BRITISH COLUMBIA

MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT

Fort St. John Timber Supply Area

Rationale for Allowable Annual Cut (AAC) Determination

Effective May 10, 2018

Diane Nicholls, RPF
Chief Forester

Table of Contents

List of Tables

Objective of this document

This document provides an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Fort St. John timber supply area (TSA). This document also identifies where new or better information is needed for incorporation in future determinations.

Acknowledgement

For preparation of the information I have considered in this determination, I am indebted to staff of the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development ("the ministry") in the Peace Natural Resource District, Northeast Region and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to First Nations, the public and the forest licensees who have contributed to this process.

Statutory framework

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

Description of the Fort St. John Timber Supply Area

The Fort St. John TSA is located in northeast British Columbia. It is the sixth largest TSA in British Columbia and covers an area of approximately 4.6 million hectares, and is administered by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Peace Natural Resource District (Peace District) office in Dawson Creek.

The TSA is bounded by the Fort Nelson TSA to the north; the Alberta border to the east; the Peace River and the Dawson Creek TSA to the south; and the height of the Rocky Mountains to the west.

A vast plateau dominates the eastern part of the Fort St. John TSA and rises westward to the foothills and the steeper terrain of the Rocky Mountains. There are four biogeoclimatic zones in the TSA: the Boreal White and Black Spruce (BWBS) zone in the plateau and lower elevations; the Englemann Spruce-Subalpine Fir (ESSF) and Spruce-Willow-Birch (SWB) zones at medium to high elevation in the mountains and foothills; and the Alpine Tundra (AT) zone at higher elevations. White spruce, lodgepole pine, aspen, and black spruce are the dominant tree species in the area. Minor amounts of subalpine fir, birch, balsam poplar and larch are also present in the forest.

Nationally and internationally recognized wildlife resources are an important feature in much of the western portion of the TSA. The Muskwa-Kechika Management Area (MKMA) contains protected areas and special management zones that ensure wilderness characteristics and wildlife habitat area maintained while allowing resource development.

Major rivers in the Fort St. John TSA include: the Sikanni Chief, Beatton, Halfway, Chowade, Graham, Ettithun, and Fontas.

According to BC Statistics 2011, 60 percent of the TSA population, or 18,609 people, lived in the city of Fort St. John and 1,373 people lived in Taylor. Hudson's Hope, which is just outside of the TSA, has a population of 970 people.

Energy development is the largest economic sector in the TSA. Other important sectors include agriculture and forestry.

The Fort St. John TSA lies within Treaty 8 Territory. Treaty rights negotiated under Treaty 8 are for hunting, trapping and fishing. Three First Nations in the TSA, who are signatories to Treaty 8, have reserve lands and traditional territories that encompass area within the TSA: Blueberry River First Nations, Doig River First Nation and Halfway River First Nation. Other Treaty 8 signatories have traditional territory that encompasses the TSA but their reserve lands are outside the TSA. These include: Fort Nelson First Nation, Prophet River First Nation, West Moberly First Nations and Dene Tha First Nation. The Dene Tha First Nation's reserve lands are in Alberta.

The Fort St. John Pilot Project (FSJPP) was implemented across the Fort St. John TSA in 2001 as a pilot project for an improved regulatory framework for forest practices. The main components of the project include regulatory flexibility to facilitate adaptive approaches to forest management, landscape-level planning through a sustainable forest management plan (SFMP), ongoing public involvement through a public advisory group (PAG) and the adoption and implementation of certification systems as surrogates for the existing administrative process.

History of the AAC for the Fort St. John TSA

In 1989, the AAC was set at 1 815 162 cubic metres, of which 900 162 cubic metres was specified for coniferous-leading stands, and 915 000 cubic metres for deciduous-leading stands.

In 1996, the AAC was increased to 2 015 000 cubic metres, of which 1 100 000 cubic metres was specified for coniferous-leading stands and 915 000 cubic metres for deciduous-leading stands.

In 2003, the AAC was set at 2 115 000 cubic metres. It included a partition of 1 200 000 cubic metres per year for coniferous-leading stands and 915 000 cubic metres per year for deciduous leading-stands.

On December 5, 2007, the chief forester issued an order postponing the AAC determination for the Fort St. John TSA until 2012. This date was further deferred until 2017 due to a change (from five years to ten years) in the legislated time frame for AAC determinations.

Table 1 show the apportionment of the current AAC set in 2003.

Table 1. Apportionment of the 2003 AAC

Apportionment	Cubic metres/year	Percentage
Forest licences – replaceable	394 952	19.0
Forest licences – non-replaceable	676 171	32.0
Pulpwood agreements	518 000	24.0
BC Timber Sales	420 614	20.0
Forest Service Reserve	61 445	3.0
Woodlot licences/Community Forest Agreements	43 818	2.0
Total	**2 115 000**	**100.0**

New AAC determination

Effective May 10, 2018, the new AAC for the Fort St. John TSA is 2 115 000 cubic metres. This AAC is partitioned as follows:

1. *Coniferous species*: a maximum of 1 200 000 cubic metres for coniferous species of which no more than 672 000 cubic metres may be harvested from the 'core' area. Within the core area spruce should comprise no more than 50 percent of the conifer volume; and
2. *Deciduous species:* a maximum of 915 000 cubic metres for deciduous species of which, no more than 512 000 cubic metres may be harvested from the 'core' area.

The core area consists of the Blueberry, Kobes, Halfway, Lower Beatton, and the Southern portion of Tommy Lakes landscape units.

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

Information sources used in the AAC determination

The information sources considered in determining this AAC for the Fort St. John TSA include but are not limited to, the following:

Legislation

- *Forest and Range Practices Act*, current to May 2, 2018.
- *Forest and Range Practices Act* Regulations and Amendments, current to May 2, 2018.
- *Forest Practices Code of British Columbia Act*, and guidebooks, January 31, 2004.

Licensee Plans and Timber Supply Review Documents

- Fort St. John Pilot Project Sustainable Forest Management Plan #2 September 2010.
- *Fort St. John TSA Timber Supply Analysis Data Package*, Forest Analysis and Inventory Branch, May 2015.
- *Fort St. John Timber Supply Area Rationale for Allowable Annual Cut (AAC) determination*, Timber Supply Branch, 2003.
- *Fort St John Supply Area Timber Supply Review Discussion Paper*, Forest Analysis and Inventory Branch, Revised November, 2016.
- Fort St. John TSA ClimateBC BEC zone projections (http://www.climatewna.com/ClimateBC_Map.aspx)
- Northeast Water Tool (https://water.bcogc.ca/newt)
- Procedures for Factoring Visual Resources into Timber Supply Analyses, 1998.
- Bulletin —Modelling Visuals in Timber Supply Review III, Ministry of Forests, December 12, 2003.
- TIPSY growth and yield model version 4.2. Research Branch, 2011.
- Letter from the Minister of Forests, Lands, Natural Resource Operations and Rural Development, dated October 30, 2017, to the chief forester, stating the Economic and Social Objectives of the Crown.

- Provincial-Level Projection of the Current MPB Outbreak: Update of the infestation projection based on the 2011 Provincial Aerial Overview of Forest health and the BC MPB model (year 9). Walton, Adrian. BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development, Forest Analysis and Inventory Branch, February 28, 2012.
- BC Ministry of Forests, Lands, and Natural Resource Operations, Climate Change Strategy to incorporate climate change into decision making: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/climate_change_strat_2015-20.pdf
- BC Ministry of Forests, Lands, and Natural Resource Operations Forest Carbon Strategy: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/bc_forest_carbon_strategy_09092016_sept_21.pdf
- BC Ministry of Forests, Lands, and Natural Resource Operations. 2016. Adapting forest and range management to climate change in the Northeast Region: consideration for planners and practitioners. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nrs-climate-change/regional-extension-notes/northeasten160222.pdf
- Northeast Region Climate Action Plan. 2015. Internal Forests, Lands, and Natural Resource Operations report.

Land Use Documents

- Identified Wildlife Management Strategy (IWMS).
- Identified Wildlife Management Strategy Version 2004. Ministry of Environment. May 2004.

First Nations

- Letter from Blueberry River First Nations regarding the AAC for the Fort St. John TSA. November 29, 2017.
- Letter from Blueberry River First Nations containing the BA Blackwell opinion regarding the TSA 40 TSR data package.
- Province's response to BRFN/BA Blackwell Opinion regarding TSA 40 TSR data package: "223951 BRFN Fort St. John TSR response letter".

Other related reports

- Draft Boreal Caribou Recovery Implementation Plan, March 30, 2017.
- Inventory Analysis of the Fort St. John TSA, Ecora Resource Group, September, 2012.
- Natural Disturbance Rate and Patch Size Distribution of Forests in Northern British Columbia: Implications for Forest Management, S.C. DeLong, 1998.
- Best Practices: A New Approach to Wildlife Management, College Matters // cab-bc.ca, Chris Addison, March 2017.
- A Strategy to Help Restore Moose Populations in British Columbia. Recommendations prepared for the Ministry of Forests, Lands and Natural Resource Operations Fish and Wildlife Branch. R.A. (Al) Gorley, July 8, 2016.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs 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.

