BRITISH COLUMBIA

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

Tree Farm Licence 35

held by

West Fraser Mills Limited

Rationale for Allowable Annual Cut (AAC) Determination

Effective March 1, 2012

Jim Snetsinger, RPF

Chief Forester

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Objective of this document

This document provides an accounting of the factors I have considered and the rationale I have employed as chief forester of British Columbia in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 35. This document also identifies where new or better information is needed for incorporation in future determinations.

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 *Forest Act* is reproduced in full as Appendix 1 of this document.

Overview of the TFL

TFL 35, also known as the Jamieson Creek TFL, is held by West Fraser Mills Limited and is administered by the Ministry of Forests, Lands and Natural Resource Operations (FLNR) Thompson Rivers District office located in Kamloops. The TFL is situated approximately 28 kilometres north of the community of Kamloops and is surrounded by the Kamloops TSA. It is located within the Skull landscape unit and is bordered by Bonaparte and Porcupine Meadows Provincial Parks.

The TFL is located to the west of the North Thompson River and contains portions of the Jamieson, Whitewood, Skull, and Lanes Creek Watersheds. In addition, a small portion of the Tranquille Community Watershed lies in the south-western corner of the TFL.

The topography of TFL 35 is typical of the Interior Plateau. The western portion of the TFL is gently rolling, low relief terrain; whereas, the eastern portion contains steeper terrain with incised canyons. Elevations range from 460 to 1860 metres. Four biogeoclimatic zones with six subzones can be found in TFL 35. The majority of the land base is within the Montane Spruce (MS) and Engelmann Spruce/Subalpine Fir (ESSF) zones, while small portions of the TFL lie within the Interior Cedar-Hemlock (ICH) and Interior Douglas-fir (IDF) zones. Principal tree species of the forests in the TFL are lodgepole pine, Engelmann spruce, subalpine fir (balsam) and Douglas-fir. The varying climate and elevation on the TFL, as demonstrated by the presence of four biogeoclimatic zones, results in fairly diverse plant species that provide habitat for a number of animal species, including deer, moose and badger.

Barriere is located just to the north of the TFL and the small communities of McLure, Louis Creek, Black Pines and Vinsulla are located to the east of the TFL along the Highway 5 corridor. Three First Nations, the Simpcw First Nation, Skeetchestn Indian Band and the Tk'emlúps (Kamloops) Indian Band, have traditional territories that overlap with TFL 35. The Bonaparte Indian Band, Canim Lake Indian Band, and Whispering Pines Clinton Indian Band have traditional territory that is in close proximity to TFL 35.

The total area of TFL 35 is 36 557 hectares, of which 32 447 hectares or about 89 percent contribute to the current timber harvesting land base.

History of the TFL and the AAC

In November 2001, the AAC for TFL 35 was determined at 125 600 cubic metres. In March 2004, the deputy chief forester increased the AAC by 159 percent to 325 600 cubic metres to allow for increased harvesting in order to minimize timber losses due to the 2003 McLure wildfire and the Mountain Pine Beetle (MPB) epidemic.

In 2005, TFL 35 and TFL 15, both held by Weyerhaeuser Canada Limited, were consolidated at the request of the licensee. In 2008, the TFLs were subdivided back to their original land bases, with the AACs set to the levels in place immediately before the consolidation.

In 2010, TFL 35 was transferred from Weyerhaeuser Canada Limited to West Fraser Mills Ltd.

New AAC determination

Effective March 1, 2012, the AAC for TFL 35 will be 125 000 cubic metres.

This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 35 includes:

- Management Plan (MP) No. 10 Public Review Strategy, Tree Farm Licence 35, accepted July 27, 2010;
- Information Package: Tree Farm Licence 35, accepted May 28, 2011;
- Existing stand yield tables for TFL 35, accepted by FLNR Forest Analysis and Inventory Branch, September 30, 2010;
- Managed stand yield tables and site index curves, accepted by FLNR Forest Analysis and Inventory Branch, September 30, 2010;
- Timber Supply Analysis: Tree Farm Licence 35, accepted February 1, 2012;
- Draft MP No. 10: TFL 35, accepted February 28, 2012;
- First Nations Consultation Record Guide, Tree Farm Licence 35, Allowable Annual Cut Determination, November 16, 2011;
- Kamloops Land and Resource Management Plan, Approved by Cabinet July 15, 1995;
- Kamloops Higher Level Plan (HLP) Order January 23, 1996; amended January 23, 2006 and February 13, 2009;
- Site Index Adjustment using BEC Classification on TFL 35, February 22, 2000;
- Status of spruce beetle and MPB in young pine on TFL 35, MacLauchlan, July 11, 2011;
- Summary of public input solicited by the licensee regarding contents of proposed MP No. 10;
- Summary of dead potential volume estimates for management units within the Northern and Southern Interior Forest Regions. Ministry of Forests and Range. March 2006;
- 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;
- Letter from the Minister of Forests and Range to the Chief Forester, dated October 27, 2010, stating the economic and social objectives of the Crown regarding mid-term timber supply in areas affected by the mountain pine beetle;
- *Forest Practices Code of British Columbia Act*, (as amended);
- *Tree Farm Licence 35 Rationale for Allowable Annual Cut Determination;* BCFS, March 1, 2004 and November 1, 2001;
- Secwepemcw – Kamloops, Skeetchestn, Adams Lake, Little Shuswap, Neskonlith, Spallumcheen, Shuswap and Simpcw – A Review of the Historical and Ethnographic Sources, produced by the Ministry of Attorney General, February 15, 2008, revised October 28, 2009;
- Field review of TFL 35 operating conditions by the deputy chief forester, July 8, 2010;

- Field review of TFL 35 operating conditions and associated discussions among Stk'emlupsemc te Secwepemc Nation (SSN) staff, the deputy chief forester/chief forester, and FLNR regional and district staff June 20, 2011 and September 28 and 29, 2011;
- Technical information provided through correspondence and communication among staff from FLNR. Review of TFL 35 operating conditions and associated discussions with West Fraser staff, the chief forester and FLNR regional and district staff on November 17 and 18, 2011;
- Information for litigation between Rick Deneault/Shane Gottfriedson and International Forest Products and West Fraser Mills Ltd., including:
    - Plaintiff's Materials including Notice of Application filed June 16, 2011 and Affidavit #1 of Allan Carroll, Affidavit #1 of Anthony Michael Anderson, Affidavit #1 of John Callhoun, Affidavit #1 of Joe Camille, Affidavit #1 of James McGrath, Affidavit #1 of Christine Simon, Affidavit #1 of Harla Jules, Affidavit #1 of Jeanette Jules and Affidavit #1 of Karen Gates – all filed June 16, 2011; Affidavit #2 of Jeanette Jules, Affidavit #2 of Anthony Michael Anderson – filed September 21, 2011; and Affidavit #2 of James McGrath – filed September 22, 2011;
    - Defendant Interfor's Materials, including Application Response – filed August 31, 2011; Affidavit #1 of Lorne Ivan McNeilly – filed August 31, 2011; Affidavit #2 of Lorne Ivan McNeilly – September 15, 2011;
    - Defendant West Fraser Ltd.'s Materials, including Application Response – filed September 21, 2011; Affidavit #1 of Brad McCullough – sworn September 8, 2011; Affidavit #1 of Greg Munden – filed September 9, 2011; Affidavit #1 of Al Christensen – filed September 12, 2011; Affidavit #1 of Douglas White – filed September 20, 2011;
    - Her Majesty Queen (HMQ)(BC)'s Materials, including Application Response – filed September 13, 2011 and Affidavit #1 of Gerald Reichenback, Affidavit #1 of Atmanand (Atmo) Prasad, Affidavit #1 of James Sutherland, Affidavit #1 of Ron Van der Zwan, Affidavit #1 of Bill Ashman, and Affidavit #1 of John McQueen – all filed September 13, 2011.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs of inventory and growth and yield data. These are concerned primarily with biophysical factors–such as the rate of timber growth and the definition of the land base considered available for timber harvesting–and with management practices.

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, 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 this AAC for TFL 35, I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

Guiding principles for AAC determinations

Rapid changes in social values and in the understanding and management of complex forest ecosystems mean there is always uncertainty in 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 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, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge.

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 forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect to factors that could affect the timber supply that are not substantiated by demonstrated performance or are beyond current legal requirements.

In many areas, the timber supply implications of some legislative provisions remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take this uncertainty into account to the extent possible in context of the best available information.

It is my practice not to speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government. However, where specific protected areas, conservancies, or similar areas have been designated by legislation or by 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 for biodiversity.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyse and account for the consequent timber supply impacts in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, further detailed planning or legal designations such as those provided for under the *Land Act* and the *Forest and Range Practices Act* (FRPA). In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstance. The requirement for regular AAC reviews will ensure that future determinations address ongoing plan-implementation decisions.

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

Some persons 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 incomplete, but this will always be true where information is constantly evolving and management issues are changing. The requirement for regular AAC reviews will ensure that future determinations incorporate improved information.

Others have suggested that, in view of data uncertainties, I should immediately reduce some AACs in the interest of caution. However, any AAC determination I make must be the result of applying my judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can 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 obligation resulting from recent court decisions to consult with First Nations regarding asserted rights and title (aboriginal interests) in a manner proportional to the strength of their aboriginal interests and the degree to which the decision may impact these interests. In this regard, I will consider the information provided to First Nations to explain the timber supply review (TSR) process and any information brought forward respecting First Nations' aboriginal interests including how these interests may be impacted, and any operational plans and actions that describe forest practices to address First Nations' interests, before I make my decision. As I am able, within the scope of my authority under Section 8 of the *Forest Act*, where appropriate I will seek to address aboriginal interests that will be impacted by my decision. When aboriginal interests are raised that are outside my jurisdiction, I will endeavour to forward these interests for consideration by appropriate decision-makers. Specific concerns identified by First Nations in relation to their aboriginal interests within the TFL are addressed in various sections of this rationale.

The AAC that I determine should not be construed as limiting the Crown's obligations under court 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 35. It is also independent of any decisions by the Minister of Forests, Lands and Natural Resource Operations with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as a steward of the forested land of British Columbia, of the mandate of the Ministry of Forests, Lands and Natural Resource Operations (formerly 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* (FRPA).

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review Program for TSAs and TFLs.

For most AAC determinations, 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 can be produced, to reflect different starting harvest levels, rates of decline or increase, and potential trade-offs between short- and long-term harvest levels.

From a range of possible forecasts, one is chosen in which an attempt is made to avoid both excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the "base case" forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply. The base case is designed to reflect current management practices.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer model used to generate it.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which resulting predictions of timber supply must be adjusted to more properly reflect the current and foreseeable situation.

These adjustments are made on the basis of informed judgement using currently available information about forest management, and that information 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, in reviewing the considerations that lead to the AAC determination, it is important to remember that the AAC determination itself is not simply a calculation. Even though the timber supply analysis I am provided is integral to those considerations, the AAC determination is a synthesis of judgement 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. Judgements that in part may be based on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation would be gained by attempting a computer analysis of the combined considerations.

Timber supply analysis

The timber supply analysis for TFL 35 was prepared in 2011 by TECO Natural Resource Group Limited on behalf of the licensee using the timber supply model Patchworks. Patchworks, developed by Spatial Planning Systems in Ontario, is a spatially explicit harvest scheduling optimization model. It is capable of modelling spatially explicit harvest allocations that can be used to explore implications of different assumptions about a broad range of management and harvest goals.

The harvest forecasts prepared from this timber supply model were reviewed by FLNR Forest Analysis and Inventory Branch staff. Staff have advised me of any implications for timber supply arising from projections generated using the timber supply model. Based on this, I am satisfied that Patchworks is capable of providing an appropriate projection of timber supply.

FLNR staff requested that the licensee prepare a base case harvest forecast that met two specific criteria, as follows: showing a non-declining even-flow of timber from healthy stands (not impacted by mountain pine beetle or spruce bark beetle), and; demonstrating the salvage harvest of beetle-impacted stands.

The base case shows an initial harvest level of 232 500 cubic metres per year could be maintained for 10 years, after which the harvest level declines to 88 000 cubic metres per year. It remains at that level, which was the level of non-declining even-flow harvest from healthy stands, for two additional decades. At the end of the third decade, the harvest level increases to 161 500 cubic metres per year where it remains for the rest of the planning horizon. The harvest levels presented in the base case do not include any volume contribution from deciduous trees and are net of unsalvaged losses. The initial harvest level in the base case harvest forecast of 232 500 cubic metres per year is 29 percent below the current AAC for the TFL.

