

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

Tree Farm Licence 1

**held by
Coast Tsimshian Resources Limited Partnership**

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

Effective July 20, 2021

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Deputy Chief Forester**

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Objective of this document

This document provides an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 1. This document also identifies where new or better information is needed for incorporation in future determinations.

Acknowledgement

For preparation of the information I have considered in this determination, I thank Coast Tsimshian Resources Limited Partnership (the licence holder) staff, and staff of the British Columbia (BC) Ministry of Forests, Lands, Natural Resource Operations and Rural Development (the “Ministry”) in the Coast Mountains Natural Resource District and the Forest Analysis and Inventory Branch. I am also grateful to First Nations and public who have taken the time to make me aware of the issues unique to this TFL.

Statutory Framework

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for Timber Supply Areas (TSAs) and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document. For the purposes of this AAC determination in accordance with Section 23(3) of the *Interpretation Act* the deputy chief forester is expressly authorized to carry out the functions of the chief forester (including those required under Section 8 of the *Forest Act*).

Description of the Tree Farm Licence

TFL 1, which is held by Coast Tsimshian Resources Limited Partnership, is in the Skeena/Nass region, centred around the City of Terrace, British Columbia. North of Terrace, TFL 1 encompasses the west side of the Kalum Valley and extends into the Lower Nass Valley, including the upper portions of the Ishkheenickh and Kiteen River drainages. To the east, the TFL encompasses portions of the Copper River Valley. To the west of Terrace, the TFL includes area south of the Skeena River near the mouth of the Lakelse River. Local communities near or within the TFL area include: Terrace, Gitaus, Old Remo, Usk, Rosswood, Nass Camp, Gitlaxt’aamiks, Gitwinksihlkw, Gingolx, and Laxgalts’ap.

The total land base for TFL 1 is 423 721 hectares. Of the total land base, 174 737 hectares or 41 percent are considered productive forest land base. The remaining 59 percent or 248 984 hectares are composed of non-forest, non-commercial, road or transmission line areas. The timber harvesting land base (THLB), that is the area estimated to be available for timber harvesting, is 68 740 hectares or 39 percent of the productive forest land base.

The climate is transitional and includes both maritime and continental influences. Temperatures are generally mild, although extremes in temperature are common. Normally, a wet spring is followed by a short period of dry summer, then heavy rain and snowfall, therefore, soil moisture deficits are uncommon. The ground generally does not freeze despite the heavy snowfall. Outbreaks of arctic air fluctuate during the winter resulting in unstable winter operating conditions.

The topography of the TFL varies from flat and undulating in the main valleys of the Kalum and Nass to steep and mountainous in the numerous side valleys.

The forests are predominantly old growth conifer stands dominated by western hemlock and amabilis fir (balsam), with mixed stands of spruce, western redcedar and cottonwood occurring along the valley floors. TFL 1 is within the Coastal Western Hemlock, Mountain Hemlock,

Interior Cedar Hemlock, Englemann Spruce-Subalpine Fir and Coastal Mountain-heather Alpine, Boreal Altai Fescue Alpine biogeoclimatic zones.

The unmanaged, older forests generally yield a low proportion of sawlog volume due to their low merchantability and timber quality. The quality of the unmanaged mature and younger managed stands is much better. Although major fires are rare, there are some mid-seral lodgepole pine stands in the Nass Valley, where wildfires have more influence on the forest structure and regeneration.

This TFL is administered by the Skeena Region and Coast Mountains Natural Resource District.

History of the AAC

In 1948, the first forest management licence (FML) in British Columbia, FML 1, totalling 778 987 hectares, was awarded to Columbia Cellulose Company Ltd. with an AAC of 410 597 cubic metres. FML 1 became TFL 1 in 1965.

TFL 1 was issued to Coast Tsimshian Resources Limited Partnership by the Province on January 1, 2008.

On April 15, 2008, the AAC was set at 500 000 cubic metres. On July 6, 2011, the AAC was reduced to 378 059 cubic metres under the Allowable Administration Annual Cut Regulation to account for the transfer of 93 959 hectares of TFL area to the new Cascadia TSA.

On June 12, 2018 the minister issued an order under Section 169, Part 13 of the *Forest Act* establishing the Kitsumkalum-Kitselas Designated Area No.1. The chief forester did not issue an order under Section 173 reducing the AAC, consequently, the current effective AAC for TFL 1 at the time of this determination is 378 059 cubic metres.

New AAC determination

Effective July 20, 2021, the new AAC for TFL 1 is 322 000 cubic metres, which is 15 percent lower than the previous AAC set in 2011.

This AAC will remain in effect until a new AAC is determined, which must take place within 10 years 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 based this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation.

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 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

Given the large number of periodic AAC determinations required for BC'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, title and interests; and considering information related to integrated decision making, cumulative effects, and climate change.

Information uncertainty

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

Two important ways of dealing with this uncertainty are:

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

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

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

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

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

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

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

First Nations

The BC government has committed to true, lasting reconciliation with Indigenous Peoples, including fully adopting and implementing the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP). The *Declaration on the Rights of Indigenous Peoples Act* of 2019 (the ‘*Declaration Act*’) commits the provincial government to aligning provincial laws with UNDRIP. Reconciliation and implementation of UNDRIP will likely require changes to policies, programs and legislation, which will take time and involve collaborative engagement with Indigenous Peoples. While this work is undertaken, BC is committed to fulfilling its legal obligations to consult and accommodate potential impacts to established and asserted Aboriginal rights, title and/or treaty rights (‘Aboriginal Interests’) consistent with the Constitution, case law, and relevant agreements between First Nations and the government of BC.

Where First Nations and the Province are engaged in collaborative land and resource planning, the Province may make 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.

Where collaborative planning between First Nations and the Province is ongoing, there may be preliminary but not yet finalized and formalized land use zones or management objectives. As is the case for land use and management planning in general, 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*, and with consultation obligations defined in court decisions. 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.

The timber on established Aboriginal title lands (meaning Aboriginal title declared by a court or defined under an agreement with necessary federal and provincial implementation legislation), Treaty Settlement Lands or Indian Reserves, is no longer likely to be provincial Crown timber, depending on the particular circumstances. Consequently, if it is not provincial Crown timber, it does not contribute to the AAC of the timber supply area or tree farm licence overlapped by those lands. 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 could affect the AAC determination, given uncertainties about the scope, nature and geographic extent of title. Unless land has been established to be Aboriginal title land, Treaty Settlement Land or reserve land it remains as provincial land managed by the Province and will contribute to timber supply.

Integrated decision making and cumulative effects

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

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

which I can note and pass to those responsible for such planning. Information on cumulative effect can also support considerations related to Aboriginal Interests.

Climate change

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

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

I note, however, that even with better information on climate change, in many cases there will be a range of reasonable management responses. For example, it is not clear if either increases or decreases to current harvest levels would be appropriate in addressing potential future increases in natural disturbance due to climate change, which appear to be likely in some areas.

Hypothetically, focused harvests in at-risk forests could forestall losses of timber and allow for planting of stands better adapted to future conditions. Conversely, lower harvest levels could provide buffers against uncertainty. The appropriate mix of timber supply management approaches is ultimately a social decision.

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

The role of the base case

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

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

Because it represents only one in a number of theoretical projections 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 projection of timber supply, whose validity - as with all the other projections provided - depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all of the assumptions made in generating the base case are realistic and current, and the degree to which any adjustments to its projections of timber supply must be made, if necessary, to more properly reflect the current situation.

These adjustments are made based on 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, once an AAC has been determined, no additional precision or validation would be gained by attempting a computer analysis of the combined considerations.

Base case for TFL 1

The timber supply analysis for TFL 1 was prepared for the licence holder by Ecora Engineering and Resource Group Limited using the modelling software Patchworks™, which has been approved by Forest Analysis and Inventory Branch (FAIB) for use in timber supply reviews. Patchworks is a spatially explicit forest estate model used to project timber harvesting activities following current management practices including objectives for non-timber values such as biodiversity, wildlife habitat, cultural heritage resources, recreation, and visual quality. Based on the review by Ministry staff, as well as my own experience reviewing results from similar models, I am satisfied that Patchworks can provide an appropriate projection of timber supply.

Harvest flow objectives in the base case are to achieve the highest non-declining harvest projection subject to maintaining non-timber objectives. Other harvest flow objectives in the base case conform to the following provincial policy:

- avoid large or abrupt changes (greater than 10 percent per 10-year period) in timber supply during the transition from the current AAC through the mid- to long-term harvest levels;
- avoid deep mid-term harvest reductions; and,
- achieve the highest harvest level while maintaining a stable inventory of growing stock.

The inventory used in the base case was projected to January 1, 2015, and updated for harvest disturbance and silvicultural treatments to December 2016. The base case begins in January 2017 and the harvest levels are reported in 10-year increments for 250 years.

In the base case, an initial harvest level of 340 000 cubic metres per year, which is about 10 percent less than the current effective AAC, is maintained for 10 years. Thereafter, the harvest level declines by about 10 percent per decade for the next 40 years to a mid-term level of 223 000 cubic metres per year. The mid-term harvest level is maintained for 40 years before increasing by about 11 percent to the long-term harvest level of 247 000 cubic metres per year.

The notable changes in the timber supply analysis for TFL 1 since the last timber supply review include:

- decrease in the size of the TFL from 518 297 hectares to 423 721 hectares, which reduced the forested land base from 229 379 hectares to 174 737 hectares;
- decrease in the size of the THLB from 89 596 hectares to 68 740 hectares; and,
- use of an optimization model instead of a simulation model for timber supply modelling.

In my determination, I have also considered several sensitivity analyses. A sensitivity analysis examines how changes in base case assumptions affect the projected timber supply. These analyses have been helpful as I made specific considerations and reasoning in 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 TFL, and 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 the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case is a reasonable reflection of current legal requirements, demonstrated forest management and the best available information, and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 1.

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

Table 1. List of factors accepted as modelled

Forest Act section and description	Factors accepted as modelled
8(8)(a)(i) Composition of the forest and its expected rate of growth	<i>non-TFL area</i> <i>non-forest and non-commercial areas</i> <i>parks, protected areas and ecological reserves</i> <i>environmentally sensitive areas</i> <i>karst resource features</i> <i>research sites</i> <i>natural stand yields</i> <i>managed stand yields</i> <i>genetic gain</i> <i>operational adjustment factors</i> <i>minimum harvest criteria</i>
8(8)(a)(iii) - silviculture treatments to be applied to the area	<i>silvicultural systems</i>
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	<i>decay, waste and breakage</i> <i>timber utilization</i>
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	<i>stand level biodiversity</i> <i>community watersheds</i> <i>scenic areas and visual resources</i> <i>cutblock adjacency and green-up</i>
8(8)(a)(vi) Any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber	<i>harvest rules and priority</i>

Forest Act Section 8 (8)

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

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

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

Land base contributing to timber harvesting

- general comments

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

The total area of TFL 1 is 423 721 hectares. Of this total area, 68 740 hectares are deemed to be currently available as THLB after deductions are applied for the factors noted above in Table 1 and in factors discussed below.

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

For this determination, I accept that the approach used to determine the THLB for the TFL 1 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.

- forest inventory

The forest inventory for TFL 1 was completed in 1992 to a pre-Vegetation Resource Inventory (VRI) standard and converted to a VRI format for use in the analysis. The VRI projected by FAIB does not cover the entire TFL. The licence holder's older proprietary inventory was utilized where inventory to the VRI format was unavailable.

The inventory was updated for harvesting and silviculture activities to December 2016 prior to use in the timber supply analysis.

I accept that the best available inventory information was used in the timber supply analysis and will make no adjustments to the base case on this account. However, in making this decision I am aware that the age of the inventory and gaps in inventory coverage increase the level of uncertainty associated with the base case and other harvest projections prepared for this determination. These deficiencies in the inventory also affect the management of other resources in the TFL, as discussed in '*cumulative effects*'. Therefore, as indicated in '**Implementation**',

I expect the licence holder to work with FAIB to update the inventory for TFL 1 for use in the next timber supply review.

- roads, trails and landings

In the derivation of the THLB, areas are excluded to account for the areas of roads, trails and landings (RTL) that will not regenerate to productive forest. Separate estimates are made to account for existing and future RTLs.

In order to account for the loss of productive forest area associated with existing access structures, a 15-metre wide buffer was applied to all of the existing roads and trails in the TFL. After accounting for areas previously excluded for other factors, a net area of 3088 hectares was excluded from the THLB.

