

**BRITISH COLUMBIA
MINISTRY OF FORESTS, LANDS,
NATURAL RESOURCE OPERATIONS
AND RURAL DEVELOPMENT**

Tree Farm Licence 37

held by

Western Forest Products Inc.

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

Effective July 25, 2018

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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 as Deputy Chief Forester of British Columbia (BC) in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 37. 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 the AAC for a Timber Supply Area (TSA) or TFL. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

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

Description of the TFL

TFL 37 is held by Western Forest Products Inc. (“the licensee”) and is located in the Nimpkish Valley on the northern half of Vancouver Island, bordering TFL 39, TFL 19 and the Pacific TSA. Communities near or within the TFL area include Port McNeill, Sayward and Woss. Adjacent provincial parks include Lower Nimpkish, Nimpkish Lake, Claude Elliot, Schoen Lake, and Woss Lake. The TFL is administered by the North Island-Central Coast Natural Resource District (NICCNRD) of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (“the Ministry” or FLNRO).

Forestry, tourism, mining and fishing are the principal economic activities in the region. Road access to the TFL is provided by provincial highway 19 between Port McNeill and Woss.

TFL 37 is comprised of ‘*Schedule A*’ (Timber Licences and private) land and ‘*Schedule B*’ (Crown) land that covers an area roughly 160 000 hectares. This area includes the Upper Nimpkish and Lower Nimpkish Landscape Units. These landscape units are named in respect of the ‘Namgis First Nation. The topography of both landscape units is varied with steep mountainous formations surrounding the wide Nimpkish Valley. Compared to other management units, the TFL has a relatively large proportion of area that is considered productive forest land, 132 217 hectares, of which 86 195 hectares is anticipated to be available for timber harvesting.

The TFL falls within two biogeoclimatic zones: the Coastal Western Hemlock (CWH) zone, where cool, wet summers and mild winters support stands with a significant proportion of western hemlock, and at higher elevations, the Mountain Hemlock (MH) zone. The other major tree species include western redcedar, balsam (amabilis fir), Douglas-fir and yellow-cedar.

TFL 37 is in the area covered by the Vancouver Island Land Use Plan Higher Level Plan Order (VILUP HLP) which came into effect on December 1, 2000. This order establishes Resource Management Zones and objectives within the area, including Special Management Zones (SMZ), Enhanced Forestry Zones (EFZ) and General Management Zones (GMZ). The plan order specifies special biodiversity conservation objectives within SMZ that were designed to reduce the impact of commercial resource development on the identified special values. EFZ are areas that were identified in the plan as having potential for increased commercial timber production and more labour-intensive forest management through intensive reforestation, spacing, pruning, thinning, and new harvest practices. GMZ accommodate a wide variety of resource values and uses.

Six First Nations have Aboriginal Interests within the traditional territories that overlap TFL 37, including the Kwakiutl First Nation, the Mowachaht/Muchalaht First Nation, the ‘Namgis First Nation, the Quatsino First Nation, the Tlowitsis First Nation, and the We Wai Kai First Nation.

As required under the Tree Farm Licence Management Plan Regulation of the *Forest Act*, the licensee has prepared Management Plan No. 10 (MP No. 10) for TFL 37. This plan includes a general description of the TFL, a timber supply analysis report that assess the short-term and long-term availability of timber for harvesting in the TFL and other supporting documentation including an information package.

History of the AAC

TFL 37 was first awarded to Canadian Forest Products in 1960 and was purchased by Western Forest Products Inc. in 2006. Since 1960, there have been nine Management Plans (formerly called *Management and Working Plans*) for the TFL, the most recent being October 1, 2006, when the deputy chief forester set the AAC at 969 000 cubic metres. The forests of TFL 37 have historically been healthy and infrequent natural disturbances have resulted in a relatively stable AAC since 1969.

In the 1994, 1999, and 2006 management plans, the timber harvesting land base (THLB) was 108 768, 103 248 and 91 325 hectares, respectively. In 2009, a large area (18 351 hectares) was removed from the TFL under the *Forestry Revitalization Act* and included in the Pacific TSA. This area removal was the most significant to date and, together with minor deletions, reduced the TFL 37 AAC to 889 415 cubic metres.

New AAC determination

Effective July 25, 2018, the new AAC for TFL 37 will be 847 000 cubic metres. This AAC is about five percent lower than the AAC in place prior to this determination (originally set in 2006 and adjusted in 2009).

In making this AAC determination, I specify, under Section 8(5)(a) of the *Forest Act*, a partition of 770 200 cubic metres of the total AAC, attributable to stands classified as conventionally-operable land base in Management Plan No. 10.

This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination. If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation.

Information sources used in the AAC determination

The information sources considered in determining this AAC for TFL 37 include the following:

- Legislation

- *Forest Act* and regulations, BC Government, current to July 11, 2018;
- *Ministry of Forests and Range Act*, BC Government, current to July 11, 2018;
- *Forest and Range Practices Act* (FRPA) and regulations and amendments, BC Government, current to July 11, 2018;
- *Forest Practices Code of British Columbia Act*, BC Government, current to July 11, 2018, and regulations and amendments;
- *Land Act*, BC Government current to July 11, 2018;
- *Environment and Land Use Act*, BC Government current to July 11, 2018;
- *Park Act*, BC Government current to July 11, 2018;
- *Protected Areas of British Columbia Act*, BC Government current to July 11, 2018;
- *Species at Risk Act*, Government of Canada (S.C 2002, c29) current to June 20, 2018;
- *Forestry Revitalization Act*, BC Government current to July 11, 2018;
- *Heritage Conservation Act*, BC Government current to July 11, 2018;

- *Interpretation Act*, BC Government current to July 11, 2018;
- *Wildlife Act*, BC Government, current to July 10, 2018.

- *Management Plans and Timber Supply Review Documents*

- Tree Farm Licence 37 Management Plan No. 10, including Information Package and Timber Supply Analysis, Western Forest Products Inc. August, 2017;
- Tree Farm Licence 37 Rationale for Allowable Annual Cut (AAC) Determination, Ministry of Forests and Range. October 1, 2006;
- Tree Farm Licence 37 review and Comment report for Management Plan No. 10 Western Forest Products Inc. January, 2018;
- Forest Stewardship Plan – North Vancouver Island Region Forest Operations of Western Forest Products Inc., Western Forest Products, January 2012;
- Letter from the Minister of Forests, Lands, Natural Resource Operations and Rural Development to the chief forester stating the economic and social objectives of the Crown, BC Government October 30, 2017;
- Letter from the Minister of Forests, Lands and Natural Resource Operations to the chief forester stating the economic and social objectives of the government for signatory First Nations of the *Nanwakolas Reconciliation Protocol*. April 12, 2013;
- Supporting Documentation for Consultation Report Draft Management Plan No. 10 and Annual Allowable Cut Determination for TFL 37, BC Government March, 2018;
- Consultation Report Draft Management Plan No. 10 and Annual Allowable Cut Determination for TFL 37, BC Government March, 2018;
- AAC Determination Binder for TFL 37 - including input received from First Nations through the consultation process and comprehensive discussions with Ministry staff, including the AAC determination meeting held in Port McNeill on March 8, 2018;
- Western Forest Strategy, A Program for Conserving Biodiversity on Company Tenures, Western Forest Products Inc., September 2007;
- Procedures for Factoring Visual Resources into Timber Supply Analysis; Ministry of Forests, March 1998;
- Updated Procedures for Meeting Legal Obligations When Consulting First Nations – Interim; Province of British Columbia; May 7, 2010.

- *Land Use, Forest Practices and other Documents*

- Vancouver Island Land Use Plan Higher Level Plan Order, effective December 1, 2000, pursuant to Sections 3(1) and 3(2) as well as Section 9.1 of the *Forest Practices Code of British Columbia Act*, BC Government current to June 27, 2018;
- Forest Stewardship Plan for the North Vancouver Island May 22, 2007 to May 20, 2017 Forest Operations of Western Forest Products Inc. (FSP #262), Western Forest Products Inc. Amended April 24, 2012;
- Identified Wildlife Management Strategy–Accounts and Measures for Managing Identified Wildlife Coast Forest Region Version 2004, Province of BC 2004;

- Government Actions Regulation (GAR) Orders applicable to TFL 37;
 - Draft and established old growth management areas, Ministry of Forests, Lands and Natural Resource Operations current to March 1, 2017;
 - Order Establishing Provincial Non-Spatial Old Growth Objectives, Ministry of Sustainable Resource Management, June 30, 2004;
 - Approved Ungulate Winter Ranges, Ministry of Environment current to March 1, 2017;
 - Approved Wildlife Habitat Areas, Ministry of Environment current to March 1, 2017;
 - Order - Fisheries Sensitive Watersheds – Vancouver Island, effective December 28, 2005;
 - Order to Identify Karst Resource Features for the North Island - Central Coast Forest District, effective March 29, 2007;
 - An Order to Establish a Landscape Unit and Objectives – Lower Nimpkish Landscape Unit, effective October 24, 2005;
 - An Order to Establish a Landscape Unit and Objectives – Upper Nimpkish Landscape Unit, effective October 24, 2005;
 - Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the North Island – Central Coast Forest District, March 2, 2006;
 - Visual Quality Objectives (VQOs) modelled on VQOs established for TFLs within the North Island-Central Coast Forest District on December 13, 2004 (date Government Action Regulation (GAR) came into force);
 - Coast Area Forest Health Aerial Overview Survey, 2015, Summary Report, B.A. Blackwell & Associates Ltd.;
 - Summary of Dead Potential Volume Estimates for Management Units within the Coast Forest Region, Ministry of Forests and Range. March 2006;
 - Adapting natural resource management to climate change in the West and South Coast Regions: Considerations for practitioners and Government staff, Ministry of Forest Lands and Natural Resource Operations, February 22, 2016;
 - Policy Regarding the Administration of Unharvested Volumes, Uncommitted Volumes and Unused BCTS Volumes, January 10 2018, Ministry of Forests, Lands, Natural Resource Operations and Rural Development;
 - Implementation Plan for the Recovery of Marbled Murrelet (*Brachyramphus marmoratus*) in British Columbia, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, February 2018;
 - Implementation Plan for the Recovery of Northern Goshawk, laingi Subspecies (*Accipiter gentilis laingi*) in British Columbia, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, February 2018;
 - Provincial Timber Management Goals, Objectives and Targets, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, July 2017.
- *First Nations*
- Updated Procedures for Meeting Legal Obligations when Consulting First Nations, May 7, 2010;
 - Haida Nation v. British Columbia (Minister of Forests), [2004] 3 S.C.R. 511, 2004 SCC 73;
 - Tsilhqot'in Nation v. British Columbia, 2014 SCC 44, [2014] 2 S.C.R.;
 - R. v. Sparrow, [1990] 1 S.C.R. 1075;

- Letter from the Minister of Forests, Lands and Natural Resource Operations to the chief forester stating the economic and social objectives of the government for signatory First Nations of the Nanwakolas Reconciliation Protocol, BC Government April 12, 2013;
- Bill C-34 – 2014 Tla’amin Final Agreement Act, Government of Canada 2014;
- Tla’amin Final Agreement Act and Tla’amin Final Agreement Interim Regulation, BC Government current to July 1, 2016;
- Forestry Fund Agreement, Province of British Columbia and ‘Namgis First Nation, September 2015;
- First Nations Consultation Report Draft Management Plan No. 10 and Allowable Annual Cut Determination for TFL 37, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, February, 2018 Status of Forest Resource Inventory;
- Summarizes the forest resource inventories currently being maintained for the TFL. Other inventories are maintained by the provincial government and periodically accessed via the BC Geographic Warehouse.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining the AAC for a TSA or TFL, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs related to inventory, growth and yield, and management. The factors used as inputs to timber supply analysis have differing levels of uncertainty associated with them, due in part to variation in physical, biological and social conditions.

Computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis, therefore, do not necessarily provide the complete answers or solutions to forest management issues that must be considered when making decisions such as AAC determinations. Such information does provide valuable insight into potential impacts of different uncertainties about or changes to resource information and management practices, and thus forms an important component of the information I must consider in AAC determinations.

In determining this AAC, I have considered the technical information provided, including any known limitations.

Guiding principles for AAC determinations

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining the AACs for timber supply areas and tree farm licences.

Given the large number of periodic AAC determinations required for British Columbia’s many forest management units, administrative fairness requires a reasonable degree of consistency of approach in addressing relevant factors associated with AAC determinations. In order to make my approach in these matters explicit, I have considered and adopted the following body of guiding principles, which have been developed over time by BC’s chief foresters and deputy chief foresters. However, in any specific circumstance in a determination where I consider it necessary to deviate from these principles, I will explain my reasoning in detail.

When considering the factors required under Section 8, I am also aware of my obligation as a steward of the forests of British Columbia, of the mandate of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (the Ministry) as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act*, *Forest and Range Practices Act* (FRPA), and *Forester’s Act*.

AAC determinations should not be construed as limiting the Crown's obligations under court decisions in any way, and in this respect it should be noted that AAC determinations do not prescribe a particular plan of harvesting activity within the management units. They are also independent of any decisions by the Minister of Forests, Lands, Natural Resource Operations and Rural Development with respect to subsequent allocation of wood supply.

These guiding principles focus on: responding to uncertainties; incorporating information related to First Nations' rights, titles and interests; and considering information related to integrated decision making, cumulative effects, and climate change.

Information uncertainty

Given the complex and dynamic nature of forest ecosystems coupled with changes in resource use patterns and social priorities there is always a degree of uncertainty in the information used in AAC determinations.

