

Gordon Cosens Forest Independent Forest Audit 2010 – 2016

Arbex Forest Resource Consultants Ltd.

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1.0. Executive Summary

This report presents the findings of an Independent Forest Audit (IFA) of the Gordon Cosens Forest (GCF) conducted by Arbex Forest Resource Consultants Ltd. The audit scope includes two years' implementation of the 2010-2012 Contingency Plan and 4 years' implementation of the 2010-2020 FMP (3 years of Phase I and 1 year of Phase II). The development and planning processes for the Phase I and Phase II FMPs are also included in the audit scope. Procedures and criteria for the IFA are specified in the 2016 Independent Forest Audit Process and Protocol (IFAPP). Forest Management Plans (FMP) were reviewed in relation to relevant provincial legislation, policy guidelines and Forest Management Planning Manual (FMPM) requirements. Audit field site examinations were completed by helicopter and truck in September 2016.

The Gordon Cosens Forest (GCF) is managed by Tembec (Tembec's Forest Resource Management Group) under Sustainable Forest License (SFL) # 550039. The Forest boundary overlaps the Cochrane, Chapleau, Hearst and Timmins Districts of the Ontario Ministry of Natural Resources and Forestry (MNRF) within the Northeast Region. One Local Citizens Committee (LCC) is associated with the Forest (Kapuskasung Local Citizens Committee). The Forest was certified by the Forest Stewardship Council¹ (FSC) throughout the audit period.

The downturn in the forest sector economy negatively impacted the delivery of forest management. Harvest levels achieved approximately 68% of the planned Phase I available harvest area due to poor markets, mill downtime and low demand for some species.

Public input to the audit process, was solicited by a notice in the Kapuskasing Northern Times and a mail out survey to 100 individuals/organizations on the 2010 FMP mailing list. Local Citizens Committee (LCC) members and Aboriginal communities and Métis organizations (with an interest in the GCF) were notified of the audit by letter and invited to participate in the field audit and/or express their views on forest management during the audit term. Individuals, businesses and organizations involved with, or impacted by, forest management activities were also interviewed.

The previous audit recommended that the SFL licence be extended.

This audit found the Forest to be well managed. Forest management was planned and implemented in accordance with the Crown Forest Sustainability Act (CFSA) and the FMP targets are consistent with the achievement of plan objectives and forest sustainability.

We provide eight recommendations to address issues identified during the audit. We require Tembec to enhance its renewal assessment program and implement remedial actions, as needed to address low stocking densities within artificial renewal areas. We

¹ Certificate RA-FM/COC-000241

are also concerned that the MNRF Hearst District's Silviculture Effectiveness Monitoring (SEM) program had focused only on free-to-grow survey audits.

We are concerned with persistent data discrepancies between MNRF FTG audit and SFL FTG survey data. These data discrepancies are primarily attributed to differences in sampling methodologies and procedures, but the utility of the SEM program as a monitoring function is compromised when field survey data produced annually by the MNRF and Company is not consistent or comparable. We provide a recommendation to MNRF to review field sampling protocol(s) for SEM FTG survey audits to provide for more comparable estimates between industry FTG surveys and MNRF FTG audits.

Recommendations are also provided to Tembec to improve the quality of its initial Annual Report (AR) and Annual Work Schedule (AWS) submissions and to the MNRF to produce Annual Compliance Operations Plans (ACOPs).

On balance, we concluded that an effective forest management program is being implemented and that Tembec is managing the GCF in compliance with the terms and conditions of its sustainable forest licence. We further concluded that forest sustainability as assessed through the 2016 Independent Forest Audit Process and Protocol is being achieved.

The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 550039 for a further five years.

2.0. Table of Recommendations

TABLE 1. RECOMMENDATIONS

Conclusion:
<p>The audit team concludes that management of the Gordon Cosens Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Tembec. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 550039 for a further five years.</p>

Recommendations Directed to Tembec

Recommendation # 3:

Tembec must implement appropriate remedial silviculture interventions within poorly stocked plantations (as required) and enhance its monitoring program on artificial renewal sites with an emphasis on areas renewed since 2012.

Recommendation # 8:

Tembec must ensure that Annual Reports meet the FMPM submission schedule and improve the quality of its initial Annual Report and Annual Work Schedule submissions.

Recommendations Directed to the Hearst District MNRF

Recommendation # 4:

The MNRF Hearst District Manager must ensure that Annual Compliance Operations Plans are prepared.

Recommendation # 5:

The Hearst District must extend its delivery of the Silviculture Effectiveness Monitoring program to include all Core Task requirements.

Recommendations directed jointly to Tembec and the MNRF District Office

Recommendation # 7:

To provide a reliable assessment of the free-to-grow condition, the District MNRF and Tembec must jointly implement sampling and data compilation procedure(s) for FTG surveys and Core Task 1 SEM monitoring that resolve data discrepancies and variability.

Recommendations Directed to the MNRF Crown Forests and Lands Policy Branch

Recommendation # 1:

The MNRF Crown Forests and Lands Policy Branch must discuss with the MOECC appropriate ways to ensure decisions on Forest Management Plan IEA requests occur within agreed timelines.

Recommendation # 2:

The MNRF Science and Research Branch must ensure the timely delivery of FRI products and implement appropriate quality control protocols to facilitate the incorporation of the current forest resource information in forest management plans.

Recommendation #6:

The MNRF Crown Forests and Lands Policy Branch and the Regional Operations Division must complete a review of its field sampling protocol(s) and data compilation procedures for SEM FTG survey audits (Core Task 1) to address local sampling variances and provide for more consistent and comparable estimates of the FTG condition between industry FTG surveys and MNRF FTG audits.

3.0. Introduction

This report presents the findings of an Independent Forest Audit (IFA) of the Gordon Cosens Forest (GCF or the Forest) conducted by Arbex Forest Resource Consultants Ltd. for the period of April 1, 2010 to March 31, 2016. The audit scope includes two years' implementation of the 2010-2012 Contingency Plan and 4 years' implementation of the 2010-2020 FMP (3 years of Phase I and 1 year of Phase II). The development and planning processes for the Phase I and Phase II FMPs are also included in the audit scope.

The Gordon Cosens Forest (GCF) is managed by Tembec (Tembec's Forest Resource Management Group²) under Sustainable Forest License (SFL) # 550039. The Forest boundary overlaps the Cochrane, Chapleau, Hearst and Timmins Districts of the Ontario Ministry of Natural Resources and Forestry (MNRF) within the Northeast Region. The Hearst District has lead management responsibilities for the Forest. Forest management records are maintained by Tembec in Kapuskasing and MNRF in Hearst and Kapuskasing.

A Forest Stewardship Council certification was maintained throughout the audit period.

4.0. Audit Process

The Crown Forest Sustainability Act (CFSA) requires that all Sustainable Forest Licences (SFLs) and Crown Management Units (CMUs) be audited every five to seven years by an independent auditor. Arbex Forest Resource Consultants Ltd. undertook the IFA utilizing a four-person team. Profiles of the audit team members, their qualifications and responsibilities are provided in Appendix 6. The procedures and criteria for the delivery of the IFA are specified in the 2016 Independent Forest Audit Process and Protocol (IFAPP).

The audit reviews the applicable Forest Management Plans (FMP) in relation to relevant provincial legislation, policy guidelines and the Forest Management Planning Manual (FMPM) and its regulated manuals. The audit further reviews whether actual results in the field are comparable with planned results and determines if the results were accurately reported. The results of each audit procedure are not reported on separately but collectively provide the basis for reporting the outcome of the audit.

Recommendations within the report “*set out a high level directional approach to address a finding of non-conformance*”³. In some instances, the audit team may develop recommendations to address situations where “*a critical lack of effectiveness in forest management activities is perceived even though no non-conformance with the law or*

² Within Ontario, Tembec has two division: Tembec – Northern Ontario East (NOE) which includes Timmins, Cochrane and Chapleau; and Tembec – Northern Ontario West (NOW) which includes Kapuskasing and Hearst.

³ 2016 Independent Forest Audit Process and Protocol.

*policy has been observed*⁴. A “*Best Practice*” is reported when the audit team finds the forest manager has implemented a highly effective and novel approach to forest management or when established forest management practices achieve remarkable success. A discussion of the audit process is provided in Appendix 4.

4.1. Management Unit Description

Several communities are located within or adjacent to the management unit including Kapuskasing, Moonbeam, Opasatika and Mattice (Map 1).



MAP 1. LOCATION OF THE GORDON COSENS FOREST

⁴ Ibid

No Aboriginal communities are located within the GCF, but First Nation (FN) communities actively involved in the planning process included the Constance Lake FN, the Moose Cree FN, the Missanabie Cree FN, and the Brunswick House FN. Other Aboriginal communities with an interest in the Forest are the Taykwa Tagamou (formerly New Post First Nation), Flying Post FN, Mattagami FN, and the Chapleau Cree. Several Aboriginal persons residing in local communities within the boundaries of the GCF have also been involved in the planning process. The Métis Nation of Ontario has also expressed an interest in the management of the Forest.

The GCF encompasses an area of 1,679,591 hectares of managed Crown land of which 1,669,683 hectares (99%) is forested land and 9,908 hectares (1%) is classified as non-forested. Tembec owns 82,070 hectares of freehold land⁵ within the Forest boundary.

The predominant tree species is black spruce. Mixedwood cover types occupy approximately 17% of the productive forest area. Common tree species include black spruce, aspen, white spruce, balsam poplar, cedar, larch, white birch, balsam fir and jack pine (Figure 1).

Species at risk (SAR) associated with the GCF include bald eagle, lake sturgeon and monarch butterfly which are listed as species of special concern. The Woodland caribou and the Canada warbler are considered threatened. The 2010 FMP addresses the requirements of the Caribou Conservation Plan (CCP) on the portion of the forest which falls within the continuous distribution caribou zone (approximately 31% of the Crown forested area) situated primarily in the northern portion of the Forest. A Dynamic Caribou Habitat Schedule (DCHS) was developed for this area to ensure a suitable and sustainable landscape containing year-round caribou habitat.

Several companies either have tenure rights or receive wood from the GCF. Lecours Lumber Co. Limited, Columbia Forest Products and Tembec NOE share some responsibility for forest management through overlapping licence agreements with the SFL holder. The primary wood processing facility is the Tembec sawmill/newsmill complex in Kapuskasing.

All harvesting utilizes the clear cut system. The predominance of wet organic soils has led to the development of special operational techniques (e.g. winter harvesting) and specialized types of equipment (e.g. high floatation equipment) to overcome operational difficulties. Lack of gravel and all-weather road building opportunities as well as the potential for site damage and disturbance on the clay/silt dominated sites requires a balance of winter and summer operations. Lowland sites are often difficult to operate in during the frost-free period so most companies only harvest 7 – 8 months a year, with most hauling occurring during the winter. Extensive regeneration treatments consisting of group seed tree harvesting and careful logging around advanced growth (CLAAG)

⁵ Tembec's private (Freehold) land is located within the boundary of the GCF. This land consists of one full township and portions of seven other townships. Approximately 73,500 ha of the land is classified as productive forest.

are the most common renewal treatments. Approximately 30% of harvest area is renewed by artificial treatments.

TABLE 2. AREA SUMMARY OF MANAGED CROWN LAND BY LAND TYPE

Managed Crown Land Type	Area (Ha)
Water	51,125
Other Land (Grass & Meadow, Unclassified Land)	9,908
Subtotal Non-Forested Land	61,033
Non-Productive Forest Land ⁶	
Non-Productive Forest	157,839
Protection Forest ⁷	47,093
Production Forest ⁸	
Forest Stands	1,263,660
Recent Disturbance	146,578
Below Regeneration Standards ⁹ (Older Low Stocked Stands/Recent Not Yet FTG)	54,513
Subtotal Production Forest	1,464,751
Subtotal Forested Land	1,669,683
Total Crown Managed Land	1,679,591

Source: Table 1 2010 FMP

The age class area distribution of forest units is shown in Figure 2. An age class area imbalance occurs with large areas of the forested land being concentrated in the 0-20, 21-40 and 141+ year age classes (~56%). A large proportion of the Forest is overmature (30%) due to effective fire suppression and low levels of harvest.

⁶ Non-Productive Forest is land within a forested area which is currently incapable of commercial timber production owing to its very low productivity or competing vegetation cover.

⁷ Protection forest land is land on which forest management activities cannot normally be practiced without incurring deleterious environmental effects because of obvious physical limitations such as steep slopes and shallow soils over bedrock.

⁸ Production forest is land at various stages of growth, with no obvious physical limitations on the ability to practice forest management.

⁹ Lands Below Regeneration Standards are lands comprised of older stocked stands, areas of natural disturbance and depleted areas that have not yet met the free-to-grow standard for height and/or stocking.