No areas were excluded from the THLB to account for the development of RTLs required for future harvesting. However, in the 2003 timber supply review, the licence holder estimated that future RTLs would result in a further 3435 hectares of productive forest land being removed from the THLB. District staff indicate that there has not been a lot of road building in the Coast Mountain Natural Resource District and that most new roads are spurs off existing mainline roads. For this reason, district staff recommend that the 2003 RTLs estimate be reduced by 75 percent for this TSR. Using this approach, the future THLB was reduced by 859 hectares and the base case long-term harvest level was reduced by 3000 cubic metres per year or 1.2 percent.

Based on my review of this information and discussions with district staff, I will account for a 1.2 percent overestimation in the base case long-term harvest level, as discussed in **‘Reasons for Decision’**.

- physical and economic operability

In the 2008 *AAC Rationale*, the deputy chief forester concluded there was significant uncertainty associated with the size of the operable land base in TFL 1. Consequently, the deputy chief forester asked the licence holder to update the operability classification for TFL 1 to provide better information regarding the amount of available merchantable timber and to identify areas of low merchantability so that these areas could be appropriately accounted for in the next AAC determination. Although the licence holder acknowledged the size of the operable land base was probably the most significant uncertainty around establishing a sustainable harvest level, it did not update the operability classification for the TFL. For this timber supply review, the licence holder noted that the sensitivity analysis that examined the timber supply effects of increasing or reducing the size of the THLB, helped to address this uncertainty.

In order to estimate the amount of area in the TFL in which timber harvesting is both physically and economically viable, stands were assigned to one of six categories based on stand volume, quality, accessibility and slope. Stands harvestable by ground skidding, cable and skyline were classified as “conventional”, while stands harvestable by helicopter or multi-span systems were classified as “non-conventional”. Within these classes, low volume stands (stands with less than 250 cubic metres per hectare) and uneconomic stands were also identified.

The area assigned to four of these categories was proportionately reduced based on the extent to which harvesting had occurred in the category. Using this approach 2303 hectares of “conventional” uneconomic, 1639 hectares “non-conventional”, 2954 hectares of “non-conventional” low volume area and 41 520 hectares inoperable areas were excluded from the THLB.

In an earlier version of the draft TFL 1 Management Plan (MP), the licence holder proposed a base case using a THLB of 83 299 hectares. The initial harvest level in this projection was 357 000 cubic metres per year and the long-term harvest level was 253 000 cubic metres per year.

Following a review of the draft MP, the licence holder was provided with BC Timber Sales (BCTS) terrain classification data and additional operability information that covers a large portion of TFL 1. Incorporating the new information, as described above, reduced the THLB to 68 740 hectares and decreased the initial and long-term harvest levels to 340 000 cubic metres per year and 247 000 cubic metres per year, respectively.

In a sensitivity analysis, increasing the THLB by five percent increased the short-, mid- and long-term harvest levels by 6.4 percent, 6.3 percent and 4.8 percent above the base case levels, respectively. Decreasing the size of the THLB by five percent decreased the short-, mid- and long-term harvest levels by 1.2 percent, 3.6 percent and 4 percent below the base case levels, respectively.

I conclude the significant decrease in the size of the THLB and adjusted harvest projections that occurred following the incorporation of the additional information from BCTS, as well as the results of the sensitivity analysis, underscore the importance of having reliable operability information for this TFL. While I accept that the best available terrain classification and operability information was used in the analysis and will make no adjustments to the base case on this account, I do expect the licence holder to complete a full update of the operability and terrain classification information, as indicated in **'Implementation'**.

- terrain stability

In the 2008 AAC *Rationale*, the deputy chief forester asked the licence holder to finalize the terrain stability mapping for incorporation in the next timber supply analysis.

Although, no broader terrain stability assessments have been completed since the last MP, the licence holder indicates that most of the TFL is covered by overview terrain stability mapping and more detailed terrain stability mapping is completed in conjunction with cutblock and road layout. The licence holder acknowledges that terrain stability mapping could be one more step in precisely defining the THLB but believes terrain stability is not a major source of uncertainty from a timber supply perspective. The timber supply implications of terrain stability are included in *'physical and economic operability'*.

District staff indicate there is a need for broader terrain stability mapping, especially along road corridors, where there appears to be an increase in the number of landslides. District staff note that physical terrain stability information is becoming increasingly critical due to the increase in climate-influenced weather events.

I conclude that terrain stability was adequately accounted for in the base case and will make no adjustments on this account. However, given the apparent increase in landslides and the need to better quantify the operable land base, I expect the licence holder to complete a full update of the operability and terrain classification information, as indicated in *'physical and economic operability'*.

- deciduous-leading stands

Unless the stand had a previous history of harvesting, deciduous-leading stands and cottonwood stands older than 140 years with volumes less than 250 cubic metres per hectare, were excluded from the THLB. The volumes of conifer-leading stands were not reduced to account for the deciduous trees in these stands that are not recovered during harvesting. A review of the base case shows that deciduous volume from coniferous-leading stands accounts for approximately 660 cubic metres per year, or 0.2 percent of the base case harvest levels.

The Kitsumkalum First Nation noted that deciduous trees are often damaged during harvesting operations or are harvested and left as firewood or burned in waste piles. They asked how this was accounted for in the timber supply analysis.

District staff indicate that it is current practice for the licence holder to retain deciduous trees in harvested conifer stands as wildlife trees. However, when deciduous trees are harvested, they are not removed from the cutblock and contribute to harvesting waste.

The modelled volumes include coniferous and deciduous, and deciduous waste volumes are accounted to the AAC, thus I conclude deciduous-leading stands were modelled correctly in the base case.

With respect to the concerns expressed by the Kitsumkalum First Nation, I encourage the district to work with the licence holder to promote the retention of deciduous trees where appropriate and to minimize the damage to retained deciduous trees during forestry operations, as indicated in **‘Implementation’**.

- recreation resources

In the previous TSR, the licence holder used environmentally sensitive area (ESA) recreation mapping to identify areas where timber harvesting may adversely affect areas with high recreation values. ESA mapping was first used in the 1970s and has since been replaced in other management units with other, more detailed information. According to the TFL 1 MP the recreation resources inventory and analysis were updated in 1997.

In the 2008 AAC *Determination Rationale*, the deputy chief forester asked the licence holder to review the 1997 recreation resource information, and if necessary, update it for use in the next timber supply review.

According to the licence holder no new recreation studies have been completed for TFL 1. For this timber supply analysis, a 10-metre wide buffer was applied to all recreational trails and sites, and the resultant net area of 10 hectares was removed from the THLB. The licence holder’s Forest Stewardship Plan (FSP) includes objectives for recreation resources.

I accept that recreation resources were correctly accounted for and will make no adjustments to the base case on this account. Although the licence holder did not undertake any new studies, I am satisfied that recreation resources are being addressed operationally through implementation of the licence holder’s FSP.

- riparian reserves and management zones

In the 2008 AAC *Determination Rationale*, the deputy chief forester asked the licence holder to seek review and approval of its riparian inventory by the Ministry of the Environment and to provide more detail regarding the approach used in the next timber supply analysis to account for riparian reserves and management zones.

For this timber supply review, the licence holder indicated that all lakes and wetlands were classified according to the Forest Planning and Practices Regulation. Most of the streams have been classified but for those parts of the TFL for which no stream classification exists, an average riparian buffer width was applied. This width was calculated as the length-weighted average for the classified streams.

The THLB used in the base case reflects the stream classification information available in 2016, which was subsequently updated in 2019. The licence holder estimates that updating the stream classification to the 2019 version would decrease the THLB by 94 hectares.

I appreciate the additional information provided by the licence holder in response to the deputy chief forester’s instruction. With regard to the 94 hectares overestimation of the THLB, this has a negligible effect on the projected timber supply and I will not adjust the base case on this account.

- cultural heritage resources

A cultural heritage resource (CHR) is defined under the *Forest Act* as “an object, site or location of a traditional societal practice that is of historical, cultural or archaeological significance to the Province, a community, or an aboriginal people”. CHRs include, but are not limited to, archaeological sites and traditional use sites. Archaeological sites, including culturally modified trees that pre-date 1846, are protected under the *Heritage Conservation Act*.

The Kalum Land and Resource Management Plan (LRMP) includes detailed objectives and strategies to fulfil the management intent for CHRs, which is to identify, and conserve select CHRs. The Kalum LRMP includes a list of sites with archaeological and historical value in the Beaver, Skeena River, Kalum, and Wedeene Landscape Units.

An archaeological overview assessment completed for the Kalum Forest District (now the Coast Mountains Natural Resource District), including TFL 1, in 1996, is available for use when planning forestry operations. In practice, most CHR sites overlap with areas already excluded from the THLB to account for the management of other non-timber resources such as riparian areas, ungulate winter ranges, wildlife tree retention requirements and old growth management areas. No reduction was made to the THLB specifically for CHRs. According to the licence holder, CHRs are protected through operational planning processes. When archaeological sites are encountered, the licence holder contacts the appropriate First Nation and conducts an archaeological impact assessment.

In the case of known archaeological sites, I accept that the amount of area reserved for these sites was adequately accounted for in the base case. I am aware that the base case did not explicitly account for unregistered and unknown archaeological sites or contemporary cultural heritage features in the TFL. While I accept that the area needed to protect sites identified in the future will largely overlap with areas reserved for other resource values, I also expect that given the extensive First Nations history in the area of the TFL, effectively managing for these resource values will require additional area be reserved from harvesting than was accounted for in the derivation of the THLB. As a result, I will account for a small unquantified overestimation of the base case mid- to long-term harvest levels, as discussed in ‘**Reasons for Decision**’.

I expect the licence holder and district to continue to track the areas excluded from timber harvesting to protect CHRs and to incorporate this information in the next timber supply review. These instructions are described in ‘**Implementation**’.

- cultural cedar

In the 2008 AAC *Rationale*, the deputy chief forest instructed the district to work with First Nations and the licence holder to develop a cedar management strategy for TFL 1, to be completed in time for the next timber supply review. He also asked the licence holder to provide the district with an annual report detailing the cedar volume harvested on the TFL compared to the cedar volume remaining on the TFL.

Following consultation with First Nations, a report entitled *Cultural Cedar Management Strategies for Cultural and Traditional Use of Cedar in the South Kalum TSA and TFL 01 and TFL 41* (March 31, 2013) was prepared by a local forestry consultant on behalf of the district. This report provides a summary of the issues and potential strategies required to meet First Nations’ cultural cedar needs over the long term. The report is intended to guide the district’s development of a cultural cedar management plan.

The licence holder did not report the requested cedar performance information. However, Ministry staff indicate the licence holder’s harvest performance has been evaluated in the *Provincial Timber Management Goals, Objectives and Targets – Management Unit Targets for*

TFL 1 Port Edward Report (August 8, 2020) (see ‘harvest performance’). A review of cutblocks harvested in the five-year period from 2015 to 2019 shows that on average cedar represented 3.7 percent of the VRI volume for stands older than 60 years and 4.2 percent of the volume reported in the Ministry’s Harvest Billing System (HBS). Ministry staff indicate that these values are reasonably similar as cedar is often underestimated during the photo interpretation of aerial photography used in the VRI.

During consultation, the Metlakatla asked how old growth cedar for cultural purposes was considered in the analysis and what strategies are in place to regenerate cedar. The licence holder indicates that there is very little cedar on TFL 1, and no specific assumptions were applied in the base case for cedar. The licence holder also noted that it continues to plant cedar on sites where it is an ecologically appropriate option. According to the *Timber Management Goals, Objectives and Targets* report, cedar represents an average of 25 percent of the planted stems and 6 percent of the stems at the free-growing stage for the five-year period from 2015 to 2019.

I conclude that the licence holder’s harvest of cedar is reasonably proportionate to its occurrence in the VRI and acknowledge the licence holder’s use of cedar in reforestation. I recognize that the foundational work required to develop a cedar management strategy has been completed and encourage the district, in partnership with First Nations and the licence holder, to complete this work, as indicated in ‘**Implementation**’.

- dead potential volume

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

Estimates of dead potential volume for TFL 1 were obtained from an inventory audit and VRI sample plots. The estimate based on the inventory audit plots was 4.4 percent, while the estimate based on the VRI sample plots was 1.1 percent. Ministry staff indicate that these values represent the maximum amount of volume from dead timber but do not consider the actual utilization of this volume.

In the 2008 *AAC Rationale*, the deputy chief forester asked the licence holder to monitor the harvest of dead potential timber over the term of the AAC so that the appropriate estimates of this volume could be incorporated into the next AAC determination.

Although the licence holder did not monitor the harvest of dead potential timber, the licence holder did review two large, current cutting permits. The results of this review suggest that dead potential volume represents less than one percent of the harvest volume. This observation is consistent with the VRI sample plot estimate.