Two important ways of dealing with this uncertainty are:

- (i) managing risks by evaluating the significance of specific uncertainties associated with the current information and assessing the potential current and future social, economic, and environmental risks associated with a range of possible AACs; and
- (ii) re-determining AACs regularly to ensure they incorporate current information and knowledge, and greater frequency in cases where projections of short-term timber supply are not stable and/or substantial changes in information and management are occurring.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, it is important to reflect those factors, as closely as possible, that are a reasonable extrapolation of current practices. It is not appropriate to base decisions on proposed or potential practices that could affect the timber supply but are not consistent with legislative requirements and not substantiated by demonstrated performance.

It is not appropriate to speculate on timber supply impacts that may eventually result from land-use designations not yet finalized by government. Where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council, these areas are deducted from the THLB and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover that helps meet resource management objectives such as biodiversity.

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

Where appropriate, information will be considered regarding 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.

I acknowledge the perspective that alternate strategies for dealing with information uncertainty may be to delay AAC determinations or to generally reduce AACs in the interest of caution. However, given that there will always be uncertainty in information, and due to the significant impacts that AAC determinations can have on communities, I believe that no responsible AAC determination can be made solely on the basis of a precautionary response to uncertainty with respect to a single value.

Nevertheless, in making a determination, allowances may need to be made to address risks that arise because of uncertainty by applying judgment as to how the available information is used. Where appropriate, the social and economic interests of the government, as articulated by the Minister of Forests, Lands, Natural Resource Operations and Rural Development, can assist in evaluating this uncertainty.

First Nations

The BC government has committed to true, lasting reconciliation with Indigenous peoples, including fully adopting and implementing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Reconciliation and implementation of UNDRIP will likely require changes to policies, programs and legislation, which will take time and involve engagement with Indigenous peoples. While this work is undertaken, BC is committed to fulfilling its legal obligations to consult and accommodate Aboriginal Interests consistent with the Constitution, case law, and relevant agreements between First Nations and the government of BC.

Where First Nations and the Province are engaged in collaborative land and resource planning, the Province may make general commitments regarding stewardship and other aspects of resource management. Where such commitments have been made, I will consider them when determining AACs, within the scope of my statutory authority.

As is the case for land use and management planning in general, where land use zones or management objectives resulting from collaborative planning between First Nations and the Province have not been finalized, it is beyond the statutory authority of the chief forester to speculate on final outcomes. If the timber supply implications of final designations are substantial, application of the Allowable Annual Cut Administration Regulation to reduce a management unit AAC between Section 8 determinations, or a new AAC determination prior to the legislated deadline may be warranted.

Where the nature, scope and geographic extent of Aboriginal rights and title have not been established, the Crown has a constitutional obligation to consult with First Nations regarding their Aboriginal Interests in a manner proportional to the strength of those Interests and the degree to which they may be affected by the decision. The manner of consultation must also be consistent with commitments made in any agreements between First Nations and the Province. In this regard, full consideration will be given to:

- (i) the information provided to First Nations to explain the timber supply review process and analysis results;
- (ii) any information brought forward through consultation or engagement processes or generated during collaboration with First Nations with respect to Treaty rights or Aboriginal Interests, including how these rights or Interests may be impacted;
- (iii) any operational plans and/or other information that describe how First Nations' Treaty rights or Aboriginal Interests are addressed through specific actions and forest practices; and,
- (iv) existing relevant agreements and policies between First Nations and the BC Government.

Treaty rights or Aboriginal Interests that may be impacted by AAC decisions will be addressed consistent with the scope of authority granted to the chief forester under Section 8 of the *Forest Act*. When information is brought forward that is outside of the chief forester's scope of statutory authority, this information will be forwarded to the appropriate decision makers for their consideration. Specific considerations identified by First Nations in relation to their Aboriginal Interests that could have implications for the AAC determination are addressed in the various sections of this rationale where it is within the statutory scope of the determination.

Established Aboriginal title lands (meaning declared by a court or defined under an agreement) and other areas, such as Treaty Settlement Lands or Indian Reserves, are not provincial Crown land. Consequently, the timber on these lands does not contribute to the AAC of the timber supply area or tree farm licence with which they overlap. Prior to establishment of Aboriginal title, it is not appropriate for the chief forester to speculate on how potential establishment of Aboriginal title in an area, either by court declaration or by agreement, could affect timber supply, given uncertainties about the scope, nature and geographic extent of

title. Until land has been established as Aboriginal title land, it remains as provincial land managed by the province, and will contribute to timber supply.

Integrated decision making and cumulative effects

One of the responsibilities of the Ministry is to plan the use of forest and range resources such that the various natural resource values are coordinated and integrated. In addressing the factors outlined in Section 8 of the *Forest Act*, I will consider relevant available information on timber and non-timber resources in the management unit, including information on the interactions among those resources and the implication for timber supply.

With respect to cumulative effects, I must interpret related information according to my statutory authority. As emphasized above, the chief forester is authorized only to make decisions on allowable harvest levels, not to change or institute new management regimes for which other statutory decision makers have specific authority. However, cumulative effects information can highlight important issues and uncertainties in need of resolution through land use planning, which I can note and pass to those responsible for such planning. Information on cumulative effect can also support considerations related to Aboriginal Interests.

Climate change

One key area of uncertainty relates to climate change. There is substantial scientific agreement that climate is changing and that the changes will affect forest ecosystems. Forest management practices will need to be adapted to the changes, and can contribute to climate change mitigation by promoting carbon uptake and storage. Nevertheless, the potential rate, amount, and specific characteristics of climate change in different parts of the province are uncertain. This uncertainty means that it is not possible to confidently predict the specific, quantitative impacts on timber supply.

When determining AACs, I consider available information on climate trends, potential impacts to forest ecosystems and communities that depend on forests and related values, and potential management responses. As research provides more definitive information on climate change and its effects, I will incorporate the new information in future AAC determinations. Where forest practices are implemented to mitigate or adapt to the potential effects of climate change on forest resources, or where monitoring information indicates definite trends in forest growth and other dynamics, I will consider that information in my determinations.

I note, however, that even with better information on climate change, in many cases there will be a range of reasonable management responses. For example, it is not clear if either increases or decreases to current harvest levels would be appropriate in addressing potential future increases in natural disturbance due to climate change, which appear to be likely in some areas. Hypothetically, focused harvests in at-risk forests could forestall losses of timber and allow for planting of stands better adapted to future conditions. Conversely, lower harvest levels could provide buffers against uncertainty. The appropriate mix of timber supply management approaches is ultimately a social decision.

Deciding on the preferred management approach will involve consideration of established climate change strategies, and available adaptation and mitigation options together with social, economic, cultural, and environmental objectives. Analysis will be useful for exploring options and trade-offs. Any management decisions about the appropriate approach and associated practices will be incorporated into future AAC determinations. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change, on its effects on forests and timber supply, and on social decisions about appropriate responses as it emerges.

The role of the base case

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

For most AAC determinations, a timber supply analysis is carried out using an information package including data and information from three categories — land base inventory, timber growth and yield, and management practices. Using this set of data and a forest estate model, a series of timber supply forecasts can be produced, reflecting different starting harvest levels, rates of decline or increase, and potential trade-offs between short- and long-term harvest levels.

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

Because the base case represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation 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 any adjustments to its predictions of timber supply must be made, if necessary, to more properly reflect the current situation.

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

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

Base case for TFL 37

The timber supply analysis for TFL 37 was prepared by Western Forest Products Inc. using the Woodstock timber supply model which has been approved by Forest Analysis and Inventory Branch (FAIB) for use in timber supply review. Woodstock was used to project timber harvesting activities following current management practices including objectives for multiple values such as visual quality, biodiversity and wildlife habitat. Based on the review by Ministry staff, as well as my own experience reviewing results from similar models, I am satisfied that Woodstock is capable of providing an appropriate projection of timber supply.

The most significant change in TFL 37 since Management Plan No. 9 (2006) occurred in May 2009 when 18 351 hectares were removed from the TFL under the *Forestry Revitalization Act* to form part of Vernon Lake Block of Pacific TSA (the current AAC of 889 415 cubic metres reflects this deletion). Other changes include improvements to site productivity estimates for some Biogeoclimatic Ecosystem Classification (BEC) units and in the accounting for non-productive areas within managed stands. These changes were modelled in the MP No. 10 base case.

The base case initial harvest level of 847 400 cubic metres per year is 42 015 cubic metres per year (4.7 percent) below the current AAC of 889 415 cubic metres. Over the first four decades of the forecast, the base case harvest level declines by 16.5 percent to a mid-term harvest level of 707 400 cubic metres per

year in 2056. Beginning in 2106, the forecast increases to the long-term harvest level of 757 900 cubic metres per year.

There are two major components of the base case land base: the conventionally-operable land base, which includes areas that are accessible by ground-based harvesting systems, and the non-conventionally-operable land base, which includes areas that are accessible only by helicopter. The initial harvest level for the conventionally-operable land base is 770 600 cubic metres per year, 91 percent of the total forecast, which is maintained for one decade. The projected harvest level decreases to 728 300 cubic metres in the second decade, and is held for 10 years before decreasing further to 707 400 cubic metres for the duration of the forecast.

The initial harvest level for the non-conventionally-operable land base is 76 800 cubic metres per, which is maintained for three decades, decreasing to 37 600 cubic metres in the fourth decade for 10 years before decreasing to 400 cubic metres in the fifth decade, and to 200 cubic metres in the sixth decade. There is no harvest from this land base in decades 7 and 8, but the harvest resumes to a long-term harvest level of 50 000 cubic metres per year in the ninth decade.

The goal of the timber supply analysis was to maximize harvest volume subject to several objectives including achieving a stable long-term growing stock on the conventionally-operable land base over the final 125 years. The base case ratio of total growing stock to the volume harvested fluctuates between one-quarter and one-third over the long term which is acceptable to FAIB staff and, on average, is not out of the ordinary compared to other management units.

To assess the potential implications and risk to timber supply arising from uncertainty in data assumptions, the licensee conducted various sensitivity analyses as part of the overall timber supply analysis. These sensitivity analyses and associated alternative harvest projections have also assisted me in considering the factors leading to my determination.

I am aware that the forecasts supporting this determination start in 2016 which is two years prior to the effective date of my AAC determination. Therefore, actual harvest levels at the current AAC have been exceeding the harvest level projected in the base case for these years. Since the current AAC is about five percent higher than the initial harvest level in the base case, the difference over two years amounts to 84 030 cubic metres. I will discuss this further under '**Reasons for Decision**'.

In consideration of government's goals, guidance from the Minister, the guiding principles for AAC determinations and the recently released *Provincial Timber Management Goals, Objectives and Targets* (2017), I have reviewed in detail the assumptions and methodology incorporated in the base case, as well as: the total growing stock; the harvest contributions from managed and unmanaged stands; the average volumes per hectare; the total area harvested annually; and the average ages of the forest stands harvested. Based on my review, I am satisfied, subject to the qualifications accounted for in various sections of this document, that the information presented to me provides a suitable basis from which I can assess the timber supply for TFL 37.

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

I have reviewed the information for all of the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case is a reasonable reflection of current legal requirements, demonstrated forest management and the best available information; and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 1.

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

Table 1. List of factors accepted as modelled

Forest Act section and description	Factors accepted as modelled
8(8)(a)(i) - Forest Composition and Rate of Growth	Non-forest and Non-productive Forest Economic Operability Deciduous-Leading Stands Recreation Sites Riparian Reserve and Management Zones Site Productivity Assignments Natural Stand Yields Managed Stand Yields Backlog and Current Non-Stocked Areas
8(8)(a)(ii) and (iii) – Re-establishment and Silvicultural Treatments	Stand Establishment Silviculture Systems
8(8)(a)(iv) - Utilization Standard and DWB Allowance	Decay, Waste and Breakage Timber Utilization
8(8)(a)(v) - Constraints For Other Uses	Higher Level Plans Scenic Areas and Visual Resources Harvest Rules and Priority
8(8)(b)(v) – Alternative Rates of Harvest	
8(8)(e) - Abnormal Infestations and Salvage Programs	Non-recoverable Losses

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 harvesting

- general comments

The timber harvesting land base (THLB) is an estimate of the land where timber harvesting is considered both available and economically feasible, given the objectives for all relevant forest values, existing timber quality, market values and applicable technology. It is a strategic-level estimate developed specifically for the timber supply analysis and, as such, could include some areas that may never be harvested or could exclude some areas that may be harvested.

The total area of the TFL 37 is approximately 160 000 hectares. Of this total area, 86 195 hectares are deemed to be available as THLB after deductions are applied for factors noted in Table 1 above and in factors discussed below.

As part of the process used to define the THLB, a series of deductions was made from the Crown forest management land base to account for various land classes that do not contribute to the TFL timber supply (e.g., non-forest areas, uneconomic areas). These deductions account for biophysical, economic or ecological factors that reduce the forested area available for harvesting. In reviewing these deductions, I am aware that some areas may fall into more than one land class. For example, an area may be both uneconomic and in unstable terrain. To ensure accuracy in defining the THLB, care was taken to avoid double-counting areas with overlapping objectives. Hence, the deduction amount for a given factor stated in the analysis, or in this document does not necessarily reflect the total area within that land class, as some portion of it may have been deducted earlier under another land class.

For this determination, I accept that the approach used to determine the THLB for the TFL 37 base case was appropriate.

- forest inventory

The current forest cover inventory for TFL 37 was produced by the previous licensee, Canadian Forest Products, in 1997, using aerial photography flown in 1995. It was originally constructed to adhere to the provincial “Forest Cover” (FC) inventory standard with additional attributes that would facilitate the future transition to the Vegetation Resources Inventory (VRI) standard, which was in development at that time. In 2001, the inventory was converted to the VRI standard and a VRI Phase II adjustment project was initiated.

The Phase II project, which was completed in 2004, involved the collection of field sample data for the purpose of adjusting age, height and net merchantable volume estimates that were derived from the aerial photo interpretation (Phase I) in order to improve the accuracy of these estimates. The Phase II adjustments increased stand volume estimates determined in Phase I. For the current MP No. 10 analysis, the Phase II adjustments were revised in order to utilize current timber yield projection software. These revisions increased overall TFL volumes estimated applied in the previous management plan.

