

Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual

Environment and Natural Resources

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Preface

The purpose of the *Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (Manual)* is to promote best practices by presenting standards for sustainable forest management in the Northwest Territories (NWT).

The direction contained within the *Manual* will form part of an overall framework for forest management that will include additional manuals and directives for forest planning, for domestic use of timber and for other industrial uses that occur on forest landscapes. Collectively, these documents, along with legislation and policy, will establish requirements and guidelines for sustainable forest management in the NWT.

The *Manual* directs how staff of the Government of the Northwest Territories (GNWT) will carry out operations to conform to relevant legislation. The Standard Operating Procedures (SOPs) contained in the *Manual* are to be used by staff of Environment and Natural Resources in planning and carrying out field activities for commercial timber harvesting operations. The SOPs are also to be followed in establishing the terms and conditions contained within permits, licences, long-term development plans, operating plans and annual operating plans.

Direction contained in the *Manual* only becomes enforceable when incorporated into terms and conditions contained in forest management authorizations such as licences and permits and in plans identified under the *Forest Management Act* (FMA). Regulatory or enforcement action must be based on and refer to the terms and conditions identified in authorizations and approved plans.

The *Manual* is not a legal document or a complete listing of forestry legislation in the NWT and cannot be relied on as such. A complete list of NWT forestry legislation and information related to legislation amendments can be found at <http://www.justice.gov.nt.ca>.

A timber operation is required to follow all applicable federal and territorial legislation, including the FMA and *Forest Management Regulations* (FMR). The *Manual* does not address an operator's obligations to other relevant agencies.

The *Manual* will be subject to periodic review and will be revised as required. If you have questions or concerns about current SOPs or revisions, please contact the GNWT Forest Management Division at 867-874-2009.

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1.0 INTRODUCTION

Forests of the Northwest Territories are an important source of economic, cultural and spiritual wealth. They are the foundation of a diverse resource-based economy, which many NWT residents depend upon for subsistence harvesting, business development opportunities and employment. Sustainable use of our forests must be balanced with social, cultural and economic values and protection of the environment.

NWT residents expect their forests will be managed to meet their diverse needs and to maintain ecological integrity so as to allow future residents continued enjoyment of the benefits of our forests.

1.1 Purpose of the Manual

The purpose of the *Manual* is to provide standards of performance for operational planning and timber harvest for all commercial timber operations. This will ensure that commercial timber-harvest operations administered by the Department are consistent and conform to sustainable use practices and territorial forestry legislation. The Standard Operating Procedures (SOPs) contained in the *Manual* are basic standards for protection, maintenance and integration of non-timber values in commercial timber harvest planning and operations.

The information contained in the *Manual* is to be used by Departmental staff as guiding principles in reviewing applications for authorizations to harvest timber and in developing terms and conditions for authorizations and plans required under the NWT *Forest Management Act* (FMA) and *Forest Management Regulations* (FMR).

The SOPs do not have legislative authority. Regulatory or enforcement action must be based on and refer to legislative statutes and regulatory requirements on which the SOPs have been developed.

1.2 Use of the Manual

The *Manual* is intended to be compatible with the NWT FMA and FMR. A directive will be contained in the Departmental Operations Manual about GNWT staff use of the *Manual*.

Departmental staff must use the SOPs and direction contained in the *Manual* when reviewing applications for an authorization to carry out forest operations, when carrying out field activities associated with planning a harvest operation or when developing terms and conditions for a timber cutting licence or permit or for a plan under the *Forest Management Act*.

The *Manual* does not cover all situations. The intent is to provide flexibility to accommodate variations in site conditions. Modifications and additions will be required to deal with special circumstances dictated by site-specific considerations and management priorities. Regional staff will discuss proposed deviations from direction contained in the *Manual* with the Manager of Forest Resources in consultation with Forest Management Division staff. The rationale for not following the SOP is to be documented.

Where agreement cannot be reached regarding deviations from the direction in the *Manual*, the proposed deviation will be forwarded to the Regional Superintendent and Director, Forest Management.

2.0 FOREST MANAGEMENT PLANNING

2.1 Timber Supply Planning

The Department creates timber supply planning reports and products to determine sustainable levels of harvest. These products ensure the sustainability of timber harvest operations and are the basis on which permitted harvest levels are determined.

Timber supply plans model sustainable harvest levels. They incorporate requirements for environmental protection, stand merchantability, and public and management priorities for forest use. The terms and conditions contained in licences, permits and plans must be reconciled with timber supply plans.

An application to harvest timber must be considered in the context of the regional or local timber supply. This enables the application to be aligned with the management goals for the forest resource and allows managers to ensure that the application fits within the sustainable harvest for the area.

When an application is approved it is tied to a specific harvest volume and area. Detailed operating plans must be developed based on the characteristic of the timber resource, characteristics of its physical environment and timber supply planning.

