in the TFL, under "Implementation" I request that the licensee provide an up-to-date estimate of unsalvaged losses and an estimate regarding how small scale salvage is addressing unsalvaged losses and dead potential volumes, in support of the next determination.

Reasons for decision

In reaching my AAC determination for TFL 8 I have considered the information addressed in the timber supply analysis including those discussed throughout this document, and I have reasoned as follows.

The 2007 timber supply analysis base case projection shows that an initial harvest level of 186 000 cubic metres per year can be maintained for 110 years before rising to a long-term sustainable harvest level of 209 000 cubic metres per year.

In determining AACs, my considerations typically identify factors which, considered separately, indicate reasons why the timber supply may be greater or less than the harvest levels projected for various periods in the base case. Some of these factors can be quantified and their implications assessed with reliability. Others may influence the assessment of the timber supply by introducing an element of risk or uncertainty, but cannot be quantified reliably at the time of the determination and must be accounted for in more general terms.

In my considerations, the following factors have been identified as reasons why the timber supply as projected in the base case may have been underestimated:

- *Riparian management:* It was assumed in the base case that 25 percent of riparian management zones for S4, S5 and S6 streams – about 700 hectares – would not be available for timber harvesting. This was in addition to deducting areas for riparian reserve zones, and riparian management zones for S1, S2 and S3 streams and wetlands and lakes from the timber harvesting land base. District staff note that the 700 hectares deducted in the base case for riparian management zones for S4, S5, and S6 streams likely exceeds requirements for current practice. I estimate that an upper bound to this underestimation of the timber harvesting land base is about 700 hectares – up to 1 percent – thereby affecting timber supply in the short to long term.
- *Not-satisfactorily restocked (NSR) areas:* In the base case, about 2679 hectares of current NSR area was deducted from the initial timber harvesting land base. The previous 2002 analysis assumed all current NSR area to be fully stocked within the first 5 years of the planning horizon, which I believe is a reasonable approach. Based on the results of a sensitivity analysis, I recognize that harvest levels could increase by 1.6 percent for the first 110 years, and by 3.8 percent over the long term.
- *Log grades:* With the new log grade system implemented for British Columbia's Interior in 2006, trees that are dead at the time of harvest but have reasonable sawlog quality, ('dead potential') are now charged to the AAC. I therefore have accounted for an underestimation of the timber supply by 1 percent in the short- to mid-term, and 3 percent in the long term.

The following factors have been identified as reasons why the timber supply projected in the base case may have been overestimated:

- *Dense pine stands:* About 8558 hectares of dense pine stands continue to contribute to timber supply in the base case. There is still uncertainty about the economic viability and potential long-term contribution of 7360 hectares of these stands to the timber harvesting land base. Therefore, I have accounted for up to an 11-percent overestimation in the short- to long-term timber supply.
- *Identified wildlife:* There are no wildlife habitat areas (WHAs) that have been currently designated for identified wildlife in the TFL and no allowances were made for future designations in the base case. Draft WHAs within the TFL suggest that designations may occur in the future. I recognize therefore up to a 1-percent overestimation of timber supply to account for identified wildlife management.
- *Landscape-level biodiversity:* the base case reasonably modelled the old forest seral stage retention requirements from the Kootenay-Boundary Higher Level Plan Order for TFL 8, with one exception. The two-thirds drawdown target requirements for low biodiversity emphasis landscape units were maintained into the long term instead of achieving the full target by the end of three harvest rotations. I therefore conclude that, relative to the base case, there is an uncertain

overestimation of timber supply of up to a 7 and 2.4 percent in the mid- to long-term.

The above list of factors identifies six areas of upward and downward pressure on the base projection. Although AAC decisions set the level of timber harvesting for 5 years in the short term, they need to consider timber supply implications throughout the full forecast horizon to avoid both excessive changes from decade to decade and significant timber shortages in the future.

In reviewing the potential for under- or overestimating timber supply in the short term, I note there is about a 2-3 percent potential underestimation in timber supply, and about a 1-percent potential overestimation due to identified wildlife. There remains considerable uncertainty regarding the longer term impacts due to assumptions in the base case about dense pine stands and landscape-level biodiversity. Overall in my assessment the factors in the short term that under- and overestimate timber supply mostly offset each other for the purposes of this determination.

The uncertainty regarding mid- and long-term timber supply do not suggest at this time that there is concern that initial harvest levels forecasted in the base case could cause significant impacts to timber supply in the future. Also, as the previous and current forecasts show a very stable and likely higher long-term timber supply, a small increase at this time is reasonable.

Nonetheless, I am mindful in my determination of the 'Current Practice with Epidemic MPB' scenario and supporting sensitivity analyses. This scenario is important to consider since the MPB infestation may change from an endemic MPB infestation to an epidemic one similar to the forecasts in the MPB model predictions. Overall conclusions from an examination of the scenario and the sensitivity analyses indicate that directing a high percentage of harvest to pine stands projected to be very severely attacked improves the mid-term timber supply level (i.e. lower short-fall in the mid term) rather than a substantive AAC uplift. The licensee recognizes this and has directed a high proportion of their harvest effort at pine-leading stands and has indicated they expect this to continue. Based on this, I am satisfied that the harvest level indicated in the short term in the base case is sufficient at this time to adequately address the current MPB infestation provided the licensee continues to direct a high proportion of their harvest at pine stands projected to be very severely attacked. I am prepared to re-examine this conclusion sooner than the five year AAC determination requirement should circumstances or information regarding the MPB change significantly from what I have considered in this determination.