Based on my review of this information I conclude that dead but potentially useable timber volume is not captured in natural stand volume estimates and was therefore not accounted for in the base case. For this reason, the base case underestimates the timber supply in the short term by an unknown, but likely very small, amount and I have accounted for this as discussed in ‘**Reasons for Decision**’.

- backlog and current non-stocked areas

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

In the 2008 *AAC Rationale*, the deputy chief forester noted that the NSR information for TFL 1 had not been updated since the previous timber supply review and asked the licence holder to complete regeneration surveys and remediate, as needed, any NSR stands.

The licence holder indicates that it is currently completing regeneration and free-growing surveys when necessary and that no backlog NSR exists on the TFL.

A review of the Ministry's Reporting Silviculture Updates and Land Status Tracking System (RESULTS) information shows that the amount of NSR is reflective of current harvest activity. The total area of current NSR (stands harvested after 2013) is 688.4 hectares and none of this area is past the regeneration due date. There were three harvested blocks with a total area of 278.5 hectares for which there is no silvicultural data in RESULTS. Ministry staff have contacted the licence holder for further information regarding these stands.

I note that the licence holder has undertaken the necessary regeneration surveys and that there is no backlog NSR beyond the current due dates. I conclude that the best available information was used, and I will make no adjustments to the base case on this account.

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

- stand establishment

In the 2008 *AAC Rationale*, the deputy chief forester asked the licence holder to complete regeneration surveys and take the necessary actions to regenerate areas with stocking below the acceptable standards. The deputy chief forester also encouraged the licence holder to plant species other than hemlock, most notably cedar.

The licence holder indicates that regeneration and free-growing surveys are completed as required and cedar is planted where it is an ecologically appropriate choice (see '*cultural cedar*').

As noted in the *Provincial Timber Management Goals, Objectives and Targets – Management Unit Targets for TFL 1 Port Edward Report*, there appears to be a two- to three-year planting delay and less than half of the harvested area is planted. The remaining harvested area regenerates without planting. The report confirms that the licence holder is consistent in meeting regeneration requirements. A review of the species composition of planted stems shows that the licence holder is planting a mix of species, including cedar.

I conclude that the managed stand regeneration assumptions used in the base case were supported by the best available information that reflects these planting practices. I am satisfied that the licence holder is completing the necessary regeneration and free-growing surveys and that they are planting a variety of tree species.

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

No factors under this section required additional comment.

Section 8 (8) (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

- avoidable harvest waste/fibre recovery

Avoidable harvest waste is merchantable timber volume left as standing or felled material within a cutblock following harvest.

The Coast Mountains Natural Resource District Manager requested a review of the effects of waste on regeneration and secondary wood fibre industries in the district. The findings indicate that the levels of felled waste are not likely affecting natural stand regeneration or planting. The reported waste values were found to be higher than the actual waste measured in the field. This

may be due to overestimation from ocular waste surveys and could pose difficulties for secondary wood fibre industries that rely on accurate waste data. This issue has been largely addressed with the April 1, 2019 *Appraisal Manual* waste requirements.

To date, the licence holder has not initiated projects on the secondary use of waste on TFL 1. Considering the large amount of waste, government staff would like to see more innovative use of waste material within TFL 1. Other licensees within the district have conducted secondary use studies funded by the Forest Enhancement Society of BC.

Waste amounts fluctuate annually, likely in response to changes in saw log and pulp prices and in the varying quality of wood in each cutblock. A review of the licence holder's waste submission data shows that a moderate to high proportion of the waste is left standing. Within the 10-year period from 2008 to 2017, the average percentage of waste left standing was 27 percent of the total waste, with one year as high as 48 percent.

The impact of waste on timber supply depends on the quality of the wood left as standing waste. If a large proportion of the standing waste is of higher quality, these stands could contribute to timber supply. However, if a large proportion of the standing waste is of low quality, these stands occupy growing space that might otherwise produce merchantable timber, thereby reducing timber supply. In addition, the effect of shading from the retention of standing waste in regenerating cutblocks was not incorporated into the growth and yield assumptions used in the timber supply analysis.

Increasing the use of lower quality fibre during primary harvesting operations is a significant priority for the government and the forest sector in BC. The provincial government is currently implementing a variety of initiatives to enhance the utilization of residual fibre left on a site after primary harvesting operations have been completed. This fibre includes smaller and poorer quality logs, pieces of logs, branches, and other forms of woody biomass. This material has historically been called "waste" or "residue" and is often burned to reduce the fire hazard that may exist on a site post-harvest.

Over the past few years, the emergence of new industries (wood pellets, biochemicals) and a decrease in wood chips from sawmills which supplied existing industries, such as pulp and paper producers, has led to an increased demand for residual fibre. Increasing the use of residual fibre supports new and existing forest industries that use lower quality timber, potentially improves future timber supply and reduces carbon emissions and wood smoke through decreased slash burning of post-harvest waste.

I commend the district on the work that it has undertaken to address waste in the district, including TFL 1. These actions are consistent with the government's commitment to increase the utilization of fibre previously considered waste.

As indicated in '**Implementation**', I expect the district to work with the licence holder to identify opportunities to undertake secondary wood fibre studies and to explore opportunities to improve the utilization of wood fibre in the TFL. I also expect the licence holder to work with FAIB to ensure that the shading effect of trees retained in harvested blocks is addressed in the growth and yield projections used in the next timber supply review. These expectations are included in '**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 and Range Act* (see Appendix 2), 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 objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- higher level plans

TFL 1 is located within the area covered by the Kalum LRMP which was approved by Cabinet in 2001. It does not have legal force but instead provides management guidance.

In 2006, some of the Kalum LRMP objectives and strategies were established as legal requirements under a Land Use Objectives Regulation Order (LUOR) for the Kalum LRMP area as part of the Kalum Sustainable Resource Management Plan (SRMP). The Kalum SRMP provides direction and guidance for land use and resource management within the Kalum plan area.

In December 2017, two amendments were made to the Kalum SRMP LUOR. One amendment was made to fulfil the Gitanyow Recognition and Reconciliation Agreement (2012) between BC and the Gitanyow Hereditary Chiefs. The other amendment was made to Objective 10 of the LUOR to better protect the Skeena Islands and to legally-establish the best management practices for the area as directed by the Kalum SRMP. These amendments were accounted for in the base case.

The Kalum SRMP area contains legally established wildlife habitat areas (WHA) for coastal tailed frogs (WHA 6-059 and 6-063) and grizzly bear (WHA 6-287), and ungulate winter ranges (UWR) for mountain goat (UWR 6-001) and moose (UWR 6-009). It also delineates old growth management areas (OGMA) and establishes objectives for biodiversity, marbled murrelet, visual objectives and community watersheds.

- Gitanyow Lax'yip Land Use Plan

The Gitanyow Lax'yip Land Use Plan (GLLUP) is the result of many years of negotiation between the Gitanyow Nation and the Government of BC. The land use plan is contained in the Gitanyow Huwilp Recognition and Reconciliation Agreement signed in March 2012. The GLLUP was brought into force under the Land Use Objectives Regulation by the *Amendment to the Land Use Objectives for the Kalum Sustainable Resource Management Plan (2006) – Kiteen Area Only* (Kiteen LUOR) dated December 4, 2017.

Following issuance of the order, the Kiteen LUOR objectives were incorporated into the base case. One of the ways the licence holder opted to do this was by excluding from the THLB all of the area within each of the Kalum-Kiteen Ecosystem Network, Kalum-Kiteen Ecosystem Network Buffer, Kalum-Kiteen Special Habitat for General Wildlife and Kalum-Kiteen Water Management Unit.

Ministry staff indicate that the management objectives for the ecosystem network buffer and water management unit do not preclude timber harvesting. The ecosystem network buffer is a 200-metre wide buffer within the periphery of the ecosystem network. Management objectives allow up to a maximum of 30 percent of the buffer area to consist of younger seral stage stands. For the Kalum-Kiteen watershed management unit, timber harvesting may occur within 200 metres of the periphery of the unit as long as less than 50 percent of the cutblock area is within the watershed management unit. After accounting for the area reductions associated with other factors, the Ecosystem Network Buffer and Kalum-Kiteen Water Management Unit management zones accounted for 1260 hectares and 3330 hectares that were excluded from the

THLB, respectively. I note that the exclusion of the Ecosystem Network Buffers and Water Management Unit Zones from the THLB in the base case was incorrect as it does not reflect the harvest potential under the modified practices allowed in these areas.

Pine mushroom (*Tricholoma magnivelare*) harvesting is a significant source of income for First Nations, local communities and itinerant mushroom pickers. Pine mushrooms are mycorrhizal fungi and consequently are more likely to persist and/or re-establish themselves if some host trees are retained during timber harvesting. Consequently, variable retention timber harvesting systems are preferred to clearcut harvesting in areas of pine mushroom habitat.

In order to maintain pine mushroom sites, the Kiteen LUOR includes an objective for pine mushrooms that requires 50 percent of the identified pine mushroom sites to be maintained in forest ages ranging from 80 to 200 years. The licence holder's recently amended FSP includes measures to maintain pine mushroom habitat. This objective, which has the potential to affect the rotation length of harvesting, was not modelled in the base case and it is unclear what effect, if any, this objective may have on timber supply.

I conclude that exclusion of the Kalum-Kiteen Ecosystem Network Buffer and Kalum-Kiteen Water Management Unit Zones from the THLB was incorrect and results in a small, unquantified underestimation of the base case harvest levels. I will account for this as discussed in '**Reasons for Decision**'. With respect to pine mushrooms, I encourage the licence holder to work with First Nations to ensure that these sites are managed in a way that both maintains and promotes pine mushroom production.

- Gitwangak Land Use Plan

The Gitxsan hereditary chiefs associated with the Gitxsan watershed of the Lower Skeena, or Gitwangak, have formed their own society entitled the Simgiget'm Gitwangak Society (SGS). The SGS independently developed the Gitwangak Land Use Plan (GLUP), which they presented to the provincial government in April 2017. Gitwangak requested that the GLUP be incorporated into the base case for this determination.

The GLUP documents Gitwangak cultural and natural resource values and specifies resource management zones for ecosystem networks, old growth management areas, Gitwangak cultural sites/places of importance, and valued wildlife habitat areas. It also specifies water management units and areas where it is not ecologically appropriate for timber harvesting or industrial development to occur.

While the GLUP has not been established as a legal land use plan, many of the values identified in the plan are covered by legal objectives in the Kalum SRMP and Government Action Regulation (GAR) Orders (e.g., grizzly bear habitat, mule deer winter range, old growth management areas, special management zones and community watersheds). As timber harvesting in TFL 1 is consistent with these legal objectives, these GLUP values are reflected in the base case.

In order to assess the timber supply impacts of the GLUP management approaches and objectives not explicitly accounted for in the base case, an alternative management scenario was prepared in which the areas associated with specified water management units and the ecosystem reserve network and surrounding buffer were excluded from the THLB. This resulted in a THLB of 66 995 hectares, which is 2.5 percent smaller than in the base case. In the alternative management scenario projection, the initial harvest level and long-term harvest levels were 1.8 percent and 1.5 percent lower than in the base case, respectively. A review of the alternative management projection outputs shows that the average annual area harvested, average harvest age and average volume per hectare are similar to those in the base case. The total area harvested throughout the projection is 1.1 percent lower than in the base case.

I have considered the request from Gitwangak that the GLUP be incorporated in the base case and note that although this plan has not been established as a legal plan by government, many of its requirements have been given legal effect under the Kalum SRMP and GAR orders and, as such, were reflected in the TFL 1 base case. The small differences - less than two percent - between the base case and alternative GLUP management scenario harvest levels and total area harvested support this conclusion.

Regarding recognition of GLUP values that have not been established as legal objectives, I note that I do not have the authority to establish legal objectives and, in keeping with my guiding principles, I will not speculate on the timber supply impacts that are not formally defined or approved by government or may eventually result from these land-use designations. However, if government establishes the GLUP as a legal land use plan, I am prepared to re-visit this decision earlier than required under Section 8 of the *Forest Act*.

- landscape level biodiversity

In the 2008 AAC *Rationale*, the deputy chief forester asked the licence holder to ensure that all land-use objectives in the Kalum SRMP related to landscape-level biodiversity, including established OGMA's, be accounted for in the analysis for the next AAC determination.

OGMA's and "mature-plus-old" seral requirements for TFL 1 have been established under the Kalum SRMP. A total of 9201 hectares are spatially located as OGMA's. After accounting for overlaps with areas reserved for other non-timber values, a net area of 6506 hectares was excluded from the THLB to account for OGMA's.

