Appendix 2:

District of Mission document titled "Information Related to a New AAC Determination for Mission TFL 26" dated November 18, 2009

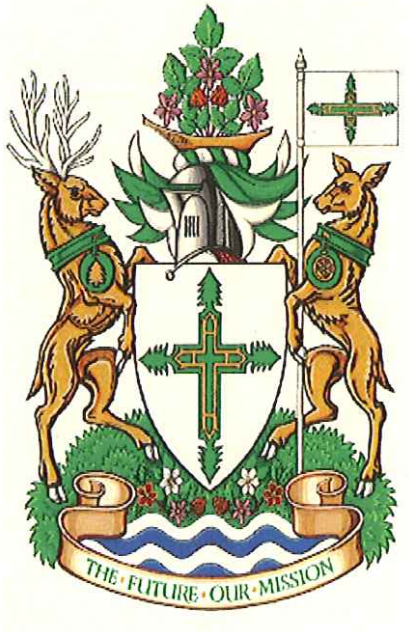
DISTRICT OF
Mission
ON THE FRASER
FORESTRY DEPARTMENT

Information Related to a

New AAC Determination

for Mission TFL 26

Version: November 18, 2009



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History Relevant to the Allowable Annual Cut (AAC) for Mission TFL 26:

The District of Mission (DOM) has been the licence holder continuously for Mission Tree Farm Licence 26 (TFL 26) since its beginning 51 years ago in 1958. TFL 26 is comprised of about 10,500 hectares and is located in the north-central part of the Fraser Valley within the northern part of the District of Mission. A more detailed history and description of TFL 26 as well as the history of the AAC is available in the documents specified below.

In accordance with the Forest Act Section 8, the Ministry of Forests and Range (MOF) Chief Forester has the responsibility to determine an allowable annual cut for each tree farm licence under established timelines.

Documents that are relevant to the current AAC for Mission TFL 26 are:

1. The Rationale for Allowable Annual Cut (AAC) Determination for TFL 26 effective August 1, 2001 (the 2001 AAC Determination) signed by then Deputy Chief Forester, Ken Baker.

   Including appendices and attachments, this was a 49 page full determination considering many factors leading up to the decision to keep the AAC for TFL 26 at 45,000 cubic metres (m3) which was the same level it has been since 1997. This 45,000 m3 includes 43,398 m3 available to the District of Mission and 1,602 m3 available to the MOF BC Timber Sales program. This determination concluded that a timber harvest level that accommodated objectives for all forest resources in TFL 26 during the next five years, that reflected current management practices as well as the socio-economic objectives of the Crown, could best be achieved by establishing an AAC of 45,000 cubic metres.

   This document can be found on the internet at:
   http://www.for.gov.bc.ca/hts/tfl/tfl26/tsr2/rationale.pdf.

2. The Chief Forester's Order Respecting an AAC Determination for Tree Farm Licence No. 26 dated May 29, 2006 (the 2006 AAC Postponement Order) signed by then Deputy Chief Forester, Henry Benskin.

   This document reflects on the many factors in the 2001 AAC Determination and concludes *"that the timber supply picture for TFL 26 remains stable and that, based on the information currently available, the AAC would not change significantly if a new determination was to be made at the present time"*. This document goes on to postpone a new AAC determination at that time, thereby keeping the AAC at the same level as determined in 2001.

   This document can be found on the internet at:
   http://www.for.gov.bc.ca/hts/tfl/tfl26/tsr3/order_pp.pdf.

3. The Timber Supply Analysis and Twenty-Year Plan for Tree Farm Licence 26 (version 2.0) dated July, 2001 (the 2001 TSA for TFL 26).

   This comprehensive document provides an extensive and detailed background of TFL 26, the timber supply analysis process including base case, sensitivity analyses, optimizations and a preferred Twenty Year Plan, description of TFL 26, inventories, growth and yield, management practices, any known uncertainties in the data and various other considerations, options and scenarios related to the setting of an appropriate AAC for TFL 26. The data is frequently comprehensive and often presented in table or chart format for easier understanding.

   This document can be found on the internet at: http://www.mission.ca/wp-content/uploads/timber-supply-analysis-report.pdf

4. The Timber Supply Analysis Information Package for Tree Farm Licence 26 (version 2.0)

dated August 30, 2000 (the 2000 TSA Information Package).