In the timber supply analysis, various sensitivity analyses were conducted to assess the potential implications and risk to timber supply arising from uncertainty in data assumptions. These analyses have also assisted me in considering the factors leading to my determination. As discussed and quantified throughout this rationale, and in consideration of the items described above, I am satisfied the information presented to me provides an adequate basis from which I can assess the current timber supply for TFL 35.

Where I specifically identify uncertainty in the considerations that follow, I have included several instructions in this rationale for the licensee, so that better information is available for the next determination for TFL 35.

Consideration of factors as required by Section 8 of the *Forest Act*

I have reviewed the information for all of the factors required under Section 8 of the *Forest Act.* Where I have concluded that the modelling of a factor in the base case appropriately represents current management or the best available information and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 1.

Table 1. List of factors accepted as modelled in the base case

Forest Act section and description	Factors accepted as modelled
8(8)(a)(i) Composition of the forest and its expected rate of growth	Forest inventory Non-forest, non-productive and non-commercial Inoperable, inaccessible and terrain stability Low site productivity Deciduous leading stands Recreation resources Volume estimates for existing unmanaged stands Harvest species profile/sequencing
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	Regeneration delay Not-satisfactorily-restocked areas Impediments to regeneration
8(8)(a)(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	Utilization standards Decay, waste and breakage
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	Visually sensitive areas Designated community watersheds Landscape-level biodiversity

For other factors, where more uncertainty exists, or where public or First Nations' input suggests contention regarding the information used, modelling, or some other aspect under consideration, this rationale incorporates an explanation of how I considered the essential issues raised and the reasoning leading to my conclusions.

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,

Mountain pine beetle and spruce bark beetle infestations

- mountain pine beetle

A mountain pine beetle (MPB) epidemic has affected much of the forests of the interior of British Columbia over the past 15 years. Under normal conditions, MPB attacks mature to over-mature lodgepole pine trees (80 years of age and older), and beetle populations decline over winters as a result of cold winter temperatures. Control measures include harvesting attacked trees before overwintering beetles can spread to additional trees in spring. However, over the course of the epidemic in the BC interior, cold winter temperatures have not been common and have failed to suppress the MPB population. With the resulting massive beetle expansion, even younger lodgepole pine trees have succumbed to the epidemic.

The lodgepole pine on TFL 35 has been impacted by the MPB epidemic. In the 2001 AAC determination for TFL 35, the licensee was able to harvest MPB-impacted stands within their AAC, but by the 2004 determination, the MPB population on the TFL had expanded to epidemic proportions.

In the 2004 AAC determination, the deputy chief forester increased the AAC to 325 600 cubic metres in order to enable salvage harvest of timber affected by the MPB as well as timber damaged in the 2003 McLure Fire. The deputy chief forester requested that the licensee focus harvesting in fire-damaged stands and stands with a high incidence of beetle-infested trees.

The deputy chief forester further requested that district staff continue to track the severity of the epidemic on TFL 35 and advise him if the licensee's harvesting activities were not substantially in line with these priorities. He encouraged the licensee to not harvest the full AAC entitlement unless necessary to control the infestation and avoid losses of merchantable dead timber, and to notify him if the higher AAC was no longer needed. The licensee's harvesting history on the TFL since the 2004 determination is discussed below under 'harvest performance'.

In preparation for the 2011 timber supply analysis, the licensee collected information regarding the status of pine on the TFL. The licensee indicates that the majority of the pine stands older than 60 years of age have been killed by the MPB. Mortality has also occurred in stands 20 to 60 years of age.

The timber supply analysis was completed in March 2011 using the most up-to-date information available at that time regarding the extent of damage from MPB. The licensee developed assumptions based on field observations and modelled them in the base case to account for the impact of the MPB epidemic on stand yields.

In pine stands 21 to 40 years of age, covering 1957 hectares of productive forest, damage estimates varied depending on stand elevation. Observations suggest very little damage in higher elevation stands, with approximately 33 percent and 10 percent mortality in mid- and lower-elevation stands respectively. The impacts on stand volumes were modelled in the base case by reducing volumes of the 21 to 40 year old stands by 15 percent. Once these reduced-volume stands were harvested for the first time in the model, subsequent stands on the sites were placed on regenerated stand yield tables.

In pine stands 41 to 60 years of age, mortality was assumed to be 80 percent. Yield tables for these existing stands, covering 149 hectares of productive forest, were reduced by 80 percent. Stands unable to

achieve the minimum harvestable criteria as a result of this reduction were assumed to regenerate naturally with a 20-year regeneration delay.

After a tree has been killed by MPB, the quality of its wood gradually deteriorates until it can no longer be used to produce wood products. The licensee modelled this deterioration using shelf life assumptions that estimate the length of time merchantable products can be derived from the trees.

FLNR staff note that preliminary sampling conducted on the TFL during 2011 suggests mortality rates of 33 percent in 20 to 55 year old pine stands. While noting that the higher elevation stands had lower mortality rates, the regional entomologist observed the majority of plantations seemed to be at low to mid elevation.

The Stk'emlupsemc te Secwepemc Nation (SSN) questioned the low level of mortality assumed in the age class 2 (20 to 40 year old) pine stands. They cited a regional entomologist report for the Kamloops TSA that indicated 97 percent of young pine stands had 37 percent damage.

When I met with the licensee in November 2011, the licensee noted that for the TFL field observations of experienced staff suggest light, scattered impact from the beetle in 20-30 year old pine-leading stands, with higher mortalities observed in the 30-40 year old stands. They also noted that balsam and spruce is regenerating naturally into the understory of these impacted stands.

I am aware that in the base case the licensee modelled a 15 percent volume reduction in 21 to 40 year old stands, and an 80 percent reduction in 41 to 60 year old stands. These assumptions are reasonably consistent with the observations of FLNR staff. With regard to the regional-level information provided by the SSN, the information used in the base case reflects local information.

In consideration of the information, I am satisfied that the base case assumptions regarding the impact of the MPB on volumes and merchantability of pine on TFL 35 are a reasonable approximation of current conditions. I am aware that the licensee obtained updated damage estimates for pine and spruce using infra-red aerial photography in the summer of 2011. Acknowledging there is still some uncertainty regarding mortality in younger stands, particularly those from 20 to 40 years of age, I expect the licensee will refine its mortality estimates for use in the next determination for TFL 35.

- *spruce bark beetle*

A spruce bark beetle (SBB) outbreak has been underway for the past few years on TFL 35. In May 2009, the former licensee, Weyerhaeuser Canada Limited, mapped the outer boundary of the outbreak, totalling approximately 3158 hectares and roughly corresponding to stands at elevations greater than 1500 metres in the Wentworth Lake and Bob Lake area. The area of timber harvesting land base within that boundary covered with 81 to 100 year old spruce-leading stands was estimated at just under 1300 hectares, with an estimated volume of 368 000 cubic metres.

The FLNR regional entomologist also provided information regarding the SBB outbreak. The entomologist notes that the infestation is located along the western boundary of the TFL next to Porcupine Meadows Provincial Park and the highest levels of attack are in stands outside the TFL. Between 2005 and 2010, field estimates for TFL 35 suggested 156 hectares of lightly affected stands, 385 hectares of moderately affected stands, and three hectares of severely affected stands.

In the base case, 450 hectares of mature balsam-leading stands with a spruce component and 1300 hectares of spruce-leading stands on the timber harvesting land base were modelled as impacted by the SBB. Spruce damaged by SBB was assumed to have a five-year shelf life. For the balsam-leading stands, the yield tables were reduced at the start of the forecast period by 50 percent to reflect the complete loss of the spruce volume, as operationally these stands were not expected to be harvested in the next five years. For the spruce-leading stands, stand volumes were unadjusted for the first five years of the forecast period. After five years, 100 percent of the spruce volume was assumed to be lost and the yield tables were adjusted accordingly.

For some stands, these adjustments reduced the total volume to below the minimum merchantability threshold of 150 cubic metres per hectare. Such stands remained unharvestable for the entire modelling horizon unless the volume contribution from the non-spruce stems increased to above 150 cubic metres per hectare.

In the summer of 2011, the licensee had satellite imagery completed for TFL 35. This information was not yet available for the March 2011 timber supply analysis. In November 2011, the licensee noted that mapping of the SBB outbreak area using the imagery suggests a larger area than modelled has now been impacted by the SBB. The imagery showed approximately 5000 hectares of spruce-leading stands have been impacted, with at least 25 percent of the trees in each stand dead. Of these 5000 hectares, ground checking of four stands showed up to 75 percent of the spruce stems to be either dead or green attacked. These damage estimates exceed what was assumed in the analysis. The licensee estimates salvage of approximately 600 000 cubic metres of spruce volume is needed before the log quality deteriorates.

The SSN questioned whether the five-year shelf life assumed in the analysis for the spruce stands impacted by SBB was too long.

I am aware that limited published information is available regarding shelf life estimates for trees killed by SBB. FLNR staff note a 1977 USDA Forest Service technical report suggests a shelf life of five years for spruce and two years for balsam. FLNR staff discussed shelf life estimates with local log buyers, who indicated that spruce logs dead for more than two years are not suitable for veneer logs due to spiral checking. The licensee states that two years is likely reasonable for veneer products; however, their recent experience milling SBB-damaged trees for lumber indicates shelf life exceeds five years. The licensee states that once SBB-impacted timber has passed two years since death, it degrades much more slowly than in the first two years, in part due to the large size of the logs. Having discussed the issue with both licensee and district staff, I accept that the base case assumptions regarding shelf life are reasonable.

I have considered the information about assumptions applied in the base case to account for the SBB infestation on TFL 35, and discussed this information and the input with both district and licensee staff. I am aware that the estimated level of damage from SBB is now generally believed to be greater than assumed in the base case, which has implications for mid- to long-term timber supply. My discussions with the licensee indicate they intend to place harvest priority on spruce timber killed within the past two years to salvage value from those logs still suitable to be milled for veneer, followed by salvage of the older impacted spruce stems and ongoing salvage of pine.

For this determination, I accept the assumptions as modelled in the base case as adequate. I acknowledge there is a need to focus on salvaging value to the extent possible from SBB-impacted stands. I am aware that the impact of the SBB introduces a level of uncertainty regarding the harvest forecasts shown in the base case in the mid- to long-term. I will discuss my considerations of this further under '**Reasons for Decision**'.

Under '**Implementation**' I request that the licensee monitor the SBB outbreak on TFL 35 and report the progress of the infestation to the district manager annually for the next five years.

Land base contributing to timber harvesting

- general comments

The total area of TFL 35 was estimated to be 36 557 hectares. Of this area, 34 438 hectares (94.2 percent) was considered to be productive forest land.

As part of the process used to define the timber harvesting land base (i.e., the land base estimated to be biologically and economically available for harvesting), a series of deductions were applied to the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest due to ecological or economic reasons.

In the base case for TFL 35, the deductions resulted in a long-term timber harvesting land base (THLB) of 32 447 hectares. This area is about 94 percent of the productive forest land base, or 89 percent of the total TFL area.

In order to assess the sensitivity of timber supply to changes in the THLB, two sensitivity analyses were performed in which the size of the THLB was either reduced or increased by five percent. Results showed that a decrease in size resulted in a four percent decrease in short- and mid-term timber supply, and a two percent decrease in the long term. Increasing the size by five percent resulted in one percent and three percent increases, in short- and mid-term timber supply, respectively and a two percent increase in the long term.

I will refer to these sensitivity analyses when considering land-base related uncertainties in this document.

- *roads, trails and landings*

A complete inventory of existing roads on TFL 35 was available for use in the base case. Roads are classified into four categories: main, operational, block and trails. The width of the road right-of-way varies for each category.

In the 2001 AAC determination, the deputy chief forester requested that the licensee review estimates of road width and in-block disturbance. In response, the licensee reviewed average right-of-way estimates for each road category from Management Plan (MP) 9 and determined them to be appropriate for use in this analysis.

To account for existing roads, the average right-of-way width was applied to the total length of road in each category, and the resulting area was excluded from the timber harvesting land base, for a total deduction of 1048 hectares or 2.9 percent of the TFL.

Licensee staff note that TFL 35 has a well-developed road network and as a result the need for future road construction is expected to be relatively minor. They note that they are in the process of reconfiguring the road network to facilitate the transportation of wood harvested from the TFL to their 100 Mile House and Chasm sawmills.

To account for future roads, the licensee estimated additional roads needed by category and applied the relevant width estimates. This area was excluded from the timber harvesting land base, for a total of 31 hectares after other deductions.