Terms and conditions built for all licences, permits and plans are the specific measures that link on-the-ground operations with requirements for environmental protection and sustainable use of the forest resources.

3.0 REQUIREMENTS FOR APPROVAL TO HARVEST TIMBER

An operator must obtain an authorization to harvest timber before proceeding with a harvest operation (FMA s. 40. Note: some exceptions are provided in the FMR s. 12). Authorizations for commercial timber harvesting under the *Forest Management Act* are all volume based. They include a timber cutting licence or timber cutting permit.

There are a number of steps that must be followed in obtaining an authorization for commercial timber harvesting in the NWT.

- a. Submission of an application by an operator (Includes the submission of a Long Term Development Plan when the application is for a Licence);
- b. Review and acceptance of the application by the Department;
- c. Public consultation as required under the FMR and any relevant land claims or interim measures agreements;
- d. Approval for an authorization to be issued;
- e. Issuance of an authorization;
- f. Development of an Operating Plan (OP) or Annual Operating Plan (AOP);
- g. Plan approval; and
- h. Approval to commence harvest.

3.1 General Application Requirements

To be eligible to apply for a timber cutting licence an applicant must have an established timber harvesting business within the NWT, or must demonstrate to the satisfaction of the Supervisor the ability to operate a viable timber harvesting business for the currency of the timber cutting licence [FMR s. 3].

Every permit or licence application must be accompanied by the prescribed fee [FMA s.12]. Detailed descriptions of proposed timber harvesting operations are required with all applications for a timber cutting licence and can be required for a timber cutting permit [FMR s. 13(1) and (2); and s. 19].

3.2 Timber Cutting Licence Application Requirements

A timber cutting licence application must be submitted in a form approved by the Supervisor [FMR s. 13(2)]. An overview map and a project description map of the areas to be logged, as described in sections 4.2.1 and 4.2.2 of *the Manual*, must be provided with the application for a timber cutting licence [FMR s. 13(2)].

The application must include a Long Term Development Plan (LTDP) [FMR s. 13(1)]. The purpose of an LTDP is to provide general information about the proposed operation and to describe the comprehensive harvesting strategy for the licence period.

The LTDP must be in a form approved by the Supervisor and must include the following, where applicable [FMR s. 13(2)]:

- a. A map of the areas to be logged;
- b. An outline of proposed roads and buildings to be constructed, and materials and equipment to be placed within the licence area;
- c. Timing and sequence of logging operations;
- d. Mill sites;
- e. A fire control plan, as per the Government of the NWT *Forest Fire Prevention and Suppression Guidelines for Industrial Activities*;
- f. A reforestation plan;
- g. A restoration plan;
- h. An environmental protection plan; and,
- i. Other details required by the Supervisor.

The Supervisor may require additional information or revisions to an LTDP and may specify terms and conditions, such as scaling agreements and other licences, before approval is given [FMR s. 13(2)-(4)].

Amendments to an LTDP are subject to the same review process as the original application.

3.2.1 Application Review

An application review ensures that the timber cutting licence application follows the standards, resource reporting requirements and considerations described in the *Manual*, the FMA and FMR. The LTDP ensures the applicant and the Department recognize and respond to forest management and sustainable resource issues.

3.2.2 Public Consultation and Screening

The Forest Management Supervisor (Supervisor) must discuss a timber cutting licence or an amended timber cutting licence with the closest municipal council [FMR s. 4(1)]. It is the responsibility of the regional offices to carry out this consultation on behalf of the Supervisor.

There may also be a requirement to refer applications to other organizations and groups such as Aboriginal organizations, resource management boards or communities. Provisions in Interim Measures Agreements, Agreements-in-Principal or Land Claim Agreements need to be followed if the proposed activities are located in areas covered by these agreements. In certain cases, some of these agreements require approval from the organization before forest management activities may proceed. Consultation requirements related to NWT organizations and Interim Measures Agreements are the responsibility of the

Forest Management Division with consultation related to local organizations and communities the responsibility of the regional office.

Timber cutting licence and permit applications will be screened for environmental and public concerns, and could be subject to the application of the *Mackenzie Valley Resource Management Act* and other Federal legislation. The FMA and FMR also apply. Consultation requirements for intergovernmental processes are the responsibility of the Forest Management Division.

Public consultations conducted by the Department do not replace the applicant's obligations to other relevant agencies. A developer is required to follow all applicable legislation.

3.2.3 Application Approval

Once a timber cutting licence is approved and issued, the holder must submit a 12-month AOP to the Supervisor at least 30 days before starting the timber operation. If a timber cutting licence is for a multi-year term, second and subsequent AOPs must be submitted at least 30 days before the anniversary date of the first licence [FMR s. 16(1)-(3)].