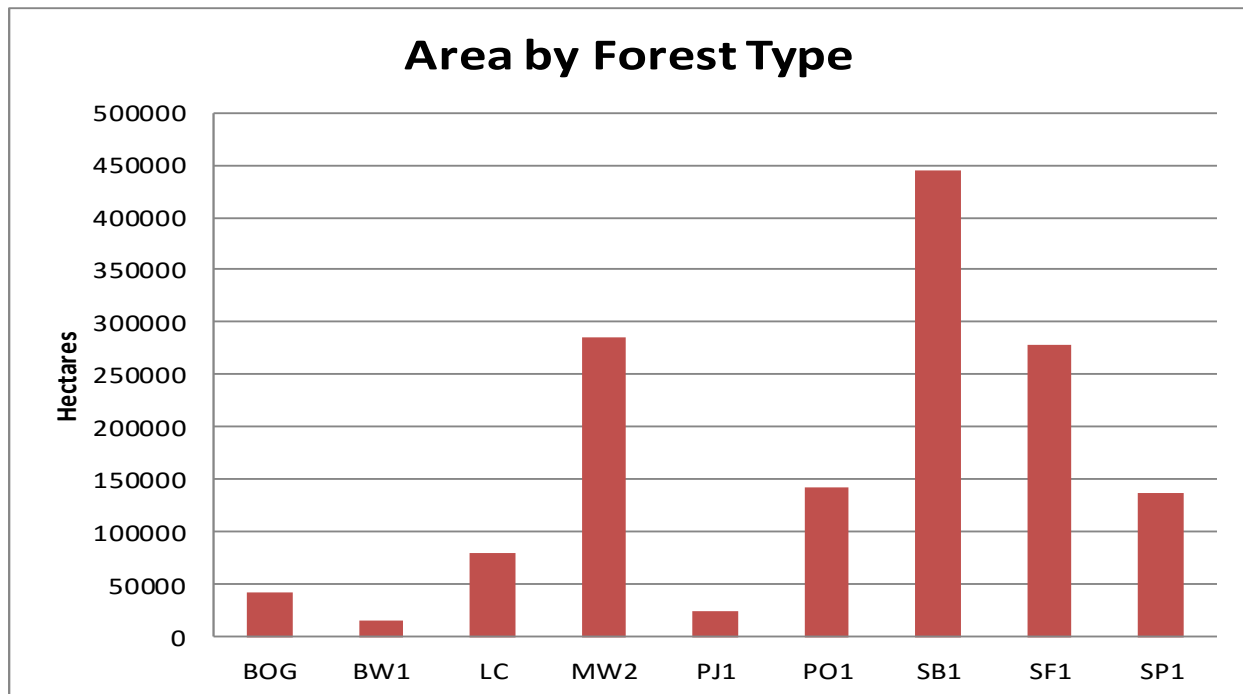


Figure 1. Area of Managed Crown Production Forest by Forest type¹⁰

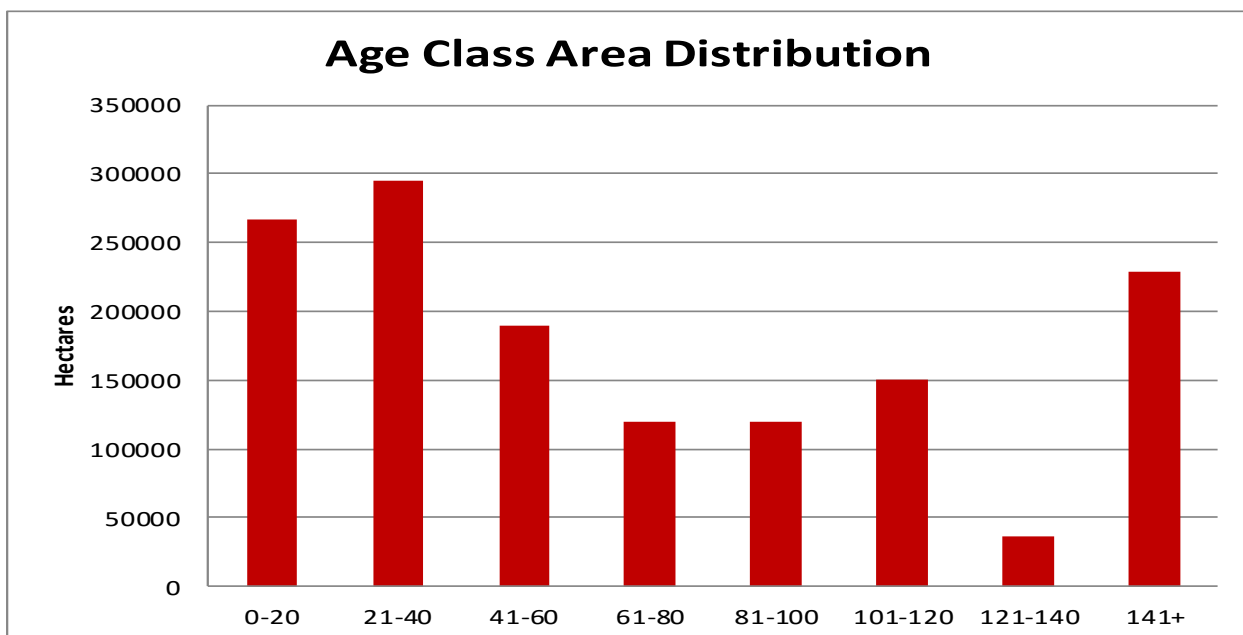


FIGURE 2. AGE CLASS AREA DISTRIBUTION (CROWN MANAGED LAND)

¹⁰ Forest Types are as follows: BOG=bog, BW1=White Birch LC1=Lowland Conifer, MW2= Mixed Poplar-Spruce-White Birch PJ1=Jack Pine, PO1=Poplar, SB1=Black Spruce SP1= Spruce/Pine Upland SF1=Spruce/Fir.

4.2. Current Issues

Our document review and discussions with Tembec and MNRF staff identified the following issues;

Caribou Management Strategy: Specific renewal and maintenance strategies are included in the FMP to promote capable caribou habitat. The inclusion of a Dynamic Caribou Habitat Schedule (DCHS) contributed to a decreased available harvest area (AHA), as eligible harvest areas in previous FMPs were deferred from harvest in the DCHS (See Section 4.4 for auditor discussion).

Poor Economic Performance of the Forestry Sector: The poor market conditions for conifer species and the lack of markets (i.e. OSB grade poplar and birch) have resulted in the underachievement of FMP harvest and related silviculture targets.

Mitigation of Harvest Impacts on First Nation Traplines: The previous audit directed the SFL holder and MNRF to seek ways to mitigate the impacts of harvesting on First Nation traplines and investigate potential approaches to improve the compatibility between fur and timber harvesting (Section 4.4).

4.3. Summary of Consultation and Input to the Audit

Details on the public consultation process are provided in Appendix 4. Comments and opinions on the forest management activities of Tembec and the MNRF were solicited from the public, Aboriginal communities, Métis organizations, tourism operators and other stakeholders using a combination of a direct mail out¹¹, a posting of a notice advising of the audit in the Kapuskasing Northern Times, and through email and telephone contacts.

Tembec and MNRF (District and Regional) staff participated in the field audit and/or were interviewed by the audit team.

All LCC members were invited to participate in the field audit and nine members were interviewed. All FN and Métis communities were contacted and invited to participate in the audit. No LCC members or representatives from the Métis or Aboriginal communities attended the field audit.

¹¹ A random sample of 100 individuals and organizations listed in the 2008 FMP mailing list received a letter and questionnaire requesting input to the audit process.

5.0. Audit Findings

5.1. Commitment

The IFAPP requires both the SFL holder and MNRF to have policy statements and display operational performance that demonstrates the organizations' commitment to sustainable forest management. Tembec's FSC certification status during the audit term met IFAPP commitment principal requirements.

MNRF policy and mission statements were available on the MNRF website. All interviewed MNRF staff were aware of MNRF direction, sustainable forestry commitments and Codes of Practice. Our assessment is that MNRF met the requirements of the IFAPP commitment principal.

5.2. Public Consultation and Aboriginal Involvement

Standard Public Consultation

Public consultation requirements including FMPM required notices and information centres were met¹². Consultation requirements for the development of the Annual Work Schedules (AWS) and Plan Amendments for the audit period were also met. The constituencies we contacted indicated that they had been made aware of the FMP process and that they were provided with opportunities to become involved and to identify values.

Our review of comments received during plan production indicated that inquiries from the public were well documented and tracked efficiently. The planning team responses to inquiries and comments were timely and appropriate.

Aboriginal Involvement in Forest Management Planning

There are nine First Nations (FNs) with an interest in the Forest; Constance Lake FN, the Moose Cree FN, the Missanabie Cree FN, Mattagami FN, Taykwa Tagamou FN, Flying Post FN, Brunswick House FN, Matachewan FN and the Chapleau Cree FN. Local and regional Métis organizations include Métis Nation of Ontario (MNO) Timmins, Northern Lights, Temiskaming and Chapleau.

The MNRF provided notification of the forest management planning process to all the FN's and Métis communities. The Moose Cree FN and Constance Lake FN had

¹² The timing of plan production and related public consultations during the development of the 2010 Phase I FMP was modified frequently resulting in more compressed timing than that projected in the approved FMP Project Plan¹². The timing of plan production and related public consultations during the development of the 2010 Phase II FMP was consistent with the timing projected in the approved FMP Project Plan.

members on the Planning Team for Phase I and II while Brunswick House FN and Missanabie Cree FN had members on the Planning Team for Phase II. Arrangements were made to send quarterly reports on the progress of the Plan to the Taykwa Tagamou FN, Matachewan FN, Flying Post FN, Chapleau Cree FN, and Missanabie Cree FN. Planning Team minutes were sent to the Mattagami FN.

Aboriginal values maps were updated based on available information and those maps were used in the development of the management plans.

MNRF's Forest Environmental Assessment Approval (Declaration Order MNRF-71) requires MNRF District Managers to conduct and report on negotiations with Aboriginal peoples to identify and implement ways of achieving a more equitable participation in the benefits provided through forest management planning. Reporting is done utilizing an annual Condition 56¹³ reporting format where annual implementation activities are recorded. These reports were completed by the MNRF for each year of the audit and met the required FMPM format and content requirements.

Our assessment is that all IFAPP requirements for Aboriginal participation in the forest management planning process were met.

Issue Resolution and Individual Environmental Assessment

Opportunities to make a request for Issue Resolution or an Individual Environmental Assessment (IEA) were clearly identified in the Phase I and Phase II planning processes. There were two requests for Issue Resolution at the Regional Director Stage during both Phase I and Phase II planning. FMPM requirements for issue resolution were met, and the issues were resolved.

An IEA request was submitted to the Ministry of the Environment and Climate Change (MOECC) on the Phase I FMP. FMPM requirements for the processing of the request were met. The MOECC decision did not meet FMPM timelines which resulted in uncertainty as to when normal operations outlined in the 2012-13 Annual work Schedule could be resumed. We have reported the chronic inability of the MOECC to provide timely decisions in several previous IFAs. We provide a recommendation to address this concern (Recommendation # 1, Appendix 1).

Local Citizens Advisory Committee

The Kapuskasing Local Citizens Committee (LCC) is a standing committee with members appointed by the MNRF District Manager. Over the audit term participation by LCC members was excellent and a sample of minutes confirmed that there was normally a quorum at meetings.

As required by the FMPM, the LCC Terms of Reference (TORs) were updated for the development of the FMPs.

¹³ Formally known as Condition 34

The Committee was actively involved in the implementation of the Phase I and II FMPs (i.e. review of Annual Work Schedules, Annual Reports, etc.) and the planning of the Phase II FMP (representation on the Planning Team). Minutes of committee meetings show an engagement in other resource management areas (e.g. moose management, fisheries,).

Interviews indicated that Committee members were very satisfied with the efforts by the MNRF and Tembec to respond to questions, provide information and solicit their input on the management of the forest. A Committee self-evaluation questionnaire that accompanied development of the Phase II FMP provided an average satisfaction rate of 8 out of a possible 10. The LCC statement with respect to the Phase II FMP is that: *“In general, the members of the Kapuskasing LCC are in general agreement with the Phase II (2015-2020) Planned Operations of the Gordon Cosens Forest 20110 -2020 Forest Management Plan.”*

Interviewed LCC members felt that their involvement provided benefit to the forest management program. MNRF and Tembec staff concurred with that assessment.

We concluded that the LCC contributed effectively towards the forest management program and that an excellent relationship exists between the LCC, MNRF and Tembec.

5.3 Forest Management Planning

The forest management planning process was complex as it included the production and implementation of the 2010-2020 Phase I and Phase II FMPs, and the implementation of the 2010-2012 Contingency Plan (CP).