The SSN expressed concern regarding the high road density on TFL 35. They stated that the extensive road network creates increased access throughout the TFL and their traditional territory, impacting their cultural values and their ability to exercise their traditional and cultural practices. In particular, they note that the high level of access increases wildlife vulnerability to being hunted.

The TFL's proximity to Kamloops leads to hunting and recreational pressures on the land base. Hunters and recreational users make use of all-terrain vehicles to access much of the TFL. Both hunters and wolves use the road network as hunting corridors resulting in increased pressure on moose populations.

In discussions with licensee staff in November 2011, they indicate that they have been working operationally with the SSN to mitigate their concerns. In harvesting areas near to but outside the TFL, they have installed gates to discourage access and plan to install additional gates on some roads. They have taken SSN representatives on a field trip to show how roads are deactivated to make them impassable for all terrain vehicles. The licensee also spoke about plans to increase reserves around wetlands to provide better screening for moose from hunters. In its forest stewardship plan (FSP), the licensee commits to maintaining the area of visual screening at a minimum of 50 percent of the total area located within 20 metres of the perimeter of a classified wetland.

District staff note that the licensee is partnering with the Skeetchestn, Tk'emlúps and the provincial government in a project to investigate the effects of increased road access and timber salvage on moose

population dynamics and habitat use on the Bonaparte Plateau. Project results will be used to develop comprehensive access management guidelines and recommendations for mitigation against the impacts of MPB salvage road networks on the long-term sustainability and health of local moose populations.

District staff have reviewed the deductions applied to account for existing roads, and indicate they provide a good approximation of the road network in the TFL. They also note that the assumptions for future roads are acceptable.

I have considered the assumptions used in the base case to account for both existing and future roads, and discussed this information with district and licensee staff. I am satisfied that the assumptions provide an appropriate accounting of the road network on TFL 35.

With regard to the concerns expressed by the SSN regarding high road density on the TFL, I am aware that the TFL has a well developed road network. However, based on discussion with licensee and district staff and my own observations, I am satisfied that it does not exceed the overall disturbance ratios as regulated under the *Forest and Range Practices Act*. Regarding concerns of the SSN about the increased vulnerability for species such as moose as a result of the extensive road network, I have discussed this with both district and licensee staff, and I am satisfied that the licensee appears to understand the concerns and is working to address them. I will discuss this further under 'First Nations considerations'.

- *performance in marginally merchantable stands and terrain class IV sites*

Marginally merchantable stands and stands on terrain class IV sites, which occupy 2500 hectares or 7.3 percent of the THLB, are assumed by the licensee to contribute to timber supply on TFL 35. Marginally merchantable stands are defined as all non-pine-leading stands older than 100 years of age but less than 19.5 metres in height; all pine-leading stands older than 80 years of age but less than 19.5 metres in height, and all pine-leading stands with low levels of stocking and/or small trees. Harvesting performance in marginally merchantable stands and terrain class IV sites has been low, given the priority to harvest MPB-impacted pine stands.

In the 2001 and 2004 determinations, the deputy chief forester requested that the licensee report on harvesting performance on these sites. Of the total area harvested since 2001, which was 5800 hectares, 0.5 percent, was harvested from marginally merchantable stands and 1.8 percent was harvested from terrain class IV sites.

In the base case, over 700 hectares, or 49 percent, of the marginally merchantable stands are harvested in the first 10 years. Many of these stands have been impacted by MPB. After the stands are harvested for the first time in the model, they are regenerated as fully productive stands.

The SSN suggest that marginally merchantable stands be excluded from the timber harvesting land base as they are not viable for harvesting.

The licensee maintains that both marginally merchantable stands and stands on terrain class IV sites should continue to contribute to timber supply as they intend to harvest them in the future. In particular, these stands have now been impacted by MPB and the licensee indicates these stands will be subject to a higher harvest priority over the next 10 years due to the MPB damage.

District staff confirm that there has been some performance in these stand types. They also note that the current licensee is likely to harvest these stands, based on past harvest performance in other areas of its operations.

I am aware that historical harvest performance in these stands has been low. However, I am mindful that the volume contribution of the stands in the base case forecast suggests a large proportion are likely to be harvested over the next few years as MPB salvage continues. The licensee confirms that many of these stands will be harvested during salvage operations. Having considered the information and discussed it with staff, I am satisfied that it is appropriate to assume these stand types contribute to timber supply in

the base case. I expect the licensee will continue to monitor its harvesting performance in these stands, so that this information can be used to develop analysis assumptions for use in the next timber supply review.

Expected rate of growth

- site index estimates

In the 2011 analysis for TFL 35, base case assumptions for site index were developed using the same approach and data as in the 2001 analysis. Site index values from the inventory were used for all existing unmanaged stands. For existing managed and future regenerated stands, site index estimates were developed using information from the report *Site Index Adjustments Using BEC Classification on TFL 35*, the Terrestrial Ecosystem Mapping for the TFL, and field plot data.

The authors of the site index report and FLNR staff note that the site index estimates for the high-elevation stands and for regenerating spruce stands in general may be overestimated. For high-elevation stands the overestimate may be one to two metres. High-elevation stands cover about 5500 hectares, or 17 percent of the timber harvesting land base. Regenerating spruce-leading stands cover about five percent of the timber harvesting land base.

This uncertainty was documented in the 2001 determination, and at that time the deputy chief forester included an instruction to the licensee to confirm or refine the site index estimates for high elevation areas and for spruce generally.

I accept the site index assumptions for existing unmanaged stands as appropriate, and that the estimates for regenerating high-elevation and spruce stands in general may be too high. On this account, I consider that mid- to long-term timber supply has been overestimated in the base case by an unquantified amount, and I discuss this further under '**Reasons for Decision**'.

I am aware that the licensee has not yet completed the work requested in 2001, in this determination I request that it either confirm or refine the site index information for spruce stands both in general and at high elevations for use in the next timber supply review for TFL 35, and I have included this request under '**Implementation**'.

- volume estimates for managed stands

Existing stands 47 years of age and younger with harvesting history and all future regenerated stands were assumed to be managed. Deciduous volume on TFL 35 is not currently utilized, and was excluded from contributing to timber supply in the base case. Species composition and density information from the forest inventory in combination with regeneration assumptions, potential site index and operational adjustment factors (OAFs) developed in the previous timber supply analysis were used as inputs to the Table Interpolation Program for Stand Yields (TIPSY) 4.1 model to project volumes.

FLNR district staff reviewed the existing managed stand assumptions used in the base case, and indicate that they reasonably reflect recent operational practices on the TFL.

Future regenerated stands were grouped into analysis units based on biogeoclimatic variant and site series and volumes were projected using TIPSY.

Younger stands used inventory attributes, however the licensee indicates that the inventory is outdated therefore actual volumes are uncertain. Furthermore, the attributes based on the inventory information may not reflect actual stand performance. Thus, the assumptions applied for the future managed stands may not reflect the current licensee`s silviculture practices.

In the 2001 determination, the licensee was requested to improve its approach to modelling mixed species regeneration. I acknowledge comments from FLNR staff that the analysis assumptions may not represent the licensee's expected silviculture regime.

Having reviewed the information and discussed it with the licensee and FLNR staff, I note that for TFL 35,uncertainty in managed stand yield estimates affects mid- to long-term timber supply and does not impact the short term. For this determination I accept that, other than the concerns I raised above under 'site index estimates' and below under 'operational adjustment factors', the best available information was used to estimate volumes for managed stands, and I make no adjustments on this account. However, I expect that the licensee will monitor its silviculture practices over the term of this determination so that assumptions used for the next determination can be verified as reflective of operational practices on the TFL.

- *operational adjustment factors*

For the 2011 base case, the licensee used the operational adjustment factors (OAFs) that had been applied in the 2001 timber supply analysis. These OAFs are non-standard values, developed based on species and silviculture information provided by the previous licensee for TFL 35.

The SSN questioned the OAF values, noting that with global warming, possible linkages to increased disease and fires, and catastrophic losses over the past 10 years, the value for OAF 1 is too optimistic. In addition, they note that the OAF 2 values were derived from a 1976 report, which is likely outdated as harvest at that time was primarily green wood rather than the current harvest profile in the face of SBB and MPB.

FLNR staff note that OAF 2 is applied to existing and future managed live stands, and that the value generally used represents the best available information. The impacts of MPB and SBB on existing managed stands are accounted for through other means in timber supply analyses. Most often shelf life assumptions in combination with yield table reductions are used to reflect the deterioration of stands following mortality from beetles. This approach was also used in the base case for TFL 35, as discussed above under 'mountain pine beetle' and 'spruce bark beetle'.

I have considered the information regarding the assumed values for OAFs in the analysis. I acknowledge that the use of non-standard OAF values introduces some uncertainty to the long-term harvest level for TFL 35. However, the timber supply implications are likely to be small and in any event, do not affect the short-term harvest level. For this determination, I find the OAFs applied to be adequate, and make no adjustments on this account.

The deputy chief forester in his 2001 determination requested that the licensee review the OAF values, and this work has not yet been completed. I request that the licensee collect the information needed to either confirm or refine OAF values for the next determination for TFL 35, and I have included this request under '**Implementation**'.

- *minimum harvestable ages*

In the base case, stands were considered eligible for harvest when they attained a merchantable volume of at least 150 cubic metres per hectare and an average piece size of at least 0.2 cubic metres per tree. Both requirements had to be met before a stand could be harvested.

Stands affected by epidemic insect infestations were held to these merchantability criteria, as discussed under 'mountain pine beetle' and 'spruce bark beetle'.

Two sensitivity analyses were conducted to assess the timber supply implications of reducing the minimum requirement to 100 cubic metres per hectare in lodgepole pine-leading stands only and in all stands. Results were similar in both sensitivity analyses; long-term timber supply was unaffected, while short-term timber supply was increased by eight to nine percent and mid-term timber supply increased by 21 percent.

In the base case, during the first 10 years of the planning horizon when the harvest priority was placed on MPB- and SBB-impacted stands the average harvest age was 150 years. The age increased to 170 years

for the next 15 years before declining to the long-term average age at harvest of 70 years. Average harvested stand volumes in the base case were 300 cubic metres per hectare in the short term and 340 cubic metres per hectare in the long term.

District staff note that in other management units the licensee has harvested stands in close proximity to a mill with volumes as low as 100 cubic metres per hectare and small piece sizes. However, it is not known whether these observations would be applicable to operations on TFL 35.

The SSN commented on the minimum merchantability criteria outlined in an earlier version of the information package. They questioned the assumptions for minimum volumes, specifically the small piece sizes that would result from initial stocking densities of 2000 stems per hectare. To address this concern, the licensee edited its information package to include the minimum average piece size of 0.2 cubic metres per tree in the merchantability requirements.

The SSN also questioned the low minimum harvestable age of 55 years assumed for some stands. The licensee responded that this age applies for high-productivity sites only. Furthermore, minimum harvestable ages are minimum ages, and they are not always the actual ages at which stands are harvested in the model.

I have considered the information and input about minimum harvestable ages and minimum merchantability criteria assumed in the base case for the stands on TFL 35 and discussed it with FLNR staff. I am satisfied that the assumptions are reasonable and reflective of operational practice, and I make no adjustments in this regard.

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

Table 1 lists each of the factors I have considered under this section for which I agree with the information respecting current practice and with the modelling as incorporated in the base case. No factors considered under this section require additional comment.

iii) silvicultural treatments to be applied to the area:

- *genetic gain*

To reflect that some existing managed stands on the TFL were regenerated using genetically improved seed, genetic gains were applied to the yield curves for stands planted between 1989 and 2007 that were classified as high productivity sites where genetically improved trees were typically planted. Gains of 5.4 percent for lodgepole pine and 5.7 percent for spruce were applied to the yield curves used in the base case.

For stands regenerated since 2007 and future managed stands, it was assumed that 100 percent of lodgepole pine and spruce were grown from class A seed. Average genetic gain values differ by elevation. For lodgepole pine, gains at elevations below and above 1400 metres are 13 percent and 15 percent respectively. For spruce, gains at elevations below and above 1300 metres are 19 percent and 15 percent respectively. These gains were applied to all future managed stand yield curves in the base case. The values for genetic gain were derived using published data from the Forest Genetics Council of British Columbia.

The SSN questioned whether genetically improved stock survives as well as natural stock over time. In response to this question, Forest Analysis and Inventory Branch staff provided them with a brochure published by the Tree Improvement Branch that contains information on British Columbia's tree improvement program, including measures taken to ensure progeny from the tree breeding program is planted in appropriate locations.

I have considered the information regarding the genetic gain assumptions in the base case for TFL 35, and I accept that the best available information was used. I expect the licensee will monitor its use of improved seed so that the information can be used in the next timber supply review for TFL 35.