"Mature-plus-old" seral requirements, which are incremental to the OGMA's, were tracked by landscape unit and biogeoclimatic variant but harvesting in the model was not limited by the seral stage requirements. The tracking in the model demonstrated the licence holder is making progress to meeting the Kalum SRMP land-use objectives.

The Kalum SRMP requires the "mature-plus-old" seral objectives to be achieved in the shortest time possible. While I accept the tracking of the seral stages for this timber supply review, I expect the licence holder, as indicated in '**Implementation**', to reflect full achievement of the "mature-plus-old" seral requirements in the next timber supply review.

- wildlife habitat

Wildlife habitat areas are established through the issuance of GAR orders to provide habitat for identified wildlife species that are at risk or are of regional importance and include objectives that may limit or prevent timber harvesting.

Coastal tailed frog habitat areas (WHA 6-063 and WHA 6-059) were established in March 2006. To account for these areas, in which timber harvesting is not permitted, and after accounting for the areas previously excluded from the THLB to account for other factors, a net area of 396 hectares was excluded from the THLB.

Grizzly bear WHA (U-6-287) was established in June 2018. To account for this area, in which timber harvesting is not permitted, a net area of 1753 hectares was excluded from the THLB. Additional grizzly bear WHAs are anticipated for TFLs 1 and 41, and the Kalum, Cascadia and Pacific TSAs. The Skeena Regional Ecosystems staff have identified completion of grizzly bear mapping as a high priority.

The Kalum LRMP includes grizzly bear objectives that are not met by the established WHAs. These objectives include providing natural levels of forage and berries, maintaining natural levels of forage within old growth forest, implementing specific stocking standards on richer, wetter sites and limiting the rate of harvest in the Copper Watershed. Tenure holders in the Kalum LRMP area include strategies to meet these objectives in their FSPs.

FSPs in TFL 1 stipulate stocking standards that allow for “clumpy” stocking of conifers. This stocking standard is intended to promote forage/berry patches for grizzly bears. Due to the increased stem mortality within clumps, reduced site occupancy, delayed regeneration and lower productivity in gap areas, the timber volume of clumpy stands is expected to be about five percent lower than conventionally managed stands.

Ministry staff estimate that the richer, wetter sites in which clumpy stocking is applied account for about 10 percent of the THLB. As the base case did not account for clumpy stocking, the base case long-term harvest level has likely been overestimated by about 0.5 percent.

The Kalum LRMP grizzly bear objective for the Copper Watershed, which accounts for 8994 hectares of forested land, of which 3986 hectares contributes to the THLB, requires that no more than 30 percent of stands in the watershed can be between the ages of 25 years and 100 years. This requirement was modelled in the base case.

In the 2008 *AAC Rationale*, the deputy chief forester encouraged the licence holder to monitor the management practices for grizzly bear prescribed in the SRMP and to include appropriate assumptions to reflect these practices in the next timber supply analysis. In response, the licence holder excluded the grizzly bear WHA from the THLB and modelled the Copper Watershed requirements in the base case. As described above, although the licence holder’s FSP commits to the Kalum LRMP grizzly bear objectives, including clumpy stocking, these practices were not reflected in the base case.

Based on my review of the wildlife habitat information and discussions with Ministry staff, I conclude that the established WHAs and Copper Watershed forest cover requirement were correctly accounted for in the base case. However, the managed stand yield estimates used in the base case did not account for the loss of timber productivity associated with clumpy stocking. This results in a 0.5 percent overestimation in the base case long-term harvest level, and I will account for this in my decision as discussed in ‘**Reasons for Decision**’.

In addition to the WHAs established by GAR orders, a Section 7 Notice under the FPPR has been issued for marbled murrelet. The licence holder has addressed the Section 7 Notice through the results and strategies in their approved FSP by adhering to patch size seral targets and maintenance of the OGMA established in the Kalum SRMP.

I commend the licence holder on its commitment to meeting the Kalum LRMP grizzly bear objectives, including the use of clumpy stocking to promote forage and berry production, and Section 7 Notice requirements for marbled murrelet in its FSPs. In order to better understand the extent and potential impact associated with this practice, I encourage the licence holder to track the use of clumpy stocking and to work with FAIB to ensure that this information is incorporated in the managed stand yield estimates for the next timber supply review, as indicated in ‘**Implementation**’.

With respect to grizzly bear WHA, I encourage staff in the Skeena Region to complete the mapping and establishment of grizzly bear WHAs. If any new grizzly bear habitat requirements are established that could have a significant effect on timber supply, I am prepared to revisit this determination earlier than required under Section 8 of the *Forest Act*.

- ungulate winter range

Ungulate winter ranges and general wildlife measures for mountain goat (U-6-001) and for moose (U-6-009) have been established by GAR orders in accordance with the Kalum SRMP. To account for these areas, a total area of 9632 hectares was excluded from the THLB.

Gitanyow commented that under UWR Order U-6-001, mountain goat polygon Mg 018 is actually canyon/escarpment mountain goat habitat, and that canyon/escarpment mountain goat polygon Mg 009 is actually mountain goat habitat. The general wildlife measures for mountain goat and canyon/escarpment mountain goat winter ranges for U-6-001 differ. For mountain goats, a 500-metre buffer in which primary forest activities are only permitted between June 15th and October 31st is applied to mountain goat winter range. For canyon/escarpment mountain goats, a 1000-metre buffer is applied that restricts primary forest activities between June 15th and October 31st. As these buffer areas are seasonably accessible to harvesting they were not excluded from the THLB.

The Gitanyow Lax'yip Land Use Plan identified a 1000-metre buffer in which no industrial activities are allowed for canyon/escarpment goat winter range. This provision was not included in U-6-001 and is currently not a legal requirement. Gitanyow further commented that canyon/escarpment mountain goat utilize this habitat in all seasons, not just the winter.

I am satisfied that the mountain goat and moose UWRs were correctly modelled, and I will make no adjustments to the base case on this account. As indicated in '**Implementation**', I encourage the Skeena Region staff to review the current identification of mountain goat and canyon/escarpment mountain goat winter ranges to ensure that the appropriate management practices are being employed.

- high conservation value area

The Kalum SRMP identifies "high conservation value" areas in which timber harvesting is either prohibited or constrained, including connectivity corridors for wildlife, the Lakelse and Kitsumkalum Special Resource Management Zones, and the Skeena Islands. These areas were accounted for in the base case by excluding the productive forest associated with each area from the THLB.

Objective 10 of the Kalum SRMP restricts timber harvesting for the preservation of rare plant communities in the Skeena Islands. This objective was amended in December 2017. For the base case, the licence holder accounted for the original Objective 10 requirements (pre-2017) by excluding 383 hectares from the THLB and the amended Objective 10 requirements by excluding an additional 106 hectares from the THLB. Since the amended Objective 10 requirements replace the previous requirements, this approach resulted in the exclusion of up to 383 hectares more than required.

Based on my discussions with Ministry staff, I conclude that, except for the Skeena Islands, the Kalum SRMP objectives for high conservation value areas were correctly modelled in the base case. For the Skeena Islands, accounting for both the original and amended Kalum SRMP Objective 10 represents an underestimation of up to 383 hectares in the size of the THLB. An underestimation in the size of the THLB of this magnitude has a negligible effect on timber supply, consequently I will not adjust the base case on this account.

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

- First Nations

The Crown maintains a duty to consult with and accommodate, as necessary, those First Nations for whom it has knowledge of claimed Aboriginal Interests that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. The AAC determination is a strategic decision that sets the stage for other decisions such as AAC apportionment and disposition, leading to issuance of cutting authorities. AAC determinations do

not determine particular harvesting areas or patterns, and as a result do not relate directly to the manner in which timber is utilized or managed on the ground. The relationship to claims of Aboriginal title is not a direct one. The AAC considers the sustainable harvest level from a geographic area which may include lands claimed as Aboriginal title lands but not yet declared by a court to be such. While under claim, such lands remain Crown lands and are part of the harvestable land base. Whether timber is ultimately harvested from those lands is an issue that is subject to allocation decisions, and the AAC determination does not determine that matter.

The AAC can affect various resource values and therefore the ability of Aboriginal Peoples to meaningfully exercise their Aboriginal rights. Information gained through consultation with potentially affected First Nations about Aboriginal Interests has been considered in the development of this determination.

Twelve Indigenous Groups and one Treaty Nation have consultative areas that overlap with TFL 1: The Office of the Wet'suwet'en, Tsetsaut Skii km Lax Ha, Nisga'a Lisims Government, Skin Tyee Nation, Kitselas First Nation, Lax Kw'alaams Band, Kitsumkalum First Nation, Metlakatla Band Council, Gitanyow Hereditary Chiefs, Haisla Nation, Gitxsan Simigyet'm Gitwangak Society, Wet'suwet'en First Nation and Gitxsan Hereditary Chiefs Haakasxw and Yal.

Consultation with four First Nations was conducted in accordance with the spectrum described in the *Haida v. British Columbia* decision as no agreement was in place at the time of engagement, including: The Office of the Wet'suwet'en, Tsetsaut Skii km Lax Ha, and the Gitxsan Hereditary Chiefs Haakasxw and Yal.

Consultation with the Metlakatla Band Council and Haisla Nation was consistent with the Coastal First Nations Engagement Framework, part of the Coastal First Nations Reconciliation Protocol (2017), of which both are signatories.

Consultation with the Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams Band, Skin Tyee and Wet'suwet'en First Nation was consistent with the consultation protocols included in current Forestry Consultation and Revenue-Sharing Agreements.

Consultation with the Gitxsan Simigyet'm Society followed the *Haida v. British Columbia* decision for the TFL 1 Information Package, as this occurred prior to signature of the Gitwangak Laxyip Strategic Engagement Agreement (SEA) in 2018. Consultation for the TFL 1 draft Management Plan was consistent with the SEA.

Consultation with Nisga'a Lisims Government was consistent with the draft Nass Stewardship Protocol that is currently being negotiated with the Province. The Skeena Region has been using the draft protocol on a pilot basis since 2017.

As per Gitanyow's Huwilp Reconciliation Agreement (2016), Gitanyow Hereditary Chiefs negotiated a Level 4 Engagement Process for TFL 1 and the Kispiox and Nass TSAs. Consultation was consistent with this agreement.

As per recent case law and current government direction, a review of available information for the First Nations was conducted to assess the level of consultation given the strength of claims made by First Nations and the degree of impact the AAC determination may have on those claims. The information reviewed included the available ethno-historic reports, traditional use studies, archaeological records, wildlife assessments and notes from related consultation processes. The initial level of consultation was derived by the Ministry based on this information, the degree of overlap with the TFL or on the levels specified in the relevant agreements.

The review of information suggests that the First Nations associated with TFL 1 have exercised their Aboriginal Interests within their asserted traditional territory and could likely support an Aboriginal rights claim in any portion of those areas in regard to hunting, fishing, use of wood for both domestic and ceremonial purposes, and gathering. The practice of some of these activities is ongoing.

Based on the available information and potential impact the AAC decision may have on First Nations' Aboriginal Interests, the suggested level of consultation for the Haisla First Nation is "notification", due to the limited overlap of Haisla territory with TFL 1.

For the Kitselas First Nation, Lax Kw'alaams Band, Kitsumkalum First Nation, Wet'suwet'en First Nation and Skin Tyee First Nation the suggested level of consultation is "level 5" or "normal" consistent with the consultation matrix of their respective Forestry Consultation and Revenue-Sharing Agreements.

For the Nisga'a Lisims Government the suggested level of consultation is "level 3", as per the draft Nass Stewardship Protocol.

For the Metlakatla Band Council the suggested level of consultation is "level 4", as per the Coastal First Nations Engagement Framework.

For the Gitanyow Hereditary Chiefs the suggested level of consultation is "level 4" as per the *Gitanyow Huwilp Recognition and Reconciliation Agreement for the Timber Supply Reviews of Tree Farm Licence 1 and the Kispiox and Nass Timber Supply Areas*.

For the Gitwangak Simiget'm Society the suggested level of consultation is "normal" as per the Gitwangak Lax'yip Strategic Engagement Agreement.

Ministry staff led the consultation process for the TFL 1 Draft Management Plan No. 11 and the timber supply review supporting this AAC determination. Representatives of the TFL licence holder were available for assistance as required. Additionally, and prior to the formal consultation process, the licence holder engaged in proponent-led information sharing with each of the relevant First Nations.

The pre-engagement process was initiated by Ministry staff with the relevant First Nations on January 6, 2017, with a written invitation from the chief forester to meet and provide feedback on the TFL 1, Kispiox TSA and Nass TSA timber supply reviews.

Formal consultation on TFL 1 was initiated by letter by Ministry staff with all relevant First Nations on May 12, 2017.