This document contains extensive background data, procedures and assumptions about TFL 26, which was used in the formulation of the 2001 TSA for TFL 26. Also explained is the timber supply analysis process, analysis and sensitivity analysis options, modeling software, inventories, land base descriptions, growth and yield process, forest management history, protection, integrated resource management and various timber modeling tables.

This document can be found on the internet at: http://www.mission.ca/wp-content/uploads/tsa-information-package.pdf

Recent conversations with MOF staff indicate that current MOF approaches in the AAC determination process generally fit into three categories:

1. Relatively unstable timber supply over time, many uncertainties, significant changes in data (inventory, growth and yield, traditional use information) and analysis and significant changes since the last timber supply analysis.

   This situation would normally warrant performing a new, comprehensive timber supply analysis based on current data.

2. Somewhere in the middle of #1 and #3.

   This situation may warrant using a significant amount of the previous timber supply analysis but augmented with some new or additional analysis to reduce any significant changes or uncertainties.

3. Relatively stable timber supply over time, few uncertainties and good existing data, inventories and analysis as well as none to few significant changes or assumptions since the last timber supply analysis.

   This situation would just warrant using the last timber supply analysis with a current examination/rationale, but with either no or a very low level of new analysis, for instructions given in the previous determination, significant identified uncertainties and any new significant uncertainties or changes since the last timber supply analysis.

The District of Mission has examined the TFL 26 timber supply analysis situation and has discussed this with various MOF staff. DOM and MOF staff have both concurred that the TFL situation is represented by #3 above. As such, the information presented in this report is consistent with using the 2001 TSA for TFL 26 and providing current updates or rationale for:

- Instructions and recommendations given in the 2001 AAC Determination and the 2006 Postponement Order,
- Significant identified uncertainties related to TFL 26 AAC and
- Any new significant uncertainties or changes since the last AAC determination and postponement order.

Rationale to Explain Simplified Procedure and Use of the 2001 TSA for TFL 26:

The current TFL 26 analysis shows a very stable situation with no significant problem periods in future. DOM believes that no significant changes have happened and that this timber supply analysis is still sound and justifiable. Comments to support this are:

1. In the 2006 AAC Postponement Order, the Deputy Chief Forester made several statements

indicating AAC stability since the 2001 AAC Determination:

a. *"The base case harvest forecast, representing the current practice of the licensee at the time of the 2001 determination, demonstrates a stable timber supply with no mid-term decreases and incremental increases in the long-term".*

b. *"I have revisited the many factors that were sources of uncertainty in the 2001 AAC determination. For many of these factors the available information has not changed since the last determination".*

c. *"I conclude that the timber supply picture for TFL 26 remains stable and that, based on the information currently available, the AAC would not change significantly if a new determination was to be made at the present time".*

2. The District of Mission believes very little has changed since 2001 regarding the available information and management practices on TFL 26 that would be reflected in a new timber supply analysis. Updates will be given later in this report on any uncertainties or issues identified previously to support this statement.

In summary, this is a request for a new AAC determination under Section 8 of the Forest Act, but in an appropriate, adequate and simplified procedure. DOM believes that to do additional analysis would not only be costly but would result in very similar outcomes to the 2001 analysis.

The Base Case in the 2001 TSA for TFL 26

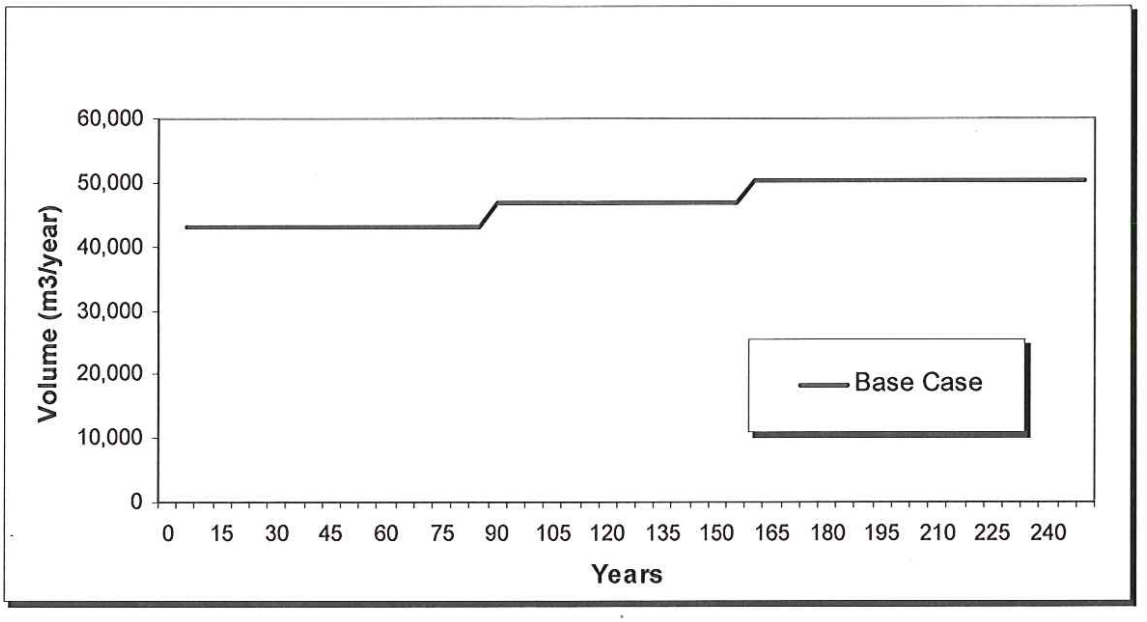
As referenced in the 2001 TSA for TFL 26 and the 2000 TSA Information Package, for each AAC determination for a TFL, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts were produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short and long-term harvest levels. From this range of forecasts, one is chosen that attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity as with all the other forecasts provided, depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it. In some cases, an AAC is determined that coincides with the base case starting point. In other cases, an AAC is determined which differs significantly from the modeled starting point.