- *silvicultural systems*

The silvicultural systems utilized on the TFL include clearcut and clearcut with reserves and this was modelled in the base case.

The SSN questioned whether clearcut harvesting is the appropriate silvicultural system for all species on the TFL. They recommended alternative silvicultural systems, which they suggest are more appropriate for protection of non-timber cultural values.

Having considered this input, I am aware that in this TFL the stand types most suited to alternative silvicultural systems are stands predominated by Douglas-fir. Given that the harvest priority on TFL 35 over the term of this determination is salvage of MPB- and SBB-impacted stands, I am satisfied there is unlikely to be much harvest in Douglas-fir stand types in the near term. I will discuss my considerations of this further under 'First Nations considerations'.

(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:

- *interior log grades*

On April 1, 2006, new log grades were implemented for the BC Interior. Under the previous grading system, logs were graded according to whether the tree was alive or dead at the time of harvest. Grade 3 endemic logs (normal endemic mortality occurring in a mature stand) and grade 5 logs (dead trees with less than 50 percent firmwood and defects such as twists, knots or heart rot) both resulting from dead trees and described as 'dead potential' volume, were not charged to the AAC if harvested.

The new system attempts to account more fully for all harvested volume. Log grades are based on a log's size and quality rather than whether the tree was alive or dead at harvest. As a result, logs that were previously considered grade 3 endemic or grade 5 are now graded differently and are charged to the AAC if they meet sufficient quality thresholds.

The VDYP model used to estimate volumes for existing stands does not assume any volume contribution from 'dead potential' trees. Therefore the volume from such trees does not contribute to timber supply in the base case.

Data available to estimate the amount of dead potential volume in stands includes inventory audit plots, Vegetation Resource Inventory (VRI) phase II ground samples, permanent sample plots and temporary sample plots. The inventory audit, considered to provide the best available estimate of the total dead potential volume on TFL 35, suggests this volume is about 3.9 percent of the volume in stands over 60 years of age on the forested land base.

The harvest billing system provides an alternative source of information on use of dead wood. Review of harvest records for the TFL between 1995 and 2004 showed that operationally grade 3 endemic and grade 5 logs contributed approximately 6.6 percent of the volume brought to mills. During this time period the licensee had the choice of bringing such logs to the mill or leaving them on the ground.

FAIB staff have reviewed the information available to estimate dead potential volume for the stands on TFL 35. With consideration of the influence of factors discussed above, and in the absence of other available information, they suggest that an appropriate adjustment is likely in the range between what is indicated by the audit values and those from the harvest billing system. They note that it is likely that short- to mid-term timber supply has been underestimated in the base case by an amount between 3.9 and 6.6 percent on this account.

Having reviewed the information regarding dead potential volume on TFL 35, I accept the assessment provided by FAIB staff. I take into account that timber supply has been underestimated in the base case by approximately five percent in the short- and mid-term, and will discuss this further under '**Reasons for Decision**'.

(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

The Ministry of Forests, Lands and Natural Resource Operations is required under the *Ministry of Forests and Range Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources 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 coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- riparian reserve and management areas

TFL 35 contains a number of streams, lakes and wetlands, all of which have been classified. The riparian management area, a buffer zone adjacent to a riparian feature, is comprised of a riparian reserve zone and a riparian management zone.

In the base case, to account for riparian reserve zones that are excluded from harvesting, a reserve buffer was placed around each feature according to its riparian feature class. The resulting area excluded from the timber harvesting land base was 426 hectares after accounting for previous overlapping deductions.

To account for modified harvest practices in riparian management zones, a buffer was placed around each feature according to its riparian feature class. A basal area retention objective was assigned for each class based on current practices. The retention in the management zones was modelled through a volume reduction applied to the yield tables of the stands in the management zones.

The licensee notes that the assumed riparian reserve zone widths, management zone widths and basal area retention factors represent current operational practices as well as the objectives laid out in the FSP for TFL 35.

The SSN provided input regarding the riparian assumptions in the timber supply analysis. They expressed concern that the watersheds in their territory have been threatened by forestry activity leading to loss of an overall sustainable forest ecosystem and a decrease in the availability of water and related food sources. As an approach to address loss of watersheds and riparian habitats, the SSN has developed a strategy based on Cultural Resource Management Zones (CRMZs) and requested this be implemented throughout their traditional territory. They recommended a 25-metre buffer be applied to all riparian features, to provide a reasonable representation of CRMZs. The SSN state that the CRMZs are important in wetlands and in moose habitat areas, and that the total area excluded to account for riparian areas in the analysis was unacceptable.

The licensee elected not to model CRMZs in the analysis, indicating the modelling assumptions are based on current operational practices in TFL 35 and riparian objectives that have been approved in their FSP.

The SSN discussed their concerns with the deputy chief forester during a meeting in June 2011. As a result of the meeting, Forest Analysis and Inventory Branch staff used geographic information system software to add a 30 metre reserve on both sides of riparian features as an approximation of the area of CRMZs that would be excluded from the timber harvesting land base, and to explore the potential timber supply implications of managing for CRMZs. Staff found this area may be as much as 4404 hectares, or 13.5 percent of the timber harvesting land base. A sensitivity analysis to determine the timber supply

implications of this reduction was not completed; however a five percent reduction in the size of the timber harvesting land base applied in another sensitivity analysis resulted in a four percent decrease in the short-term harvest level. A 13.5 percent reduction could likely reduce short-term timber supply by between 10 and 13 percent.

District staff indicate the assumptions applied in the base case to account for management around riparian features adequately reflect operational practices and the licensee's approved FSP.

In considering the above information, I acknowledge the concerns expressed by the SSN about management of riparian areas on the TFL. I expect that the licensee will continue to work with the SSN and other First Nations at the operational level to address concerns about harvesting near specific riparian features. I am also aware that the Jamieson Creek watershed is considered of significant importance to the SSN and contains many lakes and streams for which riparian health must be considered. I will discuss my considerations of this factor further under 'First Nations considerations'.

For this determination, I accept that the base case adequately reflects current operational practices in riparian areas, and I make no adjustments in this regard.

- *badger habitat*

In July 2009, two Wildlife Habitat Areas (WHAs) for the American Badger were established on TFL 35 under the Government Actions Regulation (GAR). During the review of the draft information package, the SSN noted that these WHAs had not been accounted for in the base case assumptions. As a result, the licensee excluded these areas from the timber harvesting land base in the final version of the information package.

FLNR staff indicate that the assumptions in the base case to account for badger habitat are consistent with current operational practices on the TFL.

Having reviewed the information regarding the assumptions applied in the base case, I am satisfied that management practices for badger habitat have been appropriately accounted for and I make no adjustments on this account.

- *critical moose winter range*

The KLRMP HLP Order identifies two objectives for critical moose winter range: "maintain thermal and visual cover for moose, and enhance browse production"; and "maintain suitable forest cover attributes with respect to thermal cover and browse production".

Moose winter range covers an area of 9819 hectares of the Crown forested land base on TFL 35, including 9279 hectares of timber harvesting land base.

The licensee's FSP outlines moose habitat objectives that are consistent with the critical moose winter range objectives in the HLP. To meet the requirements for mature forest cover, the FSP contains an objective to ensure at least 33 percent of stands within critical moose winter range on the forested land base are 16 metres or more in height, and this constraint was modelled in the base case.

The FSP also defines 'visual screening' as an area of timber or other vegetation that is i) in an area where moose hunting is permitted; ii) within 500 metres of a highway, secondary road or major forestry road; iii) within 20 metres of the perimeter of a wetland classified as W1 or W5 that contains significant moose forage and is visible from the road; and, iv) covered in vegetation that is at least three metres in height. To meet visual screening objectives, the FSP requires that harvesting be done so as to not cause the area of visual screening to be less than 50 percent of the total area located within 20 metres of the perimeter of the wetland.

The licensee assumed that the constraints applied in the base case to reflect management in riparian areas, including land base exclusions for reserve zones and yield curve reductions to reflect basal area retention

in management zones, were sufficient to reflect operational practices to meet moose visual screening objectives. Therefore a separate forest cover constraint to account for visual screening practices in critical moose winter range was not applied.

The SSN provided comments on moose habitat, particularly that harvesting practices near roads and riparian features do not adequately address visual screening needs. They noted that this perceived shortcoming, in combination with the increased access to all areas of the TFL offered by the extensive road network as discussed under 'roads, trails and landings' makes moose more vulnerable to hunting mortality. The SSN is concerned that current hunting exceeds what the moose population can sustain, affecting the SSN's ability to exercise their traditional hunting rights.

District staff note the area considered by the SSN to be moose habitat differs from the critical moose winter range defined under the HLP and modelled in the base case.

Consistent with the licensee's FSP, a forest cover constraint was applied in the base case to all critical moose winter range resulting in the requirement that at least 33 percent of the Crown forested land base in winter range areas must be covered at all times by stands greater than 16 metres tall. This constraint applies to approximately 28 percent of the timber harvesting land base. I am satisfied that this constrains accounts for moose winter habitat needs. In addition, I am aware the licensee is managing for forest cover and visual screening objectives using strategies such as preventing the area of visual screening to be less than 50 percent of the total areas located within 20 metres of a wetland, and such strategies are supported by FLNR biologists. The licensee is also working with the SSN to limit road access to hunters and other recreational users. Furthermore, the licensee is participating in a study with the SSN and FLNR staff to better understand the impacts of increased road access and timber salvage on moose population dynamics and habitat use. The study will result in recommendations for access management guidelines and mitigation strategies for long-term sustainability of moose populations.

I acknowledge the concerns expressed by the SSN and note that management measures carried out by the licensee and FLNR district staff are designed to maintain sufficient moose habitat. Having considered this information and discussing it with staff, I am satisfied that for this determination, the base case assumptions have adequately accounted for moose habitat objectives outlined in the HLP and reinforced in the licensee's FSP, and I make no adjustments on this account. I discuss this further under 'First Nations considerations'.

- *critical deer winter range*

Critical deer winter range on TFL 35 covers an area of approximately 730 hectares of the Crown forested land base, or 606 hectares of timber harvesting land base. Objectives for critical deer winter range are outlined in the HLP as follows: to maintain or enhance forage production and habitat requirements in critical deer winter range; to disperse the timber harvest throughout the winter range and spread it out evenly over the rotation; and to maintain at least 25 percent of the forested area in thermal cover, linking thermal cover units together with suitable travel corridors, especially mature Douglas-fir veteran trees on ridges. The management objectives are to be met within each ungulate winter range planning unit.

In the licensee's FSP, strategies for managing critical deer winter range are defined and are consistent with the objectives in the HLP. Attributes of forested areas that provide suitable snow interception and thermal cover are defined, including being greater than 0.25 hectares in size, conifer-leading, and meeting minimum crown closure classes that vary by biogeoclimatic zone and/or leading tree species. Practices required to retain contributing snow interception cover are also provided, including having no less than 25 percent of the forested Crown land within each ungulate winter range planning unit retained; where practicable having the retained area preferably met by Douglas-fir leading stands; and, where available and practicable, to have these retained areas within 250 metres of a point on a cutblock.

The critical deer winter range on TFL 35 is within one ungulate winter range planning unit. In the base case, management practices for critical deer winter range were modelled by ensuring that at all times

at least 25 percent of the stands on the forested land base were retained with the desirable cover characteristics described in the FSP.

The SSN objected to the use of the words "where practicable," particularly with respect to using Douglas-fir stands to meet the objectives. They also expressed the opinion that 0.25 hectares would be too small to be useful habitat for mule deer, particularly if isolated and not connected to other forest habitat.

FLNR staff note that the use of the term "where practicable" should have been clearer, and was meant to convey that field conditions will dictate the actual modifications of practice necessary to maintain this habitat. The licensee notes that the regeneration strategies modelled in the base case include regenerating higher proportions of Douglas-fir to stands within the deer winter range area.

Having considered the information regarding critical deer winter range, I am satisfied that the assumptions applied in the base case provide a good approximation of operational practices on the TFL and are consistent with the HLP objectives for management of critical deer winter range. I will discuss my considerations of the SSN input under 'First Nations considerations'.

- *adjacency considerations*

In accordance with the HLP, stands in areas not considered to be visually sensitive are eligible to be harvested if trees in adjacent cutblocks have achieved a height of at least three metres. In the base case, adjacency objectives were modelled by allowing no more than 33 percent of the area to be covered in trees less than three metres in height at any time.

In the licensee's FSP, operational exemptions from this requirement are permitted in areas of salvage harvesting.