<u>Information uncertainty</u>

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 timber harvesting land base (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 potential impacts to asserted Aboriginal rights, title and other interests ("Aboriginal Interests") and treaty rights 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 their Aboriginal Interests and the degree to which they may be affected by the decision. The Crown also has a constitutional obligation to consult with First Nations regarding their treaty rights. 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 treaty rights or 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 license 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 and treaty rights.

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 projections provided to me through the work of the Timber Supply Review Program (TSR) for TSAs and TFLs.

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

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

From a range of possible harvest projections, 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 it forms the basis for comparison when assessing the effects of uncertainty on timber supply. The base case is designed to reflect current management practices, demonstrated performance and established management requirements.

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

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all of the assumptions made in generating the base case are realistic and current, and the degree to which resulting projections of timber supply must be adjusted to more properly reflect the current and foreseeable 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 analyses I am provided are 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, particularly in cases characterized by a large degree of unquantified uncertainty, 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 the Fort St. John TSA

Harvest level projections, even those prepared using the same information, data and timber supply model, are dependent on the harvest flow objectives used in the analysis. The harvest flow objectives used in the base case for this determination included:

- Maximize the total harvest volume subject to meeting all management constraints, including the requirement for a stable future growing stock; and
- Maximize the mid-term harvest levels, and then increase the short-term harvest level to align with the current AAC if possible without affecting the highest mid-term level.

The timber supply forecasts, including the base case, were prepared for this determination using the Standard Timber Supply Model (StTSM), which is a Spatially Explicit Landscape Event Simulator (SELES)-based model. The data and assumptions used in the base case closely reflect current legal requirements, the best available information, demonstrated forest management practices and current conditions in the Fort St. John TSA as documented in the data package (updated May 2016).

In the base case, the initial harvest level was set at 2 117 000 cubic metres per year. Similar to the current AAC, this is composed of 1.2 million cubic metres from coniferous-leading stands and 0.915 million cubic metres from deciduous-leading stands.

The harvest from coniferous-leading stands remains at 1.2 million cubic metres per year throughout the analysis horizon. The harvest of deciduous-leading stands begins to decline 30 years into the forecast. It decreases by 10 percent per decade for three decades, then by five percent per decade for two decades. Seventy years into the forecast, the harvest of deciduous-leading stands reaches a long-term harvest level of 600 000 cubic metres per year.

Since the 2003 determination, several important changes have occurred regarding the information considered in the timber supply review (TSR) including:

- establishment of new ungulate winter ranges and wildlife habitat areas;
- establishment of visual quality objectives;
- updated mapping estimates for oil and gas seismic lines, roads, riparian areas and timber harvesting operability;
- new forest cover (vegetation resources) inventory information;
- new site productivity information;
- the presence of mountain pine beetle (MPB) infestations; and,
- implementation of the 2001 Fort St. John Pilot Project (FSJPP), which defined an improved regulatory framework for forest practices.

The base case is one of many possible harvest flows. I also considered alternative harvest projections (for the conifer-leading and deciduous-leading partitions), and a number of sensitivity analyses. These analyses have been helpful as I made specific considerations and reasoning my determination as documented in the following sections. I am satisfied that the base case, and the other analyses as noted and described, represent the best information available to me respecting various aspects of the current projection of the timber supply in this TSA, and that as such they are suitable for reference in my considerations in this determination.

Consideration of factors as required by Section 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 appropriately represents current management or the best available information, and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 2.

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 leading to my conclusions.

Table 2. List of accepted factors

***Forest Act* section and description**	**Factors accepted as modelled**
8(8)(a)(i) Composition of the forest and its expected rate of growth	• Steep Slopes • Unstable Terrain • Low Productivity Sites • Problem Forest Types • Major Projects • Economic and Physical Operability • Volume Estimates for Natural Stands • Volume Estimates for Managed Stands • Mixed Wood • Site Productivity Estimates • Minimum Harvestable Age and Volumes
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	• Regeneration Delay • Not Satisfactorily Restocked / Backlog
8(8)(a)(iii) Silvicultural treatments to be applied	• Silvicultural Systems
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	• Utilization Standards and Compliance
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	• Adjacency / Green-up • Scenic Resources – Visual Quality Objectives • Wildlife Habitat Areas • Range and Wildlife Burns

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 total area of the Fort St. John TSA is approximately 4 676 602 hectares. Of the total TSA area, about 2 791 340 hectares (58 percent) is classified as productive Crown forest land base (CFLB).

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. As part of the process used to define the THLB, a series of deductions was made from the Crown forest management

land base. These deductions account for economic or ecological factors that reduce the forest area available for harvesting. For the Fort St. John TSA, the THLB used in the base case was 1 020 817 hectares.

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

As noted under '*Role and limitations of the technical information used*', several of the factors considered influence the size of the THLB. Where I have concluded that there was an overestimate or underestimate in the land base available for harvesting, I have described my reasoning and conclusion in the sections below.

- *non-forest land: rock, ice, water, alpine*

Recently harvested areas, which should have been part of the THLB, were misclassified as non-forest and excluded from the THLB. Correcting this oversight increases the THLB by 67 000 hectares or 6.6 percent. Including these areas does not affect short-term timber supply but will increase long-term timber supply by approximately 6.6 percent. Having considered this information, I will account for this underestimate of the THLB as discussed in '**Reasons for Decision**'.

- *roads, trails and landings and oil and gas features*

In the derivation of the THLB for a TSA, areas are excluded to account for access structures that are not expected to regenerate forest. Separate estimates are made to account for: existing roads, trails, landings and oil and gas features (seismic lines, pipelines and well sites).

Existing roads, trails, powerlines and railways were classified and buffered, resulting in a net area reduction (after accounting for overlaps with other exclusions) of 63 045 hectares.

Existing oil and gas features were identified using data from the Oil and Gas Commission (OGC). Well sites were assigned an area of five hectares, and pipeline and seismic lines widths were estimated and buffered. This resulted in a net area reduction of 50 801 hectares from the THLB.

There was no reduction of forested area to account for future road development. Since the previous TSR (2003), substantial oil and gas exploration activities have resulted in the creation of many new roads and oil and gas features. District staff indicated that the forest industry regularly use existing oil and gas features when building roads. It was therefore assumed that areas for future harvesting will be accessible using existing roads or oil and gas features.

Although future forest depletion due to seismic activity is likely, estimates of their extent and location were not modelled in the base case. Blueberry River First Nations (BRFN) expressed concern that future land clearing because of oil and gas activities was not modelled. A sensitivity analysis was conducted to estimate the impact to timber supply of underestimating the THLB. It showed that if the THLB is reduced by 10 percent there is no impact to short-term timber supply and there would be a three percent reduction to mid- and long-term timber supply. For this determination, I will not make any adjustments to the base case short-term timber supply.

In light of BRFN concerns and as discussed under '**Implementation**', I expect that Ministry staff work with the oil and gas industry to improve the sharing of information for oil and gas-related infrastructure for use in the next TSR, so it more accurately represents what is occurring on the land base.

Existing forest inventory

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

- forest inventory

A vegetation resource inventory (VRI) Phase I was completed for the Fort St. John TSA in 2007. VRI stand attributes were projected to 2014. Stand disturbances (including depletions for harvesting) were updated to 2013 using the reporting silviculture updates and land status tracking system (RESULTS) data set.

VRI ground sampling was completed in 2012 to enable comparisons of ground data to inventory data. An analysis of the data showed that ground sample volumes were 9.4 percent lower than inventory volumes on the operable land base.

The base case used inventory volumes generated by the provincial Variable Density Yield Prediction (VDYP) yield model, and a sensitivity analysis was conducted using the ground sample adjusted volumes. While the lower ground sample volumes resulted in a correspondingly lower initial growing stock, there was no reduction to timber supply. The reduced growing stock was sufficient to maintain short-term timber supply while future managed stands provided the long-term timber supply.

West Fraser Mills expressed concern regarding the accuracy of the VRI ground sample (Phase II) data volume estimates. FAIB staff confirmed that these data were collected to acceptable standards, and provide an unbiased estimate of the TSA volume. Although the target sampling error was not achieved (16% vs. a target of 15%) due to the low sample size, the ground sampling confirmed that inventory volumes were overestimated by about 9.4 percent on the operable land base.

Since the sensitivity analysis conducted to test the effect of using Phase II adjusted volumes did not affect the base case harvest forecast I will not make any adjustments to the base case.

Expected time to re-establish the forest following denudation

Section 8 (8) (a) (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area:

Utilization

- grade 4 credit

Grade 4 cut control credit is a policy that was developed to provide an incentive for the harvest of low quality logs and higher levels of fibre utilization. Under the grade 4 credit, volume delivered to a non-sawlog facility is not charged to a licensee's AAC allocation and therefore is not counted under the AAC for the TSA. Although this provision is intended to provide an incentive to licensees to utilize lower quality logs, use of grade 4 credits can result in harvesting above the level of the AAC.