2010-2020 Phase I Planning

The 2010 Phase I FMP was based on the approved Long Term Management Direction (LTMD) used in the production of the 2010-2012 Contingency Plan with the notable modification that the Tembec Regional Caribou Strategy (used in the CP LTMD) was replaced by the MNRF mandated Dynamic Caribou Habitat Schedule (DCHS).

The Terms of Reference for the 2010 Phase I FMP met FMPM requirements. It included documentation of schedules, procedures and was updated with changes during the planning process. As required by the 2009 FMPM, a Steering Committee (SC) was appointed. The SC was significantly involved in assisting the Planning Team with decisions related to the implementation of the Caribou Conservation Plan.

The 2010 Phase I Planning Team met seven times between September 2010 and August, 2011. Informal meetings occurred in addition to Planning Team meetings. Meetings were well documented and were well attended.

For the development of the 2010 plan, a decision was taken to utilize the 1986 Forest Resource Inventory (FRI) updated to 2006 since a new inventory would not be available. We note that the new inventory was received in 2015 and there are issues with consistency and accuracy of inventory descriptors (e.g. stand age, species compositions). This resulted in planning and operational issues. We provide a recommendation (Recommendation # 2, Appendix 1).

The Strategic Forest Management Model (SFMM) was used to address FMPM requirements related to the development of natural benchmark investigations and other non-spatial strategic modeling requirements. SFMM is the currently approved standard used to estimate the Available Harvest Area (AHA), execute tests of sustainability and determine the range of variation of forest composition and structure. Scoping analysis was performed to further understand the effects of various management assumptions on plan objectives related to the maintenance of mature and old growth forest, the provision of wildlife habitat, forest composition and wood supply. SFMM calculations were performed in accordance with the FMPM. In addition to the SFMM model runs (SFMM Base Model) additional tactical investigations were undertaken utilizing Patchworks (a spatial model). Patchworks was used to find a balance between spatial and non-spatial management targets and objectives (e.g. wood supply, biodiversity targets etc.). The model was also used to define the 10-year harvest schedule based on the cost implications of the spatial arrangement of the cut blocks. The selection of harvest areas was consistent with the Proposed Management Strategy (PMS) and the LTMD and was guided in part by:

- the need to balance upland and lowland harvest opportunities to facilitate year-round harvesting (to the extent possible),
- consideration of traditional operating areas,
- consideration of mature and overmature conifer stands susceptible to breakup and other areas susceptible to disease, blowdown and insect infestations,
- concerns of tourism operators and other stakeholders.

Our assessment is that the PMS achieved the best balance in meeting volume and ecological targets.

Species at Risk (SAR) listed under the endangered Species Act were appropriately considered during planning. Habitat descriptions, the application of guidelines and operational prescriptions were provided in the plan text and supplementary documentation.

The GCF includes a continuous caribou management zone which occurs on approximately 31% of the management unit. Phase I planning required that a Dynamic Caribou Habitat Schedule (DCHS) be developed to ensure a suitable and sustainable landscape containing year-round caribou habitat. Caribou habitat was defined using the MNRF Northeast Region caribou habitat classification which identified three classifications of habitat; capable, winter suitable habitat and mature conifer habitat.

Specific renewal and maintenance strategies were included in the FMP to promote capable caribou habitats. The inclusion of the DCHS contributed to a decrease in the Available Harvest Area (AHA), as eligible harvest areas in previous FMPs were deferred from harvest in the DCHS¹⁴.

2010-2020 Phase II Planning

When developing a Phase II FMP (for the planning of operations for the second five-year term), the 2009 FMPM requires an analysis of the validity of basing planning of operations on the original LTMD (2010). The Regional Director (RD) decision in the Year 3 Annual Report supported and endorsed the continuation of the long-term management direction with minor adjustments to the level of renewal, tending and protection activities. Based on our review, the audit team concurs with the Regional Director's decision.

The TOR for the 2010-20 Phase II FMP met all FMPM requirements and was approved as required by the District Manager and the Regional Director. The Phase II Planning Team met three times between February 2014 and September 2014. Although the TOR called for monthly meetings, we are satisfied that the close working relationship between MNRF and Tembec resulted in ongoing discussions that made the proposed monthly meeting schedule unnecessary.

We sampled 10% of the required plan alterations (Phase I and Phase II) and found that they were appropriate and that the Plan Author had made the required modifications.

We reviewed amendments to the 2010 CP and the 2010 Phase I and Phase II FMPs that occurred during the audit period. They were appropriate, well documented, and prepared in accordance with the direction in the 2009 FMPM. The turn-around time between submission and approval was routinely less than one month. It was apparent from our discussions with Tembec and MNRF staff that attention was given to the anticipation of potential issues and their early resolution.

Requirements for the protection of resource based tourism values were addressed in all plans.

The content of Annual Work Schedules (AWS) conformed to FMPM requirements and the proposed forest management activities were consistent with those outlined in the relevant plans.

¹⁴ Approximately 225,000 ha are included within a 50-year harvest deferral area that meets specific habitat requirements for Woodland Caribou.

5.4. Plan Assessment and Implementation

Harvest

All harvesting during the audit term utilized the clear cut system. The predominance of wet organic soils requires careful scheduling and specialized types of equipment (i.e. high floatation) with a balance of winter and summer operations. Harvest operations such as careful logging around advance growth (CLAAG) and harvesting with advance regeneration protection (HARP) were effectively implemented to support extensive regeneration through the preservation of advance growth, and the creation/protection of natural seed beds.

As indicated, Tembec effectively utilized Patchworks to define the 10-year harvest schedule based on the requirements of the DCHS and considerations related to the spatial arrangement of the cut blocks. FMPM requirements for harvest operations were met.

Audit term harvest levels were below planned (68%) due to several factors including:

- 1) on-going short term curtailments at area sawmills,
- 2) a decision by Tembec to shift some harvest operations to Tembec freehold,
- 3) decisions by some Overlapping License Agreement holders to temporally shift their harvest operations to other management units.

The lack of licence commitment for OSB grade poplar and white birch (due to poor markets and long haul distances) was cited as a concern in the previous audit and this situation persists in the current audit term. The inability to achieve planned harvest targets has had implications with respect to the achievement of other planned silvicultural activities which follow harvesting and will, should the trend continue, affect the achievement of objectives related to habitat supply, forest age class distributions and future wood supply.

The SB1, MW2, PO1 and SP1 were the most frequently harvested forest units reflecting a focus on harvesting upland mixedwoods in the summer months and lowland conifer areas in the winter.

TABLE 3. PLANNED VS. ACTUAL HARVEST AREA BY FOREST UNIT¹⁵ (2010-2015)

Forest Unit	Total Planned Phase I Harvest (ha)	Actual Harvest (Ha)	Planned Vs Actual %
Pj1	204	164	80
SF1	989	641	65
SB1	4,252	2,680	63
SP1	1,802	1,535	85
LC1	679	279	41
MW2	2,255	1,396	62
PO1/BW1	2,378	1,815	76
Total	12,560	8,510	68

Table 4 presents a summary of the planned vs. actual volume utilization (annualized) between 2010 and 2015.

TABLE 4. ANNUALIZED PLANNED VS. ACTUAL VOLUME UTILIZATION (000M³) 2010-2015

Species group	Planned Volume (000 m ³)	Actual Volume (000 m ³)	% of Planned
Spruce, Pine and Fir	942	658	70
Hardwood (Poplar & Birch)	365	69	19
Other Conifer (Cedar, Larch)	96	4	4

Our site inspections indicated that, on balance, harvest operations were properly implemented. This observation is supported by the low number of not-in-compliance reports associated with harvest operations. NDEPG requirements were met and residual tree retention requirements were met or exceeded (due to marketability constraints). We did encounter some instances of site disturbance related to the timing of harvest operations which had resulted in some loss of productive land to cattails and other herbaceous species. We do not provide a recommendation since weather conditions can change dramatically during a harvesting operation, but we do encourage Tembec and its contractors to continue to exercise care and due diligence to mitigate the potential for site damage during operations.

¹⁵ Forest Units are as follows: PJ1= Jack Pine, SF1= Spruce/Fir Upland, SB1=Black Spruce Lowland, SP1=Spruce/Pine Upland, LC1=Lowland Conifer, MW2=Mixedwood, PO1= Poplar, BW1=White Birch

To address a previous IFA recommendation that directed Tembec and the MNRF to seek ways to mitigate the impacts of harvesting on First Nation traplines and investigate potential approaches to improve on the compatibility between fur and timber harvesting, Tembec implemented a 10-year deferral of harvest on five traplines¹⁶. We concluded that this harvest deferral was a pragmatic approach which will enable sufficient time for all parties to potentially reach a consensus on approaches to logging within contentious areas.

Slash Management

Slash management treatments included the windrowing, piling, chipping/grinding and the removal of logging debris.

The previous audit required Tembec to “*continue to improve its slash management program and reduce the area of productive forest land affected by piled slash.*” To respond to this recommendation Tembec adopted the use of mechanical slash alignment¹⁷ in selected areas to reduce the footprint of roadside slash.¹⁸ We observed several harvest blocks where this had occurred and the treated areas had been successfully renewed by planting, or natural regeneration, depending on the site.

While no slash pile burning operations were undertaken due to cost considerations, we concluded that losses of productive land to slash were within the bounds of the FMP targets.

Area of Concern Management

AOC prescriptions were appropriate for the protection and/or maintenance of the identified values and were implemented in accordance with the FMPs and the AWSs. Our review of FOIP records indicated few compliance issues associated with AOCs during the audit term.

Renewal, Tending and Protection

Site Preparation (SIP)

Site preparation treatments were typically scheduled to occur in the year following harvest. During the audit term, SIP treatments achieved 75% of the planned FMP targets due to the lower than planned harvest level (Table 5).

Mechanical site preparation treatments comprised 87% of the SIP treatments implemented and utilized a combination of D6 and D8 tractors fitted with shear blades to create corridors to remove excessive duff, align harvesting slash, and reduce

¹⁶ Meetings to discuss the issue were arranged with the First Nation but were initially delayed due to Band elections. The harvest deferral also lessened the urgency of the issue and the planned meetings have continued to be deferred.

¹⁷ Single pass shear blading

¹⁸ The slash footprint was reduced by approximately 50%

competition from young balsam fir, shrubs and herbaceous plants. The efficacy of the treatment is dependent on the level of mineral soil exposure (clay) in the corridor¹⁹. The method is “*tried and true*” having been implemented for decades on the GCF and, on balance, was effective²⁰.

Chemical site preparation treatments were conducted on 1,542 ha utilizing ground based air blast or aerial spray treatments. Our site inspections indicated that the treatments were effective in achieving early competition control.

No instances of site damage arising from SIP operations were observed.

We note that Tembec is attempting to re-introduce fire as a site preparation technique and has identified an area of blowdown as a candidate site for a prescribed burning project in 2017 or 2018.

TABLE 5. ANNUALIZED AREA (HA) OF PLANNED VS. ACTUAL SITE PREPARATION TREATMENTS 2010-2016.

Treatments	Planned Ha	Actual Ha	Planned Vs Actual %
Site Preparation (SIP)			
Mechanical SIP	2,200	1,774	81
Chemical SIP	500	257	51
Prescribed Burn*	0	0	0
SIP Total	2,700	2,031	75

Renewal

The 2010 FMP forecasted an annualized area of 8,560 ha of natural regeneration and 3,837 ha of artificial renewal. FMP renewal targets were not achieved due to the lower than planned harvest, and higher than anticipated amount of bypass. However, the area treated for renewal approximates the area harvested. Regeneration assessments completed by Tembec indicate a high level of regeneration (98%) and silvicultural (81%) success. (See Section 4.6).

All renewal treatments observed in the field were consistent with the FMP SGRs. Extensive regeneration treatments consisting of conventional harvesting and harvest and regeneration protection (HARP) were the most commonly applied renewal

¹⁹ Our site inspections confirmed this as there was frequently better survival and growth of the planted stock towards the edges of the rows as opposed to in the middle of the bladed corridors.

treatments. Careful logging around advance regeneration (CLAAG) was also utilized where advanced regeneration was present within harvest stands. Approximately 78% of the harvest area was renewed by natural treatments. Our site inspections of harvest blocks managed for natural renewal found the blocks were well-stocked to conifer.

The area treated by seeding was well below the FMP forecast area, achieving only 20% of the FMP target. Seeding is typically utilized on low ground winter harvest sites to augment natural ingress and our site inspections found these treatments were effective.