The inventory information used in the analysis was updated to the end of 2015 to account for growth, harvesting and other depletions.

The licensee has acquired LiDAR (Light Detection and Ranging) data for the majority of its tenures including TFL 37. LiDAR is a remote sensing technology that utilizes pulsed laser light to collect very detailed information about forest structures and key attributes, such as canopy height. An advantage of LiDAR technology is that it can be used to obtain tree height measurements of an entire area of interest rather than relying on estimates derived from a sample of the area of interest.

In TFL 37, LiDAR-derived stand height estimates were on average taller than the stand heights provided in the VRI Phase II data for both managed and unmanaged stands. Since stand height is a main factor in estimating stand volume, the LiDAR-derived height estimates were used to calculate volume adjustment factors for unmanaged and managed stands. These factors increased the VRI volume for unmanaged and managed stands by six percent and five percent, respectively. When applied in a sensitivity forecast, the adjusted volumes enabled the mid- and long-term harvest levels to be significantly increased relative to the base case. At the time of the analysis, no information was presented to verify the LiDAR-derived stand volume adjustment factors for TFL 37.

I commend Western Forest Products for undertaking the LiDAR project for TFL 37 and for its efforts at demonstrating the application of LiDAR to estimating forest inventory attributes such as stand height. However, I note that work to develop the methodology for generating and calibrating stand volume estimates for VRI using LiDAR is currently ongoing and FAIB remote sensing staff have not yet finalized standards for using LiDAR data in timber supply review. The licensee has indicated that more research and analyses using this new data source needs to be conducted to verify the timber supply impacts of these initial assessments and has committed to working with FAIB staff during the term of MP No. 10 to implement the LiDAR data for use in the next timber supply review.

For this AAC determination, I have concluded that the stand heights provided in the current VRI, which were applied in the base case forecast, currently constitute the best information for determining timber supply. However, I recognize the potential improvements provided by LiDAR data and if substantial changes in the projected timber supply for TFL 37 are demonstrated once these data have been validated and integrated into the forest inventory, I am prepared to revisit the AAC determination at an earlier date than specified under the *Forest Act*.

- *existing and future roads, trails and landings*

The THLB excludes areas of access structures, such as roads and landings that will be maintained on the land base or are unlikely to regenerate productive forest. Separate estimates were made to account for existing roads and for future roads.

Existing roads, trails and landings were accounted for in the base case in two ways. Major roads, with wide right-of-ways, were represented in the forest cover as non-forest polygons. These polygons were removed from the productive forest land base considered in the analysis. Minor roads, railways and spur roads were represented in the forest cover as lines. The non-forest area associated with these features was estimated as the area within a buffer area delineated along each feature. The buffer widths applied varied by road type as follows: mainline roads 13 metres, railway 11 metres, and spurs or stubs 10 metres. The combined area attributed to all existing roads and removed from the THLB was 4155 hectares.

No reduction to the THLB was made for trails and landings. The area associated with these features in TFL 37 is not significant, as the licensee rehabilitates and restocks all trails and the majority of landings following logging.

An estimate of the forest area that will eventually be removed from production due to future roads was formulated by the licensee based on a 20-year harvesting plan developed for the TFL in 2013. The projected roads in the plan were deemed to be a reasonable representation of future road building requirements in the TFL. An area of 361 hectares was removed from the future forested land base to account for future roads.

The licensee provided an analysis using LiDAR data showing where the amount of non-forest area in existing road buffers was overestimated in the base case. The results of this analysis suggest that the non-forest area in existing road buffers was overestimated in the base case by 1.1 percent and 2.2 percent. To demonstrate the effect of this potential overestimation, the licensee presented a sensitivity forecast that applied a one percent increase to all yield projections in the model. The yield increase applied was lower than the LiDAR results in order to account for the amount of red alder regenerating on roads (red alder is not currently utilized in the TFL). The LiDAR-supported sensitivity analysis allowed for a higher long-term harvest level compared to the base case but no change to the initial harvest level.

I am confident that the base case adequately accounted for existing roads and projected future roads. I recognize the work done by the licensee using LiDAR data to gain insight into the amount of tree cover occurring in the road buffer areas. However, additional validation of the species composition within the buffer and the deciduous and sub-merchantable component is needed. I recognize the licensee's commitment to completing further LiDAR analyses during the term of MP No. 10 to inform the next timber supply review.

- *physical operability*

The amount of productive forest land that is economically accessible by forestry operators using conventional and non-conventional harvesting systems is a key consideration in determining the economically available timber supply for an area.

The operability of productive forest lands in TFL 37 was classified and mapped by the licensee in previous management plans using information on historic operational performance, environmental sensitivity (including terrain stability), safety considerations and local conditions. For the current MP No. 10 analysis, the licensee reassessed the operability mapping considering new information on recent harvest performance,

current roads and planned future roads. There are three land classes in this operability mapping. The conventionally-operable land class, which includes areas accessible by ground-based and cable-based harvesting systems, comprises 100 919 hectares of productive forest. The non-conventionally-operable land class, which includes areas that are accessible only by helicopter harvesting systems, comprises 12 563 hectares of productive forest. The remaining physically inoperable land class, which was determined to be inaccessible for harvesting operations and removed from the THLB, comprises 18 735 hectares.

Since the future operability of stands in the non-conventionally-operable land class is less certain than those in the conventionally-operable land class, sensitivity analysis was conducted to examine the consequence of not including the non-conventional lands in the THLB. Exclusion of these lands reduced the THLB by 7770 hectares or nine percent, and significantly reduced the projected mid-term timber supply. The largest shortfall occurred in decade four of the forecast when the harvest level was 17 percent below the base case level. The results indicate that the non-conventionally-operable lands provide a disproportionately large volume contribution in the mid-term that is necessary to achieve the base case harvest level.

The previous AAC determination specified an AAC partition of 37 000 cubic metres, or 3.8 percent of the total AAC, attributed to hemlock and balsam-leading stands in non-conventionally-operable lands. At that time, the economic feasibility of harvesting these forest types using high-cost helicopter harvesting systems was uncertain. Following that determination, the licensee has monitored the area harvested within the partition forest type in the period from 2007 to 2015. Results from this monitoring indicate the area harvested in hemlock-balsam stands in non-conventional lands accounted for over four percent of the total area harvested in that time period. Although the total volume harvested from this area was not reported by the licensee, FAIB staff estimate that it likely exceeded the AAC partition amount, which is 3.8 percent of the total AAC, since non-conventionally-operable lands consists mainly of high volume old-growth stands.

I note that government has a joint decision-making protocol with the N^{an}wak^olas First Nations for areas within their asserted traditional territory. This protocol recommends that the chief forester specify an AAC partition in a manner that does not permit the AAC attributed to the portion of the land base accessible only by helicopter (non-conventionally-operable) to be harvested in the conventional land base. I discuss my considerations of this further under '*N^{an}wak^olas First Nations shared decision making*' later in this document.

I have reviewed the information regarding the AAC partition set in the previous determination and on harvest performance in this partition and, based on the information provided by the licensee, I conclude the AAC partition has been achieved. I also find no evidence that the licensee is over harvesting the conventionally-operable land base by avoiding the non-conventionally operable areas. The licensee appears to have been diligent in achieving the objective of the partition.

After reviewing the base case and the sensitivity analysis, I conclude that the base case forecast is dependent on the contribution from non-conventionally-operable lands. These lands contribute nine percent of the overall harvest volume in the first period of the forecast. Section 8(5)(a) of the *Forest Act*, enables me to attribute a portion of the AAC to different types of timber and terrain, and to influence but not direct, the behaviour of the licensees. In this determination, I will specify an AAC partition to continue to guard against a risk of overharvesting the conventionally-operable land base. I believe the partition helps provide a focus on the particular operability situation in TFL 37. I also note that current market conditions are favourable providing opportunity to harvest lower grade stands in non-conventionally-operable lands. The partition amount will be 770 200 cubic metres per year attributed to the stands that were indicated as conventionally-operable in MP No. 10. I will discuss this further under '**Reasons for Decision**'.

- terrain stability

Detailed terrain stability mapping was completed for TFL 37 in 1999. During this mapping exercise, areas within the TFL were classified into one of five terrain classes based on likelihood for post-harvest instability. In the base case forecast, a portion of the stands within the two most unstable terrain stability classes (class IV and V) were removed from the THLB. The proportion of area excluded from each class was determined by the licensee based on recent operational experience. In total, 1762 hectares were

removed from the THLB for terrain stability concerns. This area removed is incremental to the area removed as inoperable. Terrain stability was also considered in the operability classification and mapping and as a result, almost all class V terrain had already been previously excluded from the THLB. I note that the Kilpala area, located on the west side of Nimpkish Lake and north of Nimpkish Lake Provincial Park, was noted to have greater sensitivity to logging-related slope failures. In this area 26 percent of terrain stability class IV was excluded from the THLB.

During First Nations consultations, the Nanwakolas First Nation requested a summary of recent harvest performance within terrain stability classes IV and V. The licensee provided data summarizing the harvest performance and THLB distribution by terrain class for the period 2007 to 2015. These data show a slight underperformance in the most sensitive terrain classes relative to the contribution assumed in the base case. I note that this slight underperformance in class IV was not raised as a concern by Ministry staff nor was it brought to my attention by the Nanwakolas First Nation.

I conclude that the areas excluded from the THLB to account for unstable and potentially unstable terrain reasonably reflects current practice in TFL 37 and I will make no adjustment to the base case on this account.

- wildlife habitat areas

Wildlife habitat areas (WHA) conserve habitat for designated species at risk. In TFL 37, 15 WHA have been legally established for Northern Goshawk, Red-Legged Frog, Marbled Murrelet and Keen's Long-eared Myotis (a species of bat). These areas accounted for 257 hectares excluded from the THLB. There are an additional 53 proposed WHA for Northern Goshawk and Marbled Murrelet that are not yet legally established. The licensee believes that the proposed WHA reasonably represent the area that will potentially be reserved from harvesting to meet the habitat needs for these species. Therefore, despite the fact that they are not yet legally established, the licensee decided to exclude the 53 proposed WHA from the THLB, which reduced the THLB area by an additional 201 hectares.

On February 27, 2018, the Ministry announced implementation plans for the recovery of Northern Goshawk and Marbled Murrelet. These plans enable additional habitat protection measures that will aid in the recovery of the two species, building on protection already provided by WHA, OGMA, parks and protected areas, as well as conservation measures. Government wildlife biologists estimate that the habitat protection requirements under the implementation plan are likely to be met by the area covered by the proposed WHA.

I conclude that legally established WHA were appropriately considered in the base case. I recognize that the licensee is taking a proactive approach and partnering with the Ministry to protect areas that contribute to critical habitat and that a reasonable understanding of government direction for Northern Goshawk and Marbled Murrelet is reflected in the placement of the currently proposed WHA. However, in the future, additional WHA may be established within the TFL to further address habitat conservation for other species at risk. Following discussions with Ministry staff regarding this factor, I am satisfied that the requirements for legally established WHA were appropriately accounted for in the base case.

- karst resource features

A Government Actions Regulation (GAR) Order to Identify Karst Resource Features for the North Island-Central Coast Forest District was made March 29, 2007. The order identifies the following as karst resource features: karst caves; important features and elements within very high or high vulnerability karst terrain; and significant surface karst features. Licensees must ensure primary forest activities do not damage or render these features ineffective. A planning-level karst inventory was completed for TFL 37 in 2004 that identified the karst vulnerability potential (KVP). The KVP was used to identify where karst features were likely to exist and the licensee estimated the reserve area required to protect these features based on best management practices.

During the public review of the MP No. 10 Information Package, a letter was received from a member of the public concerned with karst management which expressed the opinion that the consideration for karst in the information package was credible. The letter author agreed that the 2004 karst inventory was the best

available information. The letter author also considered the proposed base case to be compliant with the 2007 karst GAR order, as well as with non-statutory karst management implications.

The North Island, including TFL 37, is known as one of the more important karst resource feature areas in the Province. Further the ‘Namgis First Nation identified karst features as a high valued resource. ‘Namgis First Nation noted that there are five species of salmon in the Nimpkish River and karst in the area enhances salmon habitat.

I am satisfied that the base case adequately accounts for current practice with respect to karst features. I am also aware this is an important feature and government is moving ahead with a karst resource protocol.

- *First Nations cultural heritage resources and archaeological resources*

A cultural heritage resource (CHR) is defined under the *Forest Act* as “an object, site or location of a traditional societal practice that is of historical, cultural or archaeological significance to the province, a community, or an aboriginal people”. CHRs include, but are not limited to, archaeological sites, structural features, heritage landscape features and traditional use sites. In practice, most of these sites overlap with areas already excluded from the THLB to account for non-timber resources due to *Forest and Range Practices Act* (FRPA) constraints such as riparian area, ungulate winter range, wildlife habitat area, wildlife tree retention area, and old growth management area. Where there is no overlap, legal requirements for their protection are outlined below.

Archaeological sites, including culturally modified trees (CMT) that pre-date 1846, are protected under the *Heritage Conservation Act*. Archaeological overview assessments (AOA) have been completed for the TFL, providing baseline information on archaeological resource potential, to guide field-level archaeological impact assessments (AIA). Both AOA and AIA are used to identify potential archaeological sites which include cultural and historic use sites. Once they have been field verified, archaeological sites, including buffer strips, are protected and recorded in the Remote Access to Archaeological Data (RAAD).

Archaeological sites registered with the provincial government were excluded from the base case THLB. In TFL 37, there are 66 hectares attributed to registered archaeological sites. Of this area, 13 hectares overlap areas that were removed from the THLB for other reason and 53 hectares were removed from the THLB specifically to account for the protection of archaeological sites.