A review of harvest records (2003 to 2015) indicated that forest licensees received a one percent (165 332 cubic metres) grade 4 credit of the total coniferous AAC and a seven percent (455 573 cubic metres) grade 4 credit of the total deciduous AAC.

Although the *Forest Act* and Cut Control Regulation were amended in 2014 to allow the Minister to set a maximum volume limit on grade 4 credits where there are concerns regarding sustainability, no such limit has been set for the Fort St. John TSA.

Since neither the coniferous nor the deciduous partitions are fully harvested in this TSA, I see no reason to make an adjustment in the base case short-term harvest forecast to account for the volume attributable to grade 4 credits. However, I expect that the Ministry, working with licensees, will keep track of grade 4 credits to ensure there are no emerging sustainability issues.

- *residual waste*

Concerns have been expressed by district staff and BRFN that there are large waste piles, which may contain merchantable timber, being left onsite or burned.

It is noted that dry grade 4 logs left on the harvest block is not considered waste as per the current *Provincial Logging Residue and Waste Management Procedure Manual* (*Waste Manual*). Licensees are also permitted to leave waste on logging sites up to a benchmark volume; when the benchmark is exceeded, surplus waste should be billed through stumpage charges and the excess volume counted towards the licensee's AAC allocation. District staff is concerned that waste piles in this TSA are not properly monitored.

Regarding the residual waste that is being left onsite, I expect the district and licensees to work together to utilize this fibre (if possible) as per the *Forestry and Fibre Action Plan*, rather than leaving it or burning it. There are tenure tools available to make residual fibre available to secondary users, (https://www2.gov.bc.ca/gov/content/industry/forestry/supporting-innovation/bio-economy).

The recently released, Ministry *Provincial Timber Management Goals, Objectives and Targets* includes a strategy that encourages the use of avoidable waste through innovative technology. I expect licensees to fully utilize the volume harvested and to consider ways in which potential waste could be used in fibre based products as described under '**Implementation**'.

I also expect Ministry staff to work with licensees to ensure that waste assessments are completed and audited, as noted under '**Implementation**'.

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

The Ministry is required, under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown; and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. The *Forest and Range Practices Act* and other legislation provide for, or enable, the legal protection and conservation of timber and non-timber values. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- *higher level plans*

The Fort St. John TSA falls within the boundaries of the Fort St. John Pilot Project Regulation (FSJPPR). The regulation was established under the *Forest Practices Code of BC Act* in 2001 to enable an improved regulatory framework for forest practices, and governs all forest development within the TSA.

The FSJPPR provides guidance on the preparation of a single Sustainable Forest Management Plan (SFMP) which must include (at a minimum) landscape-level strategies for timber harvesting, road access management, patch size, seral stage distribution and adjacency, riparian management,

visual quality management, forest health management and range and forage management. The SFMP specifies targets for these values, which are derived from the FSJPPR.

The SFMP incorporates the direction of all of the plans developed for the Fort St. John TSA: Fort St. John Land and Resource Management Plan (LRMP), Muskwa-Kechika Management Area (MKMA), and the Graham River Integrated Resource Management Plan (GRIRMP). The Fort St. John LRMP requires sustainable use of renewable natural resources and stipulates that the management of any one resource shall take into consideration other resource values, rights, tenures, and development opportunities. The *Muskwa-Kechika Management Area Act* describes the government's intent regarding the area. Section 8(1) of the *Act* specifies that a landscape unit objective is a prerequisite to a forest development plan or a forest stewardship plan. To date, no landscape unit objectives have been approved, and there are no efforts underway to develop objectives; therefore, no harvesting has occurred in the Muskwa-Kechika Management Area. The GRIRMP was developed to direct harvesting in the Graham River area, with the principle of clustered forest development in one watershed at any time, with no further development to take place during the rotation.

District staff indicated that licensee commitments meet the objectives specified under the FSJPPR and current practices are consistent with SFMP indicators and targets. I therefore accept that the base case reflects the legal objectives specified within existing higher level plans.

- *landscape-level biodiversity*

Landscape-level biodiversity can be 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 and stand conditions, old forest retention is often considered a key landscape-level biodiversity consideration.

The early seral patch size distribution targets and late seral stage requirements for each natural disturbance unit (NDU) are specified in the SFMP under the FSJPPR. These NDU targets were developed by ecologists to reflect the natural disturbance regimes in northeastern BC and are applied operationally.

Forest licensees have spatially identified non-legislated OGMAs for forest planning purposes. District staff indicated some of these OGMAs were significantly impacted by wildfire in the last several years. BRFN expressed concerns regarding landscape-level biodiversity; they stated that it may be preferable to limit fire salvage activities in some areas where the benefits of maintaining wildlife habitat may be greater than the timber value of the affected stands.

I agree that in addition to contributing to conservation of biodiversity at the landscape level, mature and old growth forests are also an important component of accommodating First Nations interests in wildlife for food and ceremonial purposes. The maintenance of landscape-level biodiversity is an important component that supports First Nations in sustaining their traditional ways of life.

However, I recognize that a balance is required between maintaining opportunities for wildlife habitat management and the salvage of areas affected by wildfire or forest health issues. For this reason, area-specific information should be considered when identifying salvage opportunities. Prior to the salvage of stands affected by wildfire or insects, consideration is required to determine whether areas set aside for wildlife habitat or biodiversity are best left unharvested to help maintain those values and/or cultural values.

Although I accept that the seral patch size requirements were appropriately modelled in the base case, as indicated under '**Implementation**', I expect Ministry staff to collaborate with licensees and First Nations where there is planned salvage in the Fort St. John TSA, to ensure that all landscape-level biodiversity values have been adequately considered.

I also note under '**Implementation**' that I expect licensees and Ministry staff work together with First Nations to spatially identify co-location opportunities for old growth management areas and cultural heritage resources in areas known to be of high interest to First Nations. I request this information be considered in future TSRs.

- riparian management

Riparian areas bordering lakes, rivers, streams and wetlands provide key habitat for fish and wildlife and help conserve water quality and biodiversity. Schedule D of the FSJPPR specifies requirements for riparian reserve zones (RRZs) which exclude timber harvesting. In order to protect riparian habitat, it also limits timber harvesting in riparian management zones (RMZs).

Large double-lined rivers were buffered 100 metres in accordance with the FSJPPR. Other double-lined rivers were buffered by 60 metres. These riparian buffers were excluded from the THLB in the base case.

There is no comprehensive mapping for stream classes (other than class 1) and there is currently no project in place to map stream classes. However, a large amount of stream order data, provided by Canfor, enabled a correlation between stream order and stream class. Using that correlation, buffer widths were calculated by stream order and BEC zone. These buffers were applied and excluded from the THLB in the base case.

I have considered the information regarding the assumptions in the base case to account for riparian areas. I accept that the base case assumptions do reflect the legal requirements for the protections of riparian features and riparian habitat and are the best available information for this determination.

However, I acknowledge that the available stream class information requires update and consolidation. Therefore, I expect Ministry and licensee staff to work cooperatively to update and consolidate stream class information collected by licensees for use in the next TSR as described under '**Implementation**'.

- ungulate winter range

Wildlife in the Fort St. John TSA have been protected through the establishment of ungulate winter ranges (UWR), wildlife habitat areas, and wildlife habitat management practices. These are specified in the SFMP that is directed by the FSJPPR.

Three UWRs have been established under the Government Action Regulation for the protection of habitat for Northern caribou and Stone's sheep. Each order includes a set of General Wildlife Measures (GWM) that prohibit or constrain primary forestry activities such as the construction of roads within each UWR unit. In the base case the GWMs were modelled by excluding the areas from the THLB. The gross area removed was 293 000 hectares. After accounting for overlaps, the net area removed was 14 717 hectares.

Boreal Caribou UWR areas (Type B habitat), established under GAR Order U-0-009, were not excluded from the THLB. Harvesting is permitted in these areas when it is completed in accordance with the guidance found in the Order. The development of provincial planning guidance for these

areas, through the draft *Boreal Caribou Implementation Plan* (BCIP) and the *Peace-Liard Implementation Plan* is expected in the near future.

I recognize that the base case reasonably accounted for ungulate winter range management, but as discussed under '**Implementation**', I request that Ministry staff work to improve how the constraints found in GAR Order U-9-009, for the Type B area, are modelled in order to better account for current practice.

- *boreal caribou*

Boreal Caribou (*Rangifer tarandus caribou*) are red-listed and ranked in category S2 (imperilled) by the Conservation Data Centre of British Columbia. In addition, the British Columbia Conservation Framework ranks Boreal Caribou as a priority 1 under goal 3 which is to maintain the diversity of native species and ecosystems. Boreal Caribou were also recognized as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in May 2002. As a result, the population was listed as threatened on Schedule 1 of the *Species at Risk Act* (SARA) in 2003.

In northeastern BC, which includes the Fort St. John TSA, at least 728 Boreal Caribou currently reside within 16 core areas throughout five ranges: Calendar, Chinchaga, Maxhamish, Snake-Sahtaneh, and Westside Fort Nelson.