In the 2001 TSA for TFL 26, starting on page 13 describes the base case for TFL in detail with the following highlights made here:

1. The base case suggested that a harvest level of 43,168 m3 per year could be maintained for 9 decades following an increase up to 46,877 m3 at 95 years and yet another increase at 155 years up to the long-term harvest level (LTHL) of 50,187 m3 (illustrated in Figure 1). In other words, this indicates a very stable timber supply over time with increases indicated at two points at year 90 and year 155.
2. As the base case was done for 2001, we are now in the 8th year of forecast. As the base case is stable and does not change for 90 years, this is not seen as a significant factor.

Figure 1: Base Case Harvest Forecast for TFL 26 (source: 2001 TSA for TFL 26)



Uncertainties identified in the 2001 AAC Determination and the 2006 AAC Postponement Order

In the 2001 AAC Determination starting on page 6, the Deputy Chief Forester provided detailed explanations regarding the process for adequately considering any risks and uncertainties in the AAC determination process. Refer to that report for those explanations.

In the 2001 AAC Determination on pages 37-39, the Deputy Chief Forester said the following about uncertainty and risk factors in his determination of the TFL 26 AAC:

"*In determining this AAC, I have identified factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Generally some of these factors can be quantified and their impacts assessed with some 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. These latter factors are accounted for in determinations in more general terms.*

In this rationale, I have identified several factors for which I believe the base case assumptions differ from current operational practices or conditions. These factors are summarized below.

For this determination, I believe there is one factor that will act to decrease timber supply as compared to the base case projection:

- *identified wildlife management strategy– I have concluded that the eventual establishment of WHAs and other measures to manage for identified wildlife may result in a decrease of up to one percent in timber supply over the entire forecast period;*

For this determination, there are five factors that will act to increase timber supply as compared to the base case projections:

- *deciduous stands – In the base case, the licensee excluded all 740 hectares of deciduous-leading stands, and the deciduous component of conifer-leading stands. I believe that is overly conservative in light of the market that exists for deciduous timber, particularly red alder, in the Fraser Valley and other parts of the south Coast. In this context, I note that the licensee's current FDP anticipates harvesting of about 1000 cubic metres per year of deciduous-leading stands. I have concluded that there is indeed a reasonable prospect for deciduous timber to contribute to overall timber supply across the planning horizon.*

- *site productivity estimates – Based on provincial OGSI and SIBEC studies and their effect on timber supply as projected in the sensitivity analyses, I have concluded that future yields of regenerating stands and hence timber supply may be greater than the base case projection by an unquantified amount across the entire forecast period.*
- *utilization standards – I have concluded that actual utilization of timber down to 12.5-centimetre dbh will support a harvest that is higher than the base case projection across the entire forecast period. This is because the base case assumed utilization down to a 17.5-centimetre dbh.*
- *landscape-level biodiversity –In the base case the licensee used the provincial distribution of 45-45-10 to estimate the proportion of the planning area subject to lower, intermediate, and higher BEOs. Based upon my review of the sensitivity analysis that examined the impact of implementing the draft low BEO with gradual implementation of old growth requirements, I have concluded that the short- to mid-term timber supply is probably about 4 percent higher than estimated in the base case.*
- *water resources – I have concluded that the timber harvesting land base was probably underestimated by approximately 2 percent due to the complete exclusion of stands in the Cannell Lake watershed.*

In combination, the above six factors indicate that the accessible timber supply is likely to be about three thousand cubic metres per year higher than modelled in the base case, and that supply will rise over time. However, I believe that this is at least partially counteracted by significant uncertainty concerning the management of visual quality on about half of the TFL landbase. Although this uncertainty is not presently quantifiable, it causes me to set the new AAC at a lower level than I otherwise would".