Culturally modified trees are the most common cultural heritage resources found within TFL 37. When CMT are identified in the TFL, wildlife tree retention areas and riparian management areas are established to protect these resources. No area reduction was applied to the THLB specifically for CMT as it was assumed that management of these is addressed through co-location with other reserve areas or protected using stand-level retention.

First Nations input included discussion with the ‘Namgis First Nation. They have indicated that their CMT/CHR Field Crew is hired by the licensee to conduct preliminary surveys in proposed development areas within the TFL. If potential features are discovered by that crew, an archaeologist is employed to further assess the proposed development area. The ‘Namgis stated that they have found features in one-third of all surveyed cutblocks. Further, as their survey techniques improve, the ‘Namgis are finding features that were left unidentified in the past, such as yellow-cedar CMTs. The ‘Namgis archaeologist has also stated that the ‘Namgis were clearly horticulturalists over the Nimpkish Valley and that they culturally ‘managed’ the trees. Finally, the ‘Namgis noted that they are undertaking post-harvest assessments of CHR, including archaeological sites, to ensure that they are being managed appropriately.

I have reviewed the information regarding cultural heritage resources provided by the licensee and First Nations. I note that government has a joint decision-making protocol with the *Nanwakolas* First Nations for areas within those Nations’ asserted Traditional Territories. I discuss my considerations of this further under ‘*Nanwakolas First Nations decision making*’ later in this document.

In the case of known archaeological sites, I accept that the amount of area reserved under current management practices for these sites was adequately accounted for in the base case. I am aware that the

base case did not explicitly account for unregistered and not yet discovered archeological sites or contemporary cultural heritage features in the TFL. While I accept that the area needed to protect sites identified in the future will largely overlap with areas reserved for other resource values, I also expect that given the extensive First Nations history in the area of the TFL, effectively managing for these resource values will require additional area to be reserved than was accounted for in the THLB. As a result, I will take into account a small unquantified overestimation of timber supply in the mid- to long-term on this account and discuss this further under ‘**Reasons for Decision**’.

In keeping with my guiding principles, should new significant information become available regarding First Nations archaeological sites and cultural heritage resources, including any new findings or recommendations by government, I may revisit the AAC determination for TFL 37 prior to the 10-year deadline provided for in legislation. For this determination, I note that the AAC I determine does not prescribe any particular plan of harvesting activity within the TFL by requiring any particular area to be harvested or to remain unharvested. Harvesting activities are guided by requirements such as those contained in the *Heritage Conservation Act*, *Forest Act*, FRPA, the VILUP and other resource management legislation.

I would like to recognize the cooperation that is evident between the ‘Namgis First Nation and Western Forest Products with respect to the survey, identification and protection of cultural heritage resources and archeological sites and that the co-operation continue with respect to; and contemporary cultural heritage resources and the protection of those resources in the TFL. I encourage the sharing of information to continue as it supports the ability to look after these resource values during operational planning.

I recognize that local First Nations play an integral role in the identification and protection of cultural heritage resource features within the TFL. Given the importance of this information, it is imperative that new and updated information be recorded in an efficient manner. The Province’s Forest and Range Evaluation Program (FREP) also monitors the impacts of forest development activities on cultural heritage resource features to determine the effectiveness of forest practices in achieving the management objectives set out for the feature. I see significant benefit in harmonizing the stewardship of cultural heritage resources and request all parties to embrace opportunities for collaboration.

- research sites

There are 28 research sites in TFL 37, the majority of which study the growth of stands reforested with trial seedlings. The objectives for these sites vary, with some designed to measure changes and implications following harvest, and others to compare unharvested areas with harvested forests. Some sites were established as early as 1959, but most date from the 1980s and 1990s. The licensee attempted to contact the researchers for each research site to establish when each study will terminate. They found that the planned termination dates for the sites generally ranged from 40 to 60 years after the establishment date. In the base case, the area within a 50-metre buffer around each research site was reserved from harvesting until the site termination year.

I am satisfied that the base case adequately accounts for current practices with respect to research sites noting that the licensee’s engaged with researchers regarding the retention period for the sites. I believe it is important to maintain these research installations to further our understanding of forest ecosystems and improve forest management techniques and I encourage continued dialogue between the licensee and the research community.

Expected rate of growth

- dead potential volume

Inventory information and yield projections do not account for the volume from dead trees that could potentially be used as sawlogs. The base case does not include any assumed contribution from the dead potential volume.

To derive estimates of dead potential volume for coastal TSAs and TFLs, a report *Summary of Dead Potential Volume Estimates for Management Units within the Coast Forest Region* (2006) was completed by FAIB. The report draws on many possible sources of data about dead potential, including inventory audit plots, VRI phase II ground samples, permanent sample plots, and temporary sample plots but none were available for TFL 37. As an alternative, FAIB staff considered inventory audit data from the adjacent TSAs to approximate an estimate of the dead potential volume in TFL 37. This approach indicated that dead potential volume in TFL 37 might be up to of 9.7 percent of the VRI green volume. An average calculated for all the coastal TFLs and TSAs for which data were available, showed that dead potential volume was 8.6 percent. FAIB staff indicated that these estimates represent the maximum amount of volume from dead timber that could be harvested.

There is significant uncertainty regarding available estimates of dead potential volume for TFL 37. I have considered this information and discussed it with district staff. I am aware that the potential volume available from dead yet merchantable stems in harvested stands was not accounted for in the base case. I consider that some portion of this volume is likely economical to harvest. Therefore, it represents an uncertain level of available volume in addition to that projected in the base case.

As summarized under ‘**Implementation**’, I expect the licensee and Ministry staff to continue as directed in the previous AAC determination, to improve estimates of the dead potential volume contribution to the timber supply in TFL 37 and to improve the information available for the next timber supply review and AAC determination. For this determination, I conclude that this potential volume contribution from dead stems represents a small, but unquantified underestimation of short-term timber supply projected in the base case, and I will discuss this further in ‘**Reasons for Decision**’.

- *genetic gain*

The licensee plants seedlings derived from genetically improved “select seed” for Douglas-fir, western hemlock, western redcedar, and yellow-cedar established in plantations on TFL 37, and plans to continue this practice in future. Projections of genetic gain applied in the base case were developed using data from the licensee’s Saanich Forestry Centre seed inventory, development plans, and the Forest Genetics Council business plans. While the gain is projected to increase from 2015 to 2034, the values associated with the 2015 cone harvest were used for all future managed stand yield projections. Hemlock is not commonly planted in the TFL. As a result, the licensee’s expected gain values for low-elevation hemlock were reduced from a gain of 17 percent to a gain of two percent and no gain was applied for high-elevation hemlock. This assumption was supported by FAIB staff who advised that there is uncertainty regarding the realization of genetic gain in planted hemlock stands due to the influence of natural ingress. The base case assumptions related to genetic gain were reviewed, verified and accepted for use by Ministry staff.

The local target within the *Provincial Timber Management Goals, Objectives and Targets* (2017) are that by 2020, 75 percent of all trees planted will be grown from select seed with an average genetic gain of at least 20 percent. I note that the licensee is currently planting using select seed. I encourage the licensee to achieve the timber management goals, objectives and targets in the following two years leading up to 2020 to support sustainable forest management for present and future generations.

I conclude the base case reflects the best available information about genetic gain for TFL 37.

- *operational adjustment factors for managed stands*

Two types of operational adjustment factors (OAF) were applied to the base case managed stand yield projections to reflect average operational growing conditions in the TFL. OAF 1 is applied to account for yield reductions associated with non-productive areas in stands, uneven spacing of trees, and endemic or random losses. OAF 2 is applied to account for volume losses that increase as stands mature, including losses attributable to decay, waste, and breakage. Standard practice OAF values are 15 percent and 5 percent for OAF 1 and OAF 2, respectively.

Root diseases, primarily *Phellinus weirii*, are commonly found in TFL 37 on medium and good productivity sites within the CWHxm2 biogeoclimatic subzone variant. Root rot studies in coastal BC have estimated

volume losses ranging from 5.0 to 8.9 percent with a mid-point estimate of seven percent. To account for root rot in the base case, the standard OAF 2 value, which does not account for disease, was increased from 5 to 12 percent for current managed Douglas-fir leading stands within the CWHxm2 variant. The Ministry forest pathologist for the coast area agreed that this approach appropriately accounted for root disease in the base case.

The licensee provided results from an initial LiDAR study that indicated the default OAF 1 value applied in the base case might be overestimated. FAIB staff noted that without local field data, such as the data acquired through the Young Stand Monitoring (YSM) program or similar studies, the default values are considered the best available information, for areas not affected by root disease. The licensee committed to completing further LiDAR analyses during the term of MP No. 10 to inform the next timber supply review.

I note that LiDAR is capable of providing a detailed understanding of site occupancy and that validation over time will help define the range of deviation between current estimates and those from the new technology. I recognize the need to better quantify the impact of active forest health issues on managed stand yields. YSM will help inform us of those impacts over time.

I have considered the assumptions for OAF applied in the base case. I acknowledge the concerns expressed by the licensee regarding the possibility that the standard OAF 1 values applied in the base overestimate losses. However, in the absence of local field data, such as YSM, specific to TFL 37, I accept that the values applied for OAF 1 and OAF 2, in combination with the adjustments to account for root diseases, adequately reflect current conditions in the TFL and represent the best available information.

As summarized under '**Implementation**', I expect the licensee and Ministry staff to continue to validate managed stand yield estimates for TFL 37 and to determine the influence of forest health factors on managed stands. Using tools such as LiDAR and YSM to improve yield estimates for managed stands should improve the information available for the next timber supply review and AAC determination.

- minimum harvestable criteria

Minimum harvestable criteria are used to define when existing and future managed stands become merchantable and available for harvest. Most stands will not be harvested until well past the minimum criteria in order to meet forest level objectives where different resource values take precedence such as old forest retention for biodiversity.

The minimum harvestable criteria for TFL 37 are based on the licensee's current practice of selecting stands for harvest based on a minimum average diameter at breast height (DBH), at which harvesting is economically feasible. The minimum DBH criteria vary by harvest system, since larger piece sizes with higher value are required to offset more expensive harvest systems. The minimum DBH criteria are 30 centimetres for ground-based harvesting, 37 centimetres for cable harvesting, and 42 centimetres for helicopter harvesting. The base case also included a minimum harvestable volume of 350 cubic metres per hectare for all stands.

A sensitivity analysis used the age at which 95 percent of culmination of mean annual increment (CMAI) was achieved as the minimum harvestable criteria. The analysis found that applying the CMAI criteria produced a very similar forecast to the base case, which used the DBH criteria, with less than 0.5 percent difference in the long term.

During discussions with the Nanwakolas Council, the licensee was asked to provide additional explanation as to why the sensitivity analysis showed so little difference from the base case. The licensee explained that in the base case, the ground-based harvesting was generally permitted prior to culmination on very productive sites, but otherwise aligned well with the age at which 95 percent of CMAI was achieved. However, the minimum harvestable ages for cable and helicopter harvesting were well beyond culmination age. The average minimum harvestable age of the three-harvest systems balances out such that the availability of stands for harvest over time is equivalent to using age at 95 percent of CMAI for all stands.

I consider the minimum harvestable criteria used in the base case reasonable and the resulting timber supply forecast stable. I have considered this information and I am confident that the age and volume thresholds used in the base case were appropriately modelled. I therefore make no adjustments to the base case minimum harvestable criteria.

Section 8 (8) (a) (ii) the expected time that it will take the forest to become re-established on the area following denudation

No factors considered under this section require additional comment.

Section 8 (8) (a) (iii) silvicultural treatments to be applied to the area

No factors considered under this section require additional comment.

Section 8 (8) (a) (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

- landscape-level biodiversity, old growth management areas

Landscape-level biodiversity is conserved by maintaining forests with a variety of patch sizes and seral stages across a variety of ecosystems and landscapes. Given other forest management provisions that provide for a diversity of forest stand conditions, old-forest retention is a key landscape-level biodiversity consideration and is a requirement under the *Forests and Range Practices Act* (FRPA).

Landscape-level biodiversity objectives for old growth in TFL 37 are managed by retaining forest in Old Growth Management Areas (OGMA) which have been established under landscape unit plan orders. In the Lower Nimpkish landscape unit, OGMAs protect sufficient old forest to meet all old-forest targets specified in the plan. In the Upper Nimpkish landscape unit, OGMA protect sufficient old forest to meet the targets for all BEC variants except the CWHmm1 subzone variant. The 84 hectare old-forest retention shortfall in this subzone is assumed to be made up for by the retention of old forest within riparian reserves. In the base case forecast, OGMAs were excluded from the THLB and no old-forest retention constraints were modelled.

The landscape unit plans for the Upper and Lower Nimpkish also established a mature-forest retention target. The plans specify that a minimum of 25 percent of the forest in the CWH zone must be at least 80 years old; and a minimum of 25 percent of the forest in the MH zone be at least 120 years old. These objectives were modelled in the base case through a mature-forest constraint applied to each VILUP special management zone.

In a letter to the Minister of Forests, Lands, Natural Resource Operations and Rural Development sent November 2017, the 'Namgis First Nation expressed its explicit lack of consent for the continued harvest of old growth in TFL 37 until such time as the nation's higher level concerns have been addressed. The 'Namgis also expressed concern that they are not able to access basic information on the location of the remaining old growth within their traditional territory. I note that district staff have been working with the 'Namgis to address this issue. During the TSR process, Western Forest Products provided the 'Namgis with inventory summary information for TFL 37 and proposed a data-sharing agreement. However, at the time of this determination, the data-sharing agreement has not ratified.

I have reviewed the information regarding the modelling assumptions for landscape-level biodiversity in the base case. Based on my review, I conclude that the landscape-level biodiversity and OGMA information used in the analysis are consistent with current legal requirements. Therefore, I will make no adjustments to the base case on this account.