In addition to submission of an AOP there may be requirements for a scaling agreement and a timber transport permit. An operator must abide by the terms and conditions of the approved scaling agreement and, where one is required, a timber transport permit.

3.2.4 Annual Operating Plan

An AOP is required for each year of operation. The AOP describes operations in the licence area for the next harvest season. It details how, where and when the operator will develop roads, harvest timber, integrate operations with other users and mitigate the impact of logging including reclaiming disturbed sites.

Specific information is required for each proposed cutblock to ensure operations meet the management objectives for the site and environmental protection is adequately addressed within the plan.

Some information on which the AOP is based has to be collected at a time when the ground is not frozen and vegetation identification is possible. Unless the information required for planning is collected during the growing season operations may have to be delayed. Fieldwork should be planned well in advance of plan development. This requirement may be waived in some cases.

AOPs must be prepared in a form approved by the Supervisor [FMR ss. 16(5) and 19.(2)]. Plans must be approved by the Supervisor, or authorized officer, prior to harvest commencing [FMA s. 16(9)].

Amendments involving a material change to an AOP are subject to the same review process as the original AOP.

A timber cutting licence holder who anticipates a material change in their timber operation is required to submit an application to amend the LTDP and the AOP [FMR s. 18(1)].

Requirements include:

- I. An AOP must be submitted to the Supervisor each year during the term of the licence. The AOP covers a period of one year beginning on the date the licence was issued.*
- II. The first AOP must be submitted at least 30 days before the start of the timber operation.*
- III. The second, and each subsequent AOP, must be submitted at least 30 days before the anniversary date of the licence.*
- IV. The AOP must be consistent with the LTDP.*
- V. An AOP must contain a program of timber operations that includes:
 - a. Information outlined in 3.2 of the Manual , as applicable; and*
 - b. The volume of timber product that the licence holder proposes to harvest during the term of the AOP.**
- VI. Detailed plans are to be submitted for each proposed cutblock in an AOP [FMR s. 16(4)]. Submission in an approved digital format may be required. A detailed harvesting plan should include:
 - a. Block number, incorporating the licence number and unique block identifier;*
 - b. Inventory stand listings, where available;*
 - c. Block area, and estimates of gross merchantable volume to be harvested by species;*
 - d. Operational cruise data;*
 - e. A detailed block plan map, described in Section 4.2.3 of the Manual;*
 - f. A pre-harvest ecological assessment (PHEA), described in Section 4.1 of the Manual; and*
 - g. A plan indicating season of operation, harvest methods, rationale for methods, equipment to be used, sequence of operations and start and completion dates of operations.**

3.3 Timber Cutting Permit Application Requirements

A timber cutting permit is a harvest allocation for a period not exceeding one year and for not more than 5,000 m³ of timber [FMR ss. 6(3) and 7(4)]. A timber cutting permit may require the permit holder to submit an OP [FMR s. 19(1)].

3.3.1 Application Review and Approval

An application review ensures that the timber cutting permit application follows the standards, resource reporting requirements and considerations described in the *Manual*, the FMA and FMR.

Similar to a cutting licence application, there may be a requirement to refer applications to organizations and groups such as Aboriginal organizations, resource management boards or communities.

3.3.2 Developing an Operating Plan

An OP describes operations in the permit area during the planned harvest season. It details how, where and when the applicant proposes to develop roads, harvest timber, integrate operations with other users, mitigate the impact of logging and reclaim disturbed sites.

Specific information is to be submitted for each proposed cutblock to ensure operations will meet management objectives for the site and environmental protection is adequately addressed within the plan.

Similar to AOP development, some information on which the OP is developed has to be collected at a time when the ground is not frozen and vegetation identification is possible. Unless the information required for planning is collected during the growing season operations may have to be delayed. Fieldwork should be planned well in advance of plan development. It is recognized that this is not always possible, and can be waived in some circumstances.

The OP must be approved by the Supervisor, or authorized officer, prior to commencement of operations. [FMA s. 16(9)].

A timber cutting permit holder who is submitting an OP is required to notify the Supervisor of any anticipated material change in their timber operation and to submit an amended OP [FMR s. 21(1)].

- I. A timber cutting permit application must be submitted in a form approved by the Supervisor [FMR s. 3].*
- II. The Supervisor may require an OP for the term of the permit [FMR s. 19(1)].*

- III. *An OP must be in a form approved by the Supervisor [FMR s. 19(2)].*
- IV. *The OP must contain a program of timber operations that includes the information required in paragraphs 13(2)(a) to (i) of the FMR [FMR s. 19(2)].*
- V. *Detailed plans are to be submitted for each proposed cutblock in an OP [FMR s. 19(1) and (5)]. A detailed harvesting plan should include:*
 - a. *Block number, incorporating the permit number and unique block identifier;*
 - b. *Inventory stand listings, where available;*
 - c. *Block area, and estimate of gross merchantable volume to be harvested by species;*
 - d. *Operational cruise data; and*
 - e. *A detailed block plan map, described in Article 4.2.3 of the Manual.*

4.0 FIELD WORK AND MAPPING REQUIREMENTS

The Supervisor may include in any licence, permit, LTDP or AOP terms and conditions respecting the fieldwork carried out, the maps prepared, operational planning, and the operations themselves [FMR s. 36.1(1)]. Typical terms and conditions that an applicant may be required to fulfill are contained in Sections 4, 5, and 6 of this *Manual*.