In the 2006 AAC Postponement Order, the Deputy Chief Forester says the following about uncertainty:

"I have revisited the many factors that were sources of uncertainty in the 2001 AAC determination. For many of these factors the available information has not changed since the last determination.

In the reasons for decision section in the 2001 determination rationale, the deputy chief forester noted only one factor, the identified wildlife management strategy, that would act to decrease timber supply as compared to the base case projection. He also identified five other factors (deciduous stands, site productivity estimates, utilization standards, landscape-level biodiversity and water resources) that could increase timber supply.

The deputy chief forester decided that, in combination, the six factors would amount to about 3000 m3/year more accessible timber supply than was modelled in the base case. Consequently he maintained the AAC at 45,000 m3 but did not attribute 3000 m3/yr to harvesting deciduous species as was done in the previous AAC determination".

The 2001 TSA for TFL 26 considered some of these uncertainties and some sensitivity analysis was done at that time as follows:

- Pages 31-33 discuss a sensitivity analysis on the uncertainty in the estimation of site indices.

  This sensitivity analysis said that using site indices based on SIBEC (Site Index by Biogeoclimatic Ecosystem Classification) rather than the existing method concluded "*By applying the revised site indices and generating new yield curves, the short-term volume increases by 23% to 53,256 m3 per year and the long-term harvest level*

increases by 14% to 57,069 m3. These increases are large and show how significant the impact of underestimating (or over estimating) the site indices can be on timber supply. A local site index study is required to confirm whether the site indices within TFL 26 have been underestimated or not. The results of the study could then be incorporated in future timber supply analyses". This sensitivity analysis is illustrated in Figures 2 and 3.

Figure 2: Site Index Adjustments for SIBEC by Analysis Units (source: 2001 TSA for TFL 26)