In the letters, Ministry staff included a summary of the initial review of available information regarding First Nations interests, and an initial assessment of the potential impact the Draft Management Plan No. 11 and subsequent AAC determination for TFL 1 may have on First Nations' interests. The letters also included the suggested level of consultation deemed appropriate for each First Nation given the initial review of available information and the consultation process specified in agreements.

First Nations were consulted on the Information Package and the draft Management Plan, including the results of the timber supply analysis. The relevant documents were provided to the First Nations by the licence holder through the information sharing process.

No responses were received from the Tsetsaut Skii km Lax Ha, Skin Tyee Nation, Kitselas First Nation, Lax Kw'alaams Band, Wet'suwet'en First Nation and the Gitxsan Hereditary Chiefs Haakasxw and Yal.

Haisla confirmed engagement at the “notification” level due to the minimal overlap with TFL 1 boundaries.

Kitsumkalum confirmed engagement at the “normal” level and shared concerns regarding Kitsumkalum Agreement-in-Principle (AIP) lands (see ‘*Kitsumkalum Agreement-in-Principle*’), the harvest of young stands (see ‘*harvest performance*’) and timber with no economic value, such as cottonwood that are either harvested or damaged and left as waste (see ‘*deciduous-leading stands*’) and concerns that the recommendations included in the 2008 AAC Rationale were not enforced. With respect to the latter, the chief forester and deputy chief forester have limited legal authority to compel licence holders to take the actions requested in AAC rationales. Generally, these requests involve improving the information available for timber supply reviews, monitoring and/or reporting on management practices and harvest performance, and collaborating with Ministry staff and First Nations to develop management strategies (e.g., cedar and second-growth management strategies).

Metlakatla confirmed engagement at “level 3” and brought forward concerns regarding the cumulative effects that harvesting and road development are having on wildlife habitat. Further, Metlakatla has noted cumulative effects concerns in consultation on cutting permits and road permits in the Lakelse and Williams Creek drainages.

Simigiet’m Gitwangak Society (SGS) confirmed engagement at the “normal” level. The SGS requested that their land use plan be used in the base case for this determination (see “*Gitwangak Land Use Plan*”).

The Office of the Wet’suwet’en (OW) indicated that the house territories impacted by TFL 1 are designated as conservancies in which harvesting is restricted. The licence holder noted that there is no THLB within the areas of overlap between the house territories and TFL 1. The OW has indicated that if this changes, the Upper Clore and Telkwa Pass areas should be excluded from the THLB. District staff discussed this concern with the OW and it was agreed that in the unlikely event that a cutting permit is submitted for these areas it would be reviewed with the hereditary chiefs.

The Nisga’a Lisims Government (NLG) raised concerns regarding the environmental impacts to treaty interests in the area overlapping TFL 1. They requested the deferral of operations in the Nass Area and Nass Wildlife Area until the licence holder addresses these areas in a major FSP amendment. The NLG raised concerns about disproportionate logging in the Nass Area and implementation of the deputy chief forester’s recommendations – cedar management, review and approval of riparian inventory in the TFL and monitoring wildlife/grizzly bear management strategies. The licence holder has negotiated best management practices with the NLG on how they will operate in the Nass Area and Nass Wildlife Area that are intended to minimize or mitigate any impacts on the NLG’s treaty interests. The licence holder also provided summaries that show the projected area and volume harvested in the base case in five-year increments for the entire modelled time horizon. Charts of the current and future age distribution for both the productive land base and THLB within the Nass Wildlife Area were also provided.

In reviewing the First Nations consultation process with district staff, I accept the Ministry staff’s assessment that all 12 Indigenous Groups and one Treaty Nation whose territories overlap TFL 1 were consulted in accordance with current provincial guidance and applicable case law. I am satisfied that consultations have been carried out in good faith and the Crown’s process of seeking to understand potentially outstanding issues and impacts was reasonable.

Any adverse impacts upon the Aboriginal Interests of the relevant First Nations, stemming from forest development activities that occur subsequent to the AAC determination can be appropriately mitigated through existing legislation and regulation, planning documents and

meaningful engagement at the operational level. I also accept their assessment that the potential for adverse effects on the Aboriginal and treaty interests of the Kitsumkalum, Nisga'a, Metlakatla, Gitwangak and Gitanyow have been avoided, minimized or otherwise accommodated to an acceptable level.

- Kitsumkalum Agreement-in-Principle

In 2015, the Kitsumkalum First Nation and the Governments of BC and Canada reached a milestone in the BC treaty process with the signing of an Agreement-in-Principle (AIP). The lands associated with the AIP represent the area that will likely be included in the actual treaty once it is finalized and implemented.

The Kitsumkalum First Nation have shared concerns regarding overlapping licences and forest management within their traditional territory, including the AIP lands. The Kitsumkalum have indicated that they do not currently have the capacity to review the licence holder's draft Management Plan in depth and must rely on professional reliance and Ministry scrutiny to ensure that resources are adequately managed. They expressed concern that harvest levels and management should protect fish, wildlife and ecosystems so that Kitsumkalum Aboriginal Title and Rights are preserved and that there remain ample opportunities for Kitsumkalum cultural and traditional use within the licence area.

An Order in Council (OIC) issued on September 19, 2016 established an area, including the AIP lands, as the Kitsumkalum-Kitselas Designated Area No.1 under Section 169 (Part 13) of the *Forest Act* for the period ending June 30, 2025. On June 18, 2018, a Ministerial Order (M228/2018) was issued restricting the issuance of cutting and road permits within the Kitsumkalum-Kitselas Designated Area No. 1 and suspending the rights of permit holders. The order has since been amended to allow for the issuance of cutting and road permits to the Kitsumkalum. The Kitsumkalum hold a forest licence to cut (FLTC) for 288 910 cubic metres for the 10-year period from 2014 to 2024. This volume was apportioned from the TFL AAC but is restricted to their traditional territory, including the designated area.

In considering the Kitsumkalum-Kitselas Designated Area No. 1, I am mindful that the Kitsumkalum Treaty is not yet in effect, and as such, the AIP lands remain provincial land managed by the Province and contribute to timber supply. Section 173 (Part 13) of the *Forest Act* allows the chief forester to issue an order temporarily reducing a management unit AAC if harvesting is not permitted in the designated area and the chief forester determines that this may adversely impact timber supply. Given that the Kitsumkalum have been issued cutting permits and road development permits within the designated area, I will not issue a Section 173 (Part 13) order at this time.

Once the Kitsumkalum Treaty takes effect, the AIP lands will no longer be provincial land and will be removed from TFL 1 for future AAC determinations. With respect to the concerns shared by Kitsumkalum, I am satisfied that the Province has taken appropriate legal measures described above to protect Kitsumkalum interests in the AIP lands while the treaty is ratified.

- Gitanyow Level 4 TSR Engagement – TFL 1

level 4 engagement process

On March 28, 2012, the Province and the Gitanyow First Nation ("the Parties"), as represented by the Gitanyow Hereditary Chiefs and Gitanyow Huwilp Society, entered into the *Gitanyow Huwilp Recognition and Reconciliation Agreement* (GRRRA). This agreement, which is intended to be "a bridging step towards reconciliation and a constructive step towards creating a positive and enduring relationship between the Gitanyow and Province", establishes a shared decision-making

model for land and resource decisions within the Gitanyow Lax'yip. This agreement was renewed in 2016.

In accordance with the GRRA, the Parties negotiated the *Gitanyow Level 4 Timber Supply Review Agreement for TFL 1 and the Nass and Kispiox TSAs* in 2016. Although this agreement has not been signed, the spirit and intent of the agreement is being followed. As part of the level 4 engagement process, the Gitanyow commissioned a *Gitanyow Timber Supply Report* that assessed the potential timber supply attributable to all three of the management unit areas on Gitanyow territory. Although the Province was unable to undertake this analysis, information was provided for use by the Gitanyow consultants through a data sharing agreement.

As per the level 4 process, the *Gitanyow Timber Supply Report* was to be completed before any of the management unit AAC decisions could be completed. In order for this to occur, the TFL 1 AAC determination was delayed. On September 16th, 2020, Gitanyow representatives presented the report to the deputy chief forester and Ministry staff.

On October 14, 2020, the Gitanyow representatives met with Ministry staff for a more detailed technical review of the report and to draft joint recommendations for the upcoming TFL 1 AAC determination. In order to allow for a substantive response to the concerns raised by the Gitanyow during this meeting, the TFL 1 AAC determination meeting was delayed to allow time for further discussion and to develop joint recommendations.

On December 3rd, 2020, the Gitanyow representatives, the deputy chief forester and Ministry staff met again to discuss the joint recommendations.

Two TFL 1 specific and one Gitanyow Lax'yip joint recommendations were accepted by Gitanyow and the Province on December 16, 2020.

level 4 engagement recommendations

In the first TFL 1 specific recommendation, the Parties agreed that the input provided by the Gitanyow Hereditary Chiefs Office for TFL 1 is without prejudice to any current or future decisions regarding harvest activities in Wilp Watakhayetsxw territory. The Parties affirmed that the TFL 1 timber supply review process will seek to describe a sustainable harvest level without unduly constraining Gitanyow's ability to transfer volume and amend TFL 1 boundaries in the future.

In the second TFL 1 specific recommendation, the Parties did not reach a consensus. The Gitanyow indicated the yield estimates used in the timber supply analysis were overestimated as they did not account for the available information for the current climate or the potential negative impacts of climate change on timber supply. The Gitanyow indicate that reducing the yields to reflect this information is critical to the continued exercise of Gitanyow rights and title, while still allowing for sustainable economic development. This would also reflect the principles outlined in the *United Nations Declaration on the Rights of Indigenous Peoples*.

The Provincial representatives agreed the yield estimates used in the TFL 1 timber supply were overestimated since they do not account for a number of forest health factors. To address this issue, the government analysts worked with the North Area Region Forest Pathologist to calculate disease loss factors. The government analysts concluded that an adjustment to the TFL 1 base case should be applied to account for these additional loss factors (see '*non-recoverable losses*').

The Gitanyow considered the government response to their recommendation and indicated that although the approach used to adjust the yield estimates acknowledged the Gitanyow's forest health findings, additional analysis and dialogue is necessary to quantify the volume reductions for the other timber supply reviews in the Gitanyow Lax'yip.

To address this issue, I met with the Regional Executive Director (RED) to determine an effective forum for additional analysis and dialogue moving forward. The RED informed me that he supports a broad array of monitoring and that he is a strong proponent for the involvement and collaboration of Indigenous communities with these monitoring programs. He recognized that significant monitoring is already underway within the Gitanyow territories and surrounding area and noted that the Gitanyow are participants in many programs such as the Skeena Sustainability Assessment Forum (SSAF). He suggested that new monitoring efforts, to address the Gitanyow's concerns, be incorporated into existing monitoring programs that provide access to funding and capacity support.

The proposed monitoring will endeavor to provide trusted information about how the current forest state, ecosystem changes and projected development, influence important Gitanyow values, including timber supply. Monitoring decisions will be shared by the Province and Gitanyow. Forest licence holders and other topic experts will be invited to discuss methodology and results, when appropriate. The monitoring will recommend immediate changes to forest management to address concerns raised in monitoring reports and will recommend changes to timber supply modelling and factors influencing the AAC determination.

Although consensus was not reached in this area, I agree that the monitoring proposed by Gitanyow is important, in order to work towards mutual resolution of outstanding questions, and to improve the information for the next TSR. Collaborative monitoring will also provide additional insight to changes within the Gitanyow territories and will assist with the information needs of the community.

I have considered the information provided by Gitanyow, including the Gitanyow Timber Supply Report (see '*Gitanyow Timber Supply Report*' below) and the recommendations summarized above. My consideration of the yield estimates used in the timber supply analysis are described below under '*non-recoverable losses*'. With respect to the Gitanyow Lax'yip Monitoring Committee, I continue to encourage and support the RED and the Office of the Chief Forester to increase the participation of the Gitanyow and other Indigenous communities in existing monitoring programs, such that monitoring the values and concerns identified by the Indigenous communities is improved. However, the scope and function of the monitoring program must be aligned with the capacity and resources available to the Ministry and Gitanyow.

In conclusion, I would like to thank Gitanyow and Ministry staff whose considerable efforts and collaborative work have helped to inform this AAC determination.

- *Gitanyow Timber Supply Report and AAC recommendations*

According to the *Gitanyow Timber Supply Report*, Gitanyow Lax'yip, which includes area in TFL 1, and the Nass and Kispiox TSAs, is 628 586 hectares, of which 362 769 hectares is forested and 149 380 hectares is THLB. TFL 1 covers 26 966 hectares of Gitanyow Lax'yip, of which 15 769 hectares is forested and 6149 hectares is THLB. The 6149 hectares of THLB within TFL 1 that overlaps the Gitanyow Lax'yip represents 4.1 percent of the THLB within the Gitanyow Lax'yip.