4.1 Pre-Harvest Ecological Assessment

A PHEA is to be required for proposed cutblocks [FMR para. 36.1(j)]. A PHEA is a detailed report of site factors that may affect the operability and regeneration of a block.

Position of a block in the landscape, local topography and site-specific conditions are assessed. Details of the plant community, soil and moisture characteristics of the site are collected. Evidence of use by people or wildlife is also noted.

PHEAs are used to prepare Pre-Harvest Silviculture Prescriptions (PHSP) for all cutblocks. The information is compiled to predict how the site will respond once the harvest is complete. A PHSP specifies the silviculture system and reforestation plan for a block. It will be designated as a condition of harvest within the terms and conditions of the approved OP.

- I. A PHEA for each cutblock will be required of the proponent with the OP or AOP [FMR s. 36(1)(j)].*
- II. The Department will establish a PHSP (based on the submitted PHEA) before operations can begin in a proposed block.*

4.2 Map Requirements

Applicants will be required to submit one or more of the following types of maps as part of the LTDP or AOP for a Timber Cutting Licence, or an OP for a Timber Cutting Permit [FMR s. 13(2)(a)]. The types of maps that may be required are: an overview map, a project description map, a final block plan map and/or a detailed block plan map as described below.

4.2.1 Overview Map

- I. An overview map, provided on a 1:250,000 scale NTS map, must show:
 - a. Delineation of the licence location; and*
 - b. The access plan.**

4.2.2 Project Description Map

- I. *A project description map, provided at 1:20,000 scale, on forest cover maps where available, must show:*
 - a. *Proposed harvest blocks and contingency blocks;*
 - b. *Known environmental and resource values, traplines, cabins, trails, recreation facilities, view sheds, traditional use and cultural heritage values;*
 - c. *Roads and watercourse crossings; and*
 - d. *Inoperable sites.*

4.2.3 Detailed Block Plan Map

- I. *A detailed block plan map for each proposed cutblock is required pre-harvest. It must be provided at 1:5,000 scale, and must show:*
 - a. *Block number and year;*
 - b. *GPS block boundaries;*
 - c. *GPS locations of tie points for blocks and roads;*
 - d. *GPS locations of PHEA field plots and numbers;*
 - e. *GPS locations of watercourse crossings;*
 - f. *Roads, landings, processing areas, general skid trail layout, felling and skidding direction; and*
 - g. *Understory stands, buffers, retention patches and other leave areas.*

4.2.4 Final Block Map

- I. *A final block map for each cutblock, provided at 1:5,000 scale, must show:*
 - a. *Block number and year;*
 - b. *GPS final block boundaries;*
 - c. *Roads and landings constructed;*
 - d. *Understory stands, buffers, retention patches and other leave areas;*
 - e. *Cutblock area; and*
 - f. *Scale volume of timber harvested from block.*

4.2.5 GPS Data Standards for Mapping

- I. *GPS data must be provided in:*
 - a. *ESRI shape file format;*
 - b. *Geographic co-ordinates, decimal minutes accurate to 3 decimal places; and*
 - c. *NAD83 datum.*
- II. *GPS data must include:*
 - a. *Licence or permit number;*
 - b. *Name and contacts of surveyor; and*
 - c. *Date of survey.*

5.0 OPERATIONAL PLANNING CONSIDERATIONS

Harvest operations must make efficient use of the merchantable timber that is available [FMR s. 10(1)]. Harvest designs must accommodate:

- a. Resource profile and distribution as defined in the inventory;
- b. Utilization standards and harvest constraints identified in timber supply plans;
- c. PHSP assessments;
- d. Silviculture requirements of the species to be reforested;
- e. Watershed, aesthetics, fish and wildlife habitat, other resource values; and
- f. The *Manual*.

5.1 Harvest Sequencing

A Timber Supply Analysis (TSA) models sustainable harvest levels for an area based on forest productivity, state of the forest and management regimes employed. Harvesting sequences may be modeled based on the TSA. Harvesting within a timber supply area must adhere to sequencing set in the model, where applicable, to maintain the sustainable harvest volume projections.

