

**BRITISH COLUMBIA
MINISTRY OF FORESTS AND RANGE**

**Tree Farm Licence 1
Coast Tsimshian Resources Limited
Partnership**

**Rationale for
Allowable Annual Cut (AAC)
Determination**

Effective April 15, 2008

**Craig Sutherland, R.P.F.
Deputy Chief Forester**

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Objective of this document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 1. 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 is reproduced in full as Appendix 1 of this document.

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

Description of Tree Farm Licence 1

TFL 1, covering 517 662 hectares of Crown or Schedule B land and 635 hectares of private forest or Schedule A land, is located in the Skeena/Nass region of the province near the City of Terrace. North of Terrace, TFL 1 encompasses the west side of the Kalum Valley and extends into the lower Nass valley, including the upper portions of Ishkheenickh and Kiteen drainages. This TFL encompasses the lower to mid Copper River valley to the east and includes much of the area south of the Skeena River near the mouth of the Lakelse River to the west. Much of the TFL is located east of the Coast Mountains and includes the rugged slopes and valleys formed by the Skeena Mountains and the Nass Basin.

The total land base for TFL 1 is 518 297 hectares. Of this total land base, 229 379 hectares or 44 percent are considered productive forest land base. The remaining 56 percent or 288 918 hectares are composed of non-forest and non-productive areas including rock, rivers and lakes, swamp, non-typed areas. The timber harvesting land base (THLB), that is the area estimated to be economically and biologically available for harvesting, is approximately 89 596 hectares or 39 percent of the productive forest land base.

Since the previous timber supply review (TSR) in 1999 and after the 2003 timber supply analysis was completed, six properties identified as Schedule A lands, covering approximately 334 hectares, were sold. These properties were subsequently removed from the TFL.

The climate is transitional and includes both maritime and continental influences. Temperatures are generally mild, although extremes in temperature are common. Normally, a wet spring is followed by a short period of dry summer, then heavy rain- and snow- falls, therefore, soil moisture deficits are uncommon. The ground generally does

not freeze despite the heavy snowfalls. Outbreaks of arctic air fluctuate during the winter resulting in unstable winter operating conditions.

The forests are predominantly old growth conifer stands dominated by western hemlock and amabilis fir, with mixed stands of spruce, western red cedar and cottonwood occurring along the valley floors. TFL 1 is within the Coastal Western Hemlock, Interior Cedar Hemlock, Mountain Hemlock, and Alpine Tundra biogeoclimatic zones. In addition, a very small area is within the Engelmann Spruce – Subalpine Fir biogeoclimatic zone. Major forest fires rarely occur. Consequently, the merchantability and timber quality is low, on average yielding less than 65 percent sawlog-quality timber. Younger mature stands are higher in quality but are a small component of the THLB.

TFL 1 overlaps the asserted traditional territories of the Lax Kw'alaams, Kitselas, Kitsumkalum, Metlakatla, Gitanyow, and Gitksan First Nations. With the implementation of the Nisga'a Final Agreement, Nisga'a Treaty Lands were deleted from TFL 1.

Access to TFL 1 is via highway 16 from Smithers or Prince Rupert. Highway 234 runs north of Terrace through part of the TFL, providing access to the Nass valley. Rural communities near or within the TFL include the Tsimshian villages of Kitselas and Kitsumkalum, as well as the Nisga'a villages of New Aiyansh, Gitwinksihlkw and Lax Galts'ap or Greenville. The north-west portion of TFL 1 lies adjacent to the Nisga'a Treaty Lands as identified in the Nisga'a Final Agreement. Forestry, tourism, mining and fishing are the principal economic activities in the region.

Coast Tsimshian Resources Limited Partnership, a company owned by the Lax Kw'alaams First Nation based out of Lax Kw'alaams, or Port Simpson, BC, is the tenure holder for TFL 1. This TFL is administered for the Ministry of Forests and Range (MFR) from the Kalum Forest District Office in Terrace.

History of TFL 1 and the AAC

In 1948, the first forest management licence (FML) in British Columbia, FML 1, totalling 778 987 hectares, was awarded to *Columbia Cellulose Company Ltd.* with an AAC of 410 597 cubic metres. In 1965 FML 1 became TFL 1. By 1968, forest operations within the TFL were changed to 'close utilization standards' which resulted in an AAC increase of 1 234 621 cubic metres. On January 1, 1970 TFL 1 and TFL 40 were amalgamated into Port Edward TFL 1 covering a total area of 2 697 697 hectares with an AAC of 2 038 824 cubic metres. In subsequent years numerous changes to the land base of TFL 1 were made so that by 1986 the total area was 981 446 hectares and the AAC was decreased to 770 000 cubic metres.

In July 1986, the TFL was subdivided into TFL 1 and TFL 51. *Skeena Cellulose Inc.* was the licensee for TFL 1 which now covered a total area of 609 346 hectares with an AAC of 600 000 cubic metres. In 1988, the AAC was increased to 720 000 cubic metres due to *Skeena Cellulose Inc.*'s commitment to harvest and manage cottonwood stands and marginally operable areas. At this same time, 5 percent or 29 950 cubic metres of the

licensee's Schedule B AAC was reserved for the former Small Business Forest Enterprise Program.

For the last AAC determination, which became effective in February 1999, the total area of the TFL area was estimated to be 610 691 hectares. The AAC remained unchanged at 720 000 cubic metres.

Since the 1999 determination, a number of changes took place that affected the total area and AAC of the TFL. On May 11, 2000, the Nisga'a Treaty Agreement came into effect, resulting in 87 706 hectares being removed from the TFL. To account for this area removal, the former chief forester reduced the AAC to 611 000 cubic metres. At the end of April 2002, the Minister consented to *NWBC Timber & Pulp Ltd.* acquiring TFL 1 from *Skeena Cellulose Inc.* On May 15, 2002, due to this change in control, the licensee's Crown portion of the AAC was reduced by five percent or 28 991 cubic metres. In early February 2003, *Skeena Cellulose Inc.* changed its name to *New Skeena Forest Products Inc.* and on November 19, 2003 the licensee applied for protection under the *Companies' Creditors Arrangement Act*. By September 20, 2004 the company went into receivership.

On March 31, 2005 the licensee portion of the AAC was reduced under the *Forestry Revitalization Act* by a further 120 782 cubic metres to 431 277 cubic metres. Currently, the total portion of the AAC that is not available to the TFL holder is 179 723 cubic metres. Of this volume, 121 941 cubic metres is allocated to British Columbia Timber Sales (BCTS) and district staff inform me that the remainder is currently intended to be allocated to First Nations. In mid July 2005 the latest change of control occurred when *New Skeena Forest Products Inc.* was disposed of by the Receiver to *Coast Tsimshian Resources Limited Partnership*.

During the period when *New Skeena Forest Products Inc.* was under creditor protection and seeking a buyer, a decision was made to award a portion of the accumulated undercut volume to the Kitselas and Kitsumkalum First Nations. On January 20, 2004 the *Kitselas and Kitsumkalum Forestry/Range Interim Measures Agreement* and a Memorandum of Understanding between the Kitselas and Kitsumkalum First Nations and the government of British Columbia were signed. These agreements provided for a total volume of 800 000 cubic metres to be harvested by these two First Nations over a five-year period in the Kalum Forest District, which includes TFL 1. As a result, in early 2005, a Forestry Licence to Cut (FLTC) was issued to each of the Kitsumkalum and Kitselas First Nations, the former to harvest a total of 240 000 cubic metres and the latter a total of 200 000 cubic meters over a five-year period in TFL 1. This volume is not a part of the AAC.

Information sources used in the AAC determination

Sources of information referenced for the purposes of this AAC determination include:

- *TFL 1 Supplemental MoFR Analysis*, Clarkson, M., Ministry of Forests and Range, Forest Analysis and Inventory Branch, January 2008;

- Tour of TFL 1 with Deputy Chief Forester, Licensee staff and District, Region and Forest Analysis and Inventory Branch staff. September 12, 2007;
- First Nations Meeting with Deputy Chief Forester. September 12, 2007;
- First Nations Consultation – First letter August 21, 2006; Follow-up Letter June 11, 2007;
- *Kalum TSA PEM Accuracy Assessment Results*, Ministry of Forests and Range, BCTS, Timber Baron, Coast Tsimshian Resources Limited Partnership, West Fraser Mills Ltd., Yole, David W., Research Consultant, March 15, 2007;
- *Management Plan No. 10 for Tree Farm Licence 1, 2004 – 2008*. Coast Tsimshian Resources Limited Partnership; Approved January 2007;
- *Managed Stand Yields – Research Branch*, Ministry of Forests and Range, December, 2006;
- *Twenty-year Plan*, Coast Tsimshian Resources Limited Partnership, Submitted November 2004, Accepted October 20, 2006;
- Letter from the Minister to the Chief Forester, Re: Economic and Social Objectives of the Crown, July 4, 2006;
- *Existing Stand Yields – Inventory Branch*, Ministry of Forests and Range, May 6, 2004;
- *Kalum Sustainable Resource Management Plan* Government of British Columbia, Victoria, BC, April 2006;
- *Ministry of Forests and Range Act*, (consolidated to March 30, 2006);
- *District Manager Policies – Kalum Forest District*. (Various dates) Terrace, BC;
- *Forest and Range Practices Regulations*, 2004 and amendments;
- *Government Actions Regulation* (B.C. Reg. 582/2004);
- *Identified Wildlife Management Strategy, Procedures for Managing Identified Wildlife*, Version 2004;
- *TFL 1 – Timber Supply Analysis Information Package*. Sterling Wood Group Inc., Victoria BC, October 2003;
- *TFL 1 – Timber Supply Analysis Report*. Sterling Wood Group Inc., Victoria BC, October 2003;
- *Red and Blue-listed plant communities*. Conservation Data Centre at <http://www.env.gov.bc.ca/cdc/> . June 2003;
- *BC Species and Ecosystems Explorer. 2003*. Victoria, British Columbia, Canada. June 2003;
- *TFL 1 Information Package*. Sterling Wood Group Inc. Victoria, BC. April 2003;
- *TFL 1 Vegetation Resources Inventory Attribute Adjustment*. Sterling Wood Group Inc. Victoria, BC. February 2003;
- *Audit of Forest Planning and Practices, Skeena Cellulose Inc., Tree Farm Licence 1*. Forest Practices Board, Victoria, BC. July 2002;
- *Kalum Land and Resource Management Plan*. Government of British Columbia, Victoria, BC. April 2002;
- *Forest and Range Practices Act*, 2002 and amendments;
- *Report on TFL 1 Second Growth Inventory*. Sterling Wood Group, Victoria, BC. September 2001;