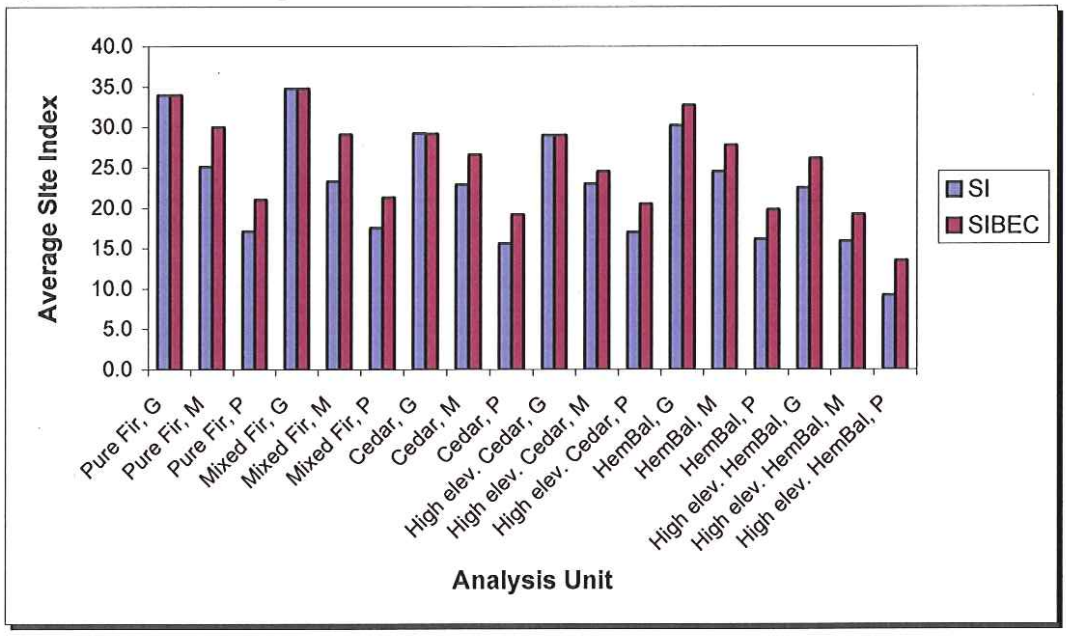
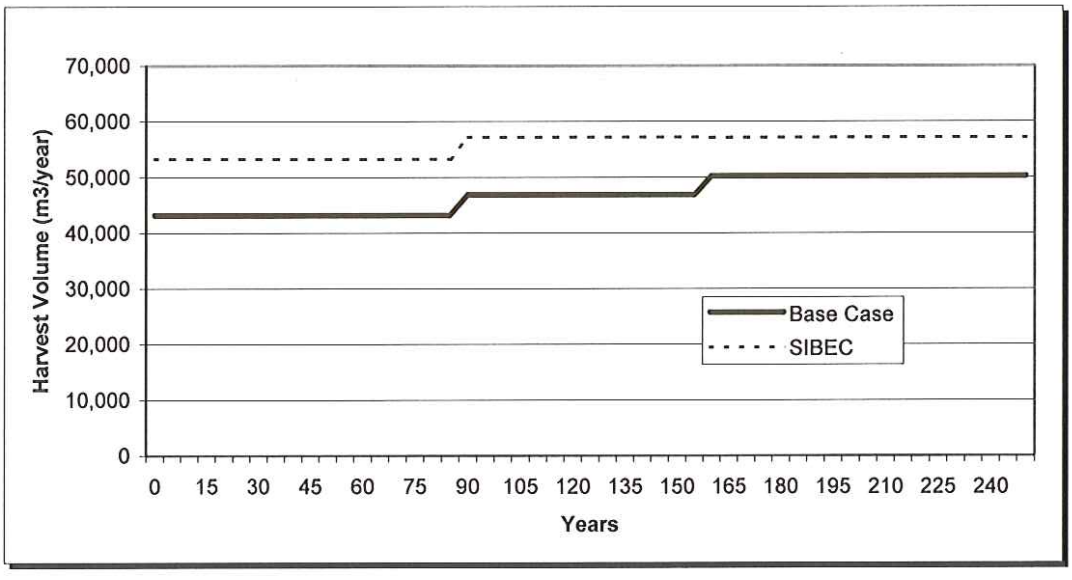


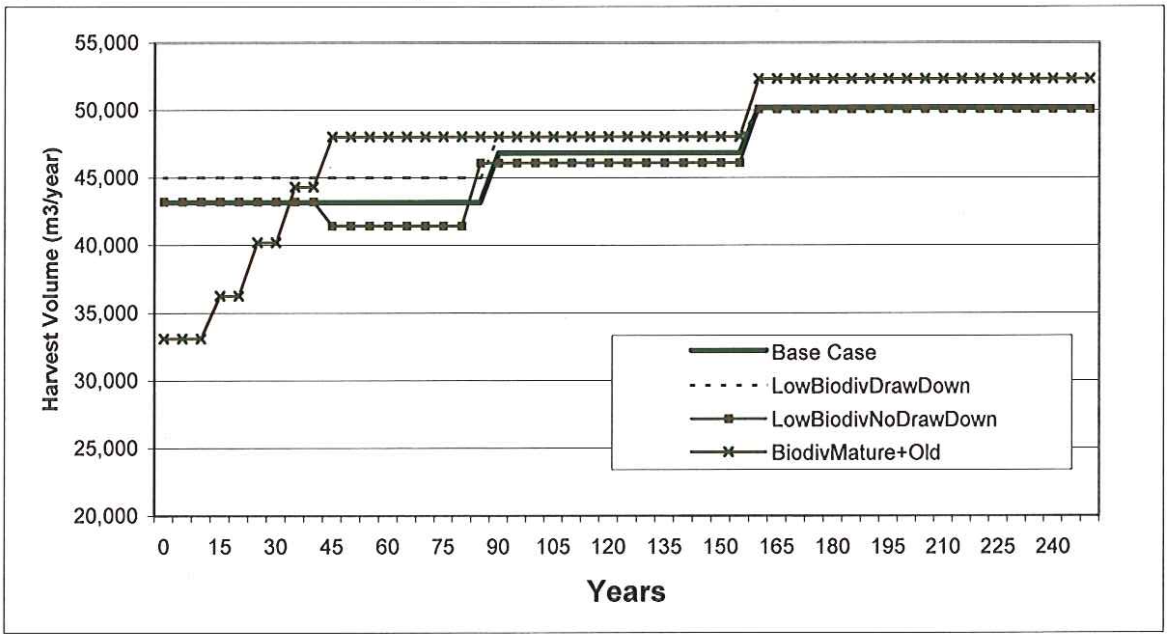
Figure 3: Base Case and SIBEC Adjusted Site Indices (source: 2001 TSA for TFL 26)



- Pages 39-40 discuss a sensitivity analysis of the harvest forecast to landscape level biodiversity.