Considerable efforts were made by district staff to obtain feedback from First Nations that have asserted traditional territories in the TFL. Few comments were received on the timber supply review itself. After considering the information available to me, including that provided by the consultation process, I am not aware of any factors regarding First Nations' interests that compels me to adjust the base case timber supply for the purpose of my AAC determination for TFL 8. If further information on First Nations' interests becomes available during the term of this determination, I am prepared to make a new decision sooner than 5 years.

Determination

I have considered all the factors in my review of the timber supply analysis, including the risks posed by and the uncertainties present in the information provided. It is my determination that a harvest level for the next 5 years that accommodates objectives for forest resources, that reflects current management practices as well as the socio-economic objectives of the Crown, and that considers First Nations' interests, can be best achieved by establishing an AAC of 186 000 cubic metres per year for TFL 8. This represents an increase of about 6 percent from the current AAC.

Regarding the MPB infestation, my decision to increase the AAC is predicated on the assumption that harvesting will continue to focus on MPB impacted stands, and if harvesting of pine is not shown to be a priority, then the next AAC decision may include partitions for pine and non-pine species.

This determination is effective April 1, 2009 and will remain in effect until a new AAC is determined, which must take place within 5 years of the date of this determination, unless the next decision is formally postponed in the meantime as permitted by Section 8 of the *Forest Act.*

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to make a new determination sooner than the 5 years required by legislation.

Implementation

In the period following this decision and leading to the next AAC determination, I request that the licensee carry out the following requests:

- *MPB infestation*: track and report harvesting performance in MPB infested stands;
- *dense pine stands*: continue to track and record harvesting in dense pine stands that contribute to the timber harvesting land base and to make an informed assessment of which dense pine stands are economically operable in the short to long term;
- *managed stands*: assess the assumptions regarding managed stands in support of the next timber supply analysis. This would include: (i) regeneration practices including reliance on natural regeneration, regeneration delay and stem density at time of planting and free-growing; (ii) quantity and quality of planting stock with genetic worth; and (iii) appropriate OAF reductions given root diseases and other pests in the TFL that impact managed stands;
- *aggregation procedures – block size*: improve modelling approaches using stand aggregation to better represent actual harvest block sizes. I urge that the licensee work with appropriate Forest Analysis and Inventory Branch staff to cooperatively determine a suitable approach;
- *adjacency and green-up*: model spatial adjacency for as long as possible (equal to or greater than 20 years) then use an aspatial approximation over the remainder of the planning horizon;

- *landscape-level biodiversity*: model attainment of the full older seral stage target for low biodiversity emphasis landscape units by the end of the third rotation or apply OGMAs if established at that time; and
- *unsalvaged losses*: provide an up-to-date estimate of unsalvaged losses given any increases in the MPB, and an estimate regarding how small scale salvage is addressing unsalvaged losses and dead potential volumes.

M. Boyce

Melanie Boyce, R.P.F.
Deputy Chief Forester

March 18, 2009

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the Forest Act, Revised Statutes of British Columbia 1996, reads as follows:

8. Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest agreement areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 10 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

(3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she

(a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and

(b) must give written reasons for setting the earlier date.

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area,

(b) different types of timber and terrain in different parts of private land within a tree farm licence area, and

(c) repealed [1999-10-1].

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine an allowable annual cut for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the stand of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) Repealed. [2003-31-2 (B.C.Reg 401/2003)]

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Document attached:

Appendix 3: Minister's letter of July 4, 2006

BRITISH COLUMBIA

JUL 0 4 2006

Jim Snetsinger
Chief Forester
Ministry of Forests and Range
3rd Floor, 1520 Blanshard Street
Victoria, British Columbia
V8W 3C8

Dear Jim:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the responsibility for determining Allowable Annual Cuts-decisions with significant implications for the province's economy, communities and environment. This letter outlines the economic and social objectives of the Crown you should consider in determining Allowable Annual Cuts, as required by Section 8 of the *Forest Act*. This letter replaces the July 28, 1994 letter expressing the economic and social objectives of the Crown, and the February 26, 1996 letter expressing the Crown's economic and social objectives for visual resources. The government's objective for visual quality is now stated in the Forest Practices and Planning Regulation of the *Forest and Range Practices Act*.

Two of this government's goals are to create more jobs per capita than anywhere in Canada and to lead the world in sustainable environmental management. The Ministry of Forests and Range supports these objectives through its own goals of sustainable forest and range resources and benefits. In making Allowable Annual Cut determinations, I ask that you consider the importance of a stable timber supply in maintaining a competitive and sustainable forest industry, while being mindful of other forest values.

The interior of British Columbia is in the midst of an unprecedented mountain pine beetle outbreak. Government's objectives for management of the infestation are contained in British Columbia's Mountain Pine Beetle Action Plan. Of particular relevance to Allowable Annual Cut determinations are the objectives of encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans.

Minister of Forests and Range and Minister Responsible for Housing

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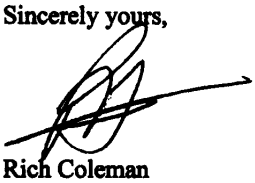
To assist the province and affected communities in planning their responses to the beetle infestation, it would be best to have realistic assessments of timber volumes that can be utilized economically. Therefore, in determining the best rate of harvest to capture the economic value from beetle-killed timber, I ask that you examine factors that affect the demand for such timber and products manufactured from it, the time period over which it can be utilized, and consider ways to maintain or enhance the mid-term timber supply.

The coast of British Columbia is experiencing a period of significant change and transition. In making Allowable Annual Cut determinations I urge you to consider the nature of timber supply that can contribute to a sustainable coast forest industry, while reflecting decisions made in land and resource management plans.

You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Sincerely yours,



Rich Coleman
Minister