Information from the licence holder indicates the Gitanyow Lax'yip that overlaps TFL 1 is 26 880 hectares, of which 16 060 is forested and 5389 hectares is THLB. The Gitanyow Lax'yip that overlaps TFL 1 represents 6.3 percent of the total area, 9.2 percent of the productive forest and 7.8 percent of the THLB within TFL 1.

The TFL 1 base case shows an average of 17 726 cubic metres per year is harvested from the Gitanyow Lax'yip within TFL 1. This harvest volume is derived from an average of 43 hectares of area harvested per year. The 17 726 cubic metres per year represents 7.1 percent of the volume harvested annually from TFL 1.

Gitanyow indicate that in order to achieve maximum timber growth across Gitanyow Territory the rate of harvest should be based on an average 102-year rotation, which equates to harvesting 0.98 percent of the THLB annually. They also suggest a 140-year rotation based on natural stand growth, which equates to harvesting 0.71 percent of the THLB annually, might also be appropriate.

In response to these recommendations, FAIB reviewed the base case outputs and found that about 566 hectares or 0.82 percent of the THLB is harvested in the model during the short term. About 511 hectares or 0.74 percent of the THLB is harvested each year in the model throughout the 250-year projection.

Gitanyow also recommend that the harvest level should be established at a level below the optimum level indicated in the timber supply model to account for non-optimal harvesting strategies and to maintain a mature volume buffer that supports at least a decade of harvesting. The Gitanyow note that while higher harvest rates can increase the short-term benefits, not all of these benefits are realized locally. They also note that sudden shortages of timber can substantially impact community stability. They suggest a sustainable AAC should balance the benefits of higher harvest rates with risks of future timber shortages.

I have met with Gitanyow representatives and Ministry staff to review and discuss the *Gitanyow Timber Supply Report*. Where the information in the report pertains to TFL 1, I have considered it in this determination.

With respect to the recommended rotation ages, I note that the annual area harvested during the short term in the base case – 0.82 percent – is within the range proposed by Gitanyow.

- harvest performance

The current TFL 1 AAC is 378 059 cubic metres. Of this, 320 277 cubic metres is apportioned to Coast Tsimshian Resources. The remaining 57 782 cubic metres, which is reserved by the province, was used to support the issuance of two Forest Licences to Cut (FLTC) for the 10-year period from 2014 to 2024 to the Kitselas First Nation and Kalum Ventures Limited on behalf of Kitsumkalum First Nation. The Kitselas First Nation FLTC has a maximum harvest volume of 305 986 cubic metres. The Kitsumkalum FLTC has a maximum harvest volume of 288 910 cubic metres. Although there has only been limited harvesting of the licence volumes to date both the Kitselas and Kitsumkalum First Nations have indicated they intend to harvest the available FLTC volumes by 2024. No licences were issued from the 57 782 cubic metres available for disposition in 2013.

A review of the Ministry's Harvest Billing System (HBS) shows that during the period 2007 to 2019, the licence holder harvested an average of 85 percent of its AAC apportionment. For the cut-control period ending in 2016, the licence holder harvested 97 percent of its AAC apportionment.

The licence holder's harvest performance is evaluated in the *Provincial Timber Management Goals, Objectives and Targets – Management Unit Targets for TFL 1 Port Edward Report*. The evaluation examines the extent to which harvest performance in TFL 1 correlates with the AAC, and the species composition, slope, age and volume classes of stands in the VRI. Note that the harvest performance information is relative to the entire TFL 1 AAC, not just the licence holder's AAC apportionment.

A comparison of the leading species profile of the harvested cutblocks reported in the Ministry's Forest Tenures Administration system during the period 2014 to 2018 to the leading species profile of stands older than 60 years in the VRI shows that the full species profile is being proportionately harvested without an undue concentration or avoidance of any particular species.

A comparison of the harvest profile of cutblocks by slope class to the slope class prevalence in the TFL shows that while harvesting is occurring in all slope classes, the harvest of the steepest slopes is less in proportion to their occurrence.

A comparison of the stand age at harvest to the age profile in the VRI shows, for the period 2014 to 2018, the harvest rate of stands older than 140 years was slightly lower and the harvest rate of stands younger than 80 years was higher than their proportional occurrence in the VRI. About 10 percent of the harvest during the 2014 to 2018 period occurred in stands less than 60 years of age.

A review of the volume per hectare of stands harvested for the period 2014 to 2018 shows that although the licence holder is harvesting in predominantly older, higher volume stands, harvesting is occurring in stands between the ages of 40 years and 140 years with volumes less than 150 cubic metres per hectare.

The Kitsumkalum First Nation have expressed concern regarding the harvest of young stands and asked how the harvesting of younger stands affects short- and long-term timber supply projections. In response, a sensitivity analysis was prepared in which the model was required to harvest 20 000 cubic metres per year from stands younger than 80 years for the first two decades of the timber supply projection. This resulted in decreases to the short- and long-term harvest levels of 0.9 percent and 0.1 percent relative to the base case, respectively.

In the 2008 AAC *Rationale*, the deputy chief forester responded to concerns regarding the harvest of young stands by encouraging the licence holder to work with the district to develop a second-growth management strategy. Following the determination, licence holders, BC Timber Sales and district staff worked collaboratively to develop the *Guiding Principles and Considerations When Planning the Harvest of Second Growth* (June 2011). These best management practices do not preclude the harvest of younger stands provided it does not adversely affect timber supply. District staff inform me the licence holder is a signatory to these principles and continues to use them to guide the management of second-growth stands.

I have considered the harvest of younger, low volume stands and the concern shared by the Kitsumkalum First Nation. And, although I commend the licence holder on its adherence to the locally developed best management principles for the harvest of second-growth stands, I am mindful that the harvest of young stands that have yet to realize their maximum growth potential can adversely affect future timber supply. For this reason, it is my expectation that the licence holder and district will monitor the harvest of young, low volume stands to ensure that these stands are reaching maturity prior to harvest. This instruction is described in '**Implementation**'.

- accumulated volume

In January 2018, the Ministry introduced the *Policy Regarding the Administration of Unharvested Volumes, Uncommitted Volumes and Unused BC Timber Sales Volumes* (collectively referred to as "accumulated volume"). One of the purposes of this policy is to guide the administration of accumulated volumes for forest licences, TFLs and woodlot licences. The policy sets out the process steps that should be followed to identify the accumulated volume that may be made available in the next AAC determination period, i.e., following a Section 8 AAC determination.

As previously discussed under ‘*harvest performance*’, no licences were issued from the 57 782 cubic metres that was available for disposition in 2013. This resulted in the accumulation of 57 782 cubic metres of uncommitted volume. Following First Nations consultation, the Skeena Regional Executive Director decided to retire the uncommitted volume. As such, the volume is no longer available for disposition and has been incorporated into the standing inventory used in the base case.

For TFL 1, regional tenures staff indicate that the licence holder has accrued a total of 41 810 cubic metres of unharvested volume in TFL 1 up to 2016, the end of the last cut control period. In accordance with Section 75.8 of the *Forest Act* this volume is no longer available for harvest by the licence holder. Regional tenures staff indicate there are currently no plans to dispose of this volume and First Nations will be consulted if a disposition strategy is considered in the future.

The growing stock used in the base case was not depleted to account for the unharvested volume. Reducing the growing stock of existing natural stands, which are the primary source of timber supply until harvesting transitions to managed stands, by 41 810 cubic metres, reduces the base case harvest levels by 0.4 percent for the first 30 years of the forecast period.

In considering the information regarding accumulated volumes, I conclude the uncommitted volume has been retired and as such will not be issued to new licences following this determination. With respect to the unharvested volume accrued by the licence holder, I accept that regional tenures staff do not currently have a strategy in place for disposing this volume. However, as I am aware Section 75.8 of the *Forest Act* does not permit this volume to be harvested by the licence holder in a subsequent cut control period, I will account for an incremental reduction of 0.4 percent to the TFL timber supply as discussed in ‘**Reasons for Decision**’.

- cumulative effects

Cumulative effects are changes to social, economic and environmental conditions caused by the combined impact of past, present and potential human activities or natural events. The Government of British Columbia supports the phased implementation of the Cumulative Effects Framework (CEF) that aims to provide relevant information and supporting policy. The CEF gives resource managers the procedures and tools to inform decisions that support sustainable management and the needs of many different users. The provincial cumulative effects team continues to support cumulative effects assessments (CEA) for grizzly bear, moose, aquatic ecosystems, forest biodiversity and old growth by region, and have recently updated assessments for grizzly bears, aquatic ecosystems and biodiversity.

In the Skeena Region, cumulative effects assessments are largely being delivered through two Environmental Stewardship Initiatives (ESI): the Skeena Sustainability Assessment Forum and the North Coast Environmental Stewardship Initiative. Both ESI forums are conducted in partnership with First Nations. The CEAs for aquatic ecosystems and grizzly bear overlap with and provide insight for TFL 1.

aquatic ecosystem CEA

The provincial assessment protocol includes indicators that relate to three main components of aquatic ecosystems: water quantity, water quality and aquatic habitat. Three indicators were chosen due to their relevance to timber supply reviews and expert recommendations, these include: road density, total land disturbance and peak flow index (equivalent clearcut area). This aquatic ecosystem CEA uses 2018 data.

The results of the aquatic ecosystems CEA show road density near streams (less than 100 metres from a stream) is high across much of the southern portions of TFL 1. Road density relates directly to forest harvesting, other industries and human habitation as road networks expand to increase access.

The impacts of roads on water quality are reported in the Forest and Range Evaluation Program (FREP) results. Sediment delivery from roads to streams has caused some FREP water quality sampling sites to rank as medium to high impact levels across the Coast Mountains Natural Resource District. High levels of sediment affect water quality, aquatic habitat quality and aquatic species.

Equivalent clearcut area (ECA) relates the influence of the forest canopy to changes in stream flow. Changes in forest cover, including disturbance and regrowth affect snow accumulation, snow melt and evapotranspiration in a watershed. Although the ECA used in this CEA does not consider the effect of natural disturbances, such as wildfire and large-scale insect or disease outbreaks, it is likely the ECA is not significantly under reported, as large-scale mortality events are not frequent in this area. In TFL 1, most of the analysis units have low ECAs, with moderate ECA analysis units largely located on the outer boundaries of the TFL.

Total land disturbance shows the percentage of area in an analysis unit that is disturbed. Total disturbance estimates reflect current human disturbance (e.g., rail and transmission corridors, mining, oil and gas infrastructure and timber harvesting), as well as natural disturbance (e.g., insects and fire). In TFL 1 most of the analysis units show a low level of disturbance.

In conclusion, when considering road density, total disturbance and ECA, the TFL 1 CEA reports moderate to high risks to aquatic ecosystems. The risk to aquatic ecosystems is expected to increase as timber harvesting progresses in TFL 1.

grizzly bear CEA

The provincial assessment protocol for grizzly bear includes indicators that affect two main components: grizzly bear habitat and population. Three indicators were chosen due to their relevance to timber supply reviews and subject expert recommendations, these include: road density, forage supply and conservation rank. This grizzly bear CEA uses 2018 data.

As discussed above, road density relates directly to forest harvesting, other industries and human habitation as road networks expand to increase access. Of the 16 grizzly bear assessment units (AU), 12 have road densities greater than the 0.75 kilometre per square kilometre threshold for core security habitat.

Berry patches are an important food source for grizzly bear and the dense, closed canopy characteristic of mid-seral conifer forests can lead to sub-optimal berry production. Forest types prone to dense conifer characteristics with more than 30 percent mid-seral forest will cause a grizzly bear AU to “fail” and be “flagged” as having low forage suitability. Although the vegetation resource inventory data utilized for the grizzly bear CEA for TFL 1 was incomplete, none of the landscape units that do have data are flagged.

The province uses a modified conservation status assessment and ranking tool developed by NatureServe to assign a conservation management concern rank to each of the province’s grizzly bear population units (GBPU). The conservation concern ranking is a high-level summary of overall threats, genetic isolation, population size and trend. The conservation concern ranking provides an effective overview of the conservation condition of a GBPU. Based on these rankings, the majority of landscape units in TFL 1 are of low concern. However, blocks 1 and 2 in the southern portion of TFL 1 are flagged as moderate concern.

High road density and moderate conservation concern ranking in blocks 1 and 2 of TFL 1, along with complications with completing the assessment due to incomplete data, identifies these as areas needing additional attention.