  This sensitivity analysis compared three biodiversity options to the base case and concluded that certain increases or decreases were suggested depending on the option considered. Figure 4 illustrates this sensitivity analysis and additional details can be found in the 2001 TSA for TFL 26.

Figure 4: Base Case and Biodiversity Sensitivity Harvest Forecasts (source: 2001 TSA for TFL 26)



- Although a sensitivity analysis was not done in 2001, the District of Mission provided the following information to MOF staff in 2005 regarding the water resources for Cannell Lake. This information is still valid today: "*There is still no harvest activity in the Cannell Lake Watershed. It is possible in future that some harvesting could occur in the upper part of the watershed although there is currently no planning for this*".
- Although this is not a sensitivity analysis, regarding the harvesting performance of TFL 26, Table 1 below (source MOF Cut Control statements) is provided. The figures show the amount of timber harvested plus waste and residue in TFL 26 since the approval of the last timber supply analysis in 2001:

Table 1: TFL 26 Harvesting Performance 2001 – 2008 (source: MOF Cut Control Statements)

Year	Cubic Metres (m3) Charged to TFL 26 Cut Control by MOF	Approved Allowable Annual Cut – District of Mission Portion (cubic metres)
2001	40,284	43,398
2002	47,612	43,398
2003	50,493	43,398
2004	43,425	43,398
2005	47,761	43,398

2006	40,267	43,398
2007	59,331	43,398
2008	26,824	43,398
Total in 8-year period	**355,997**	**347,184**
Average in 8-year period	**44,500**	**43,398**

Analysis of harvesting performance/cut control figures:

- For the five-year cut control period for 1999 – 2003, the assessed performance by the MOF Coast Forest Region was 97.2% which was determined from a total volume harvested of 210,897 m3 compared to the total allowable annual cut of 216,990 m3.
- For the five-year cut control period for 2004 – 2008, the assessed performance by the MOF Coast Forest Region was 100.3% which was determined from a total volume harvested of 217,608 m3 compared to the total allowable annual cut of 216,990 m3.
- For the combined ten-year period from 1999 - 2008, the percent harvest was 98.7% which was determined from a total volume harvested of 428,505 m3 compared to the total allowable annual cut of 433,980 m3.
- This variance of only 1.7% between the actual timber harvested and allowable annual cut over the past ten-year period indicates a very stable timber volume utilization status in TFL 26.

Status of Implementation Instructions in the 2001 AAC Determination and the 2006 AAC Postponement Order

In the 2001 AAC Determination on page 39, the Deputy Chief Forester provided the following implementation instructions:

"*In the period following this determination and leading to the subsequent determination, I encourage BCFS and licensee staff to undertake the tasks and studies noted below that I have also mentioned in the appropriate sections of this rationale document. I recognize that the ability to undertake these projects is dependent on the availability of staff time and funding. However, this work will be important to help reduce the risk and uncertainty associated with key factors that affect timber supply on TFL 26. I recommend that the licensee:*

- *closely monitor and document utilization of deciduous timber;*
- *collect localized site productivity information;*
- *review its procedures for defining minimum harvestable ages; and*
- *determine the extent of the area to which managed stand yield tables should be applied.*

Furthermore, I especially encourage the licensee and BCFS staff to clarify and bring closure to the operating practices related to managing visually sensitive areas".

In the 2006 AAC Postponement Order, the Deputy Chief Forester gave the following implementation instructions:

"I strongly encourage the licensee to implement the improved productivity estimates so that the next AAC determination better reflects the full timber growing potential of these public lands. At

the same time, given the proximity of the TFL to urban areas, it is equally important that the licensee and the BCFS staff bring closure to operating practices for managing visually sensitive areas, and that these practices are modelled in the next timber supply analysis".