In absence of a TSA, harvest plans will be sequenced to maintain utilization standards for timber resources, minimize waste and maximize benefits from the forest in a sustainable manner in accordance with timber supply plans. Priorities shall be determined according to stand age and condition and other management objectives.

A two-pass harvest system may be required for some licences to limit development of large, continuous harvested areas.

- I. Stands selected for harvest in a licence area will adhere to rules developed in TSA models for the area. Deviation from minimum stand age criteria will only occur in consultation with Forest Management Division.*
- II. In the absence of a TSA, stand merchantability and utilization standards specified in timber supply plans or the FMR s. 10(1)(a)-(d) apply.*

5.2 Merchantability and Utilization Standards

Merchantability and utilization standards are set by the FMR in s. 10(a) -(d) to minimize waste and ensure optimal use of timber from harvested stands.

- I. Minimum stand age for clearcut harvesting will be specified in the timber supply plans for the area.*

- II. *Timber harvesting will be planned according to merchantability and utilization standards specified by timber supply plans. If timber supply plans are not available the following standards shall apply:*
 - a. *Merchantable clearcut stand: 60% of the stems have a minimum diameter outside bark (dob) of 19 cm at stump height (30 cm), or 18 cm diameter at breast height (dbh), and minimum gross merchantable volume of 120 m³ per hectare.*
 - b. *Minimum gross merchantable volume only applies to even-aged harvest systems.*
 - c. *Utilization standard: trees with a stump dob of 19 cm (18 cm dbh) and 15 cm top diameter inside bark will be harvested and utilized, unless alternate specifications to meet other management objectives are authorized. Stump height must not exceed 30 cm.*
- III. *Maximum merchantable size can be set by the Department if logging equipment and/or milling facilities cannot properly use oversized stems or to meet other management objectives.*
- IV. *Merchantability and utilization standards for non-clearcut harvesting systems will be assessed on a case-by-case basis.*
- V. *Merchantability and utilization standards specified in licences or permits apply.*

5.3 Silviculture Systems

The silviculture system prescribed for a harvest block is designed to promote reforestation and to protect advanced regeneration on the site. Silviculture systems are to meet the regeneration requirements of the stand being managed, as defined in the PHSP.

- I. *PHSPs will be completed for each proposed harvest block, as described in Section 4.1 of the Manual.*
- II. *Harvest blocks will be designed to promote artificial regeneration methods, such as planting, to conform to the prescriptions in the PHSP.*
- III. *Harvest designs are to avoid damage to natural regeneration and reforested cutblocks.*
- IV. *Blocks will be designed to promote natural regeneration.*
- V. *No part of a white spruce cutblock is to be farther than 100 m from a white spruce seed source.*

- VI. *Seed sources can include adjacent stands, individual dominant seed-trees and seed-tree patches retained on the cutblock following harvest.*

5.4 Understory Protection

Damage to thrifty white spruce understory trees in stands approved for harvest must be avoided at all stocking densities. Understory trees that are vigorous, have good form and potential to be crop trees by the second rotation must be given highest priority for protection. The value of the understory may depend upon any of the following factors:

- a. Management objective for the area;
- b. Density and height of the understory;
- c. Condition of the understory;
- d. Limiting physical site factors; and
- e. Reforestation expectations.

White spruce understory trees must be given highest priority for protection. However, other tree species may also be protected for specific reasons.

In some circumstances, protection of the understory trees can be of greater management value than the harvest of the overstory stand.

- I. *Spruce understory is to be protected according to management objectives identified in the PHSP.*

5.5 Watershed Protection

Harvesting must be planned to minimize the impact of operations on water quality, watercourse structure, aquatic and riparian ecosystems and soils.

5.5.1 Waterbody Measurement and Classification

- I. *Waterbody width will be determined by taking a number of distance measurements between the left and right bank of the ordinary high water mark. Measurements are to be made with a tape, perpendicular to the water flow.*
- II. *Water bodies will be evaluated and classified according to the descriptions and classifications in Appendix II.*

5.5.2 Waterbody Protection Buffers

- I. *The following no-harvest buffers will be maintained adjacent to water bodies excepting those with explicit permitted terms:*
 - a. *Lakes larger than 16 ha: 100 m buffer.*

- b. *Lakes 1 ha to 16 ha area: 30 m buffer.*
 - c. *Ponds less than 1 ha in area: 10 m buffer.*
 - d. *Large permanent rivers: 100 m buffer.*
 - e. *Medium permanent rivers: 60 m buffer.*
 - f. *Small permanent rivers and streams: 10 m buffer.*
- II. *Buffers are measured as the slope distance from the top of the ordinary high water mark on either side of a waterbody.*
 - III. *A 10m “machine free” zone will be maintained adjacent to intermittent and ephemeral streams, draws, and water source areas.*
 - IV. *Equipment is to cross water bodies only at approved locations.*
 - V. *Buffers may be enhanced with an additional machine free zone to protect a specific resource. The Supervisor will specify width of an enhanced buffer.*

5.6 Wildlife Considerations

Timber supply plans will incorporate wildlife habitat needs at the landscape level. It is at this broad level of 100,000 hectares or more that habitat elements are best addressed and protected. They can be modeled to ensure sustainability of the timber resource and protection of wildlife habitat both occur. Habitat planning requirements will then be available for full incorporation at the AOP level.