The SSN note that the operational exemptions from green up and other forest cover constraints such as those for wildlife are too wide ranging across the TFL given the extent of salvage harvesting for MPB. They also note that the onset of the SBB infestation will increase the number of large cutblocks with reduced green up standards. In my meeting with licensee staff in November 2011, they discussed an approach of creating extra reserves in areas of large scale salvage operations.

Having considered the information regarding adjacency, I accept that the base case appropriately reflects operations on the TFL as well as objectives defined in the FSP. I request the licensee to report on and reflect the additional reserves remaining in large salvage areas in the timber supply analysis for the next determination. I will discuss my considerations of the SSN input under 'First Nations considerations'.

- *stand level biodiversity*

In the base case, existing wildlife tree patches (WTPs) on TFL 35 were identified and excluded from the timber harvesting land base. Existing WTPs cover 550 hectares after other, overlapping exclusions.

Future WTPs have not yet been identified on the ground. An analysis was completed to determine the amount of area and general location of future WTPs. For this analysis, the licensee used guidance on the maximum acceptable distance between wildlife tree patches from the September 1995, *Biodiversity Guidebook*.

First, a 250-metre buffer was applied to all forested polygons not in the timber harvesting land base. This buffered area determined the effective WTP area of influence. The remaining areas outside the buffer potentially require a WTP. A grid of points was generated to show theoretical locations of all potential WTPs across the TFL.

Each of the identified future WTPs were buffered to create a 0.5 hectare area, the average size of existing WTPs on the TFL. The resulting area, totalling 57 hectares, was excluded from the timber harvesting land base.

The SSN commented that the amount of area excluded for future WTPs was small, noting that the *Forest and Range Practices Act* (FRPA) requires a minimum of seven percent retention for stand-level biodiversity. They also commented that the base case did not appear to account for wildlife movement corridors, riparian movement corridors, or connectivity of habitat. Without proper connectivity, they expressed concern that the 0.5 hectare patches would become isolated islands of limited genetic variability for smaller species and unusable for larger species. They note this would impact the ability of the SSN to exercise their asserted aboriginal rights of hunting and trapping.

The licensee notes that the modelling approach and exclusions applied are consistent with objectives to provide for stand-level biodiversity as outlined in the FSP. The FSP sets a minimum of 3.5 percent retention at the stand level to account for biodiversity. This also meets the direction under FRPA, as confirmed by FLNR staff.

FLNR staff note other areas excluded from timber harvesting for management objectives such as OGMAs, riparian reserve areas and wildlife habitat also contribute to meeting stand-level biodiversity objectives. The management for some of these objectives was modelled through means other than timber harvesting land base reductions. For example, practices in riparian management zones were modelled through volume reductions applied to the yield curves. I have considered the information regarding stand-level biodiversity and I am satisfied the licensee has provided an appropriate accounting in the base case for the placement of WTPs that is consistent with their FSP commitments. In addition, I believe other exclusions applied in the base case both to the land base and to stand yields will contribute to meeting needs for stand-level biodiversity, including an accounting for connectivity.

I am satisfied the licensee's commitments in its FSP will serve to guide practices operationally to ensure biodiversity objectives continue to be met at the stand level. I accept there is some uncertainty regarding the actual area likely to be reserved in WTPs as operations continue on the TFL. The licensee's practices in other operating areas may or may not be representative of what can be expected on TFL 35, given slightly different operating considerations. To address this uncertainty, I expect the licensee will monitor its practices with respect to WTP implementation on the TFL and reflect this information in the analysis for consideration in the next AAC determination.

I will discuss the input of the SSN further under 'First Nations considerations'.

- *cultural heritage resources*

Provincial legislation requires that BC's forests be managed in a sustainable manner that includes considering the social and cultural needs of First Nations. The Forest Planning and Practices Regulation under FRPA lists an objective set by government for cultural heritage resources (CHRs). The objective is to conserve, or if necessary protect, CHRs that are the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and are not regulated under the *Heritage Conservation Act*. CHRs may include aboriginal interests where such traditional societal practices meet the tests associated with asserted aboriginal rights and title as set out in court decisions.

The licensee and SSN have been in discussions regarding completion of cultural heritage assessments. At this time, a draft agreement to conduct these assessments remains under discussion with no assessments yet conducted.

The SSN state they have aboriginal interests within the area defined by TFL 35, including hunting and trapping of various animals, harvesting of timber and related materials such as bark and sap, harvesting of other plants, roots and parts of plants, and of harvesting various traditional medicines, and carrying out a variety of customs, practices and traditions. Traditional practices are carried out for purposes such as food, clothing, medicine, shelter and use in ceremonies.

The SSN also note the forests of TFL 35 and other areas within their traditional territory are crucial for the maintenance of healthy watersheds and an overall sustainable forest ecosystem. The SSN state that the forests are fundamental to their traditional and cultural practices.

Concern was expressed by the SSN regarding the existence of archaeological evidence throughout the TFL that would indicate their historical connection to the land. As well, they indicated an AAC determination will have long lasting impacts to wildlife, plant and aquatic species, which are critical to SSN's cultural heritage values.

I have considered the information regarding cultural heritage resources on TFL 35. I am aware that in the 2011 base case, there were no deductions to the productive forest land base made specifically to account for cultural heritage resources. Other deductions that likely provide accounting for cultural heritage resources include those for deciduous stands that are often located along waterways where aboriginal interests are likely to be found, other land base reductions to account for riparian reserves, OGMAs, WTPs, and forest cover requirements for ungulates. It is expected that the location of these retention areas on the TFL would be delineated with consideration for identified cultural heritage resources.

I expect that the licensee will continue to work with First Nations to identify specific sites or resources of interest to them, and ensure that this information is reflected in the next timber supply review for TFL 35.

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

Other information

- Kamloops Land and Resource Management Plan

The Kamloops Land and Resource Management Plan (KLRMP) was approved in 1995 and declared as a higher level plan (HLP) in 1996 under the *Forest Practices Code*. The higher-level plan order was amended three times since then, most recently on February 13, 2009. The objectives established in the HLP and amendments provide legal direction to primary forestry activities within the area covered by the plan, including TFL 35.

I am aware of the licensee's commitments in its FSP that operations on the TFL will be consistent with the HLP direction. I have also considered, as discussed where applicable under the various factors in this rationale, the degree to which the analysis assumptions are consistent with the HLP direction. Overall, in making my determination for TFL 35, I am mindful of the land use planning decisions that affect TFL 35.

- partitioning the harvest

Section 8(5) of the *Forest Act* provides for the authority to specify certain portions of an AAC as attributable to different types of timber and terrain or to different areas of Crown land in a TFL or TSA. "Partitioning" an AAC ensures that harvesting is appropriately distributed in forest types, operability classes, or distinct areas.

The AAC for TFL 35 does not currently include a partition. In the 2004 rationale, the licensee was instructed to focus harvest in stands impacted by the McLure wildfire and MPB. Salvage harvest of the wildfire area is now complete, and salvage of MPB- as well as SBB-impacted stands is continuing.

I have considered the application of a partition for TFL 35, and I will discuss my considerations further under '**Reasons for Decision**'.

- First Nations considerations

The Crown has a duty to consult with, and where appropriate accommodate, those First Nations for whom it has knowledge of the existence of proven or claimed aboriginal rights and title (aboriginal interests) that may be impacted by a decision, including strategic-level decisions such as AAC determinations. For this

determination, I have considered information arising from the consultation process that occurred with First Nations respecting aboriginal interests that may be affected by my AAC determination. As well, I have considered other relevant information available to the ministry regarding aboriginal interests including information gathered during other consultation processes. The TFL 35 timber supply review consultation was guided by provincial procedures for consultation with First Nations that is based on *Haida* as well as recent case law.

FLNR staff consulted with the six First Nations and one First Nation organization. They include the Simpcw First Nation, Skeetchestn Indian Band, Tk'emlúps (Kamloops) Indian Band, Bonaparte Indian Band, Canim Lake Indian Band, the Whispering Pines Clinton Indian Band, and the Stk'emlupsemc te Secwepemc Nation (SSN). Any general references to First Nations in this section denote all of these nations. The traditional territories of Bonaparte, Canim Lake and Whispering Pines Clinton Indian Bands are outside of TFL 35, however because Bonaparte and Canim Lake Indian Bands expressed concern in previous consultation processes regarding TFL 35, they were included in the timber supply review consultation process. Since the traditional territory of Whispering Pines Clinton Indian Band is in close proximity to the TFL, they were also included in this consultation process.

All but the Bonaparte and Canim Lake Indian Bands are affiliated with the Shuswap Nation Tribal Council, which represents 10 of 17 Secwepemc (Shuswap) First Nations. The Skeetchestn Indian Band and the Tk'emlúps Indian Band comprise the Stk'emlupsemc te Secwepemc Nation (SSN), and are also known as the Kamloops Division of the Secwepemc Nation.

Several of the First Nations currently have agreements with the Province. The Bonaparte Indian Band has a Forest Consultation and Revenue Sharing Agreement (FCRSA) signed March 1, 2011, which contains a consultation process for AAC determinations in the 100 Mile District.

The Simpcw First Nation has a 15-year Cedar/Hemlock direct award licence with an AAC of 39 919 cubic metres as well as another direct award licence with an AAC of 32 047 cubic metres that expires July 31, 2013.

The Skeetchestn Indian Band has a Forest Tenure Opportunity Agreement (FTOA) signed in August 2011, which provides a direct award non-replaceable forest licence with an AAC of 31 220 cubic metres for a term of 10 years (total volume 312 200 cubic metres). They also currently hold a direct award licence with a total volume of 125 315 cubic metres. Tk'emlúps Indian Band has a direct award licence with a total volume of 272 700 cubic metres that expires December 31, 2012; as well they recently were offered a direct award 10-year licence with an AAC of 68 105 cubic metres. The SSN have an economic and community development agreement (ECDA), which is a mining and revenue sharing agreement that was signed in August 2010.

On May 14, 2010, the SSN filed a Petition for Judicial Review regarding the Minister's March 4, 2010 decision to transfer the TFL 35 licence and Forest Licences A74910 and A18694 from Weyerhaeuser Company Limited to West Fraser Mills Limited and International Forest Products Limited. The petition seeks court declarations including that the Minister was, and remains, under an obligation to consult and reasonably accommodate the interests of the SSN.

Subsequently, on January 18, 2011 the SSN filed an Amended Notice of Civil Claim naming the Province of British Columbia, Weyerhaeuser, West Fraser and Interfor as respondents seeking declarations, damages, an injunction, and other relief for unjustifiable infringement of their Aboriginal rights and title resulting from industrial forestry activity.

On June 16, 2011, the SSN filed a Notice of Application seeking an injunction against Interfor and West Fraser's harvesting activities in the Criss Creek, Heller Creek, Jamieson Creek and Tranquille Watersheds or portions thereof. If granted, this injunction would restrict timber harvesting in the affected areas within TFL 35. The injunction hearing is now scheduled for April 2012. At this time there is no certainty concerning the outcome of this application, and therefore, in accordance with my guiding

principles for AAC determinations, I consider the Jamieson Creek and Tranquille Watersheds to contribute to timber supply in TFL 35. If however, an injunction is granted for an extended period of time that may warrant a change to the AAC, I am prepared to revisit the determination sooner than the 10 years required by legislation.

As requested by the SSN, I have considered the information in their affidavits associated with the Petition, Amended Notice of Civil Claim and Application for injunction in my AAC determination for TFL 35.

Prior to commencing consultation on the TFL 35 AAC determination, FLNR staff undertook an initial review of available information to assess the nature of known aboriginal interests of each First Nation and how the AAC determination might impact those interests. This information was assessed in order to arrive at a suggested level of consultation. Based on the initial reviews, the suggested level of consultation for Bonaparte, Canim Lake and Whispering Pines Clinton Indian Bands was notification, while for Simpcw First Nation, Skeetchestn and Tk'emlúps Indian Bands the suggested level of consultation was normal to deep. These suggested levels of consultation were communicated to the First Nations in the letters initiating consultation on the AAC determination. Preliminary assessments for each First Nation were also completed after meetings with the First Nations were attempted or occurred and any information from the First Nation regarding their aboriginal interests and potential impacts this AAC decision may have on their interests was received These assessments confirmed the appropriate levels of consultation. Although the consultation levels differed amongst the First Nations, FLNR staff provided the same timber supply review information and opportunities for input and involvement to all First Nations. More information regarding the initial reviews and preliminary assessments is available in the consultation record. An initial assessment of the Shuswap Nation Tribal Council suggested a level of consultation at normal to deep. During consultation, the Shuswap Nation Tribal Council provided a response indicating that it is a political organization representing the Secwepemc chiefs and not a consultative body. Correspondence stated that consultation should occur with individual First Nations, and therefore consultation with the SNTC was conducted at a notification level.