Current status of the Implementation Instructions:

1. Closely monitor and document utilization of deciduous timber:

   Status: The District of Mission has done this. MOF Harvest Billing System records for TFL 26, show the following figures in Table 2 below for deciduous wood scaled in TFL 26 since the approval of the last timber supply analysis in 2001:

Table 2: Deciduous Wood Scaled in TFL 26 2002 – 2008 (source: MOF HBS records)

Year	Deciduous Volume Scaled (m3) in TFL 26 from MOF Harvest Billing System Records
2002	400.8
2003	829.3
2004	1,064.4
2005	333.7
2006	303.3
2007	634.9
2008	30.7
Total in 7-year period	**3,597.1**
Average in 7-year period	**513.4**

Note that Mission has not harvested pure or almost pure deciduous stands. However, merchantable deciduous trees growing mixed with conifer trees are harvested. Note that these figures are included in the total cut control figures. The 2001 TSA for TFL 26 did not assume deciduous harvesting would be done in the base case scenario; therefore: as Mission has only harvested incidental deciduous, then the base case is correct in this aspect.

2. Collect localized site productivity information:

   Status: Mission has taken some steps to improve the site productivity information on the TFL. Since the 2001 AAC determination, Terrestrial Ecosystem Mapping (TEM) has been completed for the entire TFL. While there has been no formal site index study, the TEM gives an opportunity to make preliminary comparisons using published SIBEC site indices for all the site series on the TFL. See Figures 2 and 3 to see the results of the sensitivity analysis comparing the base case and the SIBEC site indices.

   However, to make the SIBEC site indices acceptable for timber supply purposes/AAC determination, this would involve several significant additional stages including collecting additional field data, performing an accuracy/quality assessment of the TFL 26 Terrestrial Ecosystem Mapping and getting improved site index estimates into a redone timber supply analysis base case. Due to the expense and other priorities, the District of Mission has not completed these latter stages.

   As the above steps have not been done, DOM believes there is no point doing a new timber

supply analysis as the same conclusion would be reached as in 2001. Inventory site indices were used in the 2001 base case. As many previous AAC rationales for other timber management units in BC have indicated that inventory site indices tend to underestimate site index compared to SIBEC, it is likely that the 2001 TFL 26 base case is conservative in this aspect. DOM will consider doing the work to gather additional information and ascertain the accuracy of the SIBEC site indices during the term of the next AAC.

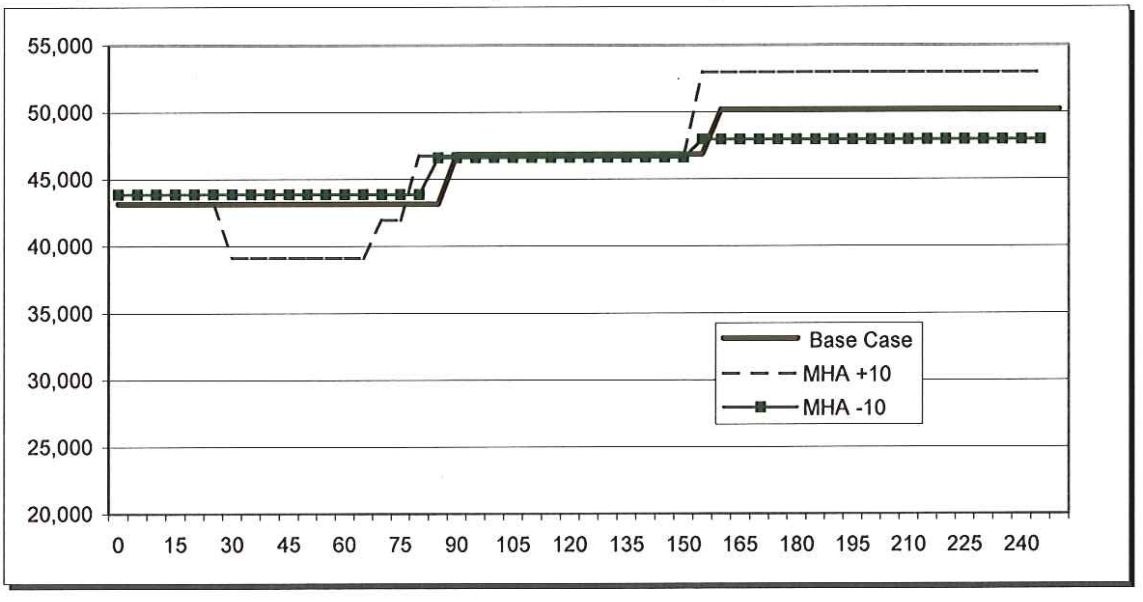
3. Review its procedures for defining minimum harvestable ages:

Status: This issue was resolved prior to the 2006 AAC Postponement Order. In 2005, the District of Mission notified MOF staff by saying "*In the last analysis the MHAs were defined by MAI culmination or minimum volume per hectare (400, 500 or 600 m^3/ha for poor, medium and good sites correspondingly). The MOF expressed concerns over these assumptions as the neighboring Fraser TSA used assumptions that allowed the harvest of stands down to 350 m^3/ha. A sensitivity analysis showed that using the 350 m^3/ha as the minimum harvestable volume per hectare had no short-term impact and only a very small impact in the long term*".