- *State of Commercial Regeneration on Built Road Disturbed Area (1985, 1990, and 1995 Harvest Areas) for Skeena Cellulose Inc., Terrace operations.* Horne Forestry, Terrace, BC. March 2001;
- *The Impact of the Kalum Local Resource Management Plan on TFL 1.* Sterling Wood Group, Victoria, BC. March 2000;
- *Kalum Timber Supply Area Analysis Report,* March 1999;
- *Landscape Unit Planning Guide,* BCFS and MELP, March 1999;
- *Tree Farm Licence 1 – Rationale for Allowable Annual Cut (AAC) Determination.* BC Ministry of Forests. Victoria BC. Pedersen, L., Chief Forester, effective February 23, 1999;
- *Identified Wildlife Management Strategy, Volume 1,* Ministry of Environment, Lands and Parks and Ministry of Forests, February 1999;
- *Site Index Adjustment for Old-Growth Stands Based on Veteran Trees,* Nigh, 1998;
- *Site Index Adjustment for Old-Growth Coastal Western Hemlock Stands in the Kalum Forest District,* Nigh and Love, 1997;
- *Recreation Analysis and Management Strategy Report, Tree Farm Licence 1,* Skeena Cellulose Inc., RRL Recreation Resources Ltd. Version 1.2. July 1997;
- *TFL 1 Inventory Audit,* June 1997;
- *General Ecosystem Descriptions and Wildlife Interpretations for Portions of TFL 1 and Forest Licence A16835,* Madrone Consultants Ltd., 1997;
- *Archaeological Overview Assessment,* Kalum Forest District, Ministry of Forests, 1996;
- *Forest Practices Code of British Columbia Act, 1995, and amendments;*
- *Forest Practices Code of British Columbia Act Regulations, 1995, and amendments;*
- *Forest Practices Code of British Columbia Guidebooks,* Province of British Columbia;
- *Heritage Resource Overview for TFL 1,* Terrace, B.C., Wilson, I.R, January 1995.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical, social and economic information in AAC determinations. 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 are necessary simplifications of the real world. There is uncertainty about many of the factors used as inputs into timber supply analysis due in part to variations in physical, biological and social conditions. Although ongoing science-based improvements in the understanding of ecological dynamics help reduce some of these uncertainties, technical information and analytical methods alone cannot incorporate all the social, cultural and economic factors relevant to forest management decisions, and do not necessarily provide complete answers or solutions to the forest management problems addressed in AAC determinations. However, the technical information and analytical methods do provide valuable insight into potential outcomes of different resource-use assumptions and actions and these are

important components of the information that must be considered in AAC determinations.

In determining the AAC for the TFL 1 I have considered and discussed known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Guiding principles for AAC determinations

The chief forester has expressed the importance of consistency in judgement in making AAC determinations. I also recognize the need for consistency of approach, and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and have adopted them as described below in making my AAC determination for TFL 1.

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 to manage uncertainty include:

- i. minimizing risk associated with making AAC determinations. To this end, 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. re-determining AACs frequently, to ensure they incorporate current information and knowledge—a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the following guiding principles.

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

In many areas the timber supply implications of some legislative provisions, such as those for landscape-level biodiversity or ecosystem-based management, remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take uncertainties into account to the extent possible in context of the best available information.

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

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to analyze and account for the full timber supply impact in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, the establishment of resource management zones and resource management objectives and strategies for those zones. Until such implementation decisions are made, it would be impossible to fully assess the overall impacts of the land-use decision. In such cases the legislated requirement for frequent AAC reviews will ensure that future determinations address ongoing plan implementation decisions. Wherever specific protected or conservation areas have been designated by legislation or by order-in-council, these areas are deducted from the THLB and are not considered as contributing any harvestable volume to the timber supply in AAC determinations. However, these areas may contribute indirectly by providing forest cover and other components to help attain other legislated resource management objectives such as those for biodiversity, wildlife, First Nation cultural resources, or those determined through government-to-government discussions such as ecosystem-based management objectives.

TFL 1 lies within the administrative boundaries of the Kalum Forest District, which also form the boundary of the area covered by the Kalum Land and Resources Management Plan (LRMP) and the Kalum Sustainable Resource Management Plan (SRMP). The LRMP was approved by the provincial cabinet in May 2002 and considers all resource values and a broad base of community interests in the mid-Skeena and Lower Nass. The SRMP approved in April 2006, effective May 17, 2006, provides legal framework for implementing the Kalum LRMP through objectives and strategies. Forest development is required to be consistent with aspects of the plan as they represent government objectives under the FRPA. These land use decisions have clarified many aspects of land and resource management and I refer to them where applicable in various components of this document.

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 have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing.

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' consultation, I am aware of the Crown's legal obligations resulting from decisions in recent years made by the Supreme Court of Canada. I am aware that the Crown consults with First Nations regarding potential aboriginal 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 any information brought forward respecting First Nations' aboriginal interests, including operational plans that describe forest practices to address First Nations' interests. As I am able, within the scope of my authority under Section 8 of the *Forest Act*, I will address those interests. When aboriginal interests are raised that are outside my jurisdiction, I will endeavour to forward information regarding these interests to other decision-makers for consideration.

The AAC that I determine should not be construed as limiting the Crown's legal obligation 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 1. Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the MFR as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the FRPA. Section 4 of the *Ministry of Forests and Range Act* is reproduced as Appendix 2 of this document.

The new regulations of the FRPA are designed to maintain the integrity of British Columbia's forest stewardship under responsible forest practices, therefore current timber supply projections are applied within the context of the definition of current practice.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in this AAC determination, I am assisted by timber supply forecasts provided to me by the licensee as part of the MFR TSR program.

For each AAC determination a timber supply analysis is carried out using an information package including data and information from three categories: land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced. These include

sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the 'base case' forecast.

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

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

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

Timber supply analysis

The timber supply analysis for TFL 1 was prepared in 2003 by Sterling Wood Group Inc. (the consultant) under the direction of the former licensee. The consultant used its proprietary simulation model TREEFARM (version 6.5) for this analysis. MFR Forest Analysis and Inventory Branch staff have reviewed results from the TREEFARM model, and based on their expertise and advice I am satisfied that it is capable of providing a reasonable projection of timber supply.

For this determination for TFL 1, the licensee accepted the timber supply analysis prepared by the former licensee as an adequate representation of its intended management strategy. The assumptions in the analysis were based on the former licensee's operational performance over its last 5 years of forest management, to meet the requirements of FRPA, the Kalum LRMP and other locally relevant legislation and policy. Assumptions for the management for non-timber resources, including visual quality objectives, identified wildlife, ungulate winter range, fish habitat, domestic water supply, and others were also included.

In the base case harvest projection, which starts in 2002, an initial harvest level of 500 000 cubic metres per year could be maintained for three decades before decreasing in 10 percent increments each decade until the fifth decade, when the mid-term harvest level of 375 000 cubic metres was achieved. The long-term harvest level of 415 000 cubic metres per year was reached in the eleventh decade.

The analysis also included sensitivity analyses, and where relevant, I have considered these in my determination.

One forest management concern identified by MFR staff was the tendency to avoid harvesting lower site timber types with a species composition that is predominated by hemlock. MFR staff conducted a supplementary analysis to provide me with information for my consideration of a possible partition by attributing a portion of the AAC to the timber types that are currently more economically attractive for harvest. I have discussed this further under 'economic and physical operability' and '**Reasons for decision**'.

As discussed throughout this rationale, and in consideration of the items described above, I am satisfied that the information presented to me provides an adequate basis from which I can assess the timber supply for TFL 1 for this determination.

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

Section 8 (8)

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

- (a) the rate of timber production that may be sustained on the area, taking into account**
 - (i) the composition of the forest and its expected rate of growth on the area**

Land base contributing to timber harvest

- general comments

The total land base of TFL 1 is 518 297 hectares with a current THLB of 89 596 hectares. As I noted earlier, since the analysis was completed, approximately 334 hectares of private land were removed from TFL 1. I am satisfied that removal of such a small area would not affect the initial base case harvest level.