To minimize possibility of damage to special or unique wildlife features proposed harvest blocks must be inspected and assessed for such sensitive areas prior to harvest.

Specific wildlife issues identified at field level and requirements for implementation of landscape objectives for wildlife management at the operating level must be coordinated with the Manager of Forest Resources and the Manager of Wildlife at the regional office.

- I. *A Department Wildlife Biologist or a Forest Management Officer can request a wildlife use referral for special or unique wildlife features such as mineral licks or active raptor nests within an OP or AOP area.*
- II. *Wildlife-use referrals will be submitted to the regional Manager of Wildlife, the Wildlife Division, and the Manager of Forest Resources.*
- III. *If consensus cannot be reached on the appropriate treatment the matter will be referred to the Director of Wildlife, the Director of Forest Management and the regional Superintendent.*
- IV. *The Supervisor must approve appropriate treatment of wildlife use referrals.*

5.7 Operability and No-Harvest Constraints

5.7.1 Buffers and Line-of-Sight Restrictions

- I. Protective buffers must be retained along water bodies, as described in Section 5.5.2 of the Manual .*
- II. No live timber may be cut within 60 meters of the centerline of a public road unless specifically authorized in a licence or permit.*
- III. Line-of-sight within cutblocks must not exceed 400 meters, unless authorized in the AOP.*
- IV. Where harvesting is planned on areas bordering or including previously harvested cutblocks a 400-meter maximum line of sight standard must apply.*
- V. Line-of-sight buffers must be at least 2 meters in height and wind-firm.*

5.7.2 Sensitive Sites and Special Protection Areas

Sites susceptible to degradation resulting from vegetation removal or impacts of heavy machinery must be identified and managed to maintain site integrity. Areas where water, soils, vegetation or archeological sites will be permanently altered by harvesting activity must be avoided.

- I. Clearcut harvesting must not occur in:
 - a. Stands on permafrost; and*
 - b. Water source areas where soils are not frozen.**
- II. No operations are allowed to occur within 60m of an archeological site.*
- III. If resource values can be maintained following harvest, alternative harvest methods may be approved on sensitive sites.*
- IV. Wildlife trees must not be disturbed.*
- V. Harvesting operations must not occur during the period when migratory birds are nesting in the AOP area.*

5.7.3 Permanent Sample Plots

- I. *Growth and Yield (G&Y) Permanent Sample Plots (PSPs) will not be disturbed or harvested. A no-harvest buffer of 100 meters, measured from the PSP center, is to be maintained around G&Y PSPs.*

5.8 Cutblocks

5.8.1 Pre-Harvest Layout

- I. *Roads, trails, landings and cutblocks are to follow the layout design and specifications outlined in the proposed OP or AOP.*
- II. *Existing roads, trails, seismic lines and campsites will be used wherever possible.*
- III. *The harvest layout will be inspected by the Forest Management Officer to ensure all management concerns are addressed prior to final OP or AOP approval.*
- IV. *The operator must correct deficiencies in the layout before final OP or AOP approval is granted [FMA s.16(7), and FMR s. 19(5)].*

5.8.2 Boundary Marking

- I. *Cutblock boundaries will be single-marked with colored flagging or paint at 10m maximum intervals.*
- II. *Standard colors will be used to mark boundaries for timber harvest operations:*
 - a. *Orange: Harvest block boundaries.*
 - b. *Pink: Landings.*
 - c. *Blue: Road, skid trails and designated crossing.*
 - d. *Yellow: Special management areas (seed trees, buffers, no harvest zones, machine-free zones).*
- III. *A block identification marker is to be placed at each cutblock, double flagged and labeled with operator name, permit or licence number, date of marking and surveyor's initials.*
- IV. *Boundary markers are to be clearly visible prior to, during, and after harvesting.*

6.0 TIMBER HARVEST OPERATIONS REQUIREMENTS

Timber harvest operations are to be carried out using appropriate forest management practices in order to:

- a. Minimize the waste of merchantable timber;
- b. Minimize the amount and degree of soil disturbance, including rutting, gouging and compaction;
- c. Prevent soil and logging debris from entering and blocking watercourses;
- d. Prevent erosion;
- e. Maintain the site's capability to support healthy tree growth; and
- f. Avoid significantly increasing risk of timber loss.