Each of the First Nations was provided with information regarding the TFL 35 timber supply review and was asked for their review and comments about how the decision might affect their aboriginal interests. Opportunities were also provided to meet with FLNR staff to discuss any concerns or questions.

In January 2010, letters were sent by FLNR staff to First Nations initiating consultation on the timber supply review process and introducing the information package. In August 2011, an updated information package and analysis report were sent to all First Nations for their review and comment.

With respect to the Bonaparte, Canim Lake, and Whispering Pines Clinton Indian Bands, the traditional territories of these First Nations are located outside of TFL 35. While these First Nations have expressed concerns about the potential impacts related to high road densities in their traditional territories and to the licence transfer, the potential impacts of this AAC decision on such concerns are minimal. The level of notification on the AAC determination was confirmed through a preliminary assessment at notification and the process followed for these First Nations was consistent with this level of consultation. No new information relevant to the determination was received from the Bonaparte Indian Band, the Canim Lake Indian Band or the Whispering Pines Clinton Indian Band.

The territory of the Simpcw First Nation overlaps with the TFL in an area considered to be shared with other First Nations. An initial review of available information for the Simpcw First Nation suggested a level of consultation of normal to deep. The Simpcw indicate that TFL 35 was a shared area. A 2003 Writ of Summons was filed with the Supreme Court of BC by the Secwepemc people, including the Simpcw First Nation, claiming aboriginal title to their territory. During the consultation on the licence transfer, the Simpcw expressed concern about the economic impacts of the transfer on their forestry operations, as well as the cumulative impact of forest licensees operating in their traditional territory. They also mentioned that they have interest in a long-term area-based forest tenure. A preliminary

assessment of the information for the Simpcw confirmed a level of consultation of normal to deep, and the process followed for this First Nation was consistent with this level of consultation. The Simpcw First Nation provided comments, noting that as a result of the petition filed by the SSN, they defer to the SSN to take the lead regarding consultation on the AAC determination. The Simpcw did not provide any additional comments relevant to the AAC determination.

The Skeetchestn Indian Band and the Tk'emlúps Indian Band were historically known as one band and together comprise the SSN. Based on a review of available information, the suggested level of consultation was normal to deep. The Skeetchestn Indian Band and the Tk'emlúps Indian Band provided input to the consultation process through the SSN. During the consultation process, the SSN provided information about their aboriginal interests, the impact of forestry on those interests and their strength of claim. A preliminary assessment using this and other information confirmed the level of consultation at normal to deep and the consultation process was consistent with this level.

In March 2010 the SSN wrote to FLNR staff that they would like their concerns regarding the licence transfer decision to be included in the timber supply review process. They provided affidavits containing ethno-historic information to be included in the TFL 35 consultation process for the timber supply review, and they requested an assessment of the impact of the AAC determination on their aboriginal interests. Affidavits filed as part of the petition by the SSN included new information regarding their aboriginal interests and the impacts of forest operations on their interests.

The SSN provided comment on many of the analysis assumptions outlined in the draft information package. In April 2010, SSN met with the deputy chief forester, district, and regional staff and discussed the information package and SSN's concerns. This meeting was followed by a teleconference with SSN, Forest Analysis and Inventory Branch, district and regional staff in May 2010 to further discuss the information package assumptions. On May 25, 2010, a meeting was held between branch staff and the licensee to discuss how to address and respond to SSN's concerns. In that meeting, it was agreed that the licensee would either address concerns by making adjustments to the analysis assumptions or provide a rationale as to why the existing assumptions were appropriate. A letter that included this information was sent to the SSN on August 2, 2011. The revised information package was used to prepare the timber supply analysis.

In September 2011, I met with SSN technical staff and FLNR staff for a helicopter tour and field tour of TFL 35, and subsequently met with SSN staff at their Joint Resource Council meeting to further discuss the TFL 35 AAC determination and the issues identified on the tour.

In addition to specific comments regarding the information package and the analysis report, I am aware the SSN also expressed the following general concerns during the consultation process:

- archaeological evidence exists throughout the TFL indicating their historical connection to the land;
- an AAC determination will create long lasting impacts to wildlife, plant and aquatic species that are critical to the SSN's cultural heritage values;
- they disagree that the AAC determination is merely an administrative decision;
- all operations in the TFL should cease and the AAC be set to zero until issues are resolved, and the TFL should be transferred to the SSN as a First Nations woodland tenure;
- range use permits and the current drought conditions affect their traditional use of plants; and
- a desire for capacity funding to participate in consultation processes and to coordinate a forestry forum held by SSN for licensees and the government.

As previously committed by the deputy chief forester, I have reviewed and considered the information contained in the affidavits provided by the SSN as part of the Petition for Judicial Review of the licence transfers and the Notice of Application seeking an injunction.

Having reviewed the information available to me, including the affidavits and other information provided in support of the petition and injunction application, meeting minutes, correspondence between SSN and FLNR staff throughout the timber supply review process, and the information provided through the field trip to TFL 35 and my meeting with SSN staff, it appears that many of the concerns can be grouped into a number of broader themes related to specific aboriginal interests of the SSN on the TFL 35 land base. These broader themes are wildlife habitat, connectivity, plant diversity, stand conversion, and riparian areas.

I acknowledge the SSN concerns related to the licence transfer, access to timber, and funding. However, these issues are outside the scope of my authority in making AAC determinations.

Wildlife habitat is important to the SSN as it supports their traditional hunting and trapping activities. Concerns regarding how wildlife habitat was modelled in the base case included the size of wildlife tree patches and the amount of area excluded, forest cover constraints applied for critical mule deer and moose winter ranges including visual screening and access considerations for moose, green up and wildlife habitat constraints in salvage areas, and the inclusion of badger habitat areas in the timber harvesting land base. I am aware that in response to input from the SSN the badger habitat areas were excluded from the timber harvesting land base. With respect to mule deer winter ranges, I am aware that forest cover constraints were applied in the analysis to reflect operational practices in these areas, which are consistent with legislated requirements and objectives under the HLP as well as the licensee's FSP. Regarding moose habitat, I am aware of several actions to address the concerns of the SSN that were described in the 'critical moose winter range' section above, and are summarized here. A joint study is in progress with FLNR, licensee staff and the SSN that will provide strategic direction on access management guidelines for mitigation of the impacts of MPB-salvage road networks on the long term sustainability of moose populations. I am satisfied that the licensee understands the specific concerns regarding the impact on wildlife habitat of roads and related access on the TFL, and is working to address concerns operationally through drag scarification and gating of roads, and retention of increased visual screening in areas frequented by moose. As well, I am aware of the forest cover constraint applied to critical moose winter range areas in the base case to account for habitat, forage and visual screening in moose habitat areas, which also reflects operational practice.

With respect to concerns about WTP retention, I am satisfied that the analysis approach used to reflect retention practices was reasonable, and I have asked the licensee to monitor and report on actual retention in order to refine information for the next timber supply review.

The SSN also expressed concern regarding connectivity in wildlife habitat and riparian areas. They noted the lack of accounting in the analysis for wildlife corridors to enable wildlife to move between areas of habitat and to ensure maintenance of genetic diversity, in particular in the larger salvage areas. Connectivity is not an explicit component of the *Forest and Range Practices Act* framework. However, the exclusion of areas from the timber harvesting land base to account for old growth management areas, riparian reserves, wildlife tree patches, and for inoperable and other non-productive or non-harvestable forested areas, in concert with the forest cover constraints applied in the analysis to account for various objectives, provide an accounting for connectivity. As I observed during my tour of the TFL in September 2011, the harvest history on TFL 35 has resulted in a variety of age classes that provide many habitat attributes for different species. In consideration of these points, I am satisfied that the base case assumptions adequately reflect operational practices that can provide for connectivity.

The SSN expressed concerns regarding the choice of silvicultural systems, uneven aged management and understory composition. The SSN noted the importance of plant diversity on the TFL, and the potential impact of forest practices on tea beds, and on overstory and understory plant species used for food, medicine, ceremonial and spiritual purposes. District staff are aware of about 150 species of plants that are culturally significant to the SSN. In a related concern that affects plant diversity, the SSN expressed their view that commonly used silvicultural systems and silvicultural practices have led to species

conversion and an even-aged monoculture on the TFL, increasing the susceptibility of the stands to MPB and other pathogens. They also requested that their strategy of CRMZs be implemented within their traditional territory.

In addition, with respect to the use of uneven aged silvicultural systems, I note that the forests best suited to these systems are those dominated by Douglas-fir. The focus on salvage of both pine and spruce over the past several years has resulted in little harvest activity in these types of stands on the TFL. Although the harvest forecasts in the analysis did suggest a level of contribution from healthy, unimpacted stands including Douglas-fir, the recent increase in SBB activity leads to an increased need for salvage harvest of spruce and therefore less contribution than modelled from Douglas-fir stands in the short term. Through conversations with and input provided by the licensee, I am satisfied that those stands that lend themselves to uneven aged management will not be harvested for at least the next 10-year period. In consideration of this, I recommend that the potential use of alternative silvicultural systems be explored further over the term of this determination, and any new information can be brought forward for the next timber supply review for TFL 35.

During our meeting in September 2011, the SSN again detailed their concerns regarding connectivity and stand conversion. Having reviewed the available information, I am aware that FLNR staff work with the SSN to take the information about culturally significant plant species into consideration operationally, such as in the cutting permit approval process. I note that the licensee has committed to planting multiple tree species where ecologically appropriate and feasible to do so. The licensee also noted in our November 2011 meeting that ingress of natural seedlings, including Douglas-fir, larch and spruce occurs in plantations. I also observed this species diversity in regenerating stands on my tour of the TFL in September 2011. I expect the licensee will review its silvicultural practices, including species selection, and report on this information in the next timber supply review.

Management of riparian areas is also important to the SSN. They have concerns related to water quality, including sedimentation, run off and other possible hydrological impacts as a result of timber harvesting. I note that operationally, the licensee is committed to the objectives for water quality outlined in their FSP, and that the district monitors water quality through the Forest and Range Evaluation Program (FREP). In the analysis, the management practices in the Tranquille River watershed, which is designated as a community watershed were reflected through forest cover constraints. The SSN has also expressed concerns about the impact of harvesting in the Jamieson Creek watershed and the need for larger reserves in riparian areas. They requested that FLNR use and implement the SSN Cultural Heritage Assessment which includes establishing their CRMZs and undertaking an assessment of cultural heritage resources within these zones with the overall goal of protection.

In response to the SSN concern, FAIB staff undertook an analysis of the possible timber supply impact if CRMZs were to be implemented operationally on TFL 35, and found that up to 13.5 percent of the timber harvesting land base would be reserved under that management scenario, recognizing overlaps with areas reserved for other reasons. I recognize SSN concerns about potential impacts on aboriginal interests in riparian areas. At this time the CRMZ model has not been implemented operationally. The FRPA-compliant riparian buffers that are currently employed operationally, and were modelled in the base case, provide significant protection of riparian values, many of which support aboriginal interests. There is still uncertainty about the need for the size of buffers desired by the SSN. I believe it is reasonable for the period of this determination to expect the currently implemented buffers will address aboriginal interests in riparian areas. However, it will be important for the licensee and FLNR staff to work with the SSN to assess if current management approaches in riparian areas need to be refined in order to address aboriginal interests. The analysis done by FAIB staff on CRMZs provides information could be useful in informing those discussions. New information can be incorporated into future TSRs.

The Jamieson watershed has not been designated as a community watershed and the modelling of this area in the analysis was reflective of current practices. Should the watershed become designated, the

effects of the associated changes in management can be reflected in future AAC determinations. The Jamieson watershed includes the Wentworth Creek sub-basin, where the SBB attack is most prominent. Therefore, it is acknowledged that this watershed will likely be a focus for salvage harvesting. The licensee has committed in their FSP to leaving riparian reserves during salvage operations, which will provide protection of riparian values.

Broader concerns communicated by the SSN during the TFL 35 timber supply review process are related in large part to the overall sustainability of the harvest level and the forests on the TFL, so they may continue to provide benefits for future generations. These included comments regarding the assumptions for minimum harvestable ages, levels of stand mortality, operational adjustment factors, shelf life and unsalvaged losses. I am aware that in response to comments from the SSN on the information package, the licensee revised the analysis assumptions to include a minimum piece size criterion as part of the calculation of minimum harvestable ages. The remaining concerns were discussed under the appropriate factors.