As part of the process used to define the THLB, that is the land base estimated to be economically and biologically available for timber harvesting, a series of deductions must be made from the productive forest land base. These deductions account for economic or ecological factors that operate to reduce the forest area available for harvesting.

In reviewing these deductions, I am aware that some areas may have more than one classification. To ensure accuracy in defining the THLB, care must be taken to avoid any potential double counting associated with over lapping objectives. Hence, a specific deduction for a given factor reported in the analysis or the AAC rationale does not

necessarily reflect the total area with that classification; some portion of it may have been deducted earlier under another classification.

Some areas that do not directly supply harvestable timber, such as parks and riparian reserves, do provide habitat and forest cover that assist in meeting a variety of management objectives, thereby contributing indirectly to the timber supply of the TFL. Areas of productive forest that contribute to forest cover requirements, whether or not they contribute directly to the timber supply, are known as the forested land base. For TFL 1, the total productive forested land base was estimated to be 229 380 hectares or approximately 44 percent of the total TFL land base.

At the time of the last TSR, the licensee and MFR staff noted that the total area of the TFL may have been overestimated in the analysis by 4223 hectares compared to the area derived using the legal description. Due to the effect boundary discrepancies could have on the THLB, the former chief forester requested that the licensee, 'in cooperation with MFR Resource Tenures and Engineering Branch staff, review the boundaries and area of the TFL, and clarify any discrepancies with the legal description prior to the next determination'. A review and re-mapping of the TFL boundary were completed. In addition to the reduction in the total area of the TFL resulting from the removal of Nisga'a treaty lands, in the 2003 analysis it is reduced by a further 4688 hectares compared to the total area reported in the 1999 timber supply analysis. I am satisfied that the discrepancy in the total land base noted at the time of the last TSR has been addressed for this determination.

I have considered all of the assumptions associated with the definition of the THLB. If for any reason I have concerns regarding an assumption, I have explained my considerations in this rationale. I will not discuss factors for which I accept the assumptions as documented in the licensee's information package and analysis. These factors include: *non-forested areas; non-productive areas; non-commercial brush; low site areas; deciduous forest types; problem forest types; alpine tundra; specific geographically defined areas; unclassified roads, trails and landings; and future roads, trails and landings.*

- economic and physical operability

The operability classification for TFL 1 was updated in 2002 during the former licensee's total chance planning project. It was based on combinations of accessibility, harvesting systems and merchantable volume. The productive forested land base was classified as 'conventional' and 'non-conventional' area. 'Conventional' was defined as harvestable by ground skidding, cable and skyline systems, while 'non-conventional' was harvestable by helicopter or multi-span systems. Within each of these the economically available and the currently non-economic areas were identified. 'Low volume' and 'non-harvestable/other' operability classes were also identified and these were excluded entirely from the THLB. There were approximately 11 230 hectares classified as 'low volume' areas, which are those stands with less than 250 cubic metres per hectare of timber. The 'non-harvestable/other' operability class, covering approximately 107 770 hectares, is those areas that are inaccessible, have low stocking or are covered

with very poor quality timber. After applying this classification scheme and other reductions for factors such as riparian reserves and environmentally sensitive areas, the total productive forested land base was reduced to a THLB of 89 596 hectares.

District staff informed me that the tendency on the TFL is for the licensees to avoid harvesting in old-growth hemlock-leading stands with a site index (site index is a measure of the productivity of an area and is expressed as the height of trees at age 50 years) that is less than 15 metres and in old-growth stands with a species composition of more than 80 percent hemlock and a site index of between 15 and 25 metres. MFR staff estimate that this area covers approximately 41 000 hectares, or 46 percent of the THLB.

According to district staff and the licensee, harvesting is currently taking place in areas where road construction requirements are minimal; little road construction is currently taking place to access timber. At a meeting with licensee staff they informed me that some areas on the TFL that are currently within the THLB are being avoided because the stands in some areas have a high pulpwood component, other areas are a long hauling distance from Terrace, or a substantial amount of road would have to be built to access the harvestable timber. These include the Nogold, Ishkheenickh and Kiteen drainages. District staff are concerned that targeting only the most easily accessible, economic timber now may hinder harvest opportunities in the future. The only other timber currently accessible by road is the limited amount of second growth, and this will form an important component of the mid-term timber supply for TFL 1. The Kitsumkalum First Nation expressed concern regarding harvesting of second-growth timber and I have discussed this further under *'First Nations Consultation'*.

Due to the concerns raised by district staff, MFR timber supply analysts prepared a supplementary analysis to provide me with a measure of timber volume that could be harvested in the more economic stands of TFL 1 without compromising future sustainability. As part of this process the MFR analyst shared this information with the licensee. In response, the licensee provided information that showed that since it commenced harvesting in November, 2005, 68 percent of the harvest came from low site stands predominated by hemlock and 32 percent from other stands. The licensee indicated that for this reason a partition is not warranted at this time. It further noted that over the next five years it would be reasonable to update the operability mapping and to continue to track harvest performance.

I have considered this information and find that the licensee's harvest performance statistics have allayed the concern expressed by district staff at this time. Therefore, I have not attributed any harvest volume to the more economic stands in this determination. However, I am still concerned about the currently dwindling access to old-growth stands and the associated increased likelihood that second-growth stands may be harvested, and the possibility that when more roads are built, they will be used to access only the more economic timber. Given that the information currently before me suggests that 46 percent of the THLB consists of stands where the economic viability of harvesting is uncertain, I will discuss this further under *'Reasons for decision'*.

In the licensee's response to the MFR supplemental analysis it suggested that it would be reasonable to update the operability inventory and to track its harvest performance by timber type for the next determination. I concur with these sentiments and have therefore included an instruction under '**Implementation**' that the licensee monitor its harvest performance within the low site hemlock areas and each year report this performance to the district manager of the Kalum Forest District. I have also included an instruction that the licensee update the operability inventory for TFL 1.

- environmentally sensitive areas

In the base case, environmentally sensitive areas (ESA) mapping was used to identify sensitive areas where timber harvesting may cause adverse effects. These include areas affected by avalanches, sensitive soils, areas where regenerating trees would be difficult, and areas with high recreation values. ESA mapping was first used in the 1970s and has since been replaced in other management units with other, more detailed information. For this determination, however, I am satisfied that the information used was the best available. As noted immediately below, I expect that the licensee will complete the already available studies and mapping projects to replace the outdated ESA inventories so that more up-to-date information can be used for the next AAC determination.

According to Management Plan (MP) No. 10, the terrain and soil erosion hazard classification and terrain stability Level C mapping have been completed for 60 percent of the total TFL area, and the area not covered is minor as it is not critical or lies within the BCTS operating area. I expect that the licensee will finalize the terrain stability mapping and use this information in place of ESA mapping in the timber supply analysis for the next AAC determination.

Also according to MP No. 10, the recreation resources inventory and analysis were updated in 1997. These documents should also be reviewed, and if necessary updated for use in the next determination in the place of ESA mapping.

Existing forest inventory

- general comments

A re-inventory of TFL 1 was completed in 1992 and for the analysis harvesting and silviculture activities were updated to December 31, 2001. Growth was also projected to December 2001.

For the analysis, second-growth forest cover types in the 1992 inventory were updated based on a Vegetation Resources Inventory (VRI) phase II project completed in 2003. Using information from the VRI, age and height were adjusted for stands aged 30 to 110 years. Using these attributes a new site index was derived for this age group of stands. In addition, ages and heights were adjusted for stands aged 10 to 29 years, except where silviculture information was available. For stands older than age 110 years the 1992 inventory information was used. The VRI adjustments were reviewed and accepted for use in this TSR by MFR staff from the Forest Analysis and Inventory Branch.

Having discussed the inventory information with MFR staff, I conclude that it is the best available and suitable for use in this determination.

- volume estimates for existing natural stands

For this analysis, stands greater than 30 years old and all cottonwood-leading stands were considered existing 'natural stands'. Stands greater than 30 years old that have been spaced were considered 'managed stands'. Stands were grouped into analysis units using criteria developed to reflect natural similarities or to facilitate the grouping of stands post-harvest for managed stand yields. For example, the criteria included leading species, productivity class, and Biogeoclimatic Ecosystem Classification (BEC) zone.

Volumes for existing natural stands were generated using the Variable Density Yield Projection (VDYP) model with weighted average species composition and site index and VDYP default crown closure. The contribution of deciduous volumes other than cottonwood was not included in the yield projections. The yield projections were adjusted to account for decay, waste and breakage.

For the 1999 AAC determination existing stand volumes were adjusted to reflect the results of the inventory audit completed in 1997. After adjustments the stands within the THLB greater than 250 years old averaged 464 cubic metres per hectare. For the 2003 analysis the average volume of similar stands in the THLB generated using VDYP was 493 cubic metres per hectare or about six percent higher. Therefore, to reflect the results of the audit, for each analysis unit the analyst reduced the yields projected after age 140 years by six percent.

The analysis included two sensitivity analyses which showed the effect on timber supply of increasing and decreasing existing and managed yields by ten percent. Reducing the yield projections resulted in an immediate small reduction in the initial harvest level compared to the base case. The harvest level then declined at ten percent per decade for four decades to a mid-term level that was about ten percent lower than the base case. However, Forest Analysis and Inventory Branch staff accepted the existing natural stand yield tables for use in the analysis and no information has been presented to me that suggest that the existing natural stand yield tables are not adequate. Therefore, I am satisfied that the appropriate information was used for this determination.