Artificial renewal treatments were applied on 9,620 ha (50% of FMP forecast area). Tree planting accounted for 60% of the artificial renewal program. We found stocking densities were variable on sites treated by artificial renewal, particularly in plantations established from 2012 onwards where many sites had low stocking densities. We were unable to ascertain, with confidence, why the reduced densities had occurred. Tembec is reviewing the issue and examining probable causes (e.g. poor stock quality, weather, improper handling of nursery stock, poor planting supervision). While natural ingress will augment the planted stocking levels over time (to varying degrees), we concluded that Tembec should implement appropriate remedial silviculture interventions within poorly stocked plantations and enhance its monitoring program on artificial renewal sites (Recommendation # 3, Appendix 1).

TABLE 6. ANNUALIZED AREA (HA) OF PLANNED VS. ACTUAL RENEWAL TREATMENTS 2010-2015.

Treatments	Planned Ha	Actual Ha	Planned Vs Actual %
Natural Renewal			
Clearcut Silvicultural System (even-aged)	8,560	5,482	64
Artificial Renewal			
Plant	2,869	1,731	60
Seed	968	193	20
Scarification	0	0	0
Total Renewal	12,397	7,407	60

With the exception noted, we concluded an effective renewal program was being implemented.

Tending

Tending treatments are often required to ensure the survival and optimal growth of desired crop species. Treatments may involve cleaning (i.e. removal of undesirable and competing vegetation) and/or the spacing of desirable stems to reduce stand densities and accelerate diameter growth on crop trees. Consistent with the FMP objectives to

increase or maintain the conifer component and remove hardwood these activities are required to ensure conifer regeneration is successful on more competitive sites.

Chemical tending operations were completed on 3,244 ha, annualized, during the audit term achieving 53% of the FMP forecast area. Treatments inspected were very effective in controlling competing vegetation and no compliance issues related to the chemical herbicide spray program were reported.

Tembec committed to a reduction in the use of chemical herbicides to maintain its FSC certification and address concerns of First Nations and other stakeholders with respect to the use of chemicals in the Forest. To meet this commitment Tembec is conducting pre-spray surveys to better assess treatment requirements and to stratify treatment blocks with the intent of focusing chemical treatments within areas where they are most needed. The company also implemented technologies such as AGNAV and Accu-flo nozzles and varied herbicide concentrations to support its chemical reduction efforts. Trials were also conducted to assess the effectiveness of alternative approaches for vegetation management such as manual tending, mulching and the planting of extra-large stock. We observed a manual tending trial which had been effective in controlling competition and stand densities.

Protection

No protection programs other than monitoring functions were implemented during the audit term.

Access Planning and Management

Access planning and road construction and maintenance is challenged by the prevalence of clay soils, low ground areas and the lack of aggregate material. The GCF is relatively well-accessed with infrastructure of primary and secondary roads being approximately 85% complete. The Patchwork model was effectively used to constrain planned road construction activities to a maximum of 200 kilometres (kms)/year. Caribou conservation requires that maintenance of large roadless areas to limit predation and the intrusion of other ungulates into areas managed primarily for caribou. We concluded that access planning met FMPPM requirements.

During the audit term 238 kms of primary road and 546 kms of branch roads were constructed. One hundred and ninety-eight culverts were installed. Our site inspections indicated that road construction, road maintenance and water crossing installations were well done.

During the field audit, we visited several locations where road decommissioning had been undertaken. The strategies adopted to decommission the roads were effective (Section 4.6) and there was no evidence of environmental degradation related to the removal of water crossings.

Activities invoiced under the “*Forest Roads and Maintenance Agreement*” were inspected and no non-conformities were observed.

Renewal Support

Renewal support includes the activities necessary to support the forecast types and levels of renewal and tending operations. Tembec is a member of the Northeast Seed Management Association (NESMA) which works to develop improved seed for stock production in north eastern Ontario. Other activities undertaken during the audit term included tree seed collection, planting stock production and tree improvement. Renewal support activities and funding were sufficient to meet the renewal program requirements.

5.5. System Support

Tembec met the 2016 IFAPP Human Resources Principle criterion through its FSC certification. Both the MNRF and the SFL holder implemented effective training programs during the audit term. We found auditee staff (Tembec and MNRF) to be knowledgeable and professional.

Document and Record Quality Control

Tembec maintains an ISO-14001 certifiable Environmental Management System (EMS). This EMS facilitates the delivery of a wide range of training programs to both Tembec staff and contractors. A companion Health and Safety Management System (HSMS) provides a standardised set of policies, directives and tools to meet company health and safety requirements.

The MNRF transformation process posed management challenges for the District during the audit term with respect to the delivery of some of its forest management obligations (i.e. Silviculture Effectiveness Monitoring). Staff changes, the creation/ shifting of responsibilities (District vis a vis Region) required some time for implementation. Training for new responsibilities is underway (e.g. two new compliance inspectors) and our interviews with staff indicated a clear understanding of their new roles and responsibilities.

Forest management records are maintained at the Tembec Woodlands Office in Kapuskasing. MNRF records are situated in the Hearst District Office and Kapuskasing Area Office. Both organizations have effective systems for record and document management and each organization made effective use of Geographic Information Systems (GIS) technology (in-house) to support their forest management program. The FSC certificate held by Tembec includes a requirement for the maintenance of a quality document and record control system. Our assessment is that both organizations have excellent support systems and both are responding to the challenges associated with managing the forest.

5.6. Monitoring

SFL and District Compliance Planning and Associated Monitoring

The monitoring of forest management operations was routinely carried out to ensure compliance with the forest management plan, CFSA, standards, guidelines, independent certification, and industry codes of forest practice.

District Compliance Planning and Monitoring

The Hearst District only produced an Annual Compliance Operations Plan (ACOP) for the last year of the audit term (2015-2016). The production of the ACOP is a requirement, and we provide a recommendation to address this shortcoming (Recommendation # 4, Appendix 1).

Based on data reported in the ARs, MNRF completed approximately 28% of the compliance inspections during the audit term (96 of 342 inspections). Our assessment is that this was an appropriate percentage based on the harvesting activity and past compliance history. There was evidence of “*risk based*” inspection priorities (i.e. focus on operators with a history of warnings). Despite the lack of formal ACOPs, the sole MNRF Compliance Inspector did deliver an effective program. Inspection priorities were based on communication/directions from the Area Supervisor, the AWS, communications with Tembec and his own long term experience on the Forest. There were effective and routine communication/meetings with Tembec Compliance staff and operators on the Forest. It is noteworthy that the MNRF inspection target of 20% of the total inspections was exceeded over the term of the audit (28%).

We randomly selected 10 MNRF FOIPs to ascertain adherence to required submission timelines. Reporting schedules were met.

SFL Compliance Planning and Monitoring

Tembec completed compliance plans as required by the guidelines and all content and format requirements were met. Based on data reported in the ARs, Tembec completed 72% of the compliance inspections that occurred on the Forest (246 of 342). An in-compliance rate of 96 % was achieved. Potential compliance issues were often identified early and avoided, or were resolved in the field. There were no discernable trends in the 15 inspections that resulted in non-compliance. A random sample of 20 industry submitted FOIPs indicated that there was adherence to reporting timelines. We note that Tembec’s EMS targeted training for contractors in instances where it was required to address compliance issues identified during the inspection process.

We concluded that the excellent compliance record reflects experienced staff, ongoing and issue-specific training, and regular communications with contractors and MNRF.

Our assessment is that Tembec and the MNRF jointly delivered an effective compliance program on the Forest.

Monitoring of Silvicultural Activities

Tembec undertook silviculture assessments and other monitoring functions in accordance with the FMP. Monitoring activities included; plantation survival assessments, regeneration assessments, competition assessments and Free-to-Grow (FTG) surveys. In Section 4.6, we provide a recommendation that the renewal assessment program should be enhanced.

Free to Grow Survey

During the audit term 71,508 ha were surveyed to determine their free-to-grow status. Ninety-eight percent of the area surveyed was declared FTG. Surveys are conducted approximately eleven years after harvest. Our field sampling (visual assessments) of FTG survey blocks substantiated the stand descriptions and forest unit designations reported by Tembec.

Silviculture Success

Regeneration is considered a “*silviculture success*” when all the standards contained in the SGR applied to that stand have been met and the projected forest unit is achieved. A “*regeneration success*” occurs when the regeneration meets all the standards of an SGR but the stand has regenerated to a forest unit other than the projected unit.

A high level of regeneration success (98%) and silviculture success (81%) was achieved (Table 7). SB1 forest units achieved the lowest level of silviculture success (60%) due to the high densities of larch and cedar which had not been identified in the original FRI and/or successfully seeded into harvest areas following logging operations. Chemical tending treatments were used in some instances to reduce the larch component (and other competitor species) in areas renewed during the audit term.

TABLE 7. SILVICULTURE AND REGENERATION SUCCESS BY FOREST UNIT (2010-2015)

Forest Unit	Total Area Assessed (Ha)	Area Regenerated to the Projected Forest Unit (Ha)	Area Regenerated to Another Forest Unit (Ha)	Area Regenerated (Ha)	Area Not Successfully Regenerated (Ha)	% Area Silviculture Success
BW1	843	843	0	843	0	100
LC1	4,545	4,536	0	4,536	9	100
MW2	18,854	18,031	619	18,650	204	96
PJ1	2,550	2,057	488	2,505	45	81
PO1	6,843	6,053	772	6,825	18	89
SB1	23,978	14,408	8,713	23,121	857	60
SF1	7,122	5,742	1,354	7,096	26	81
SP1	6,773	6,529	149	6,678	95	96
Total:	71,508	58,199	12,055	70,254	1,254	81

Silvicultural Effectiveness Monitoring

Silviculture effectiveness monitoring (SEM), as described in the Silviculture Effectiveness Monitoring Manual for Ontario (MNR 2001), directs the MNR to assess the SFL holder's renewal efforts and the effectiveness of approved Silvicultural Ground Rules (SGRs) implemented on the management unit. Silvicultural assessments are conducted on areas depleted through harvest and salvage activities, to determine if the regeneration standards of the prescribed SGRs have been met. Knowledge of the effectiveness of forest operations prescriptions in achieving the desired forest unit must be understood to facilitate reporting on forest sustainability and to provide reliable information for forest management planning (e.g. development of SGRs, base model renewal inputs). As identified in the FMPM and the Forest Information Manual (FIM) the SFL holder is required to provide Information on the outcomes of its silviculture program to the MNR. MNR is required to substantiate the reported results and evaluate the effectiveness of the silviculture program.

MNR implemented Silviculture Effectiveness Monitoring (SEM) during all years of the audit term, but only completed Core Task 1 (audit of FTG surveys) due to staff availability, staff training requirements, funding issues and the extent of the area requiring audit. We concluded that MNR must expand its SEM program to better meet the intent and objectives of the provincial SEM program (Recommendation # 5, Appendix 1).

There has been consistent variation between FTG survey and SEM FTG audit results. This is a concern given that the mandate of the MNRF is to “*substantiate the reported results and evaluate the effectiveness of the silviculture program*”. Further, the SEM manual states that “*foresters from industry and the MNRF should examine whether certain treatments are meeting expectations and if they are not they should investigate why the treatments were not successful and make appropriate modifications in the future*”. Clearly, the different sampling intensities and methodologies adopted by the SFL and the MNRF have frequently resulted in variation and data discrepancies at similar sampling locations (harvest blocks)²¹. We note that the previous audit also identified differences in FTG data between the forest managers.

The utilization of disparate sampling approaches and data compilation procedures have rendered the interpretation, comparison and assessment of SFL FTG survey MNRF audit samples difficult if not impossible. This circumstance reduces the utility of the SEM program as an audit/management tool and we concluded that the SEM program as currently implemented is not completely meeting the purpose or intent of the SEM Manual since it is not fully functional as a silviculture effectiveness monitoring program.

Clearly, the utility of the SEM program’s audit function is undermined by the inherent variability in the data generated when different processes and systems are utilized. We provide recommendations to address this concern (Recommendations # 6 and 7, Appendix 1).

Exceptions Monitoring

Exceptions monitoring is carried out to determine the effectiveness of prescriptions included in forest management plans that are “*not recommended*” in the MNRF forest management guides. The 2010 FMP identifies one exception (commercial thinning) to the Silviculture Guides that requires monitoring²²:

No exceptions monitoring was required during the audit term.

Forest Renewal Trust Specified Procedures Report

In addition to our randomly selected field sites we also inspected 10% of the area invoiced in the “*Forest Renewal Trust Specified Procedures Report (SPR)*” to verify conformity between invoiced and actual activities. No non-conformities were found.

²¹ In-block variation is reasonably expected given the variability of site conditions across a harvest block, however, sampling should provide a reasonable approximation of the parameters of the population sampled.

²² Commercial thinning is considered an exception because although operational practices are highly developed and results are well known in other jurisdictions, it is largely an untested practice in Ontario's boreal forest.