I have considered the concerns of the SSN regarding the inclusion of marginally merchantable stands in the timber harvesting land base. I note that the appropriate level of timber supply contribution to assume from marginally merchantable stands and stands on terrain class IV sites has been discussed in past AAC determinations and is subject to monitoring and reporting on the part of the licensee. The licensee indicates that many of these stands are expected to be harvested in the next five to ten year period since many are identified for salvage harvest. The base case also suggests extensive overlap of pine salvage with marginally merchantable stands, and in the model the vast majority of these stands were harvested in the first ten year period. Based on these considerations, I am satisfied that the inclusion of the marginally merchantable terrain class IV stands in the timber harvesting land base is appropriate. I have requested that the licensee continue to monitor and report out on harvesting operations to support continued refinement of our understanding of the extent to which they contribute to the timber harvesting land base.

In a letter dated January 16, 2012, the SSN expressed their concerns regarding activities on TFL 35, and provided a suggested harvest level of 15 percent of the current AAC, or 48 750 cubic metres per year. I discuss this suggestion at the end of this section.

Also in this letter, the SSN commented on the 2004 AAC determination, noting that the 200 000 cubic metre increase over the previous AAC had resulted in unexpected and unprecedented impacts to First Nations rights and values. I have considered SSN concerns related to their aboriginal interests and impacts on those interests from forest management, and as noted below, it appears to me that the significant efforts have been and continue to be made by licensee and FLNR staff to address those concerns.

In addition to reviewing the information received through the formal consultation process, I have been advised on the existence, nature and content of information that has been reviewed by FLNR and licensee staff in respect of First Nations' aboriginal interests associated with this AAC determination. I have considered this information in relation to an assessment of the strength of aboriginal interests, the adequacy of the consultation process, the presence of cultural heritage resources and the management of wildlife habitat and other interests.

To better understand and address SSN's concerns FLNR staff have provided information and responses to, and have met with the SSN; explored additional analyses; collaborated with the licensee; and reviewed affidavit material for my consideration. With respect to longer-term stewardship on TFL 35, I note that operationally, the licensee and FLNR staff work with the SSN and other First Nations to ensure operational practices are consistent with forest management objectives required under the *Forest and Range Practices Act*, the HLP, and committed to in the licensee's FSP. I am aware of the positive working relationships between the SSN and FLNR staff. I have received presentations from representatives of both the licensee and the SSN about forest practices on TFL 35. I am aware of the

commitments made by the licensee in its FSP, and note that these are consistent with FRPA requirements. I encourage both SSN and the licensee to continue to work together on issues related to the TFL.

I note that the forest management regime on Crown land in British Columbia that is regulated by the FRPA framework, as well as by land and resource management decisions is designed to ensure the capacity of the land to support values associated with forests, such as water, wildlife, fish, trees and other forest vegetation is maintained in perpetuity. I have reflected that forest management framework in my AAC determination. In particular, in making an AAC determination one of my objectives is to ensure that timber is continually available through time, and that allowable timber harvest levels in the short term are consistent with a sustainable long-term timber supply. I base the determination on analysis that indicates this objective can be met.

I am satisfied that for this AAC determination, the FLNR has engaged in consultation with potentially affected First Nations in accordance with current government guidance and with existing agreements. The level of consultation was appropriate, given the aboriginal interests expressed by each First Nation, the available information regarding their respective interests, and the potential impact that this AAC determination may have on those interests. The determination of an AAC does not, in itself, change the forest practices, the management method, the layout of operations on the ground, or the consideration of aboriginal interests at the operational level. Under current practice, the TFL area will be managed under the FRPA legislation and the HLP, which maintains a level of protection for a range of forest values such as watershed integrity, wildlife, and biodiversity. For operational and administrative decisions subsequent to this AAC determination, consultation with First Nations will continue.

With respect to the SSN suggestion that the AAC should be reduced to 48 750 cubic metres, the considerations of First Nations concerns documented in this section indicate to me that they have been addressed in part through adjustments to inputs to the base case for this TSR, and are being addressed through adjustments to practices and through discussions among First Nations, the licensee, and FLNR staff. Therefore, I do not see that a reduction in AAC would be required based on the considerations documented in this section. In '**Reasons for Decision**' I discuss the information and evidence that supported and led to my determination.

I note that if any new information becomes available regarding First Nations interests on TFL 35 that significantly varies from the information that was available for this determination and that may affect timber supply, I am prepared to revisit this determination sooner than required by legislation.

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

- *alternative harvest flows*

In addition to the base case, two alternative harvest forecasts were prepared in the analysis for TFL 35. The alternative harvest forecasts explored the trade-offs between short- mid- and long-term harvest levels. In the first alternative forecast, harvest priorities were altered to minimize the reduction in mid-term timber supply shown in the base case. The harvest was restricted to only those stands attacked by MPB and SBB during the first 10 years of the planning horizon and no healthy stands were harvested. With these priorities, the highest short-term level possible was 142 300 cubic metres per year, which is 39 percent below the level in the base case. A mid-term harvest level of 142 000 cubic metres per year or 61 percent greater than that in the base case was attained. The long-term harvest level was unaffected relative to the base case.

In the second alternative forecast, harvest priorities were set to maximize the long-term harvest level. Healthy stands were targeted in the short term to increase the rate of conversion of these stands to higher-volume managed stands. A long-term harvest level three percent greater than that of the base case was attained. However, the highest short- and mid-term harvest levels attainable were 185 000 cubic metres per year and 40 500 cubic metres per year, which are 20 percent and 54 percent lower than those

in the base case, respectively. These decreases occurred as a result of fewer beetle-damaged stands being harvested before their volume was lost under the shelf life assumptions applied in the base case.

The first alternative forecast suggests that by focusing all harvest activity on the salvage of beetle-impacted stands and reducing the harvest level immediately will help mitigate the decrease in mid-term timber supply projected in the base case, and I have considered this in my determination, as discussed under '**Reasons for Decision**'.

- *harvest performance*

In March 2004, the deputy chief forester increased the AAC for TFL 35 from 125 600 cubic metres to 325 600 cubic metres in order to enable salvage harvest of MPB and fire-damaged timber.

The table below shows the harvest history on TFL 35 from 2004 to 2010 inclusive.

Table 2. Recent TFL 35 harvest history

Year	AAC m^3	Actual m^3	Difference m^3
2004	325,600	380,058	+54,458
2005	325,600	238,852	-86,748
2006	325,600	207,468	-118,132
2007	325,600	178,320	-147,280
2008	325,600	49,619	-275,981
2009	325,600	663	-324,937
2010	325,600	89,870	-235,730
Total	2,279,200	1,144,850	-1,134,350

Having reviewed the information, I note that the full AAC for TFL 35 has not been harvested since 2004 and the lack of harvest performance has increased significantly in recent years. Given that the current cut control period began in January 2010, and harvested volume from the TFL for the year 2011, as estimated in November 2011, was 56 500 cubic metres, I note the licensee has approximately 500 000 cubic metres available for harvest, in addition to the AAC I determine, between now and the end of the cut control period in 2014.

I will discuss my considerations of this further under '**Reasons for Decision**'.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

This section of the *Forest Act* has been 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;

Minister's letter and public input

- *local objectives*

The Minister of Forests, Lands and Natural Resource Operations (formerly Forests and Range) has expressed the economic and social objectives of the government for the province in a letter to the chief forester, dated July 4, 2006 (attached as Appendix 3).

In the letter, the Minister stresses the importance of a stable timber supply to maintain a competitive and sustainable forest industry while being mindful of other forest values. The Minister 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.

I note that the base case for TFL 35 was developed with the harvest flow objective of a stable, non-declining timber supply from healthy stands into the long term, and this is consistent with the direction provided in the Minister's letter.

Local objectives for land and resource use in TFL 35 are captured in the KLRMP HLP, and in orders under the Government Actions Regulation of FRPA. The base case assumptions reflect the direction provided by these orders.

The licensee provided the public with the opportunity to comment on the timber supply review as part of the management planning process. No comments were received.

The consultation process with First Nations and the feedback received was discussed throughout this rationale and above under 'First Nations considerations'.

I have considered this information in my determination for TFL 35. I am satisfied that this determination accords with the objectives of government as expressed by the Minister.

- *mill fibre requirements and community dependence*

TFL 35 supplies logs to the licensee's 100 Mile House lumber mill and Chasm sawlog mill and the licensee's veneer operations. A major road connecting TFL 35 to 100 Mile House is nearing completion and the existing road network on the TFL is being reconfigured to enable transportation to those mills. 100 Mile House is approximately 240 kilometres to the northwest and Chasm is about 140 kilometres to the northwest of Kamloops. Alternatively, volume from harvest on the TFL may flow via the traditional TFL access routes to other mills in the Thompson Rivers District, Okanagan Shuswap District, and the Cascades District, by means of trade agreements with other licensees.

West Fraser's mills employ residents from the 100 Mile House to Clinton area. A portion of the contracting workforce that West Fraser employs to complete harvesting and hauling is also from the Kamloops area.

Licensee representatives have stated that the volume from TFL 35 is critical to the operation of both mills. In addition, the licensee purchases approximately 20 percent of mill supply requirements from the open market.

As noted earlier in this document, the volume harvested on TFL 35 has been below the level of the AAC from 2005 to present.

The SSN expressed concern that once the major road from TFL 35 to 100 Mile House is completed, fewer jobs from harvest on the TFL will be available in the communities close to the TFL. In response, the licensee states that it is working with First Nations on an ongoing basis to ensure they are aware of employment opportunities available from the volume on TFL 35 and their other tenures.

I have reviewed the information regarding mill fibre requirements and community dependence as it relates to TFL 35, and considered it in my determination.

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

Abnormal infestations and devastations of timber

- McLure Fire

The previous determination for TFL 35 included consideration of a large area of the TFL burned in the 2003 McLure Fire. The burned area covered approximately 2711 hectares in the north-eastern corner of the TFL, of which 2323 hectares was on the timber harvesting land base. Just over half of this area was in plantations and the remainder in natural stands. Based on mapping and analysis of the burned area, it was estimated that 280 000 cubic metres of volume had been damaged, 210 000 cubic metres of which was salvageable. The 2004 AAC determination included consideration of the need to expedite salvage harvesting of timber damaged by this fire in order to capture value from the stands.

The licensee states that salvage harvesting of the McLure Fire area is now complete. Two specific stand types within the burned area on the timber harvesting land base were not salvaged: residual balsam stands of low merchantability that had originated from previous harvesting and that were 100 percent killed by the fire; and Douglas-fir leading stands that incurred a lower intensity ground fire burn, with an estimated 10 percent volume loss due to fire-kill or subsequent attack by Douglas-fir bark beetle. The Douglas-fir stands meeting these criteria totalled approximately 100 hectares.

Specific assumptions were made in the base case in order to account for the timber supply implications of the fire damage in these stand types. To account for the estimated volume lost in the Douglas-fir leading stands, a 10 percent-reduction was applied to the existing yield curves for those stands. For the balsam stand types, the forest cover inventory was updated with volume estimates obtained through recent surveys.

I have reviewed the information regarding the McLure Wildfire. I accept that the salvage harvesting has now been completed for that area, and that the remaining impact to existing stands has been appropriately reflected in the base case. I make no adjustments on this account.

- unsalvaged loss estimates

Endemic volume 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 losses from the harvest forecast. In the base case for TFL 35, unsalvaged losses were assumed from fire, insects and wind.

Unsalvaged losses of 47 cubic metres per year were assumed as a result of fire, based on an annual loss average from data collected over the six year period between 1994 and 1999. The licensee indicates that six years reflects an average forest fire cycle period in the Kamloops area. The licensee states that the extensive road network on TFL 35 facilitates aggressive fire suppression activities and prompt salvage of any fire damaged timber. As a result, there are minimal losses from fire.

The licensee considers the 2003 fire season to be an anomaly in fire history for the TFL and it was not included in the data used to estimate fire losses. As mentioned earlier, volume losses from the 2003 McLure Fire were accounted for separately in the base case.

Unsalvaged losses resulting from insects were estimated as the losses from Douglas-fir bark beetle and western balsam bark beetle. A total of 250 cubic metres per year from damage from these two beetles was assumed. Losses resulting from epidemic MPB and spruce bark beetle were accounted for separately in the base case, as discussed earlier in this document.

Unsalvaged losses resulting from windthrow along block edges were estimated by evaluating losses in 20 impacted blocks harvested per year over time. An average of25 cubic metres per block was reduced by 50 percent to account for blocks where no mature timber is present along the cutblock edge, resulting in a total projected loss estimate of 250 cubic metres per year.