- dead potential volume estimates

On April 1, 2006, new log grades were implemented for the BC Interior. Under the previous grade system, logs were assessed according to whether the trees they came from were alive or dead at the time of harvest. Under the current system, a log is graded based on its size and quality at the time it is scaled or assessed, without regard to whether it was alive or dead at harvest. These 'dead potential' trees (i.e., dead trees that are potentially merchantable) are now accounted for in AAC determinations.

On the BC Coast, logs from dead trees are already harvested, scaled and charged to the licence. Dead western redcedar and old-growth Douglas-fir stems may remain sound and

suitable for milling for many years. However, they are currently not included in the inventory and have therefore not been accounted for in past AAC determinations. With the change in the BC Interior grade system it is now appropriate to account for this 'dead potential' volume in AAC determinations for coastal units as well. About 80 percent of the THLB on TFL 1 is lies in coastal BEC zones and 20 percent in interior BEC zones.

Estimates of timber volume in the base case did not include merchantable volume that could be derived from dead trees. The best data source regarding this potential is the VRI phase II ground samples for the TFL. A review of this data for TFL 1 suggests that the 'dead potential' volume equates to approximately one percent of the green volume for stands over 60 years of age on the forested land base. Although these data were not field verified, district staff confirm that there is very little 'dead potential' timber on TFL 1.

Having reviewed the information and discussed it with BCFS staff, I have concluded that the timber supply projected in the base case may be underestimated by about one percent on account of this factor. Due to the considerable uncertainty in this information and the small magnitude of the estimate I have not adjusted my determination on this account. However, as noted below under 'Implementation', I request that the licensee monitor the amount of dead potential timber harvested over the next five years. Any new information can be incorporated into the next timber supply review.

Expected rate of growth

- site index

Inventory data include estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on a stand's height as a function of its age. The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

The most accurate estimates of site productivity come from stands between 30 and 150 years of age. The growth history of stands less than 30 years of age is often not long enough to give accurate measurements of site productivity. Estimates derived from older stands underestimate site productivity as these stands are often well past the age of maximum height growth and have often been affected by disease, insects and top damage as they reach advanced age. The underestimate of site productivity based on forest inventory estimates for older stands has been verified in several studies, for example, the Old-Growth Site Index or OGSi study, in the province. These studies have confirmed that when old stands are harvested and regenerated, the site productivities realized are generally higher than those predicted for older stands from estimated site indices based on inventory data.

In the analysis site indices for existing natural stands older than 130 years of age and stands less than 30 years of age were based on inventory attributes from the 1992 inventory. As described above under '*existing forest inventory*', for stands aged from 30 to 110 years VRI phase II information was used to adjust the 1992 inventory estimates of

age and height. The site indices of this component of existing natural stands are based on these adjusted attributes.

For hemlock stands regenerating after harvesting stands older than 140 years, provincial and Kalum Forest District site index adjustment studies formed the basis for adjusting site index from those based on inventory data. A 10-metre site index adjustment was applied to post harvest stands that met criteria as stipulated in the 1997 Nigh and Love report, *Site Index Adjustment for Old-Growth Coastal Western Hemlock Stands in the Kalum Forest District*. Further, site index adjustments based on an equation were applied to post-harvest hemlock stands that met the criteria as stipulated in the 1998 Nigh report, *Site Index Adjustment for Old-Growth Stands Based on Veteran Trees*. For all other stands the site index from the 1992 inventory was used.

MFR Research Branch staff reviewed the site index information used in the base case and found it acceptable on condition that the licensee perform sensitivity analysis to investigate the effects on timber supply of varying site indices given the considerable uncertainty in the site index estimates. Therefore, four site index sensitivity analyses were provided in the analysis and these showed that the initial harvest level was not affected even when no adjustments were applied to inventory site index estimates.

I am aware that since the analysis was completed a Predictive Ecosystem Mapping (PEM) project was conducted for the Kalum Forest District and it included the area covered by TFL 1. Using PEM or Terrestrial Ecosystem Mapping and site indices correlated to the provincial Biogeoclimatic Ecosystem Classification (SIBEC) would improve the site index estimates for TFL 1. However, an accuracy assessment was completed in 2007 and it found that the Kalum PEM does not meet the standard 65 percent accuracy that would allow for it to be used in TSR.

Having reviewed this information, for this determination, I am satisfied that adequate procedures based on the best available information were used for assigning site index for existing and post harvest regenerating stands. However, given the uncertainty in the estimates, I recommend that the licensee review the available information, including the Kalum PEM information, and work towards improving site index estimates for TFL 1 so that more reliable information can be used for future determinations.

- managed stand yields

In the 2003 analysis existing managed stands were defined as stands less than 30 years of age and all stands that have been spaced. Also, all existing managed and natural stands become managed stands once harvested except for cottonwood-leading stands. These are regenerated back to the existing stand yield table in the model.

All managed stand yield tables were generated using the Table Interpolation Program for Stand Yields (TIPSY) version 3.0e using weighted average species composition and site index. All future managed stands were assumed to regenerate naturally with an initial density of 4000 stems per hectare. Standard provincial operational adjustment factors (OAF) of 15 percent for OAF 1 and 5 percent for OAF 2 were applied. Yield tables were also produced for existing spaced stands assuming the areas were spaced to

800 stems per hectare. MFR Research Branch staff accepted the yield tables for use in the analysis.

Approximately 6725 hectares or 31 percent of the stands less than 30 years of age within the TFL have been spaced. I note that very little juvenile spacing has occurred on TFL 1 in recent years.

Genetically improved stock is not available for TFL 1 and therefore no accounting for improved stock was included in the analysis.

District staff confirmed that natural regeneration is used extensively on TFL 1. I am concerned that this will inevitably lead to stands regenerating to species compositions predominated by hemlock. As discussed below under '*First Nations considerations*', the Metlakatla First Nation expressed concern about the availability of cedar and cypress on TFL 1. In addition, the Gitanyow and Gitxsan First Nations who also assert traditional territory covering portions of TFL 1 expressed concern during the TSR for the Kispiox TSA regarding the diminishing availability of cedar stands. I acknowledge that this concern may apply to TFL 1 as well. I note that the licensee included in its basic silviculture strategies in MP No. 10 its intent to plant areas when they do not regenerate naturally. I encourage the licensee to plant components of species other than hemlock, in particular cedar.

I have reviewed the information provided about managed stand yields and I am satisfied that the best available information reflecting current performance was used in the base case. I have made no adjustment to my determination on this account.

- minimum harvestable ages

A minimum harvestable age is an estimate of the earliest age at which a forest stand has grown to a harvestable condition. The minimum harvestable age assumption mainly affects when second-growth stands will be available for harvest within the timber supply model. This, in turn, affects how quickly existing stands may be harvested such that a stable flow of timber harvest may be maintained. In practice, many forest stands will be harvested at much older ages than the minimum harvestable age, due to economic considerations or forest cover constraints on harvesting that arise from managing for such values as visual quality, wildlife and water quality.

For the analysis minimum harvestable ages were based on the age at which stands were projected to attain a minimum volume per hectare or 60 years, whichever age was greater. For stands that are largely within the conventionally operable land base a minimum harvest volume of 300 cubic metres per hectare was used and for stands that are harvestable using non-conventional methods a minimum harvest volume of 350 cubic metres per hectare was used. As a result, in the base case the average age of stands harvested in the long term was around 90 years.

I note that the Kitsumkalum First Nation has expressed concern about the possibility that second growth areas in the Kalum valley will be targeted for harvest in the short term. I have discussed this further under '*First Nations considerations*' below.

I have discussed the minimum harvestable age information with MFR staff and am satisfied that the best available information was used in the base case.

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

Regeneration delay

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. Changes in regeneration delay—either lengthening or shortening—can affect the timber supply by altering both the time at which a stand reaches green-up in order to satisfy adjacency requirements, and the time at which it reaches a minimum harvestable age.

In the analysis all stands were assumed to regenerate naturally with a six year regeneration delay. I note that according to the basic silviculture strategies included in MP No. 10, the licensee intends to use a combination of planting and natural regeneration to reforest all cutblocks within an average of four years.

I accept that the best available information was used at the time of the analysis and it reflects current performance. As the licensee gains experience with its planting program, which I understand will commence in the fall of 2008, actual regeneration delays can be measured for use in future determinations.

Not-satisfactorily-restocked areas

Not-satisfactorily-restocked (NSR) areas are areas where timber has been removed, either by harvesting or by natural causes, and a stand of suitable trees and stocking has yet to be established. Where a suitable stand has not been regenerated and the site was harvested prior to 1987, the classification is 'backlog' NSR. All other NSR is considered 'current' NSR.

In the analysis, NSR was assumed to regenerate naturally over the first 10 years of each harvest forecast. The area considered to be NSR in the analysis was 2940 hectares of the THLB. According to the harvest billing system approximately 650 hectares have been harvested since 2002. I note that in the last analysis a similar area was reported to be NSR and apparently little work has been done since then to survey and update the status of NSR areas. District staff informed me that the actual NSR area on TFL 1 is likely lower than that estimated for this analysis due to natural restocking in some cutover areas.