Access Monitoring

Tembec monitors roads and water crossings through the course of normal operations. Roads monitoring is largely confined to areas of active operations. All regularly maintained roads are also surveyed in the spring during high water conditions.

A bridge and water crossing inventory is maintained in Tembec's EMS. MNRF maintains a regional bridge inventory database.

During our site inspections, we encountered two sites that had been treated for renewal that had subsequently had been excavated for aggregate. While we recognize the operational constraints associated with the scarcity of pit material on this Forest, the conversion does represent a loss of the investment in renewal and better communication is encouraged between operations (staff and contractors) and staff responsible for silviculture.

Tembec has adopted an adaptive management approach for road decommissioning within DCHS areas where it utilizes various strategies (e.g. berms, ditches, barricades (logs and soil), artificial renewal etc.) either singularly or in combination. Treated areas are monitored to determine the effectiveness of the strategy in reducing the ease of travel and use of the decommissioned roads as travel corridors for both hunters and the wildlife predators of caribou²³. We concluded that Tembec's experimentation with and the monitoring of the effectiveness of its various road decommissioning strategies was a pragmatic approach to address issues and concerns associated with access management in caribou habitat.

Our sampling of the invoices submitted to the Forest Roads and Maintenance Agreement (FRMA) indicated that they were complete and accurate.

Annual Reports

ARs were available for each year in the audit scope except for the 2015-2016 AR, which is not required until November 15, 2016. Tembec did provide the auditor with the "Additional Requirements for the Year Ten Management Unit Annual Report" section of the 2015-2016 AR to assist with the analysis of trends for the IFA.

Early in the audit term AR reporting schedules were not met²⁴ and throughout the audit term there were ongoing issues with the quality of the initial submissions. These issues resulted in the late approvals of the documents. We provide a recommendation (Recommendation # 8, Appendix 1).

As required, the ARs were presented to the LCC.

²³ We visited a block where a trail camera had been installed to monitor use of the roadway by hunters and wildlife.

²⁴ Workload issues associated with a tragic accident in 2011 and the preparation of the Phase I FMP were cited as reasons for the delays in the preparation of the ARs.

5.7. Achievement of Management Objectives & Sustainability

FMP objectives are monitored annually and reported on in the year 3, 7 and 10 Annual Reports. The lower than expected level of harvest has negatively impacted the achievement of FMP objectives related to forest cover, forest diversity and those related to the economic benefits derived from forest management. Appendix 2 provides more details on our assessment of plan objective achievement.

The IFAPP requires that an updated Year Ten AR using Section 4.0 of the 2009 FMPM be prepared. The Report Author identified the following trends as significant:

- Due to changes in forest unit definitions the area of available managed Crown productive forest has decreased by approximately 6% over the past three management plan terms.
- Planned harvest levels (area and volume) have not been achieved resulting in plan targets for silviculture activities linked with the harvest to be underachieved.
- Herbicide usage has trended downwards.
- There has been a shift from heavy mechanical site preparation to either chemical site preparation or no site preparation treatment.
- Slash management has been given an increased priority when compared to previous plan terms.

The Report Author concludes that the ongoing implementation of the 2010-2020 FMP continues to provide for the sustainability of the GCF and that plan targets and objectives have largely been met. We concur with this assessment.

In our assessment of forest sustainability, we examined factors such as the achievement of plan objectives, progress towards the desired future forest condition, and the level of benefits derived from the implementation of the forest management plan. Our field site visits, document and record reviews and interviews also informed our sustainability conclusion. We concluded that the achievement of long term forest sustainability as assessed by the IFAPP is not at risk. Our conclusion was premised on the following:

- Forest management was planned and implemented in accordance with the Crown Forest Sustainability Act (CFSA) and FMP targets are consistent with the achievement of plan objectives and forest sustainability.
- The proposed FMP management strategy achieved the best balance in meeting volume and ecological targets.

- FMP objectives and targets were mostly met or substantial progress was being made towards their achievement.
- The short-term reduction in harvest levels does not constitute a threat to the long-term wood supply or the achievement of the LTMD.
- The DCHS is being effectively implemented despite the low level of harvest activity
- Tembec maintained FSC certification during the audit term.
- The area renewed approximates the area harvested. A high level of regeneration and silviculture success has been achieved.
- There was a high in-compliance rate for forest operations during the audit term.
- We did not observe any instances of environmental damage associated with forestry operations and we concluded that AOC prescriptions were appropriately implemented to protect/maintain identified values.
- Silvicultural Ground Rules (SGRs), Silvicultural Treatment Packages (STPs) and Forest Operations Prescriptions (FOPs) were appropriate for the forest cover types and site conditions.
- An effective field silviculture program was delivered.
- The contractual obligations of the SFL holder were substantially met.

5.8. Contractual Obligations

We concluded that Tembec was substantially in compliance with the terms and conditions of its SFL (See Appendix 3).

The IFAPP requires auditors to assess the effectiveness of the actions developed to address the recommendations of the previous audit. The previous IFA resulted in 11 recommendations to address forest management concerns and a final recommendation to extend the SFL licence. Based on our review of the Action Plan Status Report and interviews with staff, we concluded that the Hearst District MNRF and Tembec had appropriately addressed or were making satisfactory progress in addressing the previous audit recommendations. We note that the required Action Plan and Action Plan Status Report were submitted on time.

5.9. Conclusions and Licence Extension Recommendation

Our assessment is that an effective forest management program is being implemented and the GCF is being managed in compliance with the terms and conditions of the SFL.

The audit team further concluded that forest sustainability as assessed through the 2016 Independent Forest Audit Process and Protocol is being achieved.

The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 550039 for a further five years.

Appendix 1

Recommendations

Independent Forest Audit – Record of Finding

Recommendation # 1

Principle: 2 PUBLIC CONSULTATION AND ABORIGINAL INVOLVEMENT

Criterion: 2.4 Environmental Assessments

Procedure(s): 1. Review the opportunities provided for, and the actual incidence of, requests for IEAs. Include the following:

Whether any IEA requests were made and if so, whether the IEA procedures in the applicable FMPM were followed where a decision has been made, whether appropriate action has been taken in relation to any conditions associated with the decision.

Background Information and Summary of Evidence:

On April 4 2012 a request for an IEA of the Phase I 2010 Forest Management Plan was submitted to the Ministry of the Environment and Climate Change (MOECC).

In processing the IEA request, FMPM procedures were followed except that the timing of MOECC's decision was considerably delayed from an agreed upon normal timeline. This, and related timelines are identified in the 2009 FMPM and supplemented by an MNR/MOE (2013) Procedure for the Review of Individual Environmental Assessment (IEA) Requests Under MNR's Forest Class Environmental Assessment Approval.

	Agreed Upon (normal) Timelines in 2009 FMPM	Actual Timelines
MOECC receives request for IEA	NA	March 18 2010 (Request was premature)
MOECC receives new request for IEA	NA	April 4 2012
MOECC notifies MNRF	NA	April 11 2012
MNRF request to MOECC for Concurrence effective April 30 2012	NA	April 16 2012
MOECC grants Concurrence, allowing Concurrence operations to begin May 15 2012	NA	May 02 2012

MOECC request to MNRF for additional information	NA	May 23 2012
MNRF responds to MOECC	Within 15 days	June 13 2012 (20 days)
MOECC makes an IEA request decision	Within 45 days	Sept 17 2012 (91 days)

Discussion:

There was significant slippage in MOECC desired decision timelines (91 days vs. 45 days). This delay in processing the IEA request resulted in uncertainty as to when normal operations as outlined in the approved Annual work Schedule for 2012-13 could be resumed.

Although MOECC responded quickly to MNRF's request for Concurrence (which allowed for tree planting, road construction and harvest operations in areas of the management unit that were unaffected by the IEA request), the delay in rendering a decision on the IEA request resulted in uncertainty as to when normal operations as outlined in the approved Annual work Schedule for 2012-2013 could be resumed.

We have observed this inability to meet desired IEA response times in many other Forests. If timelines in the FMPM and in the MNR/MOE Procedure for the Review of Individual Environmental Assessment (IEA) Requests cannot be met, perhaps the timelines should be revised to ones that are more feasible to minimize the potential for disruptions to planned operations.

Conclusion:

In processing the IEA request; the timing of MOECC's decision was considerably delayed from agreed upon timelines.

Recommendation # 1:

The MNRF Crown Forests and Lands Policy Branch must discuss with the MOECC appropriate ways to ensure decisions on Forest Management Plan IEA requests occur within agreed timelines.

**Independent Forest Audit – Record of Findings
Recommendation # 2**

Principle: 3. Forest Management Planning

Criterion: 3.3.2. Forest Resource Inventory

Procedures: 1. Assess whether the FRI has been updated, reviewed and approved to accurately describe the current forest cover that will be used in the development of the FMP.

Background Information and Summary of Evidence

For the development of the 2010 plan a decision was taken to utilize a 1986 Forest Resource Inventory (FRI) updated to 2006 as a new inventory would not be available.

A new inventory was received in 2015. There are issues with consistency and accuracy of inventory descriptors (e.g. stand age, species compositions) due to the use of several different contractors for the delivery of the inventory.

Discussion:

The timely delivery of FRI products is out of synchrony with the forest management planning cycle. This circumstance is not unique to the GCF.

Up-to-date and accurate forest inventory information is critical for reliable inputs and informed decision-making in the forest management planning process.

Conclusion:

The delivery schedule for FRI products must be improved and quality control protocols implemented.

Recommendation # 2:

The MNRF Science and Research Branch must ensure the timely delivery of FRI products and implement appropriate quality control protocols to facilitate the incorporation of the current forest resource information in forest management plans.

Independent Forest Audit – Record of Finding

Recommendations # 3 & 5

Principle: 4 Plan Assessment and Implementation

Criterion: 4.4. Renewal

Procedure(s): Review and assess in the field the implementation of approved renewal operations

Background Information and Summary of Evidence:

We found planting stock densities were highly variable on several sites treated by artificial renewal, particularly in plantations established from 2012 onwards.

Tembec and MNRF staff accompanying the audit team were largely unaware of the extent of the low stocking conditions within the artificially renewed areas.

Discussion:

Artificial renewal provides the forest manager with the opportunity to control stand density, species composition, individual tree spacing and reduce the harvest rotation length. Full site occupancy, at the desired spacing intervals, enables the forest manager to capture the growth potential of the site and thereby maximize the economic return on the investment in renewal. We are concerned that both Tembec and MNRF staff were unaware of the low stocking levels within certain plantations, suggesting that Tembec's plantation assessment program needs to be modified to ensure that renewal activities are monitored effectively and in a timely manner.

Tembec provided records to the audit team of one-year survival surveys and fifth year regeneration surveys that had been completed during the last 2 years on the Forest, however the field audit did indicate a problem with planting densities.

We also concluded that the MNRF SEM program needs to be expanded beyond its current focus on FTG survey audits to include the assessment of SFL silviculture activities (e.g. renewal and tending).

We were unable to ascertain, with confidence, why the reduced planting stock densities had occurred. We were informed that Tembec is reviewing the issue and examining probable causes.

Conclusion:

While natural ingress can reasonably be expected to augment planting densities on most sites we concluded that Tembec must implement appropriate remedial silviculture interventions within poorly stocked plantations (as required) and enhance its renewal assessment program particularly on sites renewed by planting.

The District MNRF needs to expand its SEM monitoring program to include other Core Tasks that assess and monitor silviculture activities implemented by the SFL holder.

Recommendation # 3:

Tembec must implement appropriate remedial silviculture interventions within poorly stocked plantations (as required) and enhance its monitoring program on artificial renewal sites with an emphasis on areas renewed since 2012.

Recommendation # 5:

The Hearst District must extend the delivery of the Silviculture Effectiveness Monitoring Program to include all Core Task requirements.

**Independent Forest Audit – Record of Findings
Recommendation # 4**

Principle: 6 Monitoring

Criterion: 6.1

...review and assess whether....a compliance program has been developed and implemented.

...Districts should prepare District Compliance Plans....these are annual plans

Background Information and Summary of Evidence

The Forest Compliance Handbook (2014) states that MNR districts are responsible for establishing the level of their Compliance Monitoring effort for active operations on the forest. It states, *“The primary purpose of the annual district forest compliance plans is to outline the Compliance Monitoring plan for the applicable year of the FMP implementation. It is where the district will rationalize the distribution and work effort of its staff and resources using a risk based approach”*.

A District's Compliance Monitoring program is based on the licensee's operational activities and its Compliance Monitoring program as laid out in the AWS. The forest Compliance Monitoring plan for the MNRF takes the form of an Annual Compliance Operations Plan. Usually this is a spreadsheet that documents the program, compliance category, action, reporting and assigns targets and responsibilities. In recent years, the plan format has taken the form of a template reflecting MNRFs broader provincial compliance strategy and the Compliance Handbook.