With regards to the harvesting of old-growth stands, I acknowledge that individual opinions regarding the level of old-growth retention on Crown land is very diverse and there is a balance between the need for retention and the need for harvest opportunities within the TFL. However, I understand that through the establishment of OGMA and by retention of old forest elsewhere in TFL 37, the objectives established by

government for old growth in TFL 37 are being met. I also note that harvest opportunity for the next 30 to 40 years in TFL 37 includes old-growth stands which are required in order to achieve the base case harvest level.

I recognize the efforts that the licensee has made to try to provide the information required by the ‘Namgis First Nation. I recommend that both parties continue to seek a mutually acceptable data exchange to further the understanding of the old-growth forest inventory that is of particular interest to the ‘Namgis First Nation. As described in ‘*Guiding principles for AAC determinations*’, it is not within the scope of authority granted to the chief forester under Section 8 of the *Forest Act* to make land-use decisions regarding the nature and extent of old-growth protection or the data exchanged between First Nations and the licensee in the AAC determination.

- stand-level biodiversity

Stand-level biodiversity management includes the retention of wildlife tree retention areas (WTRA) within or adjacent to cutblocks. WTRA maintain or restore important structural attributes such as wildlife trees, tree species diversity, and understory vegetation diversity.

In TFL 37, the amount of stand-level retention is guided by the Western Forest Products Forest Strategy and meets or exceeds what is mandated by policy, regulation and landscape plans. This strategy establishes WTRA where wildlife objectives can be met in constrained areas such as riparian reserves, inoperable stands or unstable slopes. The retention is long term and is assumed to be maintained for at least one rotation. Areas established as long-term WTRA adjacent to historic cutblocks were excluded from the THLB in the base case and were reserved for future harvest rotations. The area excluded from the THLB for existing reserves was 2449 hectares. The practice of establishing future WTRA at the time of first harvest was modelled by further reducing the THLB based on the amount of enhanced retention specified in the forest strategy. This removed an additional 3941 hectares from the THLB.

A sensitivity analysis was conducted that removed the modelling constraints associated with the Western Forest Products Forest Strategy. Removing the WTRA reductions associated with the strategy increased the THLB thereby increasing the initial level of harvest by 3.4 percent and the mid- and long-term harvest by 6.9 percent compared to the base case.

I have considered the information on stand-level biodiversity management and the assumptions made in the base case. From this, I conclude that the current management regarding stand-level biodiversity has been adequately accounted for in the base case and I will make no adjustments on this account. I am supportive of the licensee’s innovative forest management to improve forest stewardship especially as this practice of leaving greater amounts of stand-level retention provides more biodiversity than is legally required. I encourage the licensee to continue with such endeavours.

- adjacent cutblocks and green-up

To avoid concentrating harvesting related disturbance in particular areas, operational practices limit the size of cutblocks and maximum disturbances (areas covered by stands of less than a specified height), and prescribe minimum green-up heights required for regeneration on harvested areas before adjacent areas may be harvested. These green-up requirements help to achieve objectives for water quality, wildlife habitat, soil stability and aesthetics.

The timber supply model used by the licensee to develop the base case was not capable of precisely representing current policy for cutblock adjacency since it did not explicitly control the shape, size and placement of cutblocks across the landscape in a manner that would maximize timber flow while meeting green-up requirements. Instead, the model was configured to meet green-up requirement in the initial period and project harvesting in all other periods using a surrogate disturbance constraint. This constraint specified that a maximum of 25 percent of the THLB that could be less than the green-up height. This included a 3.0-metre green-up height applied in VILUP General and Special Management Zones and a 1.3-metre green-up height in VILUP Enhanced Forestry Zones for areas without visual quality objectives.

Adjacency and green-up concerns were raised in consultation with the ‘Namgis First Nation. The specific concerns raised by the Nation were that VILUP HLP, including that the plan does not consider or protect ‘Namgis values and that the ‘Namgis First Nation was not consulted during its development. Further, 47 percent of ‘Namgis Territory is within the VILUP Enhanced Forestry Zones which have been designated for increased timber production through enhanced silviculture practices. The Nation also noted they had written to the Minister and the licensee to express their opposition to old-growth harvesting.

It is not within the scope of my authority under Section 8 of the *Forest Act* to make land-use decisions regarding the nature of previous protection orders by government. However, recognizing the ‘Namgis First Nation concern, I am aware that government efforts to address Aboriginal Interests in this regard will be forthcoming. Currently, it appears that the forestry practices in the Enhanced Forestry Zones are meeting the guidance given to the licensee and I am encouraged that, by the licensee’s own accord under its forest strategy, the amount of stand-level retention is greater than is mandated by policy, regulation and land use plans.

I have considered the information on adjacent cutblocks and green-up and the modelling using in the base case, together with my ‘*Guiding Principles for AAC Determinations*’. From this, I conclude that the current management regarding adjacent cutblocks and green-up management has been adequately accounted for in the base case projection and I will make no adjustments on this account. I expect that the licensee will continue to work with the ‘Namgis First Nation to undertake planning and practices that are consistent with the higher-level plan order while taking into consideration ‘Namgis values.

Section 8 (8) (a) (vi) any other information that, in the chief forester’s opinion, relates to the capability of the area to produce timber

- western redcedar and yellow-cedar projections

Projections of the volume of western redcedar and yellow-cedar harvested over time in the base case were provided by the licensee. The western redcedar and yellow-cedar projections provide a means to assess whether sufficient cedar is maintained through time to support First Nations’ present and future cultural and social uses.

The projections showed that the estimated growing stock of cedar declines over the first 20 years before achieving a stable level of approximately five million cubic metres. The decline in cedar occurs because harvesting initially occurs in the oldest stands, which contain the highest volume of cedar. Cedar growing stock volume begins to recover by the start of the fourth decade. The amount of old cedar begins to increase steadily after 170 years.

I note that government has a joint decision-making protocol with the Nanwakolas First Nations for areas within their asserted traditional territories. The joint decision-making protocol makes two recommendations to the chief forester with respect to the harvest of redcedar and yellow-cedar, and with respect to the supply of large cultural cedar in TFL 37. These recommendations are:

- The chief forester should instruct Western Forest Products and FLNRO staff to continue working with Nanwakolas Council Member First Nations in the development and implementation of a strategy to identify and manage the supply of large cultural cedar in TFL 37 and assess implications on operational and strategic-level management.
- The chief forester should instruct Western Forest Products and FLNRO staff to monitor and assess harvest performance across the forest profile, and if redcedar and yellow-cedar are being disproportionately harvested relative to their modelled contribution in the MP No. 10 base case, then a cedar partition should be specified.

I discuss my considerations of this further under ‘*Nanwakolas First Nations shared decision making*’ later in this document. The harvest performance across the forest profile is discussed under the following section.

I have considered the information on western redcedar and yellow-cedar projections and the assumptions made in the base case. From this, I conclude that western redcedar and yellow-cedar forests, including

stands located outside the THLB, are maintained over time at reasonable levels in the base case projection and I will make no adjustments on this account. I encourage First Nations to continue to work with the ministry and industry to pursue the large cultural cedar joint initiative. Further, I note that the document on *Provincial Timber Management Goals, Objectives and Targets* (2017) focuses on timber objectives while also integrating management strategies for non-timber resource values. Based on discussion with staff, I accept that western redcedar and yellow-cedar forests are maintained over time at reasonable levels in the base case.

- *harvest performance*

The harvest performance of the licensee for TFL 37 was evaluated and presented in the document *Provincial Timber Management Goals, Objectives & Targets* (2017). From 2010 to 2016, the licensee has harvested 106 percent of the AAC available.

At the request of the Nanwakolas First Nations, the licensee provided a comparison of recent harvest performance by species to the VRI species profile. This report showed that the licensee is harvesting close to the species profile of the TFL. A comparison of scale data *versus* forest inventory data showed that while western redcedar comprised 10 percent of the THLB volume, it accounted for 10 percent of the harvested volume. Yellow-cedar comprised eight percent of both the THLB and harvested volume. Douglas-fir comprised 13 percent of the THLB volume and accounted for 17 percent of the harvested volume. Hemlock/balsam comprised 66 percent of the THLB volume and accounted for 64 percent of the harvested volume. In addition, a summary of harvest performance by operability class showed slight underperformance in the helicopter-operable land base. A summary of harvest by age class showed that the harvest included a reasonable component of thrifty age classes.

I have considered the information on harvest performance in TFL 37 and the assumptions made in the base case. From this, I conclude that from 2010 to 2016, the AAC for TFL 37 has been fully utilized and the harvest profile approximates the species profile of the TFL as indicated *Provincial Timber Management Goals, Objectives & Targets* (2017). I will make no adjustments on this account.

- *accumulated volume carry-forward*

Unused AAC volume can accumulate from three sources, these are: unharvested AAC, uncommitted volume, and unused BCTS volume. Collectively these are referred to as accumulated volume. Guidance on the administration of accumulated volume for forest licences, tree farm licences and woodlot licences, in accordance with Section 75.8 of the *Forest Act*, is provided by the Ministry 2018 policy on the *Administration of Unharvested Volumes, Uncommitted Volumes and Unused BCTS Volumes*. This policy sets out a process to determine the accumulated volume that may be made available for issuance in new forest agreements.

A total of 130 841 cubic metres of unused volume have accumulated in TFL 37 since the last AAC determination (2006). This includes uncommitted AAC and unharvested AAC.

The minister (or delegate) may issue new agreements in TFL 37 using historic accumulation that would be harvestable in the next AAC period. On August 25, 2017, the Regional Executive Director wrote to the 'Namgis First Nation offering an opportunity for the 'Namgis First Nation to enter into a Forest Tenure Opportunity Agreement (FTOA) with the province. If implemented, this agreement would allow the province to issue additional forest tenure opportunities to the 'Namgis, including up to 91 000 cubic metres sourced from the unharvested volume that has accumulated in TFL 37 since 2006. The AAC associated with this type of tenure would be incremental to the AAC that I determined under Section 8 for the TFL.

At issue for this determination is the volume of merchantable timber growing stock considered at the date of the timber supply analysis. The base case forecast did not deplete the standing forest to account for harvesting of historic accumulated volume in TFL 37. This means the harvest of this volume would be additional to the base case initial harvest level and that the growing stock would be used at a greater rate than projected in the base case if the AAC were fully utilized. If significant, this additional harvest could

threaten the stability of future timber supply. The risk of such an over harvest is increased when the AAC that I determined is fully utilized in coming years, which is likely the case for TFL 37.

I have considered the information on accumulated volume carry forward and the assumptions made in the base case. I am aware the province's offer to enter into a FTOA with the 'Namgis First Nation will enable a new non-replaceable forest licences for 91 000 cubic metres and that this volume, if awarded, would be incremental to the AAC I determine. Since this volume will most likely be harvested from the current growing stock that supports the first four decades of the base case, I reason the base case overestimates the timber supply in the first four decades by approximately 2300 cubic metres per year, or 0.3 percent. I do not consider this potential overharvest of this magnitude to pose a significant risk to the sustainable timber supply for TFL 37, therefore, I will make no adjustment on this account. However, I note that any significant additional allocation and utilization of volume above what is provided for in my AAC, potentially puts the sustainable timber supply for the TFL at risk. I expect staff to continue to track unused and unharvested volume and I will revisit my decision if the amount of accumulated volume significantly increases and if government indicates a desire to issue this volume in additional tenures, and if the increased harvest constitutes a significant risk to the sustainable timber supply in TFL 37.

First Nations consultation

The Crown maintains a duty to consult with, and accommodate as necessary, those First Nations for whom it has knowledge of claimed Aboriginal rights and/or title (Aboriginal Interests) that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations.

AAC determinations support other decisions such as AAC apportionment and disposition, leading to issuance of cutting authorities. AAC determinations do not define particular harvesting areas or patterns, and, as a result, do not relate directly to the manner in which timber is utilized or managed on the ground. AAC determinations consider the harvest levels that are projected to be sustainable from a TFL or TSA. Such management units may include lands claimed as Aboriginal title lands but that have not yet been declared by a court or through agreement to be such. Prior to being established as Aboriginal title land, such areas remain Crown lands and are considered to be part of the harvestable land base. Whether timber is ultimately harvested from those lands is an issue that is subject to allocation and operation planning decisions, and the AAC determination does not dictate those matters.

Six First Nations have asserted and/or established Aboriginal Interests within the traditional territories that overlap TFL 37, including the Kwakiutl First Nation, the Mowachaht/Muchalaht First Nation, the 'Namgis First Nation, the Quatsino First Nation, the Tlowitsis First Nation, and the We Wai Kai First Nation.

Aboriginal Interests or treaty rights may be connected to biophysical, spatial, social, cultural, spiritual or experiential values. AAC determinations can affect various resource values and therefore the ability of Aboriginal peoples to meaningfully exercise their Aboriginal rights. Information gained through consultation with potentially affected First Nations about Aboriginal rights claims was taken into account in the development of this determination. Where the Province and First Nations have negotiated a treaty or have contractually agreed to a process for consultation, that process has been followed. Consultation with the signatory members of the *Nanwakolas* Reconciliation Protocol, which include the Tlowitsis First Nation, was conducted consistent with that protocol and is discussed in the '*Nanwakolas First Nations shared decision making*' section of this document.