Although I accept the accounting of NSR areas as the best available information for use in this determination, it is now necessary for the licensee to complete regeneration surveys, take the necessary actions to regenerate areas with stocking below the

acceptable standards, and prepare updated information for use in future AAC determinations.

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

Incremental silviculture

In general, incremental silviculture includes activities such as commercial thinning, juvenile spacing and fertilization that are not part of the basic silviculture obligations required to establish a free-growing forest stand following timber harvesting. I note that in the past some incremental silviculture treatments were applied on TFL 1, specifically 6725 hectares of juvenile stands were spaced and 600 hectares were pruned. As I mentioned under *managed stand yields*, yield tables were prepared to represent the stands that were spaced and these were applied in the model.

In its MP No. 10, the licensee indicated that any enhanced silviculture projects on TFL 1 should be aimed at producing small diameter sawlogs within the shortest time possible, increasing total merchantable stand volume including recovering thinning volumes, and producing higher quality clear wood, generally on sites where the site index is higher than 25 metres. I encourage the licensee to consider these opportunities and to include information related to any projects undertaken in the analyses for future determinations.

(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 and decay, waste and breakage

I have reviewed the information regarding utilization standards and decay, waste and breakage assumptions used in the 2003 analysis for TFL 1 and no issues were identified that would affect this determination. I will not discuss my consideration of these factors further in this document.

(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 MFR 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.

- Land and Resource Management Planning

The forest cover requirements used in the 2003 analysis were based on current management at the time the analysis was being prepared. At the time, the Kalum LRMP,

approved in May, 2002 was in place and to the extent possible the analyst incorporated the components of the plan that are relevant to timber supply in the analysis assumptions. Since that time, on May 17, 2006 the Kalum SRMP became effective. In this plan government established detailed land use objectives for the area covered by the plan, including TFL 1, and I have considered these in this determination as discussed in each factor below.

I have considered the assumptions applied in the base case associated with integrated resource management objectives and the effect on timber supply any changes in requirements resulting from the Kalum SRMP may have. I accept the assumptions as documented in the licensee's 2003 information package and analysis for: *stand level biodiversity* and *recreation*. I will not discuss these factors further in this rationale.

- *landscape-level biodiversity*

In the 2003 analysis procedures consistent with the Landscape Unit Planning Guide (LUPG) were used to account for landscape-level biodiversity requirements. Consistent with the biodiversity strategies detailed in the Kalum LRMP, the analyst did not reduce the old-growth constraint in lower biodiversity emphasis option (BEO) landscape units to one-third of the full requirement; instead he applied the full requirement immediately. This is also consistent with the objectives for landscape-level biodiversity set in the Kalum SRMP.

The objectives for landscape-level biodiversity in the Kalum SRMP require that in addition to the old-seral stage requirement, early, and mature plus old-seral stage requirements also be accounted for when planning harvesting activities in the plan area. This was not modelled in the base case. MFR analysis staff reviewed the seral stage assessments included in appendix C of the SRMP for each landscape unit covering TFL 1. Noting that these assessments were for each entire landscape unit and not just the area covered by TFL 1, staff indicated that in each of the Intermediate and Higher BEO landscape units the area in the early-seral stage met or exceeded the allowable percentage in one or two BEC variants. However, the maximum percentage allowed in the transitions measures of the SRMP that are aimed at mitigating effects on timber supply in the short term was not exceeded. In lower BEO landscape units there is no limit for early-seral stands. The amount of mature plus old forest exceeded the minimum requirement in every landscape unit.

At the time of the analysis, old growth management areas (OGMAs) were not delineated on the TFL. Since then OGMAs were identified and established through the Kalum SRMP. They are located predominantly within the non-contributing land base. Accounting for the now-established OGMAs by excluding them from the THLB rather than applying forest cover requirements as was done in the base case would not affect timber supply significantly if at all in the short term.

The SRMP also includes objectives that will affect management on TFL 1 related to species composition and the temporal and spatial distribution of cutblocks (patch size

distribution). As experience is gained in managing for these objectives, appropriate assumptions can be incorporated into analyses for future determinations.

For this determination I am satisfied that procedures were used in the base case that adequately reflect the landscape-level biodiversity objectives established in the SRMP. I am concerned that the early and mature plus old-seral stage requirements were not modelled in the base case. However, I expect their application will not affect short-term timber supply because according to the seral stage assessments for each landscape unit contained in the SRMP, none of the landscape units appear to be constrained to the point where timber harvesting would not be permitted. I expect the licensee will ensure that all the land use objectives in the Kalum SRMP related to landscape-level biodiversity, including established OGMAs, will be accounted for in the analysis that will be prepared for the next AAC determination.

- visual quality objectives

The visually sensitive areas modelled in the base case were established by the district manager of the Kalum Forest District in 1999 and 2000. The landscape polygons were mapped from three major road travel corridors, the Nisga'a Highway, the Nass Forest Service Road and Highway 16. An additional visually sensitive area was identified in the Miligit Valley through the Kalum LRMP and the VQOs associated with this area were also modelled in the base case. According to the Kalum SRMP, Visual Quality Objectives (VQO) and scenic areas will be identified in the plan for reference purposes, but this information is not yet available in the plan.

The allowable denudation percentages applied in the base case for the visually sensitive areas were consistent with the guidelines provided in the SRMP. A green-up height of five metres was applied.

District staff informed me that the licensees and BC Timber Sales operating within TFL 1 are currently striving to maintain viable operations and are therefore harvesting as close as possible to travel corridors. The TFL licensee has expressed concern that the visual quality objectives may be jeopardized as some watersheds are being harvested at a higher rate than anticipated. However, the operators on TFL 1 are now required to follow the Kalum SRMP objectives, and therefore this issue should be addressed before visual quality objectives are compromised.

For this determination I am satisfied that the assumptions applied in the base case are consistent with current practice and requirements and I have made no adjustment to my determination on this account.

- riparian reserves and management zones

According to the 2003 Information Package, riparian reserves and management zones are spatially defined in the TFL 1 inventory. In the base case approximately 2550 hectares were excluded from the THLB after other previous exclusions. No further detailed information was provided. According to MP No. 10, stream and fisheries inventories,

classified in accordance with the *Riparian Management Area Guidebook*, are in place for all of the TFL 1 area. The licensee is updating this inventory as additional samples are gathered.

In the most recent AAC determination for TFL 1 the former chief forester instructed the licensee to thoroughly review and revise the riparian inventory. Based on the information provided in MP No. 10 it appears the licensee has worked towards complying with this instruction, however little detail was provided in the analysis and MP No. 10 on the results of this work.

I consider the accounting for riparian resources in the base case adequate for this determination. For the next determination I expect the licensee to seek review and approval of its riparian inventory from Ministry of Environment staff and to provide more detailed information concerning the accounting for this resource in the analysis.

- *community watersheds*

As part of the SRMP process five community watersheds were established under the Government Actions Regulation effective May 17, 2006. A small portion of one of these, the Rosswood (Clear Creek) community watershed covering a total of 1294 hectares, overlaps TFL 1. The objective in the SRMP is to maintain a clearcut equivalency of less than 20 percent in the sub-basin.

I am satisfied that management of this small area of community watershed will have no effect on the short-term harvest level in the base case. I have made no adjustment to my determination on this account.

- *wildlife species – grizzly bear*

The management objective for grizzly bear in the area covered by the Kalum LRMP is to maintain the population. The management strategies detailed in the LRMP and SRMP aimed at accomplishing this objective, and that may affect timber supply, are to maintain or restore grizzly bear habitat through access management and forage supply for some identified watersheds and to conserve, mitigate or restore critical patch habitats at the stand level no matter where they occur. For TFL 1 an area in the Copper watershed was specifically identified in the SRMP where the objective is to maintain forage. The constraint to be applied is that no more than 30 percent of the forested land base, excluding hardwoods, will be between 25 and 100 years old.

The objective in the SRMP for forage is to provide an adequate supply of berry feeding and to maintain natural levels of forage supply as present in old-growth forests. Reduced stocking standards for rich and wetter sites are included in the SRMP and these are intended to provide for the supply of forage. Critical patch habitat within TFL 1 will be addressed through the establishment of Wildlife Habitat Areas (WHA).

The reduced stocking standards for forage were not modelled in the base case. Given the small area impacted within the TFL and the small effect on yield projections that result when stocking is reduced, the effect of accounting for management for forage on the base

case harvest forecast are likely negligible, especially in the short term. Critical patch habitat WHAs have not yet been established on TFL 1, though I understand orders are pending. During the preparation of the Kalum LRMP, agreement was reached with licence holders on allowable timber supply impacts resulting from grizzly bear habitat. For TFL 1 impacts from forage areas was agreed to be from one to two percent and for critical patch habitat from three to five percent. The base case reflected the constraint to be applied in the Copper watershed and the analysis contained information that showed that this constraint was met.

For this determination I find the accounting for grizzly bear habitat to be adequate. Any effects on timber supply resulting from the pending orders and management for forage can be accounted for in future AAC determinations. For the next determination I encourage the licensee to monitor the management practices for grizzly bear prescribed in the SRMP and include appropriate assumptions to reflect these practices in the analysis.

-wildlife species - ungulates

Ungulates that are managed for on TFL 1 are mountain goats and moose. Critical winter range for goat was mapped in 2001 and established under the Government Actions Regulation effective January 12, 2005. After discussing this factor with the biologist who prepared the mountain goat winter range inventory, in the base case the analyst excluded 82 percent of the goat winter range from the THL; only 241 hectares remained in the THLB after other exclusions. A forest cover requirement allowing no more than 35 percent of the area to be covered with stands less than three metres in height was applied to this area. Critical moose habitat has not yet been established on TFL 1.