Boreal Caribou require large areas of contiguous habitat to avoid predators. Threats to the functionality of Boreal Caribou habitat and populations within BC include: indirect effects from habitat loss, fragmentation, and alteration primarily due to human activities; and, direct effects from predation. In 2010, the Province of British Columbia identified management actions to address these threats, including initiating an extensive research and monitoring program.

A draft *Boreal Caribou Recovery Implementation Plan* (BCIP) is currently being developed but has yet to be finalized and approved. It identifies management strategies and actions to help recover Boreal Caribou, and recognizes the potential socio-economic implications of managing Boreal Caribou and the Treaty 8 First Nations right to hunt caribou.

The timber supply impacts of the latest version of the BCIP (March 30, 2017) was investigated in a sensitivity analysis. Three core areas were removed from the THLB, and early-seral stage constraints were placed on the remainder of the herd range beyond the core area. The core area removal and constraint affects approximately 28 percent of the THLB in the TSA. This represents a five percent reduction to the short- and long-term harvest levels of the coniferous-leading partition. This effect is much less than the proportion of area and volume affected by the scenario, due to the large amount of non-forested area and non-contributing CFMLB supporting the constraint requirements.

As mentioned under '*ungulate winter range*', Boreal Caribou UWR areas (Type B habitat), established under GAR Order U-0-009, were not excluded from the THLB. I recognize that finalization of the BCIP may result in changes or amendments to this order regarding Boreal Caribou. If changes do occur, they can be factored in future AAC determinations. Meanwhile, consistent with my *Guiding Principles*, I will not speculate on potential changes to the order. In discussions with district staff, I am confident that current practices are consistent with the current requirements for Boreal Caribou.

I am aware that forest licensees are currently avoiding the BCIP-identified areas and are not harvesting or road building in core Boreal Caribou areas. The oil and gas sector, however, continues to create linear features in these BCIP areas which have an indirect effect on habitat and population. I therefore encourage Ministry staff to work with oil and gas staff to develop improved methods of meeting road building constraints, as described under '**Implementation**'.

- *moose*

Northeastern BC is home to a significant proportion of the province's moose population. First Nations within the TSA rely on moose for food, and they are a cornerstone of Dene and Cree culture. Past planning processes for moose were limited in scope (typically only addressing habitat protection and hunting regulations).

The *Peace-Liard Moose Management Plan (PLMMP)*, initiated in 2013, was developed collaboratively with Northeast First Nations and with the involvement of key stakeholders to address regional moose management issues including concerns regarding moose numbers and health.

The plan area consists of the Northeast Region and overlaps with traditional territories of several Treaty 8 First Nations in BC: Blueberry River First Nations, Doig River First Nations, Fort Nelson First Nations, Halfway River First Nations, McLeod Lake Indian Band, Prophet River First Nations, Saulteau First Nations, West Moberly First Nations, Dene Tha' First Nations, Duncan's First Nations, Horse Lake First Nations, Kaska Dena Council, and Tay Keh Dene Nation.

The plan area includes five game management zones (GMZs) and 27 wildlife management units (WMUs) supporting 50 000 to 80 000 moose.

The PLMMP evaluated a wide range of influences on moose population, including health status and monitoring; habitat management beyond protection; hunting regulation changes; compliance and enforcement; and direct population management. A primary objective of the plan was to identify needs specific to First Nations. The plan has also considered the recommendations provided in *A Strategy to Help Restore Moose Populations in British Columbia* (2016). The PLMMP is in the final stages of sign-off with implementation pending.

Currently, there are no legal objectives specific for moose in the Fort St. John TSA. The base case did not apply any THLB exclusions or management requirements for moose specifically.

BRFN expressed concerns regarding moose population decline. In particular, a recommendation was provided to establish a partition to protect critical moose habitat from timber harvesting until the moose populations have been confirmed as stable and healthy.

I recognize that current wildlife habitat area reductions do not specify requirements for moose. However, finalization of the *Peace-Liard Moose Management Plan* may result in changes to the legal objectives which can be factored in future AAC determinations. Meanwhile, consistent with my *Guiding Principles*, I will not speculate on potential land use changes.

With regards to the establishment of a partition, the aim of an AAC partition is to support sustainable use of the timber resource within the context of all applicable legislative objectives. A partition can help ensure that the allowable timber harvest attributable to one area or type of forest is not taken from another, potentially higher value, area or type of forest. A partition may be applied to encourage use of the timber inventory according to the assumed contributions of different areas and timber types in the AAC determination. Therefore, an order (with associated general wildlife measures) would more likely be the mechanism for the purposes of establishing a wildlife management requirement as part of the land use planning process.

Although I accept that the base case appropriately accounted for moose and moose habitat, I understand the concerns that were raised regarding the protection of moose habitat. Therefore, as discussed under '**Implementation**', I request that Ministry staff work with First Nations to finalize the *Peace-Liard Moose Management Plan* to address critical moose habitat.

- First Nations' land interests

First Nations' areas of interest (AOI) are defined as areas of cultural significance for First Nations. In the Fort St. John TSA, K'ih tsaaa?dze park is recognized as an area declared by the Doig River First Nation as a tribal park. Treaty Land Entitlements (TLEs) are also recognized as a correction for asserted deficiencies in accurately accounting for First Nations population estimates at the time Treaty 8 was signed. Although these AOIs are not legislatively designated, forest licensees have been avoiding harvesting in these areas.

In the base case AOIs were not excluded from the THLB. This could potentially pose harvesting pressure on the rest of the land base, as harvesting in the short term is concentrated in a smaller area. If all AOIs were excluded the THLB would be reduced by approximately 5.2 percent.

Ministry staff informed me that discussions are ongoing regarding the status of these AOIs. In keeping with my *Guiding Principles*, I will not speculate in my determination on land-use decisions that have yet to be made by government. If decisions are made that result in land being removed from the THLB then the AAC will be lowered accordingly. I have considered the information and assumptions used to account for First Nations' AOIs and conclude they were modelled appropriately in the base case.

- log grade changes

In April 2006, new log grades were implemented for the BC Interior. Previously, a log was assessed according to whether the tree it came from was alive or dead at the time of harvest. Prior to April 2006, Grade 3 endemic (the 'normal' mortality observed in a mature stand) and Grade 5 (dead tree with less than 50 percent firmwood and/or less than 50 percent of lumber produced is merchantable) were not charged to the AAC if harvested. Under the new system, grades are based on log size and quality at the time the log is scaled, not whether it was alive or dead at harvest. To better account for all harvested volume in the AAC cut control, logs that were previously considered Grade 3 endemic or Grade 5 are now charged to the AAC. Therefore, this volume now needs to be taken into account in the AAC determination. Inventory audit data for this TSA estimates dead potential volume to be 3.2 percent of all potential volume.

For the Fort St. John TSA, the best estimate of dead potential volume used by licensees can be obtained from the Ministry`s Harvest Billing System (HBS). For the period 1995 to 2004, when dead potential volumes were not charged against the AAC, the HBS showed that grade 3 endemic and grade 5 log volumes totalled about 3.8 percent of the cut-accountable volume in the Fort St. John TSA.

I have considered the information regarding log grade changes and dead potential volume and discussed it with district staff. I am aware that the potential volume from dead yet merchantable stems in harvested stands was not accounted for. I consider that some portion of this volume in stands is likely economical to harvest; therefore, represents a level of available volume in addition to what was projected in the base case. For this determination, I conclude that the potential volume contribution from dead stands represents a 3.2 percent underestimate in short-term timber supply projected in the base case. I will account for this in my determination as discussed in '**Reasons for Decision**'.

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:

Other information

- *unused AAC disposition*

HBS data for the period 2003 to 2015 indicates that approximately 68 percent of the conifer partition and 60 percent of the deciduous partition were harvested. The level of undercut for coniferous-leading stands has dropped significantly since 2013; however, the level of undercut for deciduous-leading stands remains high.

The base case harvest forecast is predicated on the condition of the forest, including the amount of merchantable timber growing stock present, as of the date of the timber supply analysis. The standing forest was not depleted to account for potential harvesting of any accumulated unharvest ('undercut') volume in the Fort St. John TSA. Therefore, any volume harvested (including undercut volume) that is above the AAC in this determination, constitutes use of the growing stock at a greater rate than projected in the base case, if the AAC were fully utilized.

In February 2018, a new *Policy Regarding the Administration of Unharvested Volume, Uncommitted Volume and Unused BCTS Volume* took effect. This policy outlines the process to be undertaken to inform the chief forester how much of the accumulated undercut volume will be awarded during the next AAC determination period. Any undercut volume that is not carried over into the next AAC determination period will no longer be available for future tenure disposition.

Since the AAC for this TSA was not fully harvested during the past 15 years, I will not make an adjustment to the base case timber supply to accommodate possible harvesting of undercut volume.