Engagement with the following First Nations was conducted in accordance with the relevant agreements signed by each First Nation or the Supreme Court of Canada Haida decision, if no agreement was in place at the time of engagement. The Kwakiutl First Nation is a signatory to the Douglas Treaty of February 1851. The Douglas Treaties granted First Nations the rights to hunt over unoccupied lands, and to carry on their fisheries as formerly. The Kwakiutl First Nation signed a Letter of Intent with respect to building harmonious relations on the foundation of the 1851 Douglas Treaty in November 2015. The Mowachaht/Muchalaht First Nation signed a Forest and Range Consultation and Revenue Sharing Agreement (FCRSA) in 2017. The Nation (under the Nuuchah-nulth Tribal Council) is negotiating at Stage 4 – Agreement-in-Principle in the British Columbia Treaty Commission process. The 'Namgis First

Nation is negotiating at Stage 4 – Agreement-in-Principle in the British Columbia Treaty Commission process. The ‘Namgis First Nation signed a FCRSA in 2015. The ‘Namgis signed a Forestry Fund Agreement in 2015. The purpose of this agreement is to: support ‘Namgis participation in the ‘Namgis Treaty Settlement Lands Operating Agreement (between the ‘Namgis and Western Forest Products Inc.); provide economic benefits to the ‘Namgis associated with the Treaty Settlement Lands in advance of a Final Agreement; and demonstrate the commitment by the parties to conclude an Agreement-in-Principle and a Final Agreement. The Quatsino First Nation signed a FCRSA in 2017, and the Nation is negotiating, though not actively, at Stage 4 – Agreement-in-Principle in the British Columbia Treaty Commission process.

Prior to the formal consultation process, the licensee engaged in a proponent-led information-sharing with each of the above noted First Nations. Formal consultation with First Nations began on September 28, 2017 and was coordinated by the North Island – Central Coast Natural Resource District and NICC staff and assisted by licensee staff.

An Initiation of Consultation letter was sent on September 28, 2017, indicating that the timber supply review (TSR) process had begun. FLNRO District staff communicated with the N̄nwaḱolas Council Referrals Office and consulted with the other First Nations directly. The notification letter defined the process, included basic information on the three stages of the process, and provided additional information on the AAC determination. A map of TFL 37 was also provided, outlining the overlap with First Nations’ consultative areas, a summary of the initial review of available information regarding First Nations interests, and an initial assessment of the potential impact on the First Nations’ interests due to the draft Management Plan No. 10 and subsequent AAC determination for TFL 37. The letters to the First Nations included the suggested level of consultation that FLNRO District deemed appropriate for each First Nation, given the initial review of available information or the consultation process specified in agreements. As well, the letters provided a summary on how Aboriginal Interests can be considered in the timber supply review process and a link providing further information on the TFL 37 timber supply review. The First Nations were invited to comment on the document and to suggest additional information on Aboriginal Interests that could be used in the timber supply analysis.

First Nations were also consulted and relevant documents provided at the information package stage of the TSR process and at the Draft Management Plan (including the timber supply analysis) stage. Each First Nation was asked to review the analysis report and provide comments or concerns regarding the information contained in the report and inform the Ministry of how their Aboriginal Interests might be impacted by an AAC determination. Ministry staff offered to meet with First Nations to discuss the information provided and they committed to providing a copy of the rationale to each First Nation once the AAC determination was made.

As noted above, the letters to First Nations included a level of consultation as outlined in applicable First Nations agreements, including a Strategic Engagement Agreement (SEA), FCRSA, or Reconciliation Protocol (RP), as applicable. Correspondence from the N̄nwaḱolas Council Referrals Office indicated its concurrence with the engagement level suggested by Ministry staff. No other First Nations commented on the suggested levels of consultation. The letters also indicated that all information received would be summarized and provided to the chief forester to be considered in the AAC determination for TFL 37. Consistent with this commitment, staff have provided the information to me and I have reviewed and considered it for the purposes of this determination.

In general, the comments and concerns from First Nations included but were not limited to the following responses received from the We Wai Kai First Nation and the ‘Namgis First Nation. The We Wai Kai First Nation indicated that they had “no comment” at this time. They also indicated that they continue to reserve the right to raise objections if any cultural use, archaeological sites or environmental impacts are identified or if they discover impacts on their rights or interests that they had not foreseen.

The ‘Namgis First Nation stated their opposition to the continued harvest of old growth within their traditional territory until their higher-level concerns had been addressed. The Nation also stated that the

TSR was being completed in isolation from the Timber Harvesting Land Base Stabilization Project (also known as the Co-location Project) which they felt was intended to increase the area of old growth available for harvest.

I have reviewed the consultation process conducted by Ministry staff and the input received from the First Nations whose asserted traditional territories overlap with portions of TFL 37. With respect to the 'Namgis concerns, I am aware of Ministry staff and licensee attempts to share information with the 'Namgis First Nation. Further, that they reviewed with the 'Namgis First Nation the base case assumptions, and other aspects of the analysis, such as assumptions regarding wildlife, biodiversity and cultural heritage values in 'Namgis First Nation's traditional territory. On April 7, 2018, I met with 'Namgis First Nation leadership and forestry advisor to directly discuss the concerns the nation has raised during the consultation process for the timber supply review.

I am satisfied, as discussed under factors in this document, that the base case assumptions have appropriately reflected the management necessary for the values present in the TFL 37, or as noted, I am making adjustments in my determination as required to ensure all values are appropriately accounted for in the assessment of the TFL's timber supply.

I recognize that TFL 37 overlaps with six First Nations' consultative areas and the overlap with 'Namgis consultative area is clearly the largest. I also acknowledge the 'Namgis First Nation's concerns. However, the timber supply review focused on the assessment of a sustainable timber supply for the TFL under the current management and legislative framework and was guided by the chief forester's principles for AAC determinations, and as noted elsewhere, I am satisfied the analysis provided the appropriate basis for my determination. As I shared with the 'Namgis First Nation on April 7, 2018, it is my commitment that if there are elements specific to interests that I see within the scope of other decision makers, I will endeavor to make those elements known to the appropriate individuals.

Following the chief forester's '*Guiding principles for AAC determinations*' and my review of the information sharing and consultation process, the Aboriginal Interest information available to Ministry staff, and the potential impact my decision may have on these interests, I believe that the Ministry has engaged in consultation in accordance with current provincial guidance and applicable case law. I conclude that no additional accommodation beyond that which I have described in this rationale document is required as part of this decision. I believe that any adverse impacts upon asserted rights within the area of TFL 37 stemming from forest development activities that occur subsequent to the AAC determination, can be appropriately mitigated or minimized through existing legislation and regulation, planning documents and meaningful engagement at the operational level.

- '*Namgis First Nation treaty settlement offered lands*

Proposed treaty settlement lands for the 'Namgis First Nation were identified as part of an Agreement-in-Principle (AIP) with the federal and provincial governments in 2012. The proposed lands covered 21 401 hectares, including 14 855 hectares within the TFL, of which 10 408 hectares were in the THLB, comprising 12.1 percent of the total THLB. In March 2013, the 'Namgis First Nation members voted to not approve the proposed treaty settlement lands.

The 'Namgis Treaty Settlement Lands Operating Agreement (between the 'Namgis and Western Forest Products Inc.) provided for the continuation of timber harvesting within the treaty settlement-offered lands, which were included in the base case. A sensitivity analysis found that the lands contributed 15 percent of the timber supply in the base case. Approximately, 8300 hectares of the THLB within the offered lands is operable by ground-based systems and nearly two-thirds fall within the good site productivity classification. I note that, since the offered lands are highly productive, excluding these lands from the timber supply has a larger impact compared to removing an equivalent area with average productivity.

I have considered that the final agreement of the 'Namgis First Nation treaty settlement-offered lands has yet to be achieved. From this, I conclude that the current management regarding 'Namgis First Nation treaty settlement-offered lands has been adequately accounted for in the base case projection and I will make

no adjustments on this account. I note that the sensitivity analysis shows that if final agreement were achieved, the potential land transfer would have significant impact to the TFL 37 THLB and the timber supply available under the licence. Should final agreement be achieved prior to the next determination of the TSR, I will consider revisiting the TFL 37 AAC determination.

- *Nanwakolas First Nations shared decision making*

The Da'naxda'xw Awaetlala First Nation, Tlowitsis First Nation, K'omoks First Nation, Mamalilikulla First Nation and Wei Wai Kum First Nation are the current signatory members of the Nanwakolas Reconciliation Protocol (NRP) with the Province. This protocol outlines a shared decision making process for AAC and land use objective decisions and provides the opportunity to make recommendations regarding these decisions and conditions that might apply to their asserted traditional territories. The shared decision process for TFL 37 applies to the First Nations who are signatories to both the Strategic Engagement Agreement (SEA) and the Reconciliation Protocol (RP). The Tlowitsis Nation is the only Nanwakolas First Nations signatory to the RP that has traditional territory in TFL 37.

Representatives of the Nanwakolas RP and the Province met by conference call March 9, 2017, to discuss how the shared decision making process would affect the timber supply review processes that were already underway. On October 25, 2017, representatives of the Nanwakolas RP and the Province met to discuss the TFL 37 timber supply analysis report. A further meeting on January 9, 2018, resulted in draft joint recommendations for the chief forester, on the AAC determination for TFL 37. The Tlowitsis Nation agreed to the draft joint recommendations on February 28, 2018, and the final set of joint recommendations was forwarded to the deputy chief forester on March 2, 2018. These recommendations are as follows:

- *Helicopter-operable area partition:* The chief forester should specify an AAC partition in a manner that does not permit AAC attributed to the portion of the land base accessible only by helicopter to be harvested in the conventional land base.
- *Large cultural cedar:* The chief forester should instruct Western Forest Products and FLNRO staff to continue working with Nanwakolas Council Member First Nations in the development and implementation of a strategy to identify and manage the supply of large cultural cedar in TFL 37 and assess the implications on operational and strategic-level management.
- *Species harvest profile:* The chief forester should instruct Western Forest Products and FLNRO staff to monitor and assess harvest performance across the forest profile, and if redcedar and yellow-cedar are being disproportionately harvested relative to their modelled contribution in the MP No. 10 base case, then a cedar partition should be specified.
- *Information sharing and cultural heritage features:* The chief forester should instruct Western Forest Products and FLNRO staff to continue improving the processes for information sharing with First Nations on the assumptions used in timber supply modelling, and on results from the monitoring of impacts of forest practices on cultural heritage features and resources.

I have considered the information presented and I am satisfied that the province and Nanwakolas First Nations have successfully implemented a protocol for shared decision making process pursuant to the Nanwakolas Reconciliation Protocol (RP). I have reviewed the recommendations provided and have considered them in my determination for TFL 37. The recommendations are consistent with good forest stewardship and are applicable to all First Nations. I discuss my considerations of all the information provided to me, including these recommendations and other First Nations input, further under **'Implementation'**.

Section 8 (8) (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area

Alternative rates of harvest

The nature of the transition from harvesting old-growth forests to harvesting second-growth forests is a major consideration in determining AACs in many parts of the province. In the short term, the presence of timber volumes in older forests often permits harvesting above long-term levels without jeopardizing the future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to ensure that current and mid-term harvest levels will be compatible with a smooth transition toward usually to the long-term harvest level.

I note that old-growth stands comprise a significant component of the current volume profile within the productive forest and the THLB in TFL 37. In the base case forecast the available old-growth stands in the THLB are largely converted to managed (second growth) stands within the first four decades of the forecast. During this period of transition from old growth to managed stands, the timber supply is projected in the base case to decline at a rate of about five percent per decade. This orderly transition is intended to maintain a sufficiently stable timber supply and to avoid inordinately adverse impacts on current or future generations.

In addition to the base case, two alternative harvest flows were provided by the licensee. These alternative flows represent trade-offs between short-, mid- and long-term harvest levels. The following alternative rates of harvest scenarios were explored in the analysis: 1) maintain the current AAC for the first 10 years scenario; and 2) maintain a non-declining even-flow harvest that restricted the contribution from the helicopter-operable land base to an even-flow scenario.

The scenario that maintained the current AAC revealed that it was possible to maintain a harvest level of 889 400 cubic metres per year for the next decade (a 5.0 percent increase over the base case), while still maintaining the same mid- and long-term as the base case. However, the harvest levels in the second and third decade of this scenario must decline by 10 percent, rather than the 5 percent and 2.6 percent decline after each of the second and third decades in the base case.

The outcomes for a non-declining even-flow harvest scenario found an even-flow conventional harvest of 716 000 cubic metres per year and non-conventional harvest of 41 900 cubic metres per year, for a total harvest of 757 900 cubic metres per year (15% less than the current AAC).

Following from discussion with staff regarding the non-declining even-flow harvest scenario, it is apparent that there is no benefit occurring in the long-term timber supply as a result of immediately decreasing the rate of harvest to the long-term sustainable level. As well, immediately decreasing the rate of harvest to the long-term sustainable level will not support the Minister's guidance in his October 30, 2017, letter. The base case rate of harvest reflects an immediate socio-economic benefit by minimizing the dropping down to that which is no larger than necessary in the first decade to achieve the long-term sustainable harvest level.

I have considered the information on alternative rates of harvest and the assumptions made in the base case. From this, I conclude that the rate of harvest has been adequately accounted for in the base case projection and I will make no adjustments on this account.

Section 8(8)(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

Economic and social objectives

- economic and social objectives of the Crown

The Minister of Forests, Lands, Natural Resource Operations and Rural Development (and the former Minister of Forests, Lands and Natural Resource Operations) have expressed the economic and social objectives of the Crown for the province in letters dated October 30, 2017, and April 12, 2013.

The October 30, 2017 (attached as Appendix 3), letter emphasizes the British Columbia Government's commitment to build a strong, sustainable, innovative economy and create well-paid jobs in the province. The letter identifies three government objectives relevant to AAC determinations. These are:

- 1) to modernize land-use planning to manage effectively and sustainably British Columbia's ecosystems, rivers, lakes, watersheds, forests and old growth forests;
- 2) to expand investments in reforestation; and,
- 3) to collaborate in developing strategies to manage wildlife resources and habitat.

In making my determination, my considerations with respect to the base case forecast, alternative harvest flow forecasts and all other factors described in this document are consistent with the following statements.