For this determination I find the accounting for ungulate management to be adequate. Any effects on timber supply resulting from the pending order for critical moose habitat can be accounted for in future AAC determinations.

- identified wildlife

I note that two WHAs for coastal tailed frogs were established on TFL 1 on April 12, 2006, after the analysis was completed. The total area of these WHAs covers 932 hectares. Staff estimate that the effect on the THLB was a reduction of approximately 360 hectares. This small reduction of the THLB would have no effect on the short-term harvest level modelled in the base case; it would reduce mid- and long-term timber supply by a small amount. I therefore find the assumptions applied in the base case for identified wildlife adequate and I expect the licensee will provide appropriate accounting for this factor for future AAC determinations.

- cultural heritage resources

No issues or concerns regarding cultural heritage resources that would change the assumptions used in the base case were identified during the First Nations consultation process. The Kalum LRMP includes detailed objectives and strategies intended to fulfill

the management intent for cultural heritage resources, which is to identify and conserve select cultural heritage resources.

An archaeological overview assessment conducted for the Kalum Forest District, and including TFL 1, was completed in 1996 and is available for use when planning harvest operations. I understand the licensee halts timber management activities when it encounters any archaeological sites, contacts the appropriate First Nation and conducts an archaeological impact assessment.

I am satisfied that archaeological resources were adequately addressed in the base case for this determination.

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

Other information

I have considered other information related to the capability of the area to produce timber and I accept the information provided in the 20-year plan. I will not discuss this factor further in this rationale.

First Nations considerations

First Nations with asserted traditional territories covering areas within TFL 1 are the Gitanyow, Gitksan, Kitselas, Kitsumkalum, Lax kw'alaams and Metlakatla First Nations. The Nisga'a Lisims Government's treaty area is adjacent to TFL 1.

All the First Nations except the Nisga'a have Forest and Range Agreements (FRAs) or Short Term Forestry Agreements with provisions for consultation on administrative decisions such as AAC determinations. I have reviewed the consultation processes followed for this administrative decision, described below, and am satisfied that these processes met the requirements as reflected in these agreements.

On April 13, 2000 the Nisga'a Treaty came into effect. Under this treaty, which is referred to as the Nisga'a Final Agreement, there are continuing obligations to consult with the Nisga'a Government about forestry related activities within portions of watersheds that are outside of Nisga'a Treaty Lands that drain into the Nass River. I am satisfied that the Nisga'a Lisims Government was provided with information related to this AAC determination and the opportunity to provide input, as described below.

First Nations were first contacted by the licensee in 2002 with a request for input into draft MP No. 10. The First Nations contacted included the Gitanyow Hereditary Chiefs Office, Gitksan Treaty Office, Gitksan House Chiefs, Kitselas Band Council, Kitsumkalum Band Council, Lax Kw'alaams Band Council and Allied Tribes Association, and the Metlakatla Band Council. The Nisga'a Lisims Government was also contacted and asked to provide input.

In response to the licensee's request for input, the Gitanyow First Nation requested to meet with the licensee. In October, 2002 a Gitanyow representative from the Wetaxhayetsxw house raised concerns regarding the protection of fish sites on the Kiteen River, an old village site on the junction of the Kiteen and Cranberry rivers, mushroom grounds, cultural features identified on the Gitanyow's Traditional Use Survey (TUS) maps and grave sites. At the meeting the Gitanyow representative agreed to share the TUS maps with the former licensee. A second meeting was held with the Gitanyow in January, 2003. Moose winter range near the mouth of the Kiteen River and maintenance of Grizzly Bear corridors were added to the list of the Gitanyow's management concerns. In addition, the Gitanyow spoke about consultation and accommodation regarding the replacement of TFL 1. The former licensee provided the Gitanyow with the most recent Forest Development Plan Maps and an overview map of the northeast portion of the TFL.

Since the input was received from the First Nation as detailed above the Kalum Sustainable Resource Management Plan came into effect. The plan was developed with opportunities for input by the public and First Nations. It includes legal objectives for many of the resources noted by the Gitanyow as concerns. I note that no further comments were made by the Gitanyow First Nation about the above-noted issues during the ensuing consultation process for TFL 1. However, if the First Nation still considers these issues to be of concern, I encourage it to bring these concerns to the Kalum Plan Implementation and Monitoring Committee. For this determination I consider that the Kalum SRMP has addressed the concerns raised by the Gitanyow in 2002 and I have discussed any implications for timber supply resulting from the implementation of the plan above under the relevant factors.

On December 5, 2002 the former licensee met with representatives of the Kitsumkalum and Kitselas First Nations to follow up on the request for input into MP No. 10. The two First Nations indicated that they wished to resolve the consultation and accommodation issues regarding the TFL 1 replacement before they would participate in consultation about MP No. 10. Subsequent to this communication, on January 20, 2004, the two First Nations signed the *Kitselas and Kitsumkalum Forestry/Range Interim Measures Agreement*. In the agreement the First Nations agreed that the government of British Columbia had fulfilled its duties to consult and seek workable accommodation with the Kitsumkalum and Kitselas with respect to the consent to replace TFL 1. TFL 1 was replaced effective January 1, 2008.

In July, 2006 Coast Tsimshian Resources Partnership Limited, the new licensee, sent all the First Nations letters inviting them to provide input on draft MP No. 10 and informing them of the pending AAC determination. The licensee provided each First Nation with a copy of MP No. 10. No response was received.

On August 21, 2006 the Kalum Forest District manager sent letters to the First Nations notifying them that administrative decisions were scheduled in the fall of 2006 for the approval of MP No. 10 and the AAC determination for TFL 1. In the letter the district manager invited the First Nations to meet with MFR staff to discuss the pending decisions. The First Nations contacted included the Gitanyow Hereditary Chiefs Office,

Gitxsan Treaty Office, Kitselas Band Council, Kitsumkalum Band Council, Lax Kw'alaams Band Council and the Metlakatla Band Council. Five Gitxsan House Chiefs were contacted. No response was received to this letter.

On June 11, 2007 a second letter was sent by Kalum District manager to the same First Nations, indicating that the AAC decision was now scheduled for the summer of 2007. As MP No. 10 had been approved effective January 1, 2007 no reference to this process was included. In the letter the district manager invited the First Nations to provide written input on this decision or to meet with MFR staff. No response was received.

On July 26, 2007 the Kitsumkalum First Nation sent the Kalum District manager a letter expressing its concern regarding the licensee's development plans in the West Kalum area of the Kitsumkalum's asserted traditional territory. According to the letter, of particular concern is the licensee's focus on second growth because it conflicts with the Kitsumkalum First Nation's entitlement interests as well as its views of conservation and preservation.

On August 8, 2007, in response to the August 21, 2006 and June 11, 2007 letters from the Kalum District manager, the Metlakatla First Nation sent a letter to the tenures officer of the Kalum Forest District. The Metlakatla indicated that the information provided to date was insufficient for the Metlakatla to determine the possible impacts of the proposed AAC determination on the people of Metlakatla's ability to continue to carry out their aboriginal customs, practices and traditions. This First Nation was also concerned about long-term harvest levels that target cedar and cypress as this would impact the long- and mid-term timber supply and compromise the economic viability of remaining stands. The Metlakatla contend that this also does not address possible infringement on Metlakatla's interests of maintaining cedar stands for Metlakatla social and cultural purposes. In addition the Metlakatla expressed concern over the location of harvest opportunities under their FRA.

On August 28, 2007 Kalum Forest District staff sent a letter to all the First Nations contacted previously and invited them to meet with me on September 11, 2007 and provide direct input regarding timber supply on TFL 1 in relation their interests. In the letter district staff asked that the First Nations who would not be able to attend the meeting provide any comments prior to the September 11, 2007 meeting or the week following.

On September 7, 2007 district staff responded to the letter from the Metlakatla by telephone and reiterated the invitation to meet with me or alternatively to meet with district staff after the meeting. The Metlakatla did not meet with me or provide any further input into this determination. In response to the concerns raised by the Metlakatla in their letter, I am aware that during the AAC determination process for the Kispiox Timber Supply Area the Gitanyow and Gitxsan First Nations also raised concerns about the current targeting of cedar in harvest operations. I too am concerned about this trend and therefore under '**Implementation**', similar to the instruction issued by the chief forester in his most recent AAC determination for the Kispiox TSA, I have instructed MFR district staff to work with First Nations and licensees to develop a cedar

management strategy for TFL 1, to be completed in time for incorporation in the analysis for the next timber supply review. I have also issued an instruction that each year the licensee report to the district manager of the Kalum Forest District the annual volume of cedar harvested on TFL 1 compared to the volume of cedar remaining in the THLB growing stock. Regarding the Metlakatla's concern about the location of harvest opportunities under their FRA, I have no authority to prescribe where harvesting should take place or by whom. I will forward this concern to the regional executive director of the Northern Interior Forest Region.