The SSN provided input that in their opinion, losses from the McLure Fire should have been accounted for in developing the unsalvaged loss estimates. They also questioned why more recent fire data was not used in the analysis, and stated that they believe fire incidence will only increase in the future, therefore the losses assumed from fire are unrealistic and conservative.

Having reviewed the information regarding unsalvaged loss assumptions, and considering the accounting elsewhere in the analysis for epidemic volume losses from insects and fire, I am satisfied that the assumptions were reasonable and acceptable for use in this determination. I share the concern expressed by the SSN that the incidence of fire may be increasing; however, the magnitude of any changes is currently unknown. However, the legal requirement for regular timber supply reviews will provide opportunities for new fire frequency information to be taken into consideration.

Reasons for Decision

In reaching my AAC determination for the TFL 35 I have considered all of the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

The base case showed that an initial harvest level of 232 500 cubic metres per year, which is 29 percent lower than the current AAC, can be maintained for 10 years before decreasing to 88 000 cubic metres per year for 20 years. After the third decade, the harvest level increases to the long-term harvest level of 161 500 cubic metres per year.

The base case harvest levels included an 87 400 cubic metre per year contribution from healthy stands. However, due to the higher than expected levels of spruce bark beetle infestation on the TFL, some stands that were assumed to be healthy in the base case are now infested. Therefore, it is likely that actual harvest priority will differ from what was assumed in the base case as harvesting will need to focus on the salvage of beetle-attacked pine and spruce stands while they retain economic value.

I am satisfied that the assumptions applied in the base case for the majority of the factors applicable to TFL 35 were appropriate, as detailed in Table 1 and elsewhere in this rationale. Following is my consideration of those factors for which I consider it necessary in this determination to further take into account implications to the timber supply projected in the base case.

In determining an AAC for TFL 35, I have identified a number of factors that, considered separately, indicate that the timber supply may be either greater or less than projected in the base case. Some of these factors can be readily quantified and their impact on the harvest level assessed with reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision, but cannot be reliably quantified at this time.

In my considerations for TFL 35, I have identified one factor as indicating that the timber supply projected in the base case may have been overestimated:

- *site index* – as a result of uncertainty about site index estimates for managed high-elevation and spruce stands, the mid- to long-term timber supply has been overestimated by an unquantified amount.

In addition, I have identified one factor as indicating that the timber supply projected in the base case may have been underestimated, as follows:

- l*og grade adjustments* – the new interior log grade system results in logs being charged to the AAC if they meet grade specifications regardless of whether they were alive or dead at the time of harvest. This volume was not included in the base case harvest forecast. I have concluded that the short- to mid-term harvest levels have been underestimated by about five percent due to this factor.

In considering the above-mentioned influences, I note that any uncertainty associated with site index information does not affect short-term timber supply and given the expected improvements in the site index estimates for managed high-elevation and spruce stands, which will be incorporated in the next timber supply review, I will not consider this factor further in this determination.

Log grade adjustment, while a significant factor when considered independently, is not a reason to contemplate an increase in harvest levels when considered in the context of mountain pine and spruce beetle salvage and the limited opportunity to salvage these volumes while they retain economic value. Therefore, in accounting for log grade adjustment, any dead potential volume harvested in the short term in place of live timber that is currently accounted for in the inventory will provide for a more robust timber supply in future. I will therefore not consider this factor further in this determination.

I am aware that there is 1.1 million cubic metres of salvageable volume on the TFL, based on the licensee's estimates and as affirmed by district staff. The vast majority of pine was killed sometime between the 2001 AAC determination and 2006, when the epidemic peaked on the TFL, and therefore most of the pine to be salvaged ranges in time-since-death from 5 to 10 years.

With respect to the beetle-impacted spruce, licensee staff have indicated they intend to place a priority on harvesting spruce within two years since death, in order to realize the highest possible value from these stems. Next in priority for harvest will be a combination of older beetle-killed pine and spruce that has been dead for more than two years.

I am aware that the licensee is in the second year of the current five-year cut control period, which ends in 2014, and that the remaining volume attributable to this period is about 500 000 cubic metres. This volume is available for harvest and is additional to the AAC that I determine.

In summary, the base case projects a mid-term timber supply decline to 88 000 cubic metres per year. However, based on the alternative harvest forecast discussed in this section, there is an opportunity to mitigate the mid term decline forecast in the base case if short-term harvesting is focused entirely on the recovery of beetle-impacted spruce and pine. The alternative forecast suggests that if this strategy is taken a mid-term level of about142 000 cubic metres per year would be possible.

If the licensee harvests the 500 000 cubic metres remaining in this cut control period, the 1.1 million cubic metres of salvageable volume on the TFL could be reduced to 600 000 cubic metres. Assuming conservative shelf life estimates of five years, the remaining volume could be harvested at a rate of 125 000 cubic metres per year for five years.

I note that the AAC in effect November 2001 was 125 600 cubic metres and that this level was increased by 159 percent to 325 600 cubic metres, the level of the current AAC, to minimize timber losses due to the 2003 McLure wildfire and the mountain pine beetle epidemic. Since the current AAC was determined in 2004, salvage of the fire-impacted timber has been completed.

Although the alternative harvest forecast suggests an even-flow harvest level of 142 000 cubic metres, this level can only be maintained if the entire harvest is focused on the salvage of beetle-impacted spruce and pine stands. As indicated in the base case, if harvesting includes healthy stands, the mid-term timber supply will decrease dramatically to 88 000 cubic metres per year. Therefore, the extent to which the licensee remains focused on the salvage of beetle-impacted spruce and pine, will have a direct impact on the mid-term harvest level.

Based on all of these considerations, I find it prudent to immediately reduce the AAC from its current level of 325 600 cubic metres to 125 000 cubic metres. When the volume remaining in the current cut control period is taken into account, the effective harvest level may be up to 225 000 cubic metres per year for the first five years following this determination. During this time, the licensee has the opportunity to refine and improve the information used in this timber supply review and to demonstrate its performance salvaging beetle-killed spruce and pine.

The TSR for TFL 35 involved extensive consultation with First Nations, particularly the SSN. In my considerations related to the consultation process presented earlier in this rationale I outlined information and concerns provided by First Nations and how they are being addressed though operational practices consistent with the HLP order and FRPA, and through ongoing interaction among First Nations, the licensee, and FLNR. I reached a conclusion that adjustments to analysis inputs for this TSR, and existing plans and operational practices address concerns expressed by First Nations' about forest operations and potential impacts on their aboriginal interests. Notwithstanding this conclusion, it is clear that First Nations in the area have many concerns about how forests are managed and how their interests may be affected by forest management plans and operations. Therefore, I strongly encourage the licensee and FLNR staff to continue working with First Nations to ensure that First Nations' aboriginal interests are considered and, where appropriate, accommodated in the management of the TFL. In particular, the licensee and FLNR staff should work with the SSN to assess the management approaches in riparian areas to ensure address aboriginal interests in those areas.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the TFL by establishing an AAC of 125 000 cubic metres.

This determination is effective March 1, 2012, and will remain in effect until a new AAC is determined. This must take place within 10 years after the date of this determination.

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 revisit this determination sooner than the 10 years required by legislation. I will also revisit this decision sooner if any new issues arise concerning First Nations that may impact timber supply.

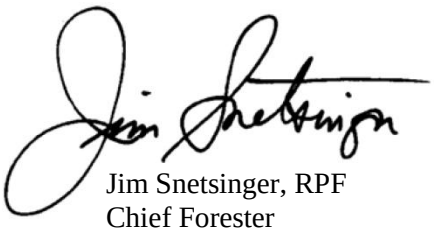
Implementation

In order to mitigate the projected decrease in mid-term timber supply, it is my expectation that the full AAC and the 500 000 cubic metres remaining in the current cut control period will be harvested from beetle-infested spruce and pine stands. District staff are expected to monitor the licensee's harvest activity and to report this information to the chief forester on an annual basis.

Five years after this determination, the salvage of the estimated 1.1 million cubic metres of beetle-impacted timber in the TFL should be complete, in addition the licensee has indicated that it will have new inventory information available for the TFL. I expect FLNR district and Forest Analysis and Inventory Branch staff will review the factors influencing timber supply on TFL 35 and to report the findings to the chief forester, so that, if necessary the AAC can be re-determined earlier than the 10-year requirement specified in the *Forest Act*.

In addition to these expectations, in the period following this decision and leading to the subsequent determination, I encourage the licensee staff to undertake the tasks noted below. I recognize that the licensee's ability to undertake these projects is dependent on available staff resources, time and funding. However, these projects are important to help reduce the level of risk and uncertainty associated with key factors affecting timber supply on TFL 35. I recommend that the licensee:

- Confirm the site index estimates appropriate for both high elevation stands and for spruce stands in general prior to the next timber supply review, and
- Ensure that operational adjustment factors are reviewed and either confirmed or modified appropriately for the next timber supply analysis.



Jim Snetsinger, RPF
Chief Forester

March 1, 2012

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to February 8, 2012), reads as follows:

Allowable annual cut

8 (1) The chief forester must determine an allowable annual cut at least once every 10 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 10 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 10 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 10 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 15 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,

(a.1) different areas of Crown land within a timber supply area or tree farm licence area, and

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

(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 standard 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.]

(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 and Range Act*

Section 4 of the *Ministry of Forests and Range Act* (current to February 8, 2012) reads as follows:

Purposes and functions of ministry

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

(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

(i) timber processing industry, and

(ii) ranching sector

in British Columbia;

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

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

Office of the Minister

Mailing Address:
PO Box 9049 Stn Prov Govt
Victoria BC V8W 9E2
Telephone: 250 387-6240
Facsimile: 250 387-1040

Location:
Parliament Buildings
Victoria BC V8V 1X4
e-mail: FOR.Minister@gov.bc.ca

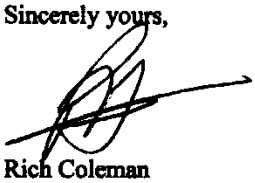
Jim Snetsinger

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

Appendix 4: Minister's letter of October 27, 2010

BRITISH COLUMBIA
The Best Place on Earth

File: 280-30/MPB
Ref: 126097

OCT 2 7 2010

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

Dear Mr. Snetsinger:

Re: Economic and Social Objectives of the Crown Regarding Mid-Term Timber Supply in Areas Affected by the Mountain Pine Beetle

On July 4, 2006, Rich Coleman, former Minister of Forests and Range, wrote to you outlining the social and economic objectives of the Crown for AAC determination (in accordance with Section 8 of the *Forest Act*) with respect to issues associated with the Mountain Pine Beetle (MPB) epidemic. The aforementioned letter articulated the Crown's objectives of ensuring 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. I am writing to you regarding the Crown's objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle.

The MPB infestation has had a profound impact on the timber supply outlook for the interior of the province. In particular, forecasts of timber supply in the mid-term—the period between the ending of the economic shelf life of killed pine and the time when the forest has re-grown and again become merchantable—are now significantly lower than prior to the infestation. These shortages threaten the wellbeing of forest-dependent cities and towns. The

Ministry of Forests and Range and Minister Responsible for Integrated Land Management Bureau
Minister's Office
Mailing Address:
P.O. BOX 9049 Stn Prov Govt
Victoria, BC V8W 1X4
Tel: (250) 387-6240
Fax: (250) 387-1040
Website:
gov.bc.ca/forilmbwww.gov.bc.ca

Jim Snetsinger, Chief Forester

Government of British Columbia is working closely with beetle action committees, municipalities, and the private sector to diversify economies. However, for many forestry-dependent towns mid-term timber supply shortages could still have significant socio-economic impacts.

During this challenging time it will be necessary to reassess management objectives and administrative approaches that were developed when forest conditions in the province's interior were very different than now exist. In this reassessment it will be important to enhance the understanding of how best to balance objectives for non-timber forest values with objectives for timber supply to achieve a range of socio-economic benefits. It will also be important to assess how innovative practices and incremental silviculture could mitigate mid-term timber supply shortfalls in MPB affected areas, and if flexibilities can be found in timber supply administration.

During the Timber Supply Review process, in addition to the considerations included in the July 2006 letter, I would like you to undertake analysis that can provide information on how changes to current management practices and administration could increase mid-term timber availability in MPB-affected areas. This information should be shared with Ministry of Forest and Range Executive and used to inform discussions among interested parties, and considered by appropriate land use and management decision makers. If formal changes are made to management objectives and administration, you will be in a position to incorporate those changes in Timber Supply Reviews and AAC determinations.

Sincerely,

Pat Bell
Minister

pc: Dana Hayden, Deputy Minister