- *partitions*

When making AAC decisions, the chief forester can specify portions of the harvest attributable to different timber types, geographic areas or types of terrain. This is referred to as an AAC partition. The aim of an AAC partition is to support sustainable use of the timber resource within the context of all applicable legislative objectives. A partition can help ensure that the allowable timber harvest attributable to certain types of timber, terrain or areas of the TSA is not taken from another (potentially higher value) area or type of forest. A partition may be applied to encourage use of the timber inventory according to the assumed contributions of different areas and timber types in the AAC determination.

Under the *Forest Act*, after the chief forester sets the partition for a TSA, the minister may set harvest limits to enforce the partition within individual license agreements if voluntary compliance with the partition is not achieved.

Historically, AAC partitions identified problem or marginal timber in order to encourage harvest performance in these stands. More recently, AAC partitions delineate timber that is typically of a higher value and / or in a more limited supply, that is at risk of overharvesting. The AAC partition therefore identifies the maximum harvest volume that the chief forester considers is available within the specified timber type, terrain type or geographic area. An AAC partition informs licensees and the public of a harvest limit but it does not directly regulate the harvest from that type of timber.

The current AAC for the Fort St. John TSA includes two partitions in place from the 2003 AAC Determination and 2007 Postponement Order:

1. *Coniferous-leading stands*: 1 200 000 cubic metres per year from coniferous-leading stands; and,
2. *Deciduous-leading stands*: 915 000 cubic metres per year from deciduous-leading stands.

As discussed previously under '*unused AAC disposition*', the level of undercut in the coniferous partition has decreased significantly since 2013. As the partitions ensure that coniferous-leading or deciduous-leading stands are not overharvested, I will continue these partitions. To facilitate monitoring of these partitions using data from HBS which records species, rather than leading species, I will also set partitions by species types rather than by leading species. In addition, I will specify that spruce should comprise no more than 50 percent of the volume harvested in the conifer partition to ensure that this species is not overharvested.

Input was received from BRFN and the public regarding concerns that the level of harvest is concentrated in the southern and central part of the TSA (the 'core'), with little likelihood of harvesting more remote parts of the TSA (the 'periphery'). They have commented that the concentrated harvest activity in the core is not sustainable and it may have negative environmental and economic impacts while also impacting their treaty rights. A supplementary analysis was conducted, verifying the concentration of harvesting in the core of the TSA.

The core encompasses approximately 56 percent of the THLB and accounts for approximately 87 percent of the historic harvesting. The periphery encompasses approximately 44 percent of the THLB and accounts for approximately 13 percent of the historic harvesting. Appendix 4 shows a map of the Fort St. John TSA outlining the landscape units comprising the core and the periphery.

In recent years Ministry staff has made requests of the forest licensees to increase their level of harvest in the periphery, but these requests have not been followed. Forest licensees commented that they are meeting the objectives and requirements of the FSJPPR and will direct harvesting to the periphery as harvest opportunities in the core decline.

I recognize that concentrating the harvest in the core may have an impact on the environment and on First Nations interests. In order to address this issue, and ensure that the harvest profile more adequately aligns with the geographic profile of the available timber, I will therefore implement a geographic partition. The geographic partition identifies two separate areas:

A. *'Core' area*: The 'core' area includes landscape units: Blueberry, Kobes, Halfway, Lower Beatton, and the Southern portion of Tommy Lakes.

B. *'Periphery' area*: The 'periphery' area includes the remaining landscape units: Millgan Kahntah, Graham, Sikinni, Trutch, Crying Girl and the northern portion of Tommy Lakes.

A sensitivity analysis was completed to determine the harvest available from the coniferous and deciduous stands from the core and the periphery areas. This analysis showed that the sum of the volume available from the core and periphery was equal to that modelled in the base case.

As mentioned under '**Implementation**' I expect forest licensees to abide by these partitions and I expect Ministry staff to track licensees' performance with regard to the partitions. If licensees fail to adhere to these partitions, I will recommend to the minister that partition orders be issued. I will discuss my consideration of the AAC partitions further under '**Reasons for Decision**'.

- *cumulative effects*

In its 2007 decision on *William*, the BC Supreme Court ruled that decision makers should consider credible information on wildlife values associated with First Nations rights and needs (e.g. hunting, trapping, fishing and trading), and the potential implications of the decision on wildlife and First Nations' needs.

The BC Supreme Court decision on West Moberly First Nation v. BC (2011), found that consideration of both the historical context or cumulative effects of past events, and potential future events, are relevant in impact analyses of proposed natural resource development.

The individual effects of oil and gas, agriculture, timber harvesting, mining, and wind energy may combine to cause unintended cumulative effects (CE) on other resources or values in the Fort St. John TSA.

Provincial Cumulative Effects Framework

The Government of BC supports the implementation of the Cumulative Effects Framework (CEF) that provides relevant information and supporting policy for decision-making needs. The CEF *Interim Policy for the Natural Resource Sector* (NRS) was approved in November 2016, and provides framework guidance to natural resource sector agencies on the assessment and management of cumulative effects.

The CEF has assessment protocols for five different values, drawing on the expertise of subject matter experts from across the province. Three values: old growth forest, aquatic ecosystems and Grizzly bear, have received interim approval to move forward for regional review. Two values: biodiversity and moose are still under development. Regional licensees are currently reviewing all five protocols.

Regional CE Initiatives

The Provincial CEF has leveraged information from three complimentary strategic initiatives in northeast BC: Liquified Natural Gas (LNG) Environmental Stewardship Initiative (ESI) Regional Strategic Environmental Assessment (RSEA); the FLNRO Northeast Cumulative Effects Program (NECEP); and BC Oil and Gas Commission's Area-based Analysis (ABA).

The LNG ESI RSEA is a collaboration amongst the Province, First Nations and LNG sector. Through this venue, the province is working with participating Treaty 8 First Nations on assessing the effects of natural resource development activities on the rights of Treaty 8 First Nations. LNG ESI is also a mechanism for identifying Aboriginal values for incorporation into the Provincial (CEF). RSEA is currently investigating the impacts of industrial development and land use on the ability of Treaty 8 First Nations to exercise their treaty rights.

Information from the NECEP (2014) supported CEF development and regional implementation of the framework. Regional reviews are used to validate methodologies and assumptions, ensure regional applicability of indicators and suggest regional modifications where required. Once review of interim assessment results is complete, including regional validation, an external review with First Nations and stakeholders will be undertaken.

NECEP staff are currently reviewing interim results for old growth, aquatic ecosystems and grizzly bear values. Although preliminary results were released regarding Grizzly bear, significant issues with the modelling assumptions regarding bear habitat, food sources and population were identified with a recommendation for the collection of additional survey data.

The BC Oil and Gas Commission (OGC) has also been working on addressing CE through their ABA work. This is the mechanism for the implementation of the Provincial CEF within the oil and gas sector.

I have considered the information presented through the cumulative effects assessment and note that it provides good information regarding the cumulative effects of all activities as well as natural events on the land base. I note that it is difficult to extrapolate from this information potential implications to timber supply, noting that the relationship of harvesting activities to the assessment results is not clear. I also note that finalization and validation of the recommendations is in progress. I look forward to the refinement of these assessments over time, so that it might be possible to understand the timber supply implications and possible mitigation measures in future timber supply reviews.

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 harvesting

- *alternative harvest forecasts*

The base case projects an initial harvest level of 2 115 000 cubic metres per year that is sustained for the first 30 years of the 250-year forecast. This harvest level is the sum of a coniferous-leading partition of 1 200 000 cubic metres per year and a deciduous-leading partition of 915 000 cubic metres per year. The coniferous-leading harvest level can be maintain for the full 250 year harvest and the deciduous partition begins to decline after 30 years and continues to decline until year 70 when it reaches a sustainable level of 600 000 cubic metres per year.

A range of alternative harvest forecasts were developed for the coniferous-leading partition and the deciduous-leading partition that varied the harvest rate over time, using different initial harvest levels and stand age harvest rules.

Three scenarios were tested to determine whether the harvest level of the coniferous-leading partition could be substantially increased. The scenarios indicated that short-term timber supply is robust but the growing stock was not sufficient to maintain the higher harvest flows over the long term.

Having reviewed the information regarding the assumptions around harvest sequencing and having discussed this information with staff, I note that the timber supply in the Fort St. John TSA is robust enough to allow for the maintenance of the current harvest level of 2 115 000 cubic metres per year and the continuation of the operational harvest preference for highest volume per hectare stands.

Section 8 (8) (c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities:

This section of the *Forest Act* has been repealed [2003-31-2 (B.C. Reg. 401/2003)]

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

- *Minister's letter*

The Minister of Forests, Lands, Natural Resource Operations and Rural Development has expressed the economic and social objectives of the Crown for the province, in a letter dated October 30, 2017. In it, he emphasizes the BC Government's commitment to building a strong, sustainable innovative economy and creating well-paid jobs in the province. The letter identifies Government's three objectives for the management of BC's forests and Crown lands that are relevant to AAC determinations. These are:

1. modernizing land use planning to effectively and sustainably manage BC's ecosystems, rivers, lakes, watersheds, forests and old growth forests;
2. expanding investments in reforestation; and,
3. developing strategies for the management of wildlife resources and habitat (in collaboration with relevant Natural Resource Ministries, indigenous partners, and industry).