- That the Ministry's approved strategies for delivering its forestry objectives were integrated into the TSR process (relevant sections include guiding principles for AAC determinations, base case for TFL 37, forest inventory, existing and future roads, trails and landings, silviculture systems, and alternative rates of harvest).
- I have considered relevant agreements between First Nations and the Government of British Columbia, and court decisions that define Aboriginal title and rights; and in addition, support government's commitment to moving forward on reviewing policies, programs, and legislation to determine how to bring the principles of the United Nations Declaration on the Rights of Indigenous Peoples into action for AAC determinations (relevant sections include First Nations consultation, 'Namgis First Nation proposed treaty settlement land, Nanwakolas First Nations shared decision making, and western redcedar and yellow-cedar projections).
- I have considered traditional knowledge and other input from First Nation communities and organizations as they pertain to this AAC determination (examples of relevant sections include First Nations cultural heritage resources, wildlife habitat areas, karst resource features, and adjacent cutblocks and green-up).
- I have considered how this AAC determination can support government's objective to focus on planning and sustainable resource management in a way that supports robust forest recovery and timely and effective responses to emerging threats from factors such as insect infestations and wildfire, while promoting forest health and values (relevant sections include research sites, genetic gain, landscape-level biodiversity, and stand-level biodiversity).
- The TSR process incorporated the best available information on climate change and the cumulative effects of multiple activities on the land base and explores management options that align with established climate change strategies, adaptation and mitigation practices (relevant sections include climate change, and cumulative effects).
- The TSR process identified those risks for consideration in land-use planning, where the cumulative effects of timber harvesting and other land-based activities indicated a risk to natural resource values (relevant sections include physical operability, and terrain stability).
- I have considered the environmental, social and economic needs of local communities as expressed by the public during this TSR process, including strategies that contribute to community economic stability, and the jobs that the forest sector creates in communities, where these are consistent with the government's broader objectives (relevant sections include public comments, First Nations, harvest performance, and unharvested volume carry forward).
- I have considered that, if necessary, reductions in the AAC should be no larger than necessary to avoid significant longer-term impacts (relevant sections include alternative rates of harvest, operational adjustment factors for managed stands, minimum harvestable criteria, and dead potential volume).

- In the letter dated April 12, 2013 (attached as Appendix 4), the Minister expressed the government's social and economic objectives for signatory First Nations of the *Nanwakolas Reconciliation Protocol*, and asked the chief forester to consider these objectives, in addition to others expressed in the earlier letter, when making determinations of AAC within the traditional territories of the Nanwakolas First Nations. I am aware that the asserted traditional territories of the Nanwakolas First Nations overlap with TFL 37. I discuss my consideration of the Nanwakolas under '*Nanwakolas First Nations shared decision making*'.

In receipt of, and review of the Minister's guidance to the chief forester, I am confident that the elements that the Minister has put forward as priorities have been adequately provided for in my determination. I have also reviewed the public and First Nations consultation process undertaken by the district and considered the input in making my determination. I have accounted for this input in the various applicable factors described in the document, and as noted below. On this basis, I am satisfied that this determination accords with the objectives of the government expressed by the minister.

- *climate change*

Climate change predictions suggest that forest ecosystems will be impacted in a number of ways due to increased temperatures, altered precipitation patterns and an increase in the frequency and severity of disturbances. Although research is ongoing, it is difficult to determine the magnitude of these changes and the long-term implications for forests.

A West Coast Natural Resource Region Extension Note *Adapting natural resource management to climate change in the West and South Coast Regions* (2016), used current climate change research to summarize projected climate changes and impacts to ecosystems for British Columbia. In this extension note, it is noted that "Averaged across the coast, over 1°C [Celsius] of warming has occurred during the 20th century. Projections suggest the West Coast may warm, on average, an additional 1.2 to 3.5°C by the end of this century and the South Coast an additional 1.9 to 5°C, similar to moving from Prince Rupert to Victoria (2.5°C warmer)."

The extension note additionally states "While it is normal for temperatures to vary considerably between seasons or from day to night, even a fraction of a degree rise in temperatures, when averaged over decades, is significant for ecosystems." And "Seemingly small increases in mean values of climate variables can substantially increase the probability of an extreme event. For example the 10 percent increase in precipitation predicted for the Georgia Basin in the 2080s would increase the frequency of slope instability by 165 percent."

Evidence indicates that wildfires will become more frequent and the stand impacts of forest pests, such as Douglas-fir bark beetle, balsam bark beetle and the western spruce budworm will increase as altered precipitation levels stress and weaken stands established under previously existing climatic conditions. In very general terms, a longer growing season may be a benefit for many tree species. However, this benefit may be offset with increased summer drought conditions due to lower summer precipitation and winter snowpack. It is projected that the area considered as Coastal Mountain Alpine and Mountain Hemlock biogeoclimatic zones will decrease, and that the Coastal Western Hemlock biogeoclimatic zone area will increase.

Coastal Douglas-fir is expected to continue growing well under warmer temperatures, even with increased summertime drought stress conditions. However, western hemlock, western redcedar, and grand fir are expected to show increasing levels of drought stress, particularly on drier sites, resulting in slower growth and possible mortality during a series of hot, dry years. Overall, some tree species may become maladapted to the climate. Current data suggests that yellow-cedar (cypress) along the coast are already experiencing mortality from reduced snowpack, which exposes roots to frost damage.

There is ongoing consultation and collaboration in the region with federal and provincial government agencies, First Nations, universities and forest licensees to better understand climate adaptation and mitigation challenges and opportunities in relation to forest management. Findings from research initiatives

can be incorporated into Coast Area climate actions. Climate change mitigation and adaptation strategies are discussed and developed through stakeholder engagement forums such as the Coast Operational Issues Forum and Forest Management Leadership Teams.

I have considered the information about climate change implications for the forests of TFL 37. I acknowledge the work done to date to better understand the actions needed. Ongoing observations, data collection, analysis and discussions through various collaborative teams, include the Climate Change Forum, will play a critical role in ensuring we are able to respond to predicted implications for timber supply. I recognize that the extension note cited above highlights the potential implications to terrain stability from the increased precipitation levels anticipated to occur over time in this TFL, a consideration that has uncertain implications for future timber supply. I am concerned about the mortality trends seen in mature yellow-cedar, as this species is important for First Nations cultural values. I note that this potential increased mortality trend places further importance on ensuring reforestation activities include strategies for the continued occurrence of yellow-cedar on the land base.

I realize that climate change will likely affect forest productivity and growth. However, it is also likely that the best approach in the short term is to monitor for changes to enable timely adaptive responses and to undertake analysis to increase our understanding. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change and its effects on forests and timber supply. It is unlikely that climate change will significantly alter the viability of the TFL prior to the next determination, but at that time better information on practice and resulting impacts may be available. The government's response to adapt or prepare for climate change and the resulting actions or processes will be reflected in the next TSR AAC determination. I encourage the licensee to continue using available tools including the *Provincial Timber Management Goals, Objectives & Targets (2017)* guidance.

- *cumulative effects*

Cumulative effects are changes to social, economic and environmental conditions caused by the combined impact of past, present and potential human activities or natural events. The Government of British Columbia supports the phased implementation of the Cumulative Effects Framework (CEF) that aims to provide relevant information and supporting policy. The framework will ultimately provide information related to a number of environmental, social and economic factors including biodiversity, riparian conditions, water and air quality, fish and wildlife impacts, cultural and heritage concerns, community needs and economic development opportunities. The CEF provides resource managers with procedures and tools to inform decisions that support sustainable management and the needs of many different users.

The provincial cumulative effects team is focusing on implementing cumulative effects assessments within pilot areas across the province, building assessment procedures for values, and developing policies and procedures. A cumulative effects pilot has not been established for the West Coast.

Many of the current objectives and management approaches applied in TFL 37 may be mitigating the negative effects of forest development activities. Such objectives that are reflected in the timber supply analysis include: Land and Resource Management Plans (LRMP); Vancouver Island Land Use Plan Higher Level Plan order (VILUP HLP); *Forest Range Practices Act (FRPA)* objectives; visual quality objectives; landscape-level biodiversity objectives; cutblock adjacency objectives; non-spatial and spatial old growth objectives; wildlife tree retention and stand-level retention objectives; wildlife habitat areas and special reserves; recreation reductions; recognition of sensitive soils, unstable terrain and avalanche areas; riparian reserve and management zones; cultural heritage reductions; watershed objectives; and the use of different harvest systems to address issues associated with differing terrain.

I have considered the information on cumulative effects and I must interpret related information according to my statutory authority and my '*Guiding principles for AAC determinations*'. I note that a cumulative effects pilot has not been established in the West Coast Natural Resource Region. However, work is ongoing that will improve our understanding. Based on discussions with staff, I believe that at this time many of the management approaches in the TFL are thought to mitigate the negative impacts of forest development activities. A cumulative effects assessment that includes analysis of potential future condition

and coordinated response across sectors is not warranted at this time. I conclude that the base case reflects current management, the current status of the effects of past and present industrial activity on the land base, and the legal objectives established by government for various non-timber resources. I will make no adjustments on this account. Changes in management, as the implications of cumulative effects are more directly considered, will be addressed in future AAC determinations.

Section 8(8)(e) Abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area

Public comments

The public was provided with two opportunities to review and provide comments on the *TFL 37 Draft Management Plan (MP) 10* following a strategy approved by the Regional Executive Director approval (January 29, 2015). The first occasion was public review and First Nations information sharing of a draft timber supply analysis information package (IP). The second occasion was public review and First Nations information sharing of a draft MP that included the accepted IP and the timber supply analysis results.

The first phase of public comments began on or about February 7, 2017, when copies of the draft IP were provided to FAIB and the North Island - Central Coast Natural Resource District (NICCNRD) Office by the licensee. Maps were delivered to the district office and digital versions were delivered to FAIB. Notification letters were sent to registered trapline holders where names and addresses could be obtained. The facilitator for the licensee's Canadian Standards Association (CSA) certification advisory group was notified prior to the onset of the review period and a reproduction of the newspaper advertisement was distributed to group members. The role of the public advisory group is to ensure that sustainable forest management decisions are made because of informed, inclusive and fair consultation with local people who are directly affected by, or who have an interest in sustainable forest management.

Advertisements ran in the North Island Gazette newspaper on February 8 and February 15, 2017, and in the Campbell River Mirror on February 10 and February 17, 2017. They stated that the draft IP was available for review and comment from February 10, 2017, until April 13, 2017, at the following locations: Western Forest Products Woss office, Western Forest Products FP Corporate Campbell River office, FLNRO NICCNRD office, and the Western Forest Products internet site.

One member of the general public visited the licensee's corporate office in Campbell River to review and discuss the draft IP. No other known public visits were made to the viewing locations. FAIB analysis staff provided comments regarding the draft IP in an email dated April 24, 2017, to which the licensee replied on May 4, 2017. On May 23, 2017, FAIB replied to the licensee that their responses appeared to address all concerns. In an email dated August 2, 2017, FAIB growth and yield staff indicated that the VDYP procedures used by the licensee to generate unmanaged stand yields were reasonable.

The second phase of public comments began on September 13, 2017, when copies of the draft MP No. 10 were provided to FAIB and the NICCNRD Office. Similar to the first phase of public comments, notification letters were sent to registered trapline holders (based on an updated version of the contact list used in February 2017). Advertisements ran in the North Island Gazette newspaper on September 13 and September 20, 2017 and in the Campbell River Mirror on September 15 and September 22, 2017. The advertisements stated that the draft MP was available for review and comment from September 15, 2017, until November 14, 2017. On October 12, 2017, I met with licensee representatives and FAIB staff to tour Western Forest Products sawmills and to review the analyses investigating the use of LiDAR data. Due to the review process, additional and updated information was provided and included in the final IP.

I am satisfied that the required effort was made, and the public was given the opportunity to review and comment on the management plan in advance of my determination.

Reasons for Decision

In reaching my AAC determination for TFL 37, I have considered all of the factors required under Section 8 of the *Forest Act*. I have made the considerations documented above, all of which are integral to the reasons for my decision, and from which I have reasoned further as follows.

I am satisfied that the assumptions applied in the base case for the majority of the factors applicable to TFL 37 were appropriately modelled and reasonably reflect current legal requirements, demonstrated forest management and the best available information. In this section, I have summarized my considerations related to other factors where uncertainty exists or I have identified a need for some adjustment with respect to the analysis inputs, which in turn affect the base case timber supply.

The base case initial harvest level of 847 400 cubic metres per year is 42 015 cubic metres per year (4.7 percent) below the current AAC of 889 415 cubic metres. The base case harvest level has two components, 770 600 cubic metres per year from conventionally-operable lands and 76 800 cubic metres per year from non-conventionally-operable lands. Over the first four decades, the base case harvest level declines by 16.5 percent to a mid-term harvest level of 707 400 cubic metres per year in 2056. Beginning in 2106, the forecast increases to the long-term harvest level of 757 900 cubic metres per year.

The base case forecast starts in 2016, two years prior to the effective date of my AAC determination. Since the current AAC is about five percent higher than the initial harvest level in the base case, the difference between actual harvest and the base case forecast is 84 030 cubic metres over the two years. I note that the alternative harvest level scenarios demonstrate there is ample flexibility in the initial harvest rate for TFL 37; therefore, a small increase in the initial harvest level would not change the forecasted mid-term timber supply. Given the assessed flexibility, I conclude that the risk from the two-year gap between the initiation of the base case and my AAC determination is negligible, and I will make no adjustment on this account.

I have identified one factor in my considerations that indicates that the timber supply projected in the base case may have been overestimated to some extent:

- *cultural heritage resources* – the base case did not account for unregistered and not yet discovered archeological sites and contemporary cultural heritage resources in TFL 37. It is expected that a small portion of the THLB will be excluded from harvest as new archaeological sites are registered and protected. For this reason, the base case overestimates the timber supply in the short-term and long-term portions of the forecast by an unknown, though likely small, amount.