Increased harvesting activity has the potential to expand the current TFL 1 road network, putting additional pressure on grizzly bears. Due to high road density, there is a high risk of grizzly bear mortality in TFL 1. With increased road density there is an increased chance of human-bear conflicts, human caused mortality and habitat fragmentation. All of these can contribute to grizzly bear population decline.

Road density is also a key factor for grizzly bear core security habitat. Core security habitat is defined as areas large enough to cover the average daily movement of an adult female grizzly bear and support her daily foraging requirements, with minimal human use. High road densities lead to a lack of core security habitat, which can negatively affect female grizzly bear survival. Immediately after forest harvesting, open forest patches may benefit bears since early seral, open tree canopies promote berry production. However, berry production declines rapidly as the canopy closes, hence the benefits of harvesting are generally short lived.

As forest harvesting continues, road densities will likely increase putting additional pressure on grizzly bears. In TFL 1, the forest stewardship plans stipulate stocking standards that allow for “clumpy” stocking of conifers (see ‘*wildlife habitat*’), a pattern that is intended to promote forage/berry patches for grizzly bears. If balanced with the concerns regarding road density, it is expected that this management approach will have positive outcomes for grizzly bears.

The age of the forest inventory and gaps in coverage make it difficult to assess the seral stage dynamics and their potential effects on grizzly bear forage supply. Although the portions of TFL 1 that do have data for the mid-seral dense conifer indicator are not flagged, there may still be concerns for areas that have insufficient data. In particular, blocks 1 and 2 have the highest road densities and are flagged as being of moderate conservation concern. Improving the inventory information for these blocks may increase our understanding of grizzly bears in these areas.

Based on my review of the cumulative effects information and discussions with staff, I conclude that the base case reasonably reflects current management, the current status of the effects of past and present industrial activity on the land base, and the legal objectives established by government for various non-timber resources. Therefore, I will make no adjustments to the base case on this account. I am aware that many of the current objectives and resource management practices applied in TFL 1 already help to mitigate the negative effects of development activities and that new objectives and changes in resource management that occur through implementation of the cumulative effects framework will be considered in subsequent determinations.

With respect to road density, I note that although there has been minimal road development over the last decade, road densities in the southern portions of TFL 1 pose risks to both aquatic ecosystems and grizzly bears. For this reason, I encourage the licence holder to work with the district and First Nations to plan the development and deactivation of roads in such a way as to minimize the potential impacts on non-timber values and resources. As indicated in ‘*wildlife habitat*’, I recognize and encourage the use of clumpy stocking, where appropriate, to promote forage production.

As indicated in ‘*forest inventory*’, I expect the licence holder to work with Ministry staff to improve the inventory information available for TFL 1. Not only will this improve the reliability of the information used in subsequent timber supply reviews, it will also improve the information available to guide the management for other values, such as grizzly bears.

- climate change

Climate change is expected to impact forest ecosystems in a number of ways, including: a general increase in temperatures; change in precipitation patterns; an increase in the frequency and severity of wildfires, floods, and landslides; and the occurrence of insects and disease above endemic levels. While the trends are generally consistent, the specific magnitude of these changes, and their spatial and temporal distribution are uncertain.

Over the period from 1942 to 2012, the region in which TFL 1 is located has realized a 1.2°C increase in mean annual temperature, with a 2.3°C increase in winter and 0.9°C increase in summer. During this period there has been a 0.6 percent increase in average annual precipitation, with a 10.8 percent decrease in winter, a 10.6 percent increase in spring and a 9.6 percent increase in summer.

Projections of mid-century climate conditions relative to the baseline period of 1961 to 1990 suggest a further increase in annual temperature of 3°C, with 3°C increases in both winter and summer. Annual precipitation is expected to increase by an additional 8.5 percent, with a 7.0 percent increase in the winter, a 7.9 percent increase in the spring and a 12.8 percent increase in the fall. Summer precipitation is projected to decrease by 0.1 percent.

At the species level, spruce and pine are expected to continue to grow well under the warmer temperatures even with the increase in summer drought stress conditions. Western hemlock, western redcedar and amabilis fir will likely show increasing levels of drought stress, particularly on average to drier sites. This will result in slower growth, with significant pulses of tree mortality when climate cycles generate a series of hot, dry years.

Suitable trees at any given point in time may become maladapted by rotation age, creating additional uncertainty and complexity for management. To assist forest managers to develop future forests that are better adapted to climate change, the Ministry has developed Climate Based Seed Transfer (CBST). CBST promotes healthy, resilient and productive forests and ecosystems through the matching of seed sources (seed lots) to climatically suitable planting sites. CBST is currently an option that can be used for seed use; it is expected to be the Chief Forester's Standard for Seed Use in 2021. The Ministry is also developing the Climate Change Informed Species Selection (CCISS) tool that will be linked to CBST.

There is a large amount of uncertainty surrounding the short-, mid-, and long-term impacts from climate change but it is important to encourage dialogue to develop climate change mitigation and adaptation strategies through stakeholder engagement forums (e.g., Operational Industry Forum, Forest Management Leadership Teams and the Kalum SRMP Implementation Committee). It will be worthwhile to continue to consult and collaborate with federal and provincial government agencies, First Nations, universities, forest licence holders and environmental organizations to better understand climate adaptation and mitigation challenges and opportunities in relation to forest management. Findings from research initiatives can be incorporated into both the North Area and Coast Area climate actions.

While projected climate change will likely affect forest productivity and growth, the dynamics of natural disturbances, forest pests and hydrological balances (e.g., drought stress) the extent and timing of these impacts is uncertain. I accept that the best approach in the short term is to monitor for changes to enable timely adaptive responses and to undertake analysis to increase our understanding over time. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change and its effects on forests and timber. Ongoing observations, data collection, analysis and discussions through various collaborative teams will play a critical role in ensuring we are able to respond to predicted implications for

timber supply. The use of CBST and CCISS will help forest managers develop future forests that are better adapted to a changing climate.

- public comments

The public was provided an opportunity to comment on the draft *Information Package*, and the draft *Management Plan* including the timber supply analysis for TFL 1. No public comments were provided for my consideration in this determination. Based on my discussions with district staff, I am satisfied that suitable opportunities were provided to the public to comment on the timber supply review for TFL 1.

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 projections

In the base case, an initial harvest level of 340 000 cubic metres per year is maintained for one decade before decreasing to a mid-term harvest level of 223 000 cubic metres per year in decades 5 to 8. Starting in decade 9, the harvest level increases to the long-term level of 247 000 cubic metres per year.

In the first of two alternative harvest projections for TFL 1, an initial harvest level of 307 000 cubic metres (about 10 percent lower than in the base case) was maintained for one decade before decreasing to the same long-term harvest level as in the base case. However, in contrast to the base case, the projected harvest levels did not fall below the base case long-term harvest level of 247 000 cubic metres per year.

In the second alternative, the initial harvest level was maintained at the level of the current AAC for as long as possible without jeopardizing the long-term harvest level. In the resultant projection, the current AAC of 378 000 cubic metres could be maintained for one decade before immediately decreasing to the base case long-term harvest level of 247 000 cubic metres per year.

I have considered these alternative harvest projections in my determination, as noted in ‘**Reasons for Decision**’.

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 (and the former Minister of Forests, Lands and Natural Resource Operations) have expressed the economic and social objectives of the Crown for the Province, in letters dated October 30, 2017, and April 12, 2013. The April 12, 2013 letter is focused on the Nanwakolas Reconciliation Protocol that does not apply to TFL 1.

In the letter dated October 30, 2017 (Appendix 3), the Minister 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:

- 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.

The October 30, 2017 letter also asks the chief forester to do the following when making an AAC determination:

- ensure that the Ministry's approved strategies for delivering its forestry objectives are integrated into the timber supply review process;
- 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; and in addition, support government's commitment to moving forward on reviewing policies, programs and legislation to determine how to bring the principles of the *United Nations Declaration on the Rights of Indigenous Peoples* into action for AAC determinations;
- consider traditional knowledge and other input from BC First Nation communities and organizations as they pertain to the AAC determination;
- consider how AAC determinations can support government's objective to focus on planning and sustainable resource management in a way that supports robust forest recovery and timely and effective responses to emerging threats from factors such as insect infestations and wildfire while promoting forest health and values;
- ensure the timber supply review 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, ensure the timber supply review identifies those risks for consideration in land use planning;
- consider the environmental, social and economic needs of local communities as expressed by the public during the 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 government's broader objectives; and,
- when faced with necessary reductions in AACs, that those reductions be no larger than necessary to avoid significant longer-term impacts.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have been mindful of the Section 8 (8) (d) objectives articulated in the Minister's October 30, 2017 letter. I have reviewed the District's consultation process with First Nations, and the public review process and am satisfied that they were appropriately conducted. I have considered the feedback received in the applicable factors in this determination. I have addressed the considerations noted above that the Minister has asked me to consider such as climate change and cumulative effects.

In this determination, in which the projected timber supply is significantly lower than the current AAC, I have been particularly mindful of the potential socioeconomic impacts of a reduced AAC and the Minister's request that AAC reductions be no larger than necessary to avoid significant longer-term impacts. These considerations are discussed in '**Reasons for Decision**'.

On this basis, I am satisfied that this determination accords with the objectives of government as expressed by the Minister.

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

- non-recoverable losses

Non-recoverable losses (NRL) are timber volumes destroyed or damaged by natural causes such as fire, wind, insects and diseases that exceed the endemic losses already accounted for within the growth and yield models used in the timber supply analysis. Non-recoverable losses do not include volumes that have been salvaged.

In the analysis, the NRLs were prorated as a percentage of the NRL estimates applied in the Kalum TSA timber supply analysis based on the relative size of the two management units. Using this approach, the Kalum TSA estimates were reduced by 20 percent from 5000 cubic metres per year to 4000 cubic metres per year for TFL 1. The base case harvest levels were reduced by 4000 cubic metres per year to account for the NRLs due to fire, wind and snow press.

The NRL estimates used to adjust the base case did not account for all stand volume losses attributable to forest health and natural disturbance factors. For this reason, Ministry staff estimated the losses due to a host of forest health agents including fire, wind, *Dryocoetes confuses* (balsam bark beetle), *Dendroctonus rufipennis* (spruce beetle) and *Dothistroma septosporum* Dorog. Morelet (dothistroma needle blight) using aerial forest health overview data for the Kalum TSA and TFL 1. The Ministry staff also estimated losses due to *Onnia tomentosa* (tomentosus root disease), a forest health agent not incorporated into the aerial forest health overview data, using research data collected within the Kispiox TSA by the Skeena Region Forest Pathologist.

Aerial forest health overview data for the Kalum TSA and TFL 1 for the nine-year period from 2010 to 2019 suggests a total annual volume loss of 0.054 percent. When applied to the TFL 1 THLB, in which the average stand volume is 500 cubic metres per hectare, the resultant total annual losses attributable to NRLs was 18 572 cubic metres per year. Harvesting within spruce beetle infested stands salvaged an average of 1104 cubic metres per year, resulting in a NRL balance of 17 468 cubic metres per year.

Loss estimates based on research data collected by the Skeena Region Forest Pathologist suggests 45-year old spruce-leading stands in the neighboring Kispiox TSA contain about 17 percent less volume than projected by the Ministry's Tree and Stand Simulator (TASS II v2.7.75) due to tomentosus root disease. Assuming similar losses relative to the managed stand volumes used in the TFL 1 analysis suggests an additional NRL of 645 cubic metres per year from the 1000 hectares of spruce-leading stands within TFL 1.

In combination, the annual forest health losses estimated using the provincial forest health overview data and the tomentosus loss estimates described above total 18 113 cubic metres per year. After accounting for the 4000 cubic metres per year reduction already applied, the base case harvest levels may be overestimated by 14 113 cubic metres per year or about four percent.

Gitanyow expressed the opinion that managed stand yield estimates used in the timber supply analysis base case were overestimated by 25 percent to 30 percent because losses associated with dothistroma needle blight, tomentosus root disease and the potential negative impacts of climate change were not considered. Gitanyow indicate that reducing the volumes to reflect these overestimations is critical to the continued exercise of Gitanyow rights and title, while still allowing for sustainable economic development. This is further discussed in 'Gitanyow Level 4 TSR Engagement – TFL 1'.

Based on my review of the information summarized above and conversations with Ministry staff and Gitanyow representatives, I conclude that the non-recoverable loss estimates did not account for all the volume losses associated with forest health factors, including dothistroma needle blight and tomentosus root disease. I recognize there is uncertainty with forest health loss estimates as these losses vary in response to many influences, including climate change. On this basis, I conclude that the base case harvest levels have been overestimated by four percent and I will account for this in my determination as discussed in ‘**Reasons for Decision**’.