The October 30, 2017 letter also asks that I ensure the Ministry's approved strategies for delivering its forestry objectives are integrated into the TSR process.

With respect to First Nations, the letter suggests I ensure AAC determinations take into consideration relevant agreements between First Nations and the Government of BC, and court decisions that define Aboriginal title and rights. In addition, it reinforces Government's commitment to move forward on reviewing policies, programs, and legislation to determine how to bring the United Declaration on the Rights of Indigenous Peoples (UNDRIP) into action with respect to AAC determinations. It asks that I consider traditional knowledge and other input from BC First Nation communities and organizations as they pertain to the AAC determination.

The Minister asked for consideration as to how AAC determinations can support Government's objective to focus on planning and sustainable resource management in a way that support 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.

As well, the Minister asks that I ensure the TSR process incorporates 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. Where the cumulative effects of timber harvesting and other land-based activities indicate a risk to natural resource values, the Minister asks that I ensure the TSR identifies those risks for consideration in land-use planning.

Finally, the minister suggested the chief forester should consider the environmental, social and economic needs of local communities as expressed by the public during TSR 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. When faced with necessary reductions in AACs, that those reductions be no larger than necessary to avoid significant longer term impacts.

With respect to the Minister's letter, I note that the base case and alternative harvest projections, prepared for this determination, have a primary objective of attaining a stable, long-term harvest level where the growing stock is also stable. I am satisfied that the base case has incorporated the best available information regarding the impacts of insect infestations and wildfire while promoting forest health and values in the Fort St. John TSA.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have considered both the local objectives, as provided in the FSJPP and associated plans and orders, as well as the objectives of First Nations. I have considered the socio-economic objectives expressed in the 2017 letter in this determination for the Fort St. John TSA, and have reviewed the public consultation process undertaken by the district and considered the input received in making my determination. On this basis, I am satisfied that this determination accords with the objectives of Government as expressed by the Minister.

- *First Nations consultation*

There is a rich and diverse Aboriginal history in the area covered by the Fort St. John TSA. Eleven First Nations have traditional territories overlapping the TSA: Blueberry River First Nations, West Moberly First Nations, Halfway River First Nation, Prophet River First Nation, Doig River First Nation, Dene Tha' First Nation, Fort Nelson First Nation, Tsay Keh Dene Nation, Saulteau First Nations, McLeod Lake Indian Band and Horse Lake First Nation. All of these First Nations except for Tsay Keh Dene Nation are Treaty 8 nations.

After the initiation of the TSR, Horse Lake First Nation, McLeod Lake Indian Band, and Saulteau First Nations changed their consultation boundaries. This resulted in boundary overlaps with the Fort St. John TSA. These nations were included in the consultation process during the *Discussion Paper* phase of this TSR.

Aboriginal peoples of Canada have distinct, constitutionally protected rights. The Crown has a duty to consult with, and accommodate if required, those First Nations for whom it has knowledge of the potential existence of Aboriginal Interests or treaty rights that may be affected by a proposed decision, including strategic-level decisions such as AAC determinations. In particular, recent court decisions have stated that decision makers must use credible information to consider the effects of land management decisions, including AAC determinations, on Aboriginal Interests or treaty rights. As chief forester, I must therefore consider information arising from the engagement process with First Nations respecting Aboriginal Interests and treaty rights that may be affected by my AAC determination. As well, I will consider other relevant information available to the provincial government regarding Aboriginal Interests and treaty rights, including information gathered during other consultation processes.

The Province continues to work with First Nations to develop agreements including tenure opportunities related to forestry. The following agreements are in place at the time of this decision:

- Saulteau First Nations signed a New Relationship and Reconciliation Agreement in 2015.
- Economic and Community Development Agreements (ECDA) have been signed by Halfway River First Nation (2015), McLeod Lake Indian Band (2010), Saulteau First Nations (2015) and Tsay Keh Dene Nation (2017) (related to mineral development).
- McLeod Lake Indian Band signed a Forest Consultation and Revenue Sharing Agreement (FCRSA) in 2016. A Government-to-Government Agreement was signed by McLeod Lake Indian Band in 2017. This agreement established a consultation process for fulfilling the procedural and information sharing obligations of the Province; established government-to-government committees to review and discuss strategic level issues in the

Agreement area; support collaboration on wildlife management issues; and support improving the social and economic well-being of the McLeod lake Indian Band through economic benefits.

- Amended Economic Benefits Agreements (AEBA) exists with West Moberly First Nations and Prophet River First Nation. The original EBAs were signed in 2010 and amended in 2017.
- A Government to Government Agreement was signed by Halfway River First Nation March 31, 2017. This agreement includes a provision for a joint recommendation from HRFN and the Province, to establish a Conservancy (Tsaa Nuna) totalling 6000 hectares under the *Protected Areas of British Columbia Act*. An offer has been made to set aside 35 000cubic metres within the TSA for a First Nations Woodland Licence. The option for HRFN to apply for this Licence is to be left open for two years.
- K'ih Tsaa?Dze is a tribal park covering 90 000 hectares declared by Doig First Nations in September of 2011. At this time no MOU exists between DRFN and the licensees with respect to K'ih Tsaa?Dze.

- *litigation*

Blueberry River First Nations are currently in litigation with the Crown. On March 3, 2015, BRFN filed a notice of civil claim alleging that the Province has significantly infringed on BRFN rights protected under Treaty 8. The claim alleges that the cumulative effects of natural resource development have led to irreversible damage to the lands and waters, which significantly infringes on the BRFN's ability to hunt, trap, fish, and to pursue cultural and economic activity on the land. The trial has been tentatively scheduled for the summer of 2018.

- *consultation process*

In August 2014, an initial letter was sent to all First Nations with territory overlapping the Fort St. John TSA advising them that a new TSR was going to be initiated and that this process would culminate with the chief forester determining a new AAC for the Fort St. John TSA. The potential impact of an AAC determination was assessed as low by the First Nations Advisor; therefore consultation was undertaken at the normal level for all First Nations.

On June 9, 2015, the *Fort St. John Timber Supply Area Timber Supply Review Data Package* and the Initial Impact Assessment was sent to all Treaty 8 First Nations and the Tsay Keh Dene Nation (TKDN) for review.

The Province initiated consultation on the TSR under the Forest and Range Resource Management Agreement (FRRMA) with West Moberly First Nation (WMFN) and Prophet River First Nation (PRFN) on the Timber Supply Review on June 9, 2015. A copy of the *Data Package* was emailed to the co-chairs, board members, and the PRFN and WMFN land department contacts, for review. Potential impacts to the AAC determination were assessed as low, so the Province originally suggested consultation occur at the FRRMA Board Level (Level 3). The file was formally referred at the July 8, 2015, board meeting but no discussion took place at that time.

On January 4, 2016, a presentation was made by Elizabeth Hunt, Stewardship Officer, Peace Natural Resource District, at the Forest and Range Resource Management Agreement (FRRMA) Board meeting with WMFN and PRFN regarding the *Data Package* and TSR process. No comments were received from WMFN and PRFN.

On November 9, 2016 a referral package including the *TSR Discussion Paper* and the Initial Impact Assessment was emailed to all First Nations with traditional territory in the Fort St. John TSA.

- *Blueberry River First Nations*

On August 11, 2015 the Province received comments from BRFN on the *TSR Data Package* outlining their concerns regarding impacts of forestry and other industrial activities. The Province provided BRFN with a letter suggesting several meeting dates to further discuss BRFN's concerns.

On August 21, 2015, the Province provided BRFN a written response to their comments on the *TSR Data Package* and suggested several meeting dates to further discuss BRFN's concerns. On September 23, 2015, the Province contacted BRFN to request a meeting regarding the TSR.

On October 27, 2015, a meeting between the Province and BRFN took place where BRFN asked technical questions regarding the TSR and requested BC provide funding for their review. The Province referred BRFN to MARR to explore capacity funding options.

On January 5, 2016, the Province responded to BRFN's November 12, 2015 request for capacity funding and offered BRFN the assistance of a TSR analyst to assist with technical support. The province also granted a further extension in the review and comment period to January 20, 2016.

On January 18, 2016, BRFN agreed that a further extension would not be necessary as there would be another opportunity to comment when the *Discussion Paper* was released.

On April 12, 2016, BRFN provided the Province with a report written by B. A. Blackwell and Associates Ltd. outlining BRFN's concerns regarding the *TSR Data Package*.

On August 23, 2016, the Province responded and proposed six steps that would be taken to address BRFN concerns:

1. Assess whether or not harvesting is increasing in the areas outside of the south and central areas of the TSA;
2. Assess the timber supply implications of addressing the current geographic distribution of harvest by limiting harvesting to the southern part of the TSA;
3. Provide the chief forester with cumulative effects assessment information for old forest, riparian habitat and high priority wildlife species, including grizzly bear populations and priority wildlife habitat in northeast British Columbia;
4. Provide the chief forester with the results of any reliable reports related to cumulative effects on wildlife habitat as they relate to Treaty 8 rights, prior to the AAC determination;
5. Prepare sensitivity analysis to examine the effect of boreal caribou habitat requirements that may be formalized prior to the AAC determination; and,
6. Provide the chief forester with BRFN's recommendation that an AAC partition be applied to critical moose habitat.