Representatives for the Nisga'a Lisims Government and the Kitsumkalum First Nation as well as Kalum Forest District and Forest Analysis and Inventory Branch staff attended the meeting with me on September 11, 2007. The Nisga'a representative noted the Nisga'a citizens' concern regarding the configuration of a recent cutblock and the resulting effect on visuals. He indicated this would be addressed with the district manager. He further expressed general satisfaction with the management of TFL 1 at the time of the meeting. The Kitsumkalum representative reiterated the concerns expressed above in the letter of July 26, 2007 regarding possible plans for harvesting of second growth in the area currently being considered as future treaty lands for the Kitsumkalum. The representative indicated that the Kitsumkalum would prefer no harvesting on Kitsumkalum core interest areas so the treaty lands would not be put at risk.

In a letter to me dated September 24, 2007 the Kitsumkalum First Nation indicated that any decision on the AAC for TFL 1 should be applicable to TFL 1 only; that the Kitsumkalum had provided the licensee with a draft memorandum of understanding respecting the movement of wood from Kitsumkalum territory; and reiterating the Kitsumkalum's sentiment that no harvesting should occur within the area under treaty negotiation. In my response of March 20, 2008 to the Kitsumkalum I indicated the AAC I determine is applicable only to TFL 1. I also indicated that the other two issues are outside of my jurisdiction and that I would pass the last concern on to the district manager and the licensee.

In the letter the Kitsumkalum also expressed concern over the licensee having identified second-growth stands for harvest and that these have not yet attained their culmination age, that is, the age at which the maximum annual volume accrues in a stand. The Kitsumkalum further indicated that MP No. 10 is based on harvesting the oldest stands first. I note that in the base case of the 2003 timber supply analysis preference was given to harvest the historic harvest profile first and the secondary preference was to harvest the oldest stands first. These are standard and acceptable assumptions used in timber supply modelling. They are intended to reflect current performance as well as possible in the computer model, but are not commitments by the licensee to harvest in that manner. If management practices change over the term of an AAC, new assumptions will be developed to reflect these practices in the computer model and these will be accounted for in the next determination. In Mp No. 10 the licensee does not commit to harvest the oldest stands first and discusses the need to determine financial rotations for second growth. In my response to the Kitsumkalum I indicated that I would ask district staff to

monitor the actual harvest profile and compare it to the profile used in the strategic analysis. Further, the licensee has agreed to track harvest performance by timber type.

I am aware that on October 19, 2007 district staff met with the Kitsumkalum to discuss the licensee's proposed harvest of second growth within the Kitsumkalum's proposed treaty settlement lands on TFL 1. One of the options discussed for limiting the harvest of second growth was that I partition the AAC by attributing a portion of the AAC to harvesting second growth. I have considered this option. District staff inform me that since the licensee bought TFL 1 it has harvested little second growth and not in the Kitsumkalum's proposed treaty settlement lands. In its MP No. 10 the licensee does perceive the extensive advanced second growth in the Kalum Valley as a potential economic opportunity. In the MP the licensee commits to analysing within eight years the potential contribution of second-growth stands to current harvest regimes, including modelling commercial thinning. I met with the licensee on September 10, 2007 and staff indicated to me that they consider second growth to be a long-term opportunity. For this determination I will not attribute a portion of the AAC to second-growth harvesting, however, under **'Implementation'** I have asked the licensee to report the harvest of second growth to the Kalum Forest District manager annually. I encourage the licensee to perform the analysis as per the commitment in MP No. 10 soon so that the information can be considered in future AAC determinations. I also encourage the licensee to work with district staff to develop a second-growth management strategy.

Having considered the information received from First Nations and from other available sources, I am satisfied that First Nations have been provided with reasonable opportunities to provide input on their aboriginal interests and how those interests may be affected by this AAC determination. No information was brought forward that leads me to conclude that an adjustment relative to the base case timber supply forecast is required to account for First Nations interests at this time. I believe I have adequately addressed those First Nations' concerns and interests raised during the consultation process that are within my authority to address.

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

Alternative harvest flows

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be regularly determined to ensure that short-term harvest levels are compatible with a smooth transition to medium- and long-term levels. Timber supply needs to remain sufficiently stable so that there are no significant adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

One alternative harvest forecast was provided in the 2003 analysis. In this alternative an initial level of 540 000 cubic metres per year could be maintained for two decades before the projection declined in 10 percent per decade increments to the same mid- and long-term harvest levels attained in the base case.

The initial harvest level in both the base case and alternative harvest forecasts are lower than the previous AAC of 611 000 cubic metres. As discussed below under '*Actual harvest*', the licensee has been harvesting less than its current AAC allocation. In my determination I have considered alternatives to the base case harvest flow and the licensee's harvest performance as discussed under '*Reasons for decision*'.

Actual harvest

- cut control and harvest performance

According to cut control information for TFL 1, during the period from 2002 to 2005 just under 10 percent of the AAC available to the licensee was harvested. In 2005 only 2260 cubic metres were charged to the licensee's portion of the AAC. In its first year of operating on TFL 1 in 2006, Coast Tsimshian Resources Limited Partnership harvested just over 70 000 cubic metres of the 431 277 cubic metres of AAC currently allocated to the licensee. In 2007 it harvested just over 300 000 cubic metres.

During a meeting I attended with licensee staff on September 12, 2007 they indicated that finding timber that is economically viable for harvest is their greatest concern, and that even when the market conditions were better, it was difficult to harvest the previous AAC. The other licensees on the TFL are also targeting the most accessible and economically viable stands, thereby further limiting the easily accessible timber supply on TFL 1. Consequently, the licensee considers the proposed harvest level of 500 000 cubic metres per year a reasonable level of harvest for the TFL.

The starting point of the base case is the year 2002. Therefore six years of the base case harvest forecast have already elapsed. However, over that period approximately 2.4 million cubic metres of a total of about 3 million cubic metres of AAC available to the licensee were not harvested. I understand that BCTS harvested most of its allocation for the period from 2001 to 2006 and the two "undercut" licensees have harvested about half of their total allocation of 440 000 cubic metres to be harvested over a five-year period. Therefore, even though six years of the base case forecast have already elapsed, the forecast for the next thirty years remains essentially as stable as it was in 2003 when the analysis was completed.

I have considered the information on harvesting performance and will discuss this further under '**Reasons for decision**'.

Community implications

The largest community adjacent to TFL 1 is Terrace with a population in 2006 of 11,320. Terrace is the service centre for many north-western communities, including Kitimat and

Smithers, as well as an important communications, transportations and trade link. Thornhill, a residential suburb of Terrace has a population 4,002, while the populations of two neighbouring Tsimshian communities, Kitselas and Kitsumkalum, are 78 and 251, respectively. Several other small communities in the Greater Terrace area have a combined population approaching 3,000.

The largest employer in Terrace is the service sector, including department stores, supermarkets and hotels. Other major employers include the provincial and federal governments, School District No. 82, Mills Memorial Hospital, Northwest Community College, the City of Terrace and West Fraser Mills Ltd.

Stable employment opportunities in the forest industry have been scarce over the last eight years because sawmills and pulp mills in the area have been sold and closed. Woodlands operations now operate independently of any mill.

Employment from TFL 1 is currently tied to woodlands operations and these are performed by contractors. According to MP No. 10 the work force is primarily drawn from Prince Rupert, the greater Terrace area and villages in the Nass valley. The licensee indicates it prefers to employ local residents and First Nations as well as local contractors to perform forestry work. The licensee sells its timber products to different customers as market conditions dictate. In my determination I have been mindful that maintaining viable harvesting opportunities on TFL 1 will contribute to employment stability in the Terrace area.

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

This section of the *Forest Act* was repealed in 2003. [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

The Minister has expressed the economic and social objectives of the Crown for the province in a letter dated July 4, 2006 to the chief forester (attached as Appendix 3).

The letter stresses the importance of a stable timber supply while being mindful of other forest values. The letter also highlights objectives in the BC's Mountain Pine Beetle Action Plan. I am aware that there is a small mountain pine beetle outbreak within TFL 1. It will be monitored and if it expands considerably, it may be considered in the next determination.

I have considered carefully the Minister's stress on the importance of providing a stable timber supply while maintaining other forest values. In that regard I consider the stability in the short term of the base case harvest forecast to provide a considerable buffer to any further pressures on timber supply that may be experienced following the operability review or further developments in the land-use planning process. I further

note that because the land base assumptions in the base case accounted for some of the land-use decisions in the SRMP, as well as other non-timber values, this has reduced the uncertainty in timber supply associated with these factors.

- local objectives

The Minister's letter of July 4, 2006, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives as well as any relevant information received from First Nations.

The licensee provided opportunities for public review of its draft Management Plan No. 10 including the draft Information Package. Comments were received by several trappers and these were mainly related to access. One trapper indicated that mountain top to valley bottom strips should be left to permit better animal movement. I note that connectivity was considered during the Kalum LRMP process and objectives for connectivity are in place for landscape connectivity in the Kalum SRMP. If the trapper wishes to pursue this issue further, I encourage him to bring his concerns to the Kalum Plan Implementation and Monitoring Committee. No other issues that might affect timber supply were raised by the public during the review process.

I am satisfied that the licensee has carried out its public involvement obligations satisfactorily, and that no specific issues were identified in public review which would impact this determination.

I also note that local objectives for land and resource use on TFL 1 are largely captured in the Kalum SRMP. I have accounted for the objectives established in that plan as they relate to various factors I have considered in my determination.