I have identified one factor that indicates that the timber supply projected in the base case may have been underestimated to some extent:

- *dead potential volume* – dead but potentially useable timber volume is not captured in natural stand volume estimates and was not accounted for in the base case. FAIB staff advise that a portion of the dead volume in some stands is likely economical to harvest and is being utilized. For this reason, the base case underestimates the timber supply in the short-term portion of the forecast by an unknown, though likely small, amount.

From reviewing the overestimation and underestimation in the projected timber supply listed above, I surmise that the combined result is an unknown, though likely a small overestimation in the base case timber supply that I approximate to be in the order of 400 cubic metres. Decreasing the base case initial harvest level by this amount results in an initial harvest level of 847 000 cubic metres per year.

As noted under '*physical operability*', the harvest level indicated in the base case forecast is dependent on the contribution from stands in the non-conventionally-operable land base. These stands contribute nine percent of the overall harvest volume in the first period of the forecast. If these areas were excluded from the THLB the sustainable mid-term timber supply would be significantly lower than the level indicated in the base case. Therefore, to help provide a focus on the operability situation in TFL 37 and to ensure that timber volume that I intend to be harvested from the non-conventionally-operable land base is not harvested

from the conventionally-operable land base, I will specify an AAC partition that is attributable to conventionally-operable land base in TFL 37. The amount of this partition is 770 200 cubic metres, which is the volume attributed to the conventionally-operable land base in the base case, less my adjustment of 400 cubic metres per year indicated above.

In making this AAC determination, I have considered the joint recommendations provided to me in March 2018 by representatives from the Nanwakolas First Nations and the Province under the Nanwakolas Reconciliation Protocol, as presented under '*Nanwakolas First Nations shared decision making*'. Specifically, I note that the AAC partition that I have attributed to the conventionally-operable land base is consistent with the joint recommendation for an AAC partition. With respect to the large cultural cedar, species harvest profile, and information sharing and cultural heritage features recommendations, I note that my determination includes the combined effect of these factors influencing the timber supply projected in the base case. I have also addressed these recommendations in my instructions under '**Implementation**'.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in TFL 37 by establishing an AAC of 847 000 cubic metres.

In making this AAC determination, I specify, under Section 8(5)(a) of the *Forest Act*, a partition of 770 200 cubic metres of the total AAC attributable to stands classified as conventionally-operable land base in Management Plan No. 10.

This determination becomes effective on July 25, 2018, and will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation.

Implementation

From my review of the information regarding forest planning and management practices being carried out on TFL 37, I note that management practices of the licensee meet or exceed expectations set by government. However, there are some considerations where I would like to see improvement. In the period following this decision and leading to the subsequent determination, I encourage Ministry staff, other agencies and licensees (as appropriate) to undertake or support the tasks noted below, the particular benefits of which are described in greater detail in appropriate sections of the rationale document.

I recognize that the ability of staff and licensees to undertake projects is dependent on available resources, including funding. However, the following projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the TFL 37.

1. *dead potential volume* – I expect the licensee and Ministry staff will continue, as directed in the previous AAC determination, to improve estimates of the dead potential volume contribution to the timber supply in TFL 37 for use in the next timber supply review and AAC determination.
2. *operational adjustment factors for managed stands* – I expect the licensee and Ministry staff to validate managed stand yield estimates for TFL 37 and quantify the impact of forest health factors on managed stands using tools such as LiDAR and Young Stand Monitoring sampling.
3. *Nanwakolas First Nations* - consistent with the recommendations of representatives of the Nanwakolas First Nations and the Province under the Nanwakolas First Nations Shared Decision Making Process, I expect the licensee and Ministry staff will:

- continue working with Nanwakolas Council Member First Nations in the development and implementation of a strategy to identify and manage the supply (at both the operational and strategic scales) of large cultural cedar in TFL 37 and assess implications on operational and strategic-level management;
- continue to monitor and assess harvest performance across the forest profile to ensure redcedar and yellow-cedar are not being disproportionately harvested relative to their modelled contribution in the Management Plan 10 base case;
- continue to improve the process for information sharing with First Nations with regards to the assumptions used in timber supply modelling, and the results from the monitoring of impacts of forest practices on cultural heritage features and resources.



Shane Berg, RPF
Deputy Chief Forester

July 25, 2018

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to July 11, 2018), reads as follows:

Allowable annual cut

8 (1) The chief forester must determine an allowable annual cut at least once every 10 years after the date of the last determination, for

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

(2) If the minister

- (a) makes an order under section 7 (b) respecting a timber supply area, or
- (b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),

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

- (c) within 10 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and
- (d) after the determination under paragraph (c), at least once every 10 years after the date of the last determination.

(3) If

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

the chief forester must determine an allowable annual cut at least once every 10 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

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

- (a) by written order may postpone the next determination under subsection (1) to a date that is up to 15 years after the date of the relevant last determination, and
- (b) must give written reasons for the postponement.

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

- (a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and
- (b) must give written reasons for setting the earlier date.

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

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify that portions of the allowable annual cut are attributable to one or more of the following:

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

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

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

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

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

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

(a) the community forest agreement, and

(b) any directions of the chief forester.

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

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

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

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

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

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

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

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

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

(c) [Repealed 2003-31-2.]

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

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

(9) Subsections (1) to (4) of this section do not apply in respect of the management area, as defined in section 1 (1) of the **Haida Gwaii Reconciliation Act**.

(10) Within one year after the chief forester receives notice under section 5 (4) (a) of the **Haida Gwaii Reconciliation Act**, the chief forester must determine, in accordance with this section, the allowable annual cut for

(a) the Crown land in each timber supply area, except the areas excluded under subsection (1) (a) of this section, and

(b) each tree farm licence area

in the management area, as defined in section 1 (1) of the **Haida Gwaii Reconciliation Act**.

(11) The aggregate of the allowable annual cuts determined under subsections (6), (7) and (10) that apply in the management area, as defined in section 1 (1) of the **Haida Gwaii Reconciliation Act**, must not exceed the amount set out in a notice to the chief forester under section 5 (4) (a) of that Act.

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

Section 4 of the *Ministry of Forests and Range Act* (current to July 11, 2018) reads as follows:

Purposes and functions of Ministry

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

- (a) encourage maximum productivity of the forest and range resources in British Columbia;
- (b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;
- (c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation 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 sectorin British Columbia;
- (e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Appendix 3: Minister's letter of October 30, 2017



Reference: 230810

October 30, 2017

Diane Nicholls, Chief Forester and Assistant Deputy Minister
Ministry of Forests, Lands, Natural Resource Operations
and Rural Development
Victoria, British Columbia
V8W 2H1

Dear Diane

The British Columbia *Forest Act* conveys the responsibility to determine an Allowable Annual Cut (AAC) to the Chief Forester of the Province of BC for each timber supply area and tree farm licence in the province. It also specifies considerations that must be brought to bear during the course of such determinations including, among others, the economic and social objectives of the government.

This letter is intended to provide you with guidance regarding the objectives of the British Columbia (BC) government that require your consideration when determining an AAC.

Your office implements a rigorous Timber Supply Review Process to help ensure that each AAC you determine responds to a broad array of objectives and aligns with land use and management decisions established by provincial statutes and regulations. The objectives identified below are to be considered and as part of the review process to ensure that AAC determinations, and the timber harvest rates they enable, continue to support government goals.

This letter replaces two letters previously issued by the Minister of Forests and Range to the chief forester, dated July 4, 2006 and October 27, 2010. It is intended to be used in concert with direction provided by the Minister of Forests, Lands and Natural Resource Operations to the chief forester in a letter dated April 12, 2013, concerning objectives outlined in the Shared Decision Making Process pursuant to the Nanwakolas Reconciliation Protocol.

The BC government has committed to building a strong, sustainable, innovative economy and creating well paid jobs in the province. The health of the forest sector, and its ability to respond to an array of short and long term social, economic and environmental interests, is a key to delivering on this commitment. As such, Government has identified specific objectives for the management of BC's forests and Crown lands. Those relevant to AAC determinations include:

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Ministry of Forests, Lands,
Natural Resource Operations
and Rural Development

Office of the Minister

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Website: www.gov.bc.ca/for

Diane Nicholls, Chief Forester and Assistant Deputy Minister

- modernizing land-use planning to effectively and sustainably manage BC's ecosystems, rivers, lakes, watersheds, forests and old growth forests
- expanding investments in reforestation; and
- collaborating to develop strategies to manage wildlife resources and habitat

Strategies for delivering on these objectives will be developed in collaboration with the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, relevant Natural Resource Ministries, indigenous partners and industry. Once approved by government, I ask that you ensure such strategies are integrated into the Timber Supply Review Process to support AAC determinations.

The BC government has committed to full and lasting reconciliation with Indigenous peoples. As chief forester, your responsibility includes continuing to ensure that AAC determinations take into consideration relevant agreements between First Nations and the Government of BC, court decisions that define Aboriginal title and rights as well as moving forward on reviewing policies, programs, and legislation to determine how to bring the principles of the United Nations Declaration on the Rights of Indigenous Peoples into action for AAC determinations. You also have a responsibility to continue to carefully consider traditional knowledge and other input from BC First Nation communities and organizations in the course of AAC determinations as they pertain to the AAC determination.

The *Forest Act* requires that the chief forester consider a range of forest health issues as part of AAC determinations, including the impacts of circumstances such as infestations, devastations and salvage programs. This is particularly relevant as BC's forest sector emerges from a period of significant, compounding challenges. The infestation of the Mountain Pine Beetle that peaked in the late 2000s has largely subsided but with continuing effects to the size and composition of the forest inventory. Currently, the north area is experiencing Spruce Beetle infestations which also pose impacts. Recently, the Province has experienced record levels of wildfires that have impacted timber supply, community stability and multiple forest values.

In response to these challenges, it is a government objective to focus on planning and sustainable resource management in a way that supports robust forest recovery and timely and effective responses to emerging threats. Please consider how your AAC determinations can support these objectives while promoting forest health and values. In some cases AAC determinations may encourage management practices that avert another infestation in the province's forests. In certain regions, they will need to reflect the reality of a lower timber supply. Some regions will require expanded investment in reforestation and/or an increased focus on timber utilization and recovery. In the wake of extensive natural disasters, the extent of damage in certain areas may also warrant re-determining AACs earlier than scheduled.

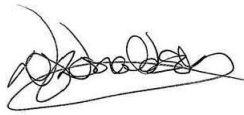
In order to ensure that AAC determinations align with government objectives to modernize land-use planning and sustainably manage B.C.'s ecosystems, rivers, lakes, watersheds, forests and old growth forests, the Timber Supply Review process should incorporate the best available information on climate change and the cumulative effects of multiple activities on the land base. Management options that align with established climate change strategies, adaptation and mitigation practices should be explored. Where the cumulative effects of timber harvesting and other land based activities indicate a risk to natural resource values, the process should identify those risks for consideration in land-use planning.

Diane Nicholls, Chief Forester and Assistant Deputy Minister

This government recognises that the forest sector is of critical importance to BC. The needs of rural communities and forest based industries are evolving in response to a number of the factors mentioned above. To support BC's forest-dependent communities, I ask that your AAC determinations consider the environmental, social and economic needs of local communities as expressed by the public during Timber Supply Review processes, including strategies that contribute to community economic stability, and the jobs that the forest sector creates in communities, where these are consistent with the government's broader objectives. I also ask that when faced with necessary reductions in AAC's, that those reductions be no larger than necessary to avoid significant longer term impacts.

Thank you Diane, for your continued service and considerable efforts in these regards.

Sincerely,

A handwritten signature in black ink, appearing to read "Doug Donaldson", with a stylized flourish underneath.

Doug Donaldson
Minister

Appendix 4: Minister's letter of April 12, 2013



Ref: 196701

April 12, 2013

Dave Peterson
Chief Forester and Assistant Deputy Minister
Ministry of Forests, Lands & Natural Resource Operations
Tenures, Competitiveness and Innovation Division
PO Box 9352 Stn Prov Govt
Victoria, British Columbia
V8W 9M1

Dear Dave Peterson:

The *Forest Act* gives you the responsibility and authority to make allowable annual cut determinations.

Section 8 of the *Forest Act* requires you to consider the government's social and economic objectives, as expressed by the Minister, as well as the other items listed in section 8.

As provided for in Section 1.1 of the Shared Decision Making Process agreed to as part of Schedule B, Appendix 2 (the Forestry Schedule) of the Nanwakolas Reconciliation Protocol, this letter provides government's social and economic objectives for signatory First Nations. In addition to government's social and economic objectives provided in other letters, please consider these objectives when making determinations of Allowable Annual Cut within the traditional territories of Nanwakolas First Nations:

- To share in economic development initiatives within the Traditional Territories of the Nanwakolas First Nations that facilitate, over time, the individual members of the Nanwakolas First Nations obtaining a quality of life that is equal to or better than the national Canadian average;
- To become full partners with the Province (i.e. to the fullest or maximum extent possible) in the forest sector within the Nanwakolas Traditional Territories including, but not limited to, opportunities for shared decision-making, forest tenures and revenue sharing;
- To develop significant involvement with the forest industry operating within their Traditional Territories, through the development of measures that will facilitate new relationships with industry;

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Ministry of Forests, Lands and
Natural Resource Operations

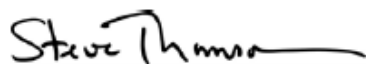
Office of the Minister

Mailing Address:
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Victoria, BC V8W 9E2

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- To significantly increase employment opportunities in the forest industry, over time, for Nanwakolas First Nations members, within their Traditional Territories; and
- To consider the value of forest resource development in the Traditional Territories of Nanwakolas First Nations when developing appropriate strategies for full Nanwakolas First Nations participation in the management and operation of the forest resource sector in the Traditional Territories.

Sincerely,

A handwritten signature in black ink that reads "Steve Thomson". The signature is written in a cursive style with a long horizontal stroke at the end.

Steve Thomson
Minister