6.1 Timber Harvesting

6.1.1 Harvesting

- I. *Harvesting operations are to abide by the terms and conditions of the approved OP or AOP [FMR ss. 17 and 20].*
- II. *The operator is to notify the Forest Management Officer that harvest operations are to commence at least 24 hours in advance of falling.*
- III. *The operator is to notify the Forest Management Officer 72 hours before commencing harvest operations in a new block.*
- IV. *Timber harvesting operations are to be confined to approved cutblock boundaries and approved road locations.*
- V. *Timber harvesting operations are to be confined to no more than two blocks at one time.*
- VI. *Timber harvesting operations are to avoid damage to natural regeneration, reforested areas or stands outside the block boundaries.*
- VII. *Timber felled into stands outside the block boundaries will be skidded into the cutblock before delimiting and topping.*
- VIII. *Merchantable trees are to be felled, skidded, decked and handled to avoid waste of timber. Mechanical damage to merchantable logs shall be measured and included in the scale calculations.*
- IX. *All merchantable logs are to be removed from the harvest blocks.*
- X. *All unmerchantable and mechanically damaged or unstable trees on the harvest block are to be felled.*

- XI. *All downed unmerchantable logs and debris are to be cut to lengths not exceeding two meters and scattered on the block.*

6.1.2 Roads and Campsites

- I. *Merchantable timber from haul roads and campsites will be recovered, scaled and included as part of the licence or permit volume [FMR s. 10].*
- II. *Haul road width must not exceed 10m.*

6.1.3 Skidding and Forwarding

- I. *All skidding and forwarding must be confined to designated trails when understory protection of white spruce regeneration is a harvesting condition.*
- II. *Designated trail width is not to exceed 7m.*
- III. *Designated trails are not to exceed 25% of the cutblock area.*
- IV. *Skid posts will be trimmed to not exceed two meters height before use.*

6.1.4 Landings

Landings must be located with consideration to operational efficiency and environmental protection. Additional landings can be requested during the course of operations if they are required to assist these goals.

- I. *Landings are not to exceed 0.4 ha in size unless authorized in the AOP.*
- II. *The number of landings permitted are:*
 - a. *Two on cutblocks less than 15 ha; and*
 - b. *Three on cutblocks over 15 ha, and one additional landing for every additional 10 ha.*

6.1.5 Block Clearance

- I. *After all merchantable logs are removed from the cutblock, and slash has been treated to meet the specifications of the OP to the satisfaction of the Forest Management Officer, a cutblock may be given final clearance.*

6.2 Operational Amendments

If a change to operations is required after issuance of the authorization and plan approval, the change must be noted in plan documents as an amendment and the rationale for the change documented [FMR s. 18(1)].

Proposed non-material changes to an OP or AOP should be implemented within the direction established *Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual*.

A proposed non-material change not consistent with procedures established in the *Manual* will be referred to the Superintendent/Director.

Material changes to an OP or AOP require a complete review of the proposed change and are subject to the same process of review and consultation as the original plan [FMR s. 18(2)].

- I. *The operator is to submit an application to amend a LTDP and the AOP of a timber cutting licence to the Supervisor prior to a material change in a timber operation.*
- II. *No operations will be conducted in accordance to an amended LTDP and AOP until the plans have been approved by the Supervisor [FMR s. 18(4)].*
- III. *Prior to a material change to operations of a timber cutting permit the operator must:*
 - a. *Notify the Supervisor in writing of the proposed change; and*
 - b. *Submit an amended OP where required by the Supervisor [FMR s. 21].*
- IV. *No operations will be conducted in accordance with an amended OP until the plan has been approved by the Supervisor [FMR s. 21(4)].*
- V. *Minor modifications (non-material changes) to an approved OP or AOP can be made within block boundaries to protect resource values or remove unforeseen harvest constraints. These changes will be consistent with direction contained in the Manual.*

6.3 Post-harvest Reporting

Final block maps are to be submitted for each block after each harvesting season. Information provided by the maps is used to update the forest inventory, plan for site treatment and reforestation and meet the Department's national reporting obligations.

- I. *Final block maps will be submitted within 30 days following completion of seasonal harvest operations, as described in Section 4.2.4 of the Manual.*

6.4 Final Clearance

- I. *All merchantable timber will be removed from a licence or permit area within 90 days of expiry of the licence or permit.*
- II. *The Supervisor will issue a letter of clearance to a timber cutting permit holder or timber cutting licence holder when the Supervisor is satisfied that all the requirements or obligations of the permit or licence, the FMA and the FMR have been fulfilled [FMR s. 47(1)]. [Note: exceptions for Free Timber Cutting Permits under FMR s. 22].*

7.0 APPENDICES

Appendix I: Glossary

Buffer: A protected strip of vegetated land beside roads, watercourses, mineral licks or other important features.

Crop Tree: Any tree selected to become part of a future commercial harvest.