Hearst District did prepare a formal ACOP in 2015-16. However, prior to that there was no formal document produced.

Discussion

We determined that a very effective forest compliance program was appropriately planned and delivered; however, ACOPs were not produced during all years of the audit term as required.

Conclusion:

The District did not prepare formal annual compliance plans for five of the six years of the audit term.

Recommendation # 4:

The MNRF Hearst District Manager must ensure that Annual Compliance Operations Plans are prepared.

Independent Forest Audit – Record of Finding

Recommendations # 6 & 7

Principle: 6 Monitoring

Criterion: 6.3. Silvicultural Standards Assessment Program

Procedure(s): Review and assess, including in the field achievement and reporting of the silvicultural standards for the specific SFL/management unit.

Background Information and Summary of Evidence:

Silviculture effectiveness monitoring (SEM), as described in the Silviculture Effectiveness Monitoring Manual for Ontario (MNR 2001), directs the MNRF to assess the SFL holder's renewal efforts and the effectiveness of approved Silvicultural Ground Rules (SGRs) implemented on the management unit.

MNRF implemented a Silviculture Effectiveness Monitoring (SEM) during all years of the audit term but the work focused exclusively on the delivery of Core Task 1 (audit of FTG surveys). MNRF SEM sampling is based on the Well-Spaced Free Growing methodology that is conducted with ground surveys. Aerial surveys have not been permitted. The SFL FTG sampling is largely conducted using aerial surveys.

There is significant and consistent variation between FTG survey (SFL holder) and FTG audit (MNRF) results.

Discussion:

We are concerned that the data variations and discrepancies between the parties persisted throughout the audit period given the mandate of the MNRF to "*substantiate the reported results and evaluate the effectiveness of the silviculture program*". The SEM manual further states that "*foresters from industry and the MNRF should examine whether certain treatments are meeting expectations and if they are not they should investigate why the treatments were not successful and make appropriate modifications in the future*".

Clearly, the different sampling intensities and methodologies and data compilation procedures adopted by the SFL and the MNRF frequently result in variation and data discrepancies at similar sampling locations (harvest blocks). The utilization of disparate sampling approaches and data compilation procedures frequently renders the interpretation/comparison/assessment of initial survey findings and SEM audit samples difficult or impossible, and limits the utility of the SEM program as an audit/management tool. We were informed that the MNRF is working to improve upon field sampling protocols.

We also concluded that had other Core Task activities been completed the issue of the poor stocking densities within audit term plantations may have been identified. Field audits of current or recent silviculture activities can be included in SEM Core Task 3 and special projects to assess/investigate a silviculture activity can be completed in SEM Core Task 4.

Conclusion:

The SEM program implemented by the District is not fully functional as a monitoring program. The utility of the program's audit function is undermined by the inherent variability in the data generated when different processes and systems are utilized.

The intent of the SEM program is not being fully met when the program is focused exclusively on Core Task 1 monitoring functions (See Recommendation # 4).

Recommendation # 6:

The MNRF Crown Forests and Lands Policy Branch and the Regional Operations Division must complete a review of its field sampling protocol(s) and data compilation procedures for SEM FTG survey audits (Core Task 1) to address local sampling variances and provide for more consistent and comparable estimates of the FTG condition between industry FTG surveys and MNRF FTG audits.

Recommendation # 7:

To provide a reliable assessment of the free-to-grow condition, the District MNRF and Tembec must jointly implement sampling and data compilation procedure(s) for FTG surveys and Core Task 1 SEM monitoring that resolve data discrepancies and variability.

Independent Forest Audit – Record of Findings Recommendation # 8

Principle: 6. Monitoring

Criterion: 6.5 Annual Reports

Procedure(s): 6.5.1. Determine if Annual Reports have been prepared in accordance with the applicable FMPM including associated deadlines.

Background Information and Summary of Evidence:

Annual Reports are to be submitted to the MNRF in accordance with the requirements of the FMPM and the Forest Information Manual (FIM). The AR is to be prepared and submitted by November 15. MNRF staff review the report for accuracy and completeness and are to provide the results of this review to the Report Author within 30 days of the receipt of the AR. Comments provided by the MNRF are to be addressed and if required a revised AR is to be submitted by February 15. The submission review and re-submission timelines for the audit term ARs are as follows:

Year	Initial Submission Date	Date of Receipt of Comments	AR Resubmission Date	Date of Final Approval
2010-2011	2011/11/10	Na	2013/04/08	2013/11/01
2011-2012	Na	Na	2013/02/13	2013/03/01
2012-2013	2013/11/12	2013/12/02	2014/02/18	2014/03/17
2013-2014	2014/11/20	2015/01/16	2015/02/05	2015/03/01
2014-2015	2015/11/12	2015/12/08 2016/01/27	2016/01/06 2016/05/02	2016/05/27

Discussion:

Tembec experienced difficulties in meeting AR submission deadlines early in the audit term and there were ongoing issues with respect to the quality of the initial submissions of the reports. The requirement to re-submit the documents or associated products resulted in the late approval of the ARs.

Our audit investigations indicated that there were significant problems with the initial and subsequent submissions of the ARs and AWS products.

Recommendation # 8:

Tembec must ensure that Annual Reports meet the FMPM submission schedule and improve the quality of its initial Annual Report and Annual Work Schedule submissions.

Appendix 2

Achievement of Management Objectives

Appendix 2
Achievement of Management Objectives
2010-2020 FMP Gordon Cosens Forest

2010 FMP OBJECTIVES ²⁵	ASSESSMENT OF OBJECTIVE ACHIEVEMENT	AUDITOR COMMENTS
Objective A1: To maintain all major boreal forest types and an overall forest age class structure in a manner similar to the pre-industrial condition.	Forest Diversity	
Indicator A1.1: Area (hectares) by forest type (i.e., forest unit) over time.	MET	Desired levels were achieved for all forest units.
Indicator A1.2: Area and distribution of old forest (hectares).	PARTIALLY MET	The target level of 70% of the natural benchmark was achieved in the short and medium term (with the exception of the MW2, Po1 and SP1 forest units). The level of deviation from target levels for these FUs was acceptable to the planning team.

²⁵ Note: Forest Diversity objectives, as created and tested in the production of the 2010 FMP are by their design, long term. For most of the diversity objectives inadequate time has elapsed since approval of the 2010 FMP for the effects of limited natural disturbance and limited harvesting to have a measurable impact on forest diversity. In the case where inadequate time has elapsed to assess the achievement of an FMP objective and in the absence of other relevant information, we have assigned it a status of “MET” or “BEING MET”, based on testing of the objective during 2010 FMP preparation.

Indicator A1.3: Area and distribution of mature forest (hectares).	MET	In the short and medium term 15 of the 16 mature forest targets were met. In the long term, the target level could not be met for SF1 forest unit.
Indicator A1.4: Area and distribution of immature forest (hectares).	NA	This indicator was for tracking purposes only; no targets were set in the 2010 FMP.
Indicator A1.5: Area and distribution of sapling forest (hectares).	NA	This indicator was for tracking purposes only; no targets were set in the 2010 FMP.
Indicator: A1.6: Area and distribution of pre-sapling forest (hectares).	NA	This indicator was for tracking purposes only; no targets were set in the 2010 FMP.
Objective A2: To ensure that harvest patches emulate, as close as possible, natural wildfire events in terms of size, number, shape, forest composition, orientation, and connectivity, as well as contain representative post-disturbance structural elements including leave areas.	Forest Diversity	
Indicator A2.1: Landscape Pattern – Number of forest disturbances by size class.	PARTIALLY MET	<p>The 2010 FMP target of showing movement towards the natural disturbance frequency template by 2020 was not fully met.</p> <p>Modelling indicated a need to increase the number of disturbances within the three largest size classes.</p>

Indicator A2.2: Landscape Pattern – Area of forest disturbances by size class.	PARTIALLY MET	<p>The 2010 FMP target of showing movement towards the natural disturbance frequency template by 2020 was not fully met.</p> <p>Modelling indicated a need to increase the number of disturbances within the three largest size classes.</p>
Objective A3: To account for and provide core habitat for marten.	Forest Diversity	
Indicator A3.1: Proportion of capable marten habitat in suitable condition within cores (10-20% of capable in a suitable condition).	MET	Marten core habitat was within the acceptable range.
Indicator A3.2: Spatial distribution of marten cores.	MET	The plan provides for an improved distribution of marten cores, particularly in the centre of the Forest. The indicator was achieved.
Indicator A3.3: Average suitable % of forested area within marten cores.	MET	The plan target to increase the % of suitable marten core areas over time was achieved.
Objective A4: To maintain a continuous supply of suitable and mature caribou habitat distributed both geographically and temporally across the landscape in such a manner to provide for permanent range occupancy.	Forest Diversity	
Indicator A4.1: Incorporate a Dynamic Caribou Habitat Schedule (DCHS) in the Gordon Cosens FMP for the portion of the forest	MET	A DCHS was incorporated into the development of the LTMD. Good progress in harvesting A blocks was made during the audit term.

within the continuous caribou range.		
Indicator A4.2: Maintain mature conifer and winter suitable caribou habitat within the inter-quartile range (IQR) of the Simulated Range of Natural Variation (SRNV) for the portion of the forest within the continuous caribou range.	MET	The SRNV values were achieved for both winter suitable and mature conifer caribou habitats. Our aerial reconnaissance confirmed the maintenance of mature conifer and winter conifer cover within the caribou zone.
Indicator A4.3: Provide for a spatial and temporal arrangement of tracts to provide connectivity.	MET	This indicator was achieved in the 2010 FMP modelling.
Objective B1: Maintain habitat for the selected featured species within the bounds of the natural benchmark run.	Forest Cover	
Indicator B1.1: Area of habitat for forest-dependent provincially and locally featured species (ha).	BEING MET	Targets levels of 70% of the Natural Benchmark were fully achieved in the short term. Where targets were not achieved (medium and long term) the level of deviation from the desired target level was acceptable to the planning team.
Objective B2: To provide for the protection of identified area-of-concerns through the maintenance of adequate forest cover.	Forest Cover	
Indicator B2.1: Compliance with prescriptions developed for the protection of water quality and fish	MET	The compliance target was achieved.

habitat (% of inspections in compliance).		
Indicator B2.2: Compliance with prescriptions for the protection of natural resource features, land uses or values dependant on forest cover (% of inspections in compliance).	MET	The compliance target was achieved.
Indicator B2.3: Compliance with prescriptions developed to provide protection to species identified within Tembec's High Conservation Value Report (FSC) that are known or believed to exist within the forest (% of inspections in compliance).	MET	The compliance target was achieved.
Objective B3: To conduct timber management activities in a manner which and mitigates the impacts on environmental quality.	Forest Cover	
Indicator B3.1: Compliance with management practices that prevent, minimize or mitigate site disturbance (% of inspections in compliance).	MET	The compliance target was achieved. We did encounter some minor occurrences of site disturbance that resulted in the loss of productive land to cattails and other vegetation.
Objective C1: To employ cost-effective renewal and tending treatments that will provide for a new, free-growing forest that meets all desired benefits.	Silviculture	
Indicator C1.1: Sufficient levels of available silviculture funding to	MET	The target was achieved.

maintain a silviculture program consistent with the silviculture treatment levels / intensities prescribed by the LTMD (Patchworks).		
Indicator C1.2: Percent of harvested forest area assessed as free-growing during the 10- year term of the plan (%).	MET	71,508 hectares were assessed for FTG. Of the total area assessed 98% was FTG. The target of >90% was met.
Indicator C1.3: Area assessed annually as part of the free-to-grow program (ha). The desired level for this indicator is to complete 100% of the annual FTG program.	PARTIALLY MET	71,508 hectares was assessed for FTG as compared to a planned level of 86,713.8 hectares. This represents an achievement of 83% of planned level. The FMP target was met.
Objective C2: To maintain or enhance future timber yields through intensive silviculture techniques.	Silviculture	
Indicator C2.1: Area renewed during the 10-year term of the plan using Intensive or Elite treatments as defined by Tembec's Regional Silvicultural Matrix.	MET	In the 2010 FMP modelling the target of treating 2% of the annual summer harvest area was met over the short, medium and long term. The target was achieved. Our field inspections indicated that Elite renewal treatments were effective.
Objective C3: To address existing forest health concerns on the Forest, such as balsam fir, aspen decline areas, areas impacted by blowdown, and loss of productive lands due to slash piles, roads and site disturbance.	Silviculture	