Reasons for Decision

In reaching my AAC determination for TFL 1, I have considered all the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

The base case shows that an initial harvest level of 340 000 cubic metres per year can be maintained for 10 years before declining over the next 40 years by 10 percent per decade to the mid-term level of 223 000 cubic metres per year. After 40 years at the mid-term level, the harvest level increases by 11 percent to the long-term level of 247 000 cubic metres per year for the remainder of the 250-year harvest projection.

I am satisfied that the assumptions applied in the base case, for most of the factors applicable to TFL 1, were appropriate including those detailed in Table 1 or as described in my considerations previously discussed in this rationale. However, I have identified some 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 harvest projections 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.

I have identified the following factors that indicate a potential overestimation in the base case timber supply:

1. *future roads* – accounting for future roads results in a 1.2 percent overestimation of timber supply in the long term.
2. *cultural heritage resources* – accounting for the management of unidentified archaeological sites and contemporary cultural heritage resources leads to a small, unquantified overestimation of timber supply in the mid- to long-term.
3. *wildlife habitat* areas – accounting for the effect of clumpy stocking to promote grizzly bear forage in the managed stand yield estimates leads to a 0.5 percent overestimation of timber supply in the long term.
4. *accumulated volume* – depleting the growing stock to account for the harvest of the accumulated volumes available for disposition leads to a 0.4 percent overestimation of timber supply in the short term.
5. *non-recoverable losses* – accounting for the volume losses associated with forest health factors in the non-recoverable losses leads to a four percent overestimation of timber supply throughout the harvest projection.

I have identified the following factors that indicate a potential underestimation in the base case timber supply:

1. *dead potential volume* – accounting for the dead potential volume in natural stand estimates results in a small, unquantified underestimation of timber supply in the short term.
2. *Gitanyow Lax'yip Land Use Plan*– incorrectly excluding the Kalum-Kiteen Ecosystem Buffer and Kalum-Kiteen Water Management Unit resource zones from the THLB results in a small, unquantified underestimation of timber supply throughout the harvest projection.

When reviewing the factors that result in the underestimation and overestimation of timber supply in the base case, I conclude that the base case short-term harvest levels have been overestimated by 4.4 percent. The mid- and long-term harvest levels have been overestimated by four percent and 5.7 percent, respectively. Adjusting the base case to account for these overestimations results in an initial harvest level of 325 040 cubic metres per year, mid-term harvest level of 214 080 cubic metres per year and long-term harvest level of 232 921 cubic metres per year.

In considering the adjusted base case, I am aware that the base case starts in January 2017 and that in the four-year period since then, harvesting has continued at a level significantly higher than the harvest levels projected in the adjusted base case. Consequently, the initial growing stock of existing natural stands is overestimated by 212 076 cubic metres, which is the difference between the current AAC of 378 059 cubic metres and the initial harvest level in the adjusted base case. Since the initial growing stock of existing natural stands primarily supports short-term timber harvesting, it would be reasonable to account for the growing stock depletion over the first two decades of the harvest projection. Doing so reduces the first decade harvest level to 314 436 cubic metres per year or 16.8 percent lower than the current AAC. The second decade harvest level is reduced by a further 10.3 percent to 281 932 cubic metres per year.

Alternatively, it is possible to equalize the harvest reductions over two decades, such that the initial harvest level is reduced by 14.8 percent to 322 000 cubic metres per year and the second decade harvest level is reduced by 14.8 percent to 274 368 cubic metres per year.

In considering these two approaches, both of which entail a significant AAC reduction, I am guided by the letters from the Minister, expressing the social and economic objectives of the Crown. In these letters, the Minister asks that when faced with an AAC reduction, I limit the reduction to the extent necessary to avoid significant longer-term impacts and consider the socio-economic effects on local communities. Equalizing the harvest reduction over two decades is reflective of the government's objective for a strong, innovative economy and the need to support forest dependent communities. I also note that by off-setting the full impact of the growing stock depletion, I am providing the licence holder with an opportunity to undertake the actions and implement the practices I have requested that may support a smaller reduction in the subsequent AAC determination.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in TFL 1 by establishing an AAC of 322 000 cubic metres. This is about 15 percent lower than the current AAC of 378 059 cubic metres.

This determination is effective July 20, 2021, 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 this decision is based, 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 expect Ministry staff and licence holder staff 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 TFL 1. Prior to the next AAC determination:

- *forest inventory* – I expect the licence holder to work with FAIB to update the inventory for TFL 1 for use in the next timber supply review.
- *physical and economic operability* – I expect the licence holder to complete a full update of the operability classification.
- *deciduous-leading stands* – I expect district staff to work with the licence holder to promote the retention of deciduous trees where appropriate and to minimize the damage to deciduous trees during forestry operations.
- *cultural heritage resources* – I expect the licence holder to continue to track the areas excluded from timber harvesting to protect CHRs and incorporate this information in the next timber supply review.
- *cultural cedar* – I expect the district, in partnership with First Nations and the licence holder, to complete development of a cedar management strategy.
- *avoidable harvest waste* – I expect the district to work with the licence holder to find opportunities to undertake secondary wood fibre studies and to explore opportunities to improve the utilization of wood fibre in the TFL. I also expect the licence holder to work with FAIB to ensure that the shading effect of trees retained in harvested blocks is addressed in the growth and yield projections used in the next timber supply review.
- *landscape-level biodiversity* – I expect the licence holder to reflect full achievement of the ‘mature-plus-old’ seral requirements in the next timber supply review.
- *wildlife habitat* – I expect the licence holder to track the use of clumpy stocking and to work with FAIB to ensure that this information is incorporated in the managed stand yield estimates used in the next timber supply review.
- *ungulate winter range* – I expect the Skeena Region staff to review the current identification of mountain goat and canyon/escarpment mountain goat winter ranges to ensure that the appropriate management practices are being employed.
- *harvest performance* – I expect the licence holder and district to monitor the harvest of young, low volume stands to ensure that these stands are reaching maturity prior to harvest.

- *collaborative engagement with Indigenous Peoples* – I encourage the Ministry to continue collaborative engagement within existing monitoring programs and strategic frameworks with indigenous communities, such that monitoring the values and concerns identified by the indigenous communities is improved.



Shane Berg, RPF
Deputy Chief Forester

July 20, 2021

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to June 16, 2021), 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 the Crown land in the following areas:

- (i) tree farm licence areas;
- (ii) community forest agreement areas;
- (iii) first nations woodland licence areas;
- (iv) 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 respect of an allowable annual cut determined under subsection (1), the chief forester may, at any time, 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.]

(5.1) The chief forester may, at any time, amend or cancel a specification made under subsection (5).

(6) The minister must determine an allowable annual cut for each woodlot licence area in accordance with the woodlot licence for that area.

(7) The minister must determine an allowable annual cut for

- (a) each community forest agreement area in accordance with the community forest agreement for that area, and

(b)each first nations woodland licence area in accordance with the first nations woodland licence for that area.

(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 June 16, 2021) reads as follows:

Purposes and functions of ministry

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

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



Reference: 230810

October 30, 2017

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

Dear Diane

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

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

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

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

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

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

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Diane Nicholls, Chief Forester and Assistant Deputy Minister

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

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

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

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

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

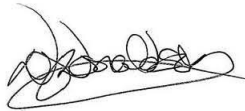
In order to ensure that AAC determinations align with government objectives to modernize land-use planning and sustainably manage B.C.'s ecosystems, rivers, lakes, watersheds, forests and old growth forests, the Timber Supply Review process should incorporate the best available information on climate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

Diane Nicholls, Chief Forester and Assistant Deputy Minister

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Doug Donaldson', with a stylized flourish at the end.

Doug Donaldson
Minister

Appendix 4: Information sources used in the AAC determination

The information sources considered in determining the AAC for TFL 1 include the following:

Legislation

- *Forest Act* and regulations, BC Government, current to June 16, 2021;
- *Ministry of Forests and Range Act*, BC Government, current to June 16, 2021;
- *Forest and Range Practices Act (FRPA)* and regulations and amendments, BC Government, current to June 16, 2021;
- *Forest Planning and Practices Regulation (FPPR)*; [Last Amended February 5, 2021 by B.C. Reg. 11/2021];
- *Forest Practices Code of British Columbia Act*, BC Government, current to June 16, 2021, and regulations and amendments;
- *Land Act*, BC Government current to June 16, 2021;
- *Environment and Land Use Act*, BC Government current to June 16, 2021;
- *Protected Areas of British Columbia Amendment Act, 2019*;
- *Species at Risk Act*, Government of Canada (S.C 2002, c29) current to June 28, 2021;
- *Forestry Revitalization Act*, BC Government current to June 16, 2021;
- *Heritage Conservation Act*, BC Government current to June 16, 2021;
- *Interpretation Act*, BC Government current to June 16, 2021;
- *Wildlife Act*, BC Government, current to June 16, 2021;
- *Biodiversity Guidebook*, Ministry of Forests and BC Ministry of Environment, Lands and Parks, 1995. BC Ministry of Forests, Lands and Natural Resource Operations;

Licence Holder Plans and Timber Supply Review Documents

- *Tree Farm Licence 1 Management Plan #11*, including Information Package and Timber Supply Analysis, Coast Tsimshian Resources LP. February 2019;
- *Tree Farm Licence 1 Rationale for Allowable Annual Cut (AAC) Determination*, Ministry of Forests and Range. April 15, 2008;
- Coast Tsimshian LP's Approved Forest Stewardship Plan. 2018;
- Letter from the Minister of Forests, Lands, Natural Resource Operations and Rural Development to the chief forester stating the economic and social objectives of the Crown. BC Government. October 30, 2017;
- *Procedures for Factoring Visual Resources into Timber Supply Analyses*, Ministry of Forests. March 1998;
- *Updated Procedures for Meeting Legal Obligations When Consulting First Nations – Interim*. Province of British Columbia. May 7, 2010;

Land Use, Forest Practices and other Documents

- *Kalum Sustainable Resource Management Plan*. April 2006 and associated Legal Direction and Orders

- *Identified Wildlife Management Strategy–Accounts and Measures for Managing Identified Wildlife Coast Forest Region*. Version 2004. Province of BC. 2004;
- Government Actions Regulation (GAR) Orders applicable to TFL 1;
- Approved Ungulate Winter Ranges, Ministry of Environment, 2016;
- Approved Wildlife Habitat Areas, Ministry of Environment, 2016;
- Coast Mountains Natural Resource District Forest Health Aerial Overview and Detailed Surveys, 2010 – 2019;
- *Summary of Dead Potential Volume Estimates for Management Units within Northern and Southern Interior Forest Regions*. March 2006;
- TFL 1 Climate Change Analysis. Vanessa Foord. October 1, 2020;
- Policy Regarding the Administration of Unharvested Volumes, Uncommitted Volumes and Unused BCTS Volumes. January 10, 2018. Ministry of Forests, Lands, Natural Resource Operations and Rural Development;
- Implementation Plan for the Recovery of Marbled Murrelet (*Brachyramphus marmoratus*) in British Columbia. Ministry of Forests, Lands, Natural Resource Operations and Rural Development. February 2018;

First Nations

- Updated Procedures for Meeting Legal Obligations when Consulting First Nations. May 7, 2010;
- *Haida Nation v. British Columbia (Minister of Forests)*, [2004] 3 S.C.R. 511, 2004 SCC 73;
- *Tsilhqot'in Nation v. British Columbia*, 2014 SCC 44, [2014] 2 S.C.R.;
- *R. v. Sparrow*, [1990] 1 S.C.R. 1075;
- Coastal First Nations Reconciliation Protocol Amending Agreement. 2017;
- Nisga'a Final Agreement, 2000;
- Skin Tyee Nation Forest Consultation and Revenue Sharing Agreement (FCRSA), 2018;
- Wet'suwet'en First Nation FCRSA, 2019;
- Lax Kw'alaams Band FCRSA, 2018;
- Gitxaala Nation FCRSA, 2020;
- Kitselas First Nation FCRSA, 2017;
- Kitsumkalum First Nation FCRSA, 2018;
- Gitanyow Recognition and Reconciliation Agreement, 2019;
- Gitanyow Level 4 Timber Supply Review Agreement (unsigned, negotiated 2016);
- Gitwangak Land Use Plan for all Gitwangak Traditional Territory within the Kispiox, Kalum, and Bulkley Forest Districts. Philpot Forestry Services. April 20, 2015;
- Gitwangak Lax'Yip Strategic Engagement Agreement, 2018 First Nations Consultation Report Draft Management Plan.