Figures were also provided in 2005 to show that from 2001 to 2004, the average harvest volume per hectare had ranged from 508 to 650 m3 per hectare based on merchantable volume not including waste and residue. Average harvest volumes per hectare have been in the 482 – 600 m3/year range for the years since 2004. The lowest volumes/ha are rarely below the 400, 500 or 600 m^3/ha for poor, medium and good sites correspondingly. The District of Mission believes that the minimum volume per hectare will likely never be as low as 350 m3/ha except in isolated cases and therefore, is not a significant uncertainty factor.

Note that there is a sensitivity analysis related to minimum harvestable ages discussed on pages 33-35 of the 2001 TSA for TFL 26 and shown below in Figure 5. This sensitivity analysis shows the effects on the base case with a ten-year increase and a ten-year decrease in harvest ages. The figure shows that adding ten years appears to cause a significant harvest decrease in the short-mid term and a significant increase in the longer term while the ten-year decrease does not show a significant change to the base case.

Figure 5: Base Case Harvest Sensitivity Forecast to Changes in Minimal Harvestable Ages



4. Determine the extent of the area to which managed stand yield tables should be applied:

   Status: The District of Mission has not yet followed up this recommendation. It is noted that in the 2001 AAC Determination, the Deputy Chief Forester said "*A sensitivity analysis prepared by the licensee to assess the impact on timber supply of increasing or decreasing the managed stand yields by 10 percent indicated that there was no impact on the initial harvest level modelled for 10 decades*". In other words, this is not seen as a very significant issue.

5. District of Mission and BCFS staff to clarify and bring closure to the operating practices related to managing visually sensitive areas:

   Status: For background, the District of Mission has used a 4.0 metre Visual Quality Objective (VQO) VEG height in the timber supply analysis in 1996, 13 years ago and also in the 2001 analysis. In the Chief Forester's "Rationale for Allowable Annual Cut (AAC) Determination' effective July 1, 1996, the following wording (attached) was used in the part discussing 'visually sensitive areas' rationale:

   "A visually effective green-up (VEG) height of four metres was determined to be appropriate for TFL 26 by the BCFS regional landscape staff after an on-site examination. I am satisfied that the commitment to careful management of viewscapes was appropriately modeled in the licensee analysis, and I consider the management assumptions acceptable for this determination".

   DOM held a field trip at that time with MOF regional landscape staff and the Chilliwack District. DOM showed several examples and subsequently reached an agreement by all that 4.0 metres was an appropriate and acceptable height to use for VEG on TFL 26. However, verification was later sought by the MOF if this should be the most appropriate figure to be used.

   Following some discussion, in an email dated February 3, 2009, the Chilliwack Forest District concurred at both a professional and management level that TFL 26 using 4.0 m. as a suitable Visual Quality Objective (VQO) VEG height was acceptable. In summary, 4.0 metres was used in the most recent AAC timber supply analysis (2001) and that no further analysis needs to be done regarding this figure because the DOM and MOF agree that it is the correct figure to have used. Therefore, the VEG height issue related to visually sensitive areas has now been resolved without the need for further analysis as the 2001 base case would be correct for this aspect.

As stated to MOF staff in our 2005 submission prior to the 2006 AAC Postponement Order, the District of Mission continues to believe that the timber supply in TFL 26 is robust with a stable timber supply over time. We are of the belief that nothing significant has changed in TFL 26 regarding inventories, data or management practices that would necessitate the need for either a new timber supply or a change in AAC. As such, we believe a new AAC determination maintaining the TFL 26 AAC at 45,000 cubic metres (43,398 m3 for DOM & 1,602 m3 for BCTS) valid for a ten year period would be the most prudent approach to take and would not pose an unreasonable risk to the province.

"I certify that the work described herein fulfills the standards expected of a member of the Association of BC Forest Professionals and that I did personally supervise the work".

------ original signed and sealed ------

Kim Allan, RPF
DIRECTOR OF FOREST MANAGEMENT

AAC Determination Information Package