All of these actions were completed and the information was considered in my determination.

On October 31, 2017, I met with a representative of BRFN in Vancouver to discuss their concerns regarding forest practices in the Fort St. John TSA. I made plans to travel to Fort St. John on November 22, 2017 so that I could tour the TSA with BRFN and witness examples of practices of concern to BRFN. This trip did not occur because of inclement weather.

On November 29, 2017, I received a letter from BRFN outlining five issues they would like me to consider in my AAC determination. I responded on January 8, 2018 acknowledging their concerns and offered to meet to discuss those concerns in greater detail.

On April 18, 2018 I met with representatives of BRFN where I described the AAC determination process and answered questions they raised.

A discussion of how the information was considered, including these concerns and other First Nations input, is included in '**Reasons for Decision**'.

- *Halfway River First Nation*

On June 26, 2015, Halfway River First Nation (HRFN) submitted comments and overarching concerns regarding forest management within HRFN's identified critical community use areas (CCUA). Specifically, the use of chemical sprays and its effect on the Chowady River watershed, and the medicinal plants in the area which are also food sources for moose.

On July 16, 2015, the Province provided a letter responding to HRFN concerns. The concerns were forwarded to the licensees working in the area, CanFor and BCTS. CanFor agreed to the requests made by HRFN and is working together to address them. BCTS has yet to respond. As noted under '**Implementation**', I request district staff follow-up with BCTS to ensure the concerns of HRFN are addressed.

- *Fort Nelson First Nation*

On September 1, 2015, comments were received from Fort Nelson First Nation (FNFN) requesting that consultation be undertaken at the deep level in consideration of the long-term potential for impact on FNFN's treaty rights. They also expressed concerns regarding the cumulative impact to the landscape due to oil and gas development.

In response to the level of consultation applied, results of a preliminary assessment (conducted by a consultation specialist) indicated a 'normal' level of consultation was appropriate. Regarding concerns related to cumulative effects, the relevant information considered in this decision is discussed under '*cumulative effects*'.

On January 26, 2016, the Province and FNFN discussed the Fort St. John TSR process and next steps including additional time to consult at the *Discussion Paper* phase.

- *Dene Tha' First Nation*

January 16, 2017, comments were received from Dene Tha' First Nation regarding technical capacity, the inclusion of Dene Tha' First Nation traditional use studies in the TSR process, and the concern that the Province's determination of the "A" and "B" consultation areas further handicaps Dene Tha's ability to meaningfully consult on projects in their asserted traditional territory. The Province responded with an offer of technical support.

I have reviewed the information regarding the consultation undertaken with First Nations and I have discussed it in detail with Ministry Regional, District and Branch staff. I am satisfied that the First Nations engagement was conducted appropriately and that all reasonable efforts were made by Ministry staff to engage and inform First Nations, with interests within the Fort St. John TSA, to collect information regarding their Aboriginal Interests, and to understand how these Aboriginal Interests may be affected by this determination. I have considered the information received from First Nations and, where appropriate, I have addressed these concerns in my decision.

While I am of the view that the issues and concerns raised have been appropriately addressed, given the information available at this time, if new information regarding First Nations' Aboriginal Interests and treaty rights becomes available that significantly varies from the information that was available

for this determination, I am prepared to revisit this determination sooner than the 10 years required by legislation.

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

Abnormal infestations

- *mountain pine beetle*

The BC Mountain Pine Beetle model (BCMPB), developed the Ministry to project the annual volume of mature pine killed by mountain pine beetle (MPB) was integrated with the forest estate model used for this TSR.

By area, approximately 29 percent of the THLB is occupied by pine-leading stands. By volume, 25 percent of THLB is pine.

The following assumptions regarding MPB-impacted stands were modelled in the base case:

- The live component of MPB-impacted stands that remain unsalvaged continue to grow and develop as complex stands (with the dead pine component removed after 15 years of shelf life have passed);
- No advanced regeneration, release or ingress was modelled;
- If the live volume component is above the minimum harvest criteria (or eventually grows to achieve the minimum) the stand may contribute to the timber supply; and,
- The contribution of these stands to the harvest forecast can be tracked.

District staff indicated that the MPB epidemic in the Fort St. John TSA started in 2007 and peaked in 2011. This is consistent with what was modelled using the BCMPB model. Timber tenures totalling approximately 500 000 cubic metres have been issued to salvage MPB-damaged stands in this TSA.

BRFN expressed concerns regarding MPB in their response to the data package. They felt the data package must better consider salvage harvest allocations as they relate to timber supply as it may be a better decision to limit salvage in some areas where the benefits of maintaining habitat far outweigh the value of a degraded timber supply resource.

The Ministry responded (August 23, 2016) that salvage within this low level of mortality can be accommodated within the AAC set for the Fort St. John TSA. No major program to salvage beetle-killed pine is planned for this TSA.

I recognize that some MPB-affected pine volume may not be suitable for sawlogs given time since death. In support of this issue, a sensitivity analysis confirmed that base case harvest levels can be maintained without salvaging all MPB-impacted stands.

In conclusion, I am satisfied that the base case appropriately modelled MPB-impacted stands. I recognize the concerns of the BRFN to forgo salvage opportunities where wildlife habitat values are high. As mentioned under '*landscape-level biodiversity*' and under '**Implementation**' I expect Ministry staff to investigate the value of these stands as wildlife habitat. I expect district staff to work with licensees and First Nations to maximize the utilization of existing MPB-salvage opportunities (where they exist), while considering wildlife habitat values.

Reasons for Decision

In reaching my AAC determination for the Fort St. John TSA, I have considered all of the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

The base case harvest forecast presented in the *Fort St. John TSA Timber Supply Analysis Discussion Paper* (revised November 2016) showed an initial harvest level of 2 115 000 cubic metres per year composed of 1 200 000 cubic metres per year from coniferous-leading stands and 915 000 cubic metres per year from deciduous-leading stands. While the coniferous-leading portion remains at 1 200 000 cubic metres per year for the remainder of the forecast, the deciduous-leading portion declines between decades four through seven to 600 000 cubic metres per year.

I am satisfied that the assumptions applied in the base case forecast, for the majority of the factors applicable to the Fort St. John TSA, were appropriate as detailed in Table 2 or previously discussed in this rationale. However, I have identified a number of factors, which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Some of these factors can be readily quantified and their impact on the harvest level assessed with reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision, but cannot be reliably quantified at this time.

Factors identified as indicative of a potential underestimate in the base case timber supply to a degree that can be quantified include:

- *Non-forest land: rock, ice, water, alpine:* Following the release of the *Discussion Paper,* an error was discovered in the determination of the THLB. Recently harvested areas were misclassified as non-treed and excluded from the THLB. This area represents a 6.6 percent underestimate in the long-term timber supply indicated in the base case.

- *Log grade changes:* Stand yield information used in the base case did not account for the contribution of dead potential volume; this resulted in a 3.2 percent underestimate in the short- and mid-term timber supply indicated in the base case.

A factor which indicates that timber supply may be overestimated in the base case is:

Minimum harvest criteria: The base case assumed that stands have to attain at least 140 cubic metres per hectares to be considered merchantable regardless of leading species. District staff indicated that stands with volumes ranging from 200 to 220 cubic metres per hectare better represent the merchantable harvest criterion. This difference in merchantability criterion indicates an unquantified overestimate in the long-term timber supply.

From reviewing the under- and overestimates in the projected timber supply listed above, the combined result is a 3.2 percent net underestimate in the base case timber supply in the short term. There is a 6.6 percent net underestimate in the base case timber supply in the long term. However, given all of the considerations noted above, I do not find it reasonable to determine an AAC above the current level.

In support of concerns from BRFN, and to underscore the importance of not overharvesting in the core area, I will specify a geographic partition limiting the harvest in the core of the TSA. I will also limit the harvest of spruce in the core to be consistent with the species distribution in the TSA:

1. *Coniferous species*: a maximum amount of 672 000 cubic metres coming from the 'core' area. Spruce should comprise no more than 50 percent of conifer volume; and,
2. *Deciduous species*: a maximum amount of 512 000 cubic metres coming from the 'core' area.

The 'core' and 'periphery' areas are defined as:

a. *'Core' area*: The 'core' consists of the Blueberry, Kobes, Halfway, Lower Beatton, and the Southern portion of Tommy Lakes landscape units as shown at Appendix 4.

b. *'Periphery' area*: The 'periphery' consists of the Millgan Kahntah, Graham, Sikinni, Trutch, Crying Girl and the northern portion of Tommy Lakes landscape units.

The maximum amounts specified by the partitions are consistent with the distribution of the THLB between the core and periphery. A supplementary analysis was conducted to confirm that these harvest contributions are possible while still maintaining the base case timber supply projection.