Indicator C3.1: Percent of area treated for slash as outlined within Tembec's regional slash management strategy (%).	MET	81% of the levels specified were achieved. The target of achieving $\geq 80\%$ was met.
Indicator C3.2: Number of Forestry Future Funding applications submitted annually for review during 2-year term of the plan.	PARTIALLY MET	Two Forestry Futures application were submitted. The FMP target of four submissions was not achieved, Tembec's ability to meet this target was directly related to the low number of natural disturbance events that occurred.
Indicator C3.3: Number of hectares treated using Forestry Future Funding (ha).	MET	132 hectares were treated using Forestry Futures Funding. Although the FMP target of 170 ha/year was not met, Tembec's inability to meet the target was directly related to the low number of natural disturbance events that occurred.
Objective C4: To employ cost-effective silviculture treatments within the "Area of Application" outlined in OMNR's Ontario Woodland Caribou Conservation Plan (CCP), which will provide for future woodland caribou habitat	Silviculture	
Indicator C4.1: To ensure harvested areas are successfully regenerated such that the conifer forest unit composition is maintained or increased within the continuous caribou range.	BEING MET	<p>The assessment of this indicator will be made at FTG and in the development of the 2020-2030 FMP based on a new inventory.</p> <p>In 2010 FMP modelling the medium to long term projection show the target of maintaining or increasing the conifer forest unit composition within harvested areas by preferred forest unit grouping (i.e., conifer grouping = SB1 + PJ1 + SP1) at or above the 2010 levels (%) was being met.</p>
Indicator C4.2: To ensure harvested areas are successfully regenerated such that the spruce and/or pine composition within the pure conifer forest units is	BEING MET	<p>The assessment of this indicator will be made at FTG and in the development of the 2020-2030 FMP based on a new inventory.</p> <p>In 2010 FMP modelling the medium to long term projection show the target to maintain</p>

maintained or increased within the continuous caribou range on the Forest.		or increase the average spruce and/or pine composition at or above the 2010 levels within the pure conifer forest units was being met.
Objective D1: To provide for a continuous and predictable supply of wood resources, at a competitive cost, to the forest industry now and into the future.	Socio-economic	
Indicator D1.1: Long-term projected available harvest area and volume by species group.	PARTIALLY MET	Targets for SPF and PO volumes could not be achieved in the short, medium and long term in the planning models. Lower harvest volumes were acceptable to the planning team, as they resulted in the best balance with biodiversity targets over the short, medium and long term.
Indicator D1.2: Forecast and actual harvest area by forest unit (ha).	PARTIALLY MET	The 10-Year planned harvest area was 178 ha less than the 10-Year Available Harvest Area, meeting that objective.
Indicator D1.3: Available and actual harvest volume by species group (m ³ /year).	PARTIALLY MET	<p>The target was met. The 10-Year planned harvest volume was 68 m³ greater than the 10-Year Available Harvest Volume.</p> <p>During the 2010-2015 period an average of 741,814 m³ per year were harvested. This represents 51% of the 5-year planned volume. The lack of full achievement of this target was directly related to a downturn in the forest industry over the last decade.</p>
Indicator D1.4: Percent of planned volume utilized by mill (%).	MET	<p>During the 2010-2015 period, three mills with volume commitments received 80%, 130% and 73% of their planned volume.</p> <p>Four mills did not operate during most, or all of the audit term. Two facilities operated on a limited basis but received their volume from other sources.</p>

		Ten mills received volume that was unplanned.
Indicator D1.5: Area of productive, managed Crown Forest available for timber production (ha).	MET	A GIS analysis estimated that area lost to roads and landings was 3%. The target of no more than a 4% loss was met.
Indicator D1.6: Kilometers of road construction per year, projected over time.	MET	This was a 2010 FMP modelling target. In 2010 FMP planning the Patchwork's model was used to ensure that the road construction remained at a minimum (200 km/year).
Indicator D1.7: Road maintenance costs over time.	PARTIALLY MET	This was a 2010 FMP modelling target. In 2010 FMP planning the Patchwork's model was used for improving cut block sequencing. This minimized the number of access routes to each mill resulting in the compartmentalization of cut blocks. Although the road maintenance budget exceeded the maximum of \$2,000,000 annually over the short term, the management strategy was able to successfully aggregate cut blocks within the first 60-year period.
Objective D2: To provide the public and local entrepreneurs with opportunities to harvest fuelwood and other forest resources.	Socio-economic	
Indicator D2.1: Harvest volume of species traditionally used for fuelwood.	MET	An average of 684 m ³ per year of White Birch and 1,790 m ³ per year of Larch were harvested. The target that the fuelwood harvest would be maintained or increased was met.
Indicator D2.2: Number of Memorandum of Agreement (MOA) signed with local entrepreneurs for non-traditional harvest volumes.	MET	16 MOAs (or OLAs) were signed. The target of one MOA /year was met.

Indicator D2.3: Area of productive, managed Crown Forest available for fuelwood collection (ha).	MET	100% of the blocks in the AWSs were made available for fuelwood collection. The target of 90% was met.
Indicator D2.4: Number of personal use fuelwood permits issued for designated and non-designated fuelwood areas.	MET	853 Personal Fuelwood Permits were issued by MNRF. The target of at least 90 permits/year was met.
Objective D3: To support the emerging bio-economy sector by providing, where possible, opportunities to utilize wood resources.	Socio-economic	
Indicator D3.1: Number of bio-economy projects supported by Tembec.	MET	Biomass was delivered to the Tembec boiler in Kapuskasing. The target to support one bio-economy project/year was met.
Indicator D3.2: Percent of annual harvest volume utilized for non-traditional purposes.	MET	The target of 2% target of the annual harvest being available for non-traditional purposes was achieved.
Objective D4: To provide opportunities to local First Nations for input, consultation, participation, and education during the development and implementation of the forest management plan.	Socio-economic	
Indicator D4.1: Opportunities for involvement in plan development provided to, and involvement of First Nations communities	MET	The FMP target of 100% of all communities being provided with the type of consultation and notification that they desired was met.

interested in the Gordon Cosens Forest.		
Indicator D4.2: Annual opportunities for First Nations communities interested in the Gordon Cosens Forest to provide input on the implementation of the forest management plan.	MET	The target to provide each First Nation community with at least one opportunity to provide comments re: AWS development and to offer to present the draft AWS to the FN Communities was met.
Objective D5: To provide due consideration to other forest users (i.e., hunter and angler associations, snowmobile associations, bear management areas, and commercial bait fishermen) when planning and implementing forest management activities.	Socio-economic	
Indicator D5.1: Local Citizens Committee self evaluation of its effectiveness in plan development.	MET	An LCC self-evaluation was completed and achieved a score of 8 out of 10.
Indicator D5.2: Annual opportunities for other forest users to provide input in the implementation of the forest management plan.	MET	The target of at least one opportunity provided to all forest use groups (100% participation) on the implementation of the FMP was met.
Objective D6: To protect all known, potential and newly discovered cultural heritage values on the Gordon Cosens Forest.	Socio-economic	
Indicator D6.1: Compliance with prescriptions designed		The target of no moderate or major non-compliances and no more than 5% minor

to protect cultural heritage values (% of inspections in compliance).	MET	non-compliances was met. There were 0 non-compliances.
Objective D7: To respectfully incorporate available First Nations values to mitigate impacts of forest operations.	Socio-economic	
Indicator D7.1: Area of concerns planned for all known Aboriginal values identified during the forest management process.	MET	The target to develop AOC's for all known Aboriginal Values was met
Indicator D7.2: Compliance with prescriptions designed to protect identified First Nations values (% of inspections in compliance).	MET	The plan target for this objective was achieved. There were no non-compliances associated with Aboriginal values.
Objective D8: To plan and manage forest access in a manner that achieves an appropriate balance between accessed areas for those who want access to the Forest, and remote roadless and / or functionally roadless areas for those who value this attribute of the Forest.	Socio-economic	
Indicator D8.1: Kilometres of all-season road per square kilometre of Crown forest (i.e., road density).	MET	As of 2016, there are 3,254 kms of all-season roads. This represents a road density of 0.15 km /km ²). The target density of 0.15 km/km ² - 0.16 km/km ² was met.
Indicator D8.2: The ratio of all-season roads (kms) with access restrictions to all-	MET	The target to maintain a ratio of 28% of all-season roads with access restrictions vs.

season roads (kms) without access restrictions.		72% of all-season roads without access restrictions was met.
Indicator D8.3: Annual meeting with the Kapuskasing LCC to review proposals for the physical abandonment of SFL roads.	MET	The desired level of at least 1 annual meeting with the LCC to review / discuss the scheduled abandonment of roads was met.
Objective D9: To minimize significant increases in road density within the continuous caribou range on the Forest.	Socio-economic	
Indicator D9.1: Kilometres of road per square kilometre of Crown Forest within the continuous caribou range (Industry and SFL roads).	BEING MET	The desired level of this indicator, was to minimize significant increases in the number of kilometres of roads per square kilometre of Crown Forest from plan start level over time. There was fewer access roads constructed during the audit term due to the lower than planned harvest level. A baseline measurement of road density within the contiguous caribou zone was established (0.68 Km/ Km ²).
Objective D10: To maintain opportunities for forest-dependent industries (i.e., trapping and remote-based tourism) whose operations may be affected by forest management activities.	Socio-economic	
Indicator D10.1: Compliance with prescriptions for the protection of resource-based tourism values (% of inspections in compliance).	MET	The target of 0% moderate or major non-compliances and no more than 5% minor non-compliances was met. There were no non-compliances related to resource based tourism values.
Indicator D10.2: Compliance with prescriptions for the	MET	The target of 0% moderate or major non-compliances and no more than 5% minor non-compliances with the prescriptions

protection of trapline values (%) inspections in compliance).		designed to protect trapline values was met. There was 1 minor non-compliance.
Indicator D10.3: Annual opportunity for forest-dependent industries to provide input on forest management activities that may impact their operations.	MET	The target of providing at least one opportunity a year for forest-dependent industries to provide input on forest management activities that may impact their operations was met.
Objective D11: To conduct forest operations in a sustainable and socially acceptable manner.	Socio-economic	
Indicator D11.1: Non-compliance in forest operations inspections (% of inspections in non-compliance by category (minor, moderate and significant as determined by OMNR).	MET	The target of no moderate or major non-compliances and no more than 5% minor non-compliances inspections was met. Fifteen compliance inspections out of a total of 342 were not in-compliance.

Appendix 3

Compliance with Contractual Obligations

SFL Obligation	Comment
Payment of Forestry Futures and Ontario Crown Charges.	<p>As of March 31, 2016, FRL's are in arrears as follows:</p> <ul style="list-style-type: none"> - Forest Futures – \$9,028.78 - Crown Dues - \$ 111,339.30 <p>A re-payment schedule with the MNRF is in place, so a recommendation is not provided.</p>
Wood supply commitments, MOAs, sharing arrangements, special conditions.	<p>Tembec commitments include:</p> <ol style="list-style-type: none"> 1. Levesque Plywood Limited 2. True North Hardwood Plywood Inc. 3. Lachance Saw and Planer 4. Synco Timber Limited 5. Tembec (Hearst) 6. Lecours Lumber Co. Ltd. <p>Markets determined the volumes received at the facilities during the audit term.</p>
Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CFSA.	<p>Phase I and II FMPs were completed and approved as required by the FMPM and CFSA.</p> <p>Our audit investigations indicated that there were problems with the initial submissions of the ARs and AWS products. A Recommendation (#8) has been provided.</p>
Conduct inventories, surveys, tests and studies; provision and collection of Information in accordance with FIM.	<p>Inventories and surveys were completed as required in accordance with FIM.</p> <p>Variability in sampling procedures have resulted in data discrepancies in FTG surveys and SEM monitoring that need to be corrected jointly by Tembec and MNRF. A Recommendation (#7) has been provided.</p>
Wasteful practices not to be committed.	<p>There were no wasteful practices observed in the field audit or reported in FOIP.</p>

Natural disturbance and salvage SFL conditions must be followed.	Approximately 24 ha of blowdown was salvaged over two operating seasons. SFL salvage conditions were met.
Protection of the licence area from pest damage, participation in pest control programs.	There were no pest control activities carried out during the audit period.
Withdrawals from licence area.	There were no withdrawals from the license.
Audit Action Plan and Action Plan Status Report.	Both documents were completed on time in the required format.
Payment of forest renewal charges to Forest Renewal Trust (FRT).	As of March 31, 2016, FRL's were in arrears \$ 12,961.28. A payment schedule is in place.
Forest Renewal Trust eligible silviculture work.	Audit site inspections determined that work was completed and appropriately invoiced in the SPA report.
Forest Renewal Trust forest renewal charge analysis.	Forest Renewal Trust renewal charge analysis work was completed annually.
Forest Renewal Trust account minimum balance.	The minimum balance of \$ 6,869,000 was maintained during all years in the audit scope.
Silviculture standards and assessment program.	Silviculture assessment work was completed on an annual basis.
Aboriginal opportunities.	Tembec has a good track record of providing economic opportunities to Aboriginal communities and individuals.
Preparation of compliance plan	Compliance plans were prepared which met the required format and content.
Internal compliance prevention/education program.	<p>The Company has an EMS that provides for on-going environmental and safety training.</p> <p>Tembec maintains a comprehensive training matrix which documents the level and currency of training of all forest workers.</p>

Maintenance of records, including maps, of the amount of Eligible Silviculture Work implemented and the cost.	Annual records were maintained for all silviculture work. .
The Company shall meet the silvicultural standards on all class X and Y lands.	There are no class X and Y lands.
The Company shall carry out tending treatments on Class Z Lands as required by the Minister.	There are no Class Z lands.
The Company shall assess and report on the achievement of its regeneration efforts.	Documentation of the SFL's regeneration efforts is provided in Annual reports.
Compliance inspections and reporting; compliance with compliance plan.	Inspections and reporting were completed as planned.
SFL forestry operations on mining claims	Mining Companies were notified in the AWS's as to the locations of annual operations.
SFL Extension Recommendation	<p>The last extension to the licence was granted in 2011 with the current licence term expiring in 2026.</p> <p>Based on the findings of this audit, in accordance with the IFAPP, we concluded that the SFL should be extended for a further five years.</p>

Appendix 4
Audit Process

This IFA consisted of the following elements:

Audit Plan: An audit plan describing the schedule of audit activities, audit team members, audit participants and the auditing methods was prepared and submitted to the Tembec MNRF Hearst District, Northeastern Regional MNRF Office, Forestry Futures Trust Committee and the LCC Chair on May 10, 2016.