District staff briefed me on the information sharing and consultation process with First Nations associated with this timber supply review, which I discussed earlier under 'First Nations Considerations' and 'Cultural Heritage Resources'. I have taken this information into account in my determination.

Based on this, I believe my accounting for objectives established in the Kalum SRMP, and my review of public and First Nations considerations that I detailed above, have appropriately addressed the Minister's request that I consider local objectives.

- partitioned component of the harvest

As I discussed above under 'economic and physical operability', I have considered the concern expressed by Kalum Forest District staff regarding their perception that low site hemlock-leading stands are being avoided in harvest operations. The licensee provided information that indicates that since it began harvesting in November 2005, 68 percent of the harvest came from these stands. I concluded that therefore a harvest partition on this account is not necessary at this time.

Under '*First Nations considerations*' I discussed the concern expressed by the Kitsumkalum First Nation regarding the likelihood that the licensee may harvest second growth in the First Nation's proposed treaty settlement lands. One option discussed was that I could attribute a portion of the AAC to harvesting second growth. Based on the information available at this time I did not pursue this option.

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

Unsalvaged losses

Unsalvaged losses are timber volumes destroyed or damaged by natural causes such as insects, disease, fire, and blow down, and are not recovered through salvage operations. They are in addition to endemic timber volume losses due to insects and diseases that normally affect stands and that are accounted for by VDYP decay, waste and breakage, or for losses associated with second-growth stands, by TIPSYP operational adjustment factors.

In the 2003 analysis, the annual net unsalvaged loss was deducted from the harvest flow results to determine net harvest volumes. Estimates were prorated from the 1999 TFL 1 Analysis Report based on the current THLB area. The net loss applied in the analysis was 2900 cubic metres per year.

There is currently an epidemic of red-band needle rust (*Dothistroma*) in the Kispiox and Kalum Forest Districts, however since there is just a small component of pine within the TFL THLB, this will have little impact on timber supply.

District staff informed me of an outbreak of mountain pine beetle in Salmon-Run Creek in the Copper River drainage in TFL 1. According to staff most of the pine in the area is now dead. Leading pine stands cover approximately 4000 hectares, or 4.5 percent of the THLB and most of this area is in the Salmon-Run Creek area. Stands on this area comprise only 1.2 percent of the total growing stock on the THLB of TFL 1. District staff informed me that there is currently no road access into the area, so it is not likely that the timber will be salvaged.

I have reviewed the information regarding unsalvageable losses. I am satisfied that the assumptions for unsalvaged losses made in the analysis are adequate for use in this determination. The loss of pine trees to the mountain pine beetle affects a small amount of the growing stock of TFL 1 and accounting for this loss would not affect the short-term timber supply attained in the base case. I expect the licensee and district staff will continue to assess the mountain pine beetle infestation and that the licensee will include appropriate assumptions to reflect the loss of pine in the analysis for the next determination.

Reasons for decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

The 2003 timber supply analysis base case projection indicates an initial harvest level of 500 000 cubic metres per year can be sustained for thirty years. This initial harvest level is about 18 percent lower than the current AAC of 611 000 cubic metres. Under '*cut control and harvest performance*' I concluded that even though six years of the base case projection have elapsed, if the initial year of the base case were 2008, the harvest forecast for the first thirty years would remain substantially as stable as originally projected

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

For this determination I have identified no quantifiable factors that suggest the timber supply may be over- or underestimated. I have, however, identified a significant source of uncertainty, and that is the definition of the operable land base. As I described under '*economic and physical operability*', 41 000 hectares, or about 46 percent of the THLB is in areas where the economic viability of harvesting is uncertain. The licensee provided me with information that shows that it has been harvesting these areas, but I understand that the licensees on TFL 1 are concentrating the harvest on areas that are easily accessed and close to markets. The other economically viable opportunity for harvesting on TFL 1 is the older second growth. The Kitsumkalum First Nation has expressed concern that the licensees may harvest the second-growth areas that are within the Kitsumkalum's proposed treaty lands.

The stability of the base case forecast reduces my concern that the uncertainty associated with the inclusion of poor quality stands in the THLB could require an immediate further reduction in the AAC. I note that the reduction of 18 percent from the previous AAC to the initial harvest level in the base case is already very significant. However, the magnitude of the land base uncertainty is substantial. Therefore, I agree with the licensee that an operability review is warranted and have included an instruction to that effect under '*Implementation*'.

Under '*Alternative harvest flows*' I described a harvest flow alternative in which an initial harvest level of 540 000 cubic metres per year was attained for two decades followed by a steady decline to the base case mid-term harvest level. Given the land base uncertainty and the decline in future harvest levels projected in both the base case and the alternative harvest flow, I have concluded that determining an AAC that is consistent with the base case initial harvest level with its projected stability for thirty years rather than the alternative flow is a prudent approach at this time.

Since the licensee bought TFL 1 it has not harvested the AAC available to it. However, in 2007 it harvested just over 300 000 cubic metres and this volume is close to the volume that would be available to the licensee with an AAC for TFL 1 of 500 000 cubic metres. Under '*cut control and harvest performance*' I also noted that BCTS is harvesting close to its AAC allocation. I am therefore satisfied that an AAC of 500 000 cubic metres is attainable.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties in the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved on TFL 1 by establishing an AAC of 500 000 cubic metres.

This determination is effective April 15, 2008, and will remain in effect until a new AAC is determined, which normally must take place within five years of the effective date of this determination.

If 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 five years required by legislation.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage the licensee and/or MFR staff to undertake the tasks noted below that I have also described further in the appropriate sections of this rationale. These projects are important to help reduce the risk and uncertainty associated with key factors that affect the future timber supply in TFL 1. I therefore request that the following be completed before the next determination:

1. *Harvest monitoring*: that the licensee record its harvest of low site hemlock-leading areas (as defined under '*economic and physical operability*'), second-growth stands and cedar and each year report this harvest to the district manager of the Kalum Forest District.
2. *Operability classification*: that the licensee update the operability classification for TFL 1 to provide better information regarding the amount of available merchantable timber and to identify areas of low merchantability so that these areas can be appropriately accounted for in the next AAC determination.
3. *Dead potential timber*: that the licensee monitor the harvest of dead potential timber over the term of this AAC so that appropriate estimates of this volume can be incorporated into the next AAC determination.
4. *Cedar management strategy*: that MFR Kalum Forest District staff work with First Nations and the licensee to develop a cedar management strategy for TFL 1, to be completed in time for incorporation in the analysis for the next timber supply review.

In some of the factors discussed above I have identified information that is now outdated and that I expect will be replaced with the new information that is already available to the licensee or that requires minimal work to make it available for the next AAC determination. This information includes:

1. *Terrain stability mapping*: I expect the licensee will finalize the terrain stability mapping for incorporation in the timber supply analysis for the next AAC determination.

2. *Recreation inventory and analysis*: I expect the licensee will review these documents, and if necessary update them for use in the next determination.
3. *Landscape-level biodiversity*: I expect the licensee will ensure that all the land-use objectives in the Kalum SRMP related to landscape-level biodiversity, including established OGMA's, will be accounted for in the analysis that will be prepared for the next AAC determination.
4. *Riparian reserves and management zones*: I expect the licensee to seek review and approval of its riparian inventory from Ministry of Environment staff and to provide more detailed information concerning the accounting for this resource in the analysis for the next AAC determination.
5. *Wildlife species – grizzly bear*: I encourage the licensee to monitor the management practices for grizzly bear prescribed in the SRMP and include appropriate assumptions to reflect these practices in the analysis for the next determination.

I have also asked the licensee to address the following items for future AAC determinations.

1. The licensee should review the available site index information, including the Kalum PEM information, and work towards improving site index estimates for TFL 1 so that more reliable information can be used for future determinations.
2. The licensee should complete regeneration surveys and take the necessary actions to regenerate areas with stocking below the acceptable standards. Any progress made on this task should be incorporated in the analysis for future AAC determination.
3. I encourage the licensee to analyse the potential contribution of second-growth stands to current harvest regimes as per the commitment in MP No. 10. soon so that the information can be considered in future AAC determination.
4. I encourage the licensee to work with district staff to develop a second-growth management strategy.
5. I encourage the licensee to plant components of species other than hemlock, in particular cedar.



Craig Sutherland, R.P.F.
Deputy Chief Forester

April 15, 2008



Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157
Consolidated to October 21, 2004, reads as follows:

Allowable annual cut

- 8 (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for
- (a) the Crown land in each timber supply area, *excluding tree farm licence areas, community forest 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 the result set out under section 39 (2) or (3),

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

- (c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and
- (d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

- (3) If

- (a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and
- (b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

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

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

- (a) by written order may postpone the next determination under subsection (1) to a date that is up to 10 years after the date of the relevant last determination, and
- (b) must give written reasons for the postponement.

- (3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection

- (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she
- (a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and
 - (b) must give written reasons for setting the earlier date.
- (4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).
- (5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to
- (a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, 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 a 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 [2003-31-02]
- (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* (consolidated 2006) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to
 - (a) encourage maximum productivity of the forest and range resources in British Columbia;
 - (b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;
 - (c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;
 - (d) encourage a vigorous, efficient and world competitive (i) timber processing industry, and (ii) ranching sector in British Columbia; and
 - (e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Document attached:

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



JUL 04 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.

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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,

A handwritten signature in black ink, appearing to be 'Rich Coleman', with a long horizontal stroke extending to the right.

Rich Coleman
Minister