In making this AAC determination, I have considered concerns from BRFN (letter dated November 29, 2017) including:

1. An AAC set on management objectives that disproportionately harvests BRFN territory;
2. An AAC that does not include significant forest clearing from oil and gas activities;
3. Too much wood waste being left (and burned) on site;
4. Beetle salvage threshold results in more land than necessary being cleared;
5. Too many new blocks being cleared adjacent to existing clearcuts.

A response letter was sent to BRFN January 8, 2018 explaining that the chief forester must consider those factors identified in Section 8 of the *Forest Act* and is unable to consider factors that are outside the scope of authority granted under Section 8. I met with representatives of the BRFN on April 18, 2018 to discuss these concerns in greater detail.

With regard to concern #1, as discussed above and in greater detail under '*partitions*', the AAC partitions implemented in this decision limit the amount of harvest from the core area of the TSA.

With respect to concern #2, as discussed under '*roads, trails and landing and oil and gas features*', in the base case the extent and location of future oil and gas activities were not modelled. However, a sensitivity analysis which reduced the THLB by 10 percent showed that short-term timber supply can still be maintained. For this reason I did not reduce the AAC for this TSA.

I have also included an instruction under '**Implementation**' to address this issue. I expect that Ministry staff work with the oil and gas industry to improve the sharing of information for oil and gas-related infrastructure for use in the next TSR, so it more accurately represents what is occurring on the land base.

Although concern #3 is outside of the scope of authority granted under Section 8 of the *Forest Act*, I have discussed this issue under '*residual waste*'.

Regarding the residual waste that is being left onsite, I expect the district and licensees to work together to utilize this fibre (if possible) as per the *Forestry and Fibre Action Plan*, rather than leaving it or burning it. There are tenure tools available to make residual fibre available to secondary users,

reducing the amount of carbon emissions from burning or slash piles when utilized (https://www2.gov.bc.ca/gov/content/industry/forestry/supporting-innovation/bio-economy).

I have also included follow-up with instructions under '**Implementation**'.

As well, the recently released, Ministry *Provincial Timber Management Goals, Objectives and Targets* includes a strategy that encourages the maximum use of avoidable waste through innovative technology. I expect licensees to fully utilize the volume harvested and to consider ways in which potential waste could be used in fibre-based products.

I recognize that monitoring residual waste is critical to accurately reflect the merchantable volume harvested and charged to the AAC. Due to the concerns raised, I expect Ministry staff to work with licensees to ensure that waste assessments are completed and audited.

Regarding concern #4, I recognize the concerns of the BRFN to forgo salvage opportunities where wildlife habitat values are high. I note that timber tenures totalling approximately 500 000 cubic metres were issued to salvage MPB-damaged stands in this TSA.

Considering this information, I have concluded that salvage within this low level of mortality can be accommodated within the AAC set for the Fort St. John TSA.

I expect district staff to work with licensees and First Nations to maximize the utilization of existing MPB-salvage opportunities (where they exist), while considering wildlife habitat values.

Regarding concern #5, I recognize that the Fort St. John SFMP requires the emulation of the temporal and spatial characteristics of natural disturbance (primarily fire) which are modelled using a range of, small to large, patch sizes. Where timber harvesting is designed to be consistent with the structural characteristics and the temporal and spatial distribution of an opening that would result from natural disturbance, no specific requirements for adjacency are required under the Forest Planning and Practices Regulation. In the base case, no specific adjacency requirements were modelled, however, the modelled landscape-level biodiversity targets included both early seral patch-size distribution targets in addition to late seral requirements.

Although this concern is outside of the scope of authority granted under Section 8 of the *Forest Act*, I expect licensees, monitored by the district to meet the SFMP objectives and to be able to specifically explain how proposed cutblocks fit into these objectives.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the TSA by establishing an AAC of 2 115 000 cubic metres.

This AAC is partitioned as follows:

1. *Coniferous species*: a maximum of 1 200 000 cubic metres for coniferous species of which no more than 672 000 cubic metres may be harvested from the 'core' area. Within the core area spruce should comprise no more than 50 percent of the conifer volume; and
2. *Deciduous species:* a maximum of 915 000 cubic metres for deciduous species of which, no more than 512 000 cubic metres may be harvested from the 'core' area.

As discussed under *partitions*, the core area consists of the Blueberry, Kobes, Halfway, Lower Beatton, and the Southern portion of Tommy Lakes landscape units. The periphery consists of the Millgan Kahntah, Graham, Sikinni, Trutch, Crying Girl and the northern portion of Tommy Lakes landscape units.

The partition recognizes the need to address concerns from BRFN and the public regarding the level of harvest being concentrated in the southern and central part of the TSA.

This determination is effective May 10, 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

In the period following this decision and leading to the subsequent determination, I encourage Ministry staff, other agencies and licensees (where appropriate) to undertake or support the tasks and studies noted below, the particular benefits of which are described in appropriate sections of this rationale document.

I recognize that the ability of all parties to undertake or support these projects is dependent on provincial priorities and available resources, including funding. However, these projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Fort St. John TSA.

1. *Roads, trails and landing and oil and gas features:* I expect Ministry staff to work with the oil and gas industry to improve the sharing of information for oil and gas-related infrastructure for use in the next TSR, so it more accurately represents what is occurring on the land base.

2. *Residual waste:* I expect Ministry staff to work with licensees to ensure that waste assessments are completed and audited. This will ensure the volume of waste is properly monitored and accounted for.

   I expect the district to work with licensees to ensure that waste fibre being left onsite is appropriately utilized as per the *Forestry and Fibre Action Plan*, rather than leaving it or burning it. The available tenure tools should be used to make residual fibre available to secondary users, reducing the amount of carbon emissions from burning or slash piles when utilized.

   Likewise, the recently released, Ministry *Provincial Timber Management Goals, Objectives and Targets* should be consulted to encourage the maximum use of avoidable waste through innovative technology.

3. *Landscape-level biodiversity:* I expect Ministry staff to collaborate with licensees and First Nations where there is planned salvage, to ensure that all landscape-level biodiversity values have been adequately considered.

4. *First Nations – cultural heritage resources*: I expect that First Nations, licensees and Ministry staff work together to spatially identify co-location opportunities for old growth

management areas and cultural heritage resources in areas known to be of high interest to First Nations. I request this information be brought into future TSRs.

5. *Stand-level biodiversity*: I expect licensees to work with district staff to ensure that wildlife tree patches (WTPs) areas are coded and submitted to the RESULTS database. This will ensure operational performance is accurately accounted for in future TSRs. Forest and Range Evaluation Program (FREP) data should be used (where available) to monitor and establish wildlife tree retention numbers for use in the next TSR.

6. *Riparian data management:* I expect Ministry and licensee staff to work cooperatively to update and consolidate stream class information collected by licensees for use in the next TSR.

7. *Ungulate winter range:* I request Ministry staff work to improve how the constraints found in GAR Order U-9-009, for the Type B area, are modelled in order to better account for current practice.

8. *Boreal Caribou:* There are inconsistencies in the application of resource development recommendations in forestry vs. the oil and gas sectors, particularly concerning road development. I expect Ministry, oil and gas staff, and First Nations to work towards an improved (consistent) method of meeting road building constraints.

9. *Moose:* I recognize the links between moose habitat supply and the sustainability of moose populations. This is a critical factor in the ability of First Nations to practice their Aboriginal rights. As the *Peace-Liard Moose Management Plan* is in the final stages of sign-off, I request that Ministry staff work with First Nations to finalize the plan and its implementation to address moose-related values including population, health and habitat.

10. *Partitions:* I expect forest licensees to abide by these partitions and I expect Ministry staff to track licensees' performance with regard to the partitions. If licensees fail to adhere to these partitions, I will recommend to the minister that partition orders be issued.

11. *Halfway River First Nations*: I request district staff follow-up with BCTS to ensure the concerns of HRFN are addressed.

12. *Mountain pine beetle:* I recognize the impact of mountain pine beetle on the timber supply of the Fort St. John TSA, as a substantial volume of affected pine remains unharvested for a variety of ecological and economic reasons. I expect Ministry staff to work with licensees and First Nations to maximize salvage opportunities (where they exist), while considering wildlife habitat values.

Diane Nicholls, RPF
Chief Forester

May 10, 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 May 2, 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 May 2, 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 sector

in British Columbia;

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

Appendix 3: Minister's letter of 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:

Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Office of the Minister
Mailing Address: PO BOX 9049 Stn Prov Govt Victoria, BC V8W 9E2
Telephone: (250) 387-6240
Fax: (250) 387-1040
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.

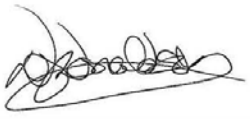
In order to ensure that AAC determinations align with government objectives to modernize land-use planning and sustainably manage B.C.'s ecosystems, rivers, lakes, watersheds, forests and old growth forests, the Timber Supply Review process should incorporate the best available information on climate 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,



Doug Donaldson
Minister

Appendix 4: Map of the Fort St. John TSA showing the landscape units comprising the core and the periphery areas.