Public Notices: Public participation in the audit was solicited through the placement of a public notice in the Kapuskasing Northern Times (September 1, 2016) and a random mailing to 100 individuals/organizations listed in the 2010 FMP mailing list. All Aboriginal communities with an interest in the Forest were contacted by mail to participate and/or express their views. Community leaders received several follow-up telephone calls and/or e-mails.

All LCC members received letters and follow-up telephone calls with an invitation to participate in the audit process.

Field Site Selection: Field sample sites were selected randomly by the Lead Auditor in May 2016. Sites were selected in accordance with the guidance provided in the IFAPP (e.g. operating year, contractor, geography, forest management activity, species treated or renewed, and access) using GIS shapefiles provided by Tembec. The sample site selections were reviewed Tembec and MNRF District Staff at the Pre-Audit Meeting. The sample selection was finalized with Tembec staff on August 19, 2016 once access conditions were better known.

Site Audit: The audit team spent 5 days on the GCF in September 2016 conducting the field audit, document and record reviews and interviews. The field audit was designed to achieve a minimum 10% of the forest management activities (including road construction and maintenance) that occurred during the audit term (see the IFA Field Sampling Intensity on the GCF below).

Not every hectare of the area sampled is surveyed, as this is not feasible. Individual sites are initially selected to represent a primary activity (e.g. harvesting, site preparation) but all associated activities that occurred on the site are assessed and reported in the sample table.

The audit team also inspected the application of Areas of Concern prescriptions, aggregate pit management and rehabilitation and water crossing installations. Areas listed in the "*Road Construction and Maintenance Agreement*" were visited to ensure conformity between invoiced and actual activities.

The field inspection included site-specific (intensive) and landscape-scale (extensive helicopter) examinations.

Report: This report provides a description of the audit process and a discussion of audit findings and conclusions. Recommendations are directed at deficiencies in forest management and associated processes that require a corrective action.

Procedures Audited by Risk Category

Principle	Low Risk			Medium Risk			High Risk	Comments
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% Audited)	
1. Commitment	0	0	0	0	0	0	0	The FSC certification met IFAPP Principle 1 criterion.
2. Public Consultation and Aboriginal Involvement	0	0	0	6	6	100	2	All procedures were audited.
3. Forest Management Planning	7	5	71	12	11	92	41	The following procedures were not audited; 3.2.1., 3.2.2. & 3.6.2.
4. Plan Assessment & Implementation	1	1	100	1	1	100	10	All procedures were audited.
5. System Support	0	0	0	0	0	0	0	The FSC certification met IFAPP Principle 5 criterion.
6. Monitoring	0	0	0	7	7	100	11	All procedures were audited.
7. Achievement of Management Objectives and Forest Sustainability	0	0	0	2	2	100	15	All procedures were audited.
8. Contractual Obligations	0	0	0	2	2	100	5	All procedures were audited.
Totals	8	6	85	30	29	97	84	

IFA Field Sampling Intensity on the Gordon Cosens Forest²⁶

Activity	Total Area (Ha) / Number	Planned Sample Area (Ha)	Actual Area (Ha) Sampled ²⁷	Number of Sites Visited	Percent Sampled
Harvest	38,093	9,586	3,790	30	10
Renewal	71,617	7,994	7,406	11	10
Site Preparation	5,358	610	662	9	12
Tending	16,880	15,716	2,585	15	15
FTG	35,764	6,362	3,867	9	11
Water Crossings (# of Crossings)	168	16		16	10
Forest Resource Aggregate Pits (# of Pits)	32	3		3	10

Summary of Consultation and Input to the Audit

Public Stakeholders

Public participation in the audit was solicited through the placement of a public notice in the Kapuskasing Northern Times. This notice directed interested individuals to contact the audit firm with comments or complete a survey questionnaire on forest management during the audit term on the Arbex website. One response was received which expressed a general satisfaction with the forest management activities of Tembec.

One hundred individuals/organizations in the 2010 FMP mailing list received a letter and the survey questionnaire. No responses were received.

An additional sample of stakeholders was contacted directly by telephone. Comments were received from resource-based tourism operators and recreationalists including anglers and hunters and snowmobilers. All respondents indicated that they had been made aware of FMP processes and opportunities to engage in the planning process

²⁶ During the field audit, we observed numerous areas where AOCs had been implemented in either linear buffer strips or in association with an identified value. We cannot provide an accurate estimate of the sample intensity given the linear nature of many of the buffers. All AOCs associated with sample sites were observed. These included riparian reserves and nest buffers.

²⁷Not every hectare of the area sampled is surveyed, as this is not feasible. Individual sites are initially selected to represent a primary activity (e.g. harvesting, site preparation); although all associated activities that occurred on the site were also assessed these areas have not been included in the table summary.

were provided. The comments received included a range of opinions with some respondents being satisfied with the performance of the MNRF and Tembec and their relationship with the organizations while other respondents expressed concerns about their relationship with Tembec/MNRF and other issues associated with forest management operations and land use.

Some specific concerns included:

- Inadequate notice about the specific timing and location of herbicide tending operations.
- Uncertainty that the comments provided would be acted on.
- Concerns about inadequate harvest buffers to protect values associated with an established TOPS secondary snowmobile trail.
- Concern about reduction of fishing/hunting access due to road closures.
- Too much protection (including excessive size of buffers) for remote tourism operations.
- Not enough protection of remote tourism operations
- Too few moose tags and not enough monitoring of moose populations to make good resource management decisions
- Clearer information about accessing fuelwood in harvest areas.

MNRF

MNRF District and Regional staff who attended the field audit and/or had responsibilities on the GCF were interviewed. General comments expressed by staff to the auditors were:

- Concern as to the quality of initial submissions of ARs and AWS'.
- Concern about the amount of balsam fir being left in some harvested areas leading to long term problems with silviculture success.
- Satisfaction with the participation of the LCC in forest planning and its representation of the various interest in the Forest.
- Satisfaction with the level of communications with the SFL and contractors.
- Concern about the accuracy of the FRI.

Tembec

Tembec staff were interviewed and/or attended the field audit. General comments made to the audit team included:

- A concern over the lack of a licence commitment for OSB grade poplar and white birch.
- Satisfaction with the level of communication and work relationships with MNRF staff.

- Concern that there were no markets for balsam fir.
- Satisfaction with relations with aboriginal communities.
- Concern that the caribou guidelines were removing forest from potential harvest.
- Questioning the priority of caribou management vis-a-vis moose.

LCC Members

Individual members of LCC received a letter inviting their participation in the audit. Nine members of the LCC were interviewed. No LCC members attended the field audit. General comments included:

- Disagreement with caribou management having greater management priority than moose management.
- Satisfaction with relations with MNRF and Tembec staff.
- Concern with respect to unlicensed fuelwood operators selling fuelwood.
- Concern that MNRF staffing levels were not sufficient to properly carry out its mandate.

First Nations and Métis Organizations

All Aboriginal communities with an identified interest in the Forest and the Métis Nation of Ontario were contacted by mail, telephone and/or email and asked to express their views on forest management during the audit term and/or participate in the field audit. General concerns included:

- There are not enough resources (knowledgeable staff and funding) for First Nation communities to participate as full partners in forest management planning/strategy discussions.
- General concern/confusion about the number and purpose of IFA and certification audits on the different forests they have an interest in.
- A concern that the issues they raise do not appear in the audit reports.

Appendix 5

List of Acronyms Used

AHA	Available Harvest Area
AOC	Area of Concern
AR	Annual Report
AWS	Annual Work Schedule
B&S	Barren and Scattered
B.Sc.F.	Bachelor of Science in Forestry
CCP	Caribou Conservation Plan
CFSA	Crown Forest Sustainability Act
DCHS	Dynamic Caribou Habitat Schedule
eFRI	Enhanced Forest Resource Inventory
EMS	Environmental Management System
FIM	Forest Information Manual
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FN	First Nation
FOIP	Forest Operation Inspection Program
FOP	Forest Operations Prescription
FRI	Forest Resource Inventory
FRT	Forest Renewal Trust
FSC	Forest Stewardship Council
FTG	Free-to-Grow
HSMS	Health and Safety Management System
Ha	Hectares
IEA	Individual Environmental Assessment
IFA	Independent Forest Audit
IFAPP	Independent Forest Audit Process and Protocol

KM	Kilometer
LCC	Local Citizens Committee
LTMD	Long Term Management Direction
m ³	Cubic Metres
MNRF	Ministry of Natural Resources and Forestry
MOA	Memorandum of Agreement
NDPEG	Natural Disturbance Pattern Emulation Guideline
GCF	Gordon Cosens Forest
HSMS	Health and Safety Management System
NESMA	Northeast Seed Management Association
NRS	Not Satisfactorily Regenerated
OFRL	Overlapping Forest Resource Licence
PMS	Proposed Management Strategy
PT	Planning Team
RD	Regional Director
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreements
SAP	Supplemental Aerial Photography
SAR	Species at Risk
SEM	Silvicultural Effectiveness Monitoring
SFL	Sustainable Forest Licence
SFMM	Strategic Forest Management Model
SGR	Silvicultural Ground Rule
SIP	Site Preparation
SPR	Specified Procedures Report
SRNV	Simulated Range of Natural Variation

STP Silvicultural Treatment Package
VS Versus

Appendix 6

Audit Team Members and Qualifications

Name	Role	Responsibilities	Credentials
Mr. Bruce Byford R.P.F. President Arbex Forest Resource Consultants Ltd.	Lead Auditor Forest Management & Silviculture Auditor	Audit Management & coordination Liaison with MNRF Review documentation related to forest management planning and review and inspect silviculture practices Determination of the sustainability component.	B.Sc.F. ISO 14001 Lead Auditor Training. FSC Assessor Training. 37 years of consulting experience in Ontario in forest management planning, operations and resource inventory. Previous work on 32 IFA audits with lead auditor responsibility on all IFAs. 27 FSC certification assessments with lead audit responsibilities on 7.
Mr. Al Stewart Arbex Senior Associate	First Nations & LCC Participation in Forest Management Process Auditor Forest Compliance	Review & inspect AOC documentation & practices. Review of operational compliance. First Nations consultation.	B.Sc. (Agr) ISO 14001 Lead Auditor Training. FSC assessor training. 46 years of experience in natural resource management planning, field operations, policy development, auditing and working with First Nation communities. Previous work experience on 32 IFA audits.
Mr. David Watton Arbex Senior Associate	Forest Management Planning & Public Participation Auditor	Review documentation and practices related to forest management planning & public participation. Determination of the sustainability component.	B.Sc., M.Sc. (Zoology) ISO 14001 Lead Auditor Training. 46 years of experience in natural resource management planning, land use planning, field operations, and policy development. Previous work experience on 31 IFA audits.

Mr. Trevor Isherwood R.P.F. Arbex Senior Associate	Silvicultural, Forest Management and Contractual Compliance Auditor	Review and inspect silvicultural practices and related documentation. Review and inspect documents related to contractual compliance.	B.Sc.F. Former General Manager of an SFL. 46 years of experience in forest management and operations. Previous work experience on 28 IFA audits.
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