Cutblock: A specified area of merchantable timber with defined boundaries designated for harvest.

Dominant [tree]: A tree whose height extends above the general height of the main canopy of the stand.

Ecological Integrity: The quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, ecosystem diversity assured for the future.

Ecological Processes: The actions or events that link organisms and their environment, such as disturbance, succession, nutrient cycling, carbon sequestration, productivity and decay.

Even-aged Stand: Forest stand composed mainly of a single age class in which the ages of most trees are within plus or minus 20 percent of rotation age.

Final Clearance: The status given to a cutblock after all harvest and reclamation requirements have been met.

Forest Management Act: The *Forest Management Act*, R.S.N.W.T. 1988, c.F-9.

Forest Management Officer: A forest management officer appointed pursuant to s. 4(1) of the *Forest Management Act*, or *ex officio* officers as specified under s. 4(2).

Forest Management Regulations: The *Forest Management Regulations* R.R.N.W.T. 1990, c.F-14, as amended.

Forest Management Supervisor: The Forest Management Supervisor appointed under s. 2 of the *Forest Management Act*, or a forest management officer authorized to perform the Supervisor's duties pursuant to s. 3(5) of the *Forest Management Act*, to the extent of that authorization.

Form [tree]: The classification of trees according to shape, often bole taper.

GPS: Global Positioning System.

Harvest Sequence: The order in which cutblocks will be harvested.

Landing: An area of a harvest block where timber is accumulated, topped and decked for loading.

Legislation: Federal and territorial statutes and regulations.

Long Term Development Plan (LTDP): A plan that provides a comprehensive description of an operators proposed general harvest strategy and reclamation operations for the period of the timber cutting licence.

Machine Free: Wheeled or tracked equipment is prohibited in a specified area. This does prohibit removal of timber from the area.

Material Change: A modification to expand the area or the volume of an operating plan or annual operating plan or a fundamental change in the operating procedure for a cutblock that requires a new silviculture prescription.

Natural Regeneration: The renewal of a forest stand by natural rather than human means (e.g., seeding in from adjacent stands vs. artificial regeneration - planting).

Non-material Change: A modification within a Licence, Permit or Operating Plan that does not affect the overall land base footprint, allowable volume, or relate substantively to business requirement conditions. Designations are determined on a case by case basis. This may mean that the Licence, Permit or Operating Plan does not require an amendment from the Supervisor.

Operator: The timber cutting permit or licence holder.

Operating Plan (OP): A plan that outlines how timber harvesting will be implemented in a timber disposition. It describes how, where and when the operator will develop roads, harvest timber, integrate operations with other users, mitigate the impact of logging and reclaim disturbed sites.

Ordinary High Water Mark: The top edge of the unvegetated channel of a water body.

Permanent Sample Plots (PSP): Plots established in forest stands for long-term timber growth-and-yield studies.

Pre-Harvest Ecological Assessment (PHEA): The process of evaluating a site prior to harvest, according to a specific set of procedures, to accomplish certain forest management objectives. This assessment system uses an ecological approach to site evaluation as opposed to single variable or very restricted set of variables.

Pre-Harvest Silviculture Prescription (PHSP): The planned strategy and series of treatments, that will be used to harvest and then control the establishment, composition, constitution and growth of forests from regeneration through to the desired endpoint of the forest stand to meet specific forest management objectives.

Regeneration: The renewal of a tree crop by natural or artificial means. It may also refer to a young crop produced by such means.

Rotation: Generally, the time interval between regeneration of the crop trees until harvest.

Sawlogs: All timber products other than cones, seeds, seedlings, saplings, fence posts, fuelwood, Christmas trees and trees intended for transplanting.

Silviculture: The theory and practice of controlling the establishment, composition, structure and growth of forests.

Silvicultural Systems: Systems that follow accepted silvicultural principles, whereby the tree crops are tended, harvested and replaced to produce a crop of a desired form. This includes even-aged (i.e., clearcutting, shelterwood or seed tree cutting) or uneven-aged (i.e., selection cutting) systems.

Skid Trail: An unimproved temporary forest trail suitable for use by equipment such as bulldozers, skidders and forwarders in bringing trees or logs to a landing.

Stand: A community of trees sufficiently uniform in species, age, arrangement or condition so as to be distinguishable as a group in the forest or other growth in the area.

Standards: The basic strategies, practices and requirements needed to achieve objectives of legislation and sound management.

Supervisor: The Forest Management Supervisor.

Sustainable Forest Management: Management of forests in order to maintain and/or enhance the long-term health and productivity of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations.

Timber Cutting Licence: A multi-year timber harvest allocation or a single year allocation that exceeds 5000 m³.

Timber Cutting Permit: A one-year timber harvest allocation for 5000 m³ or less.

Timber Operations: All activities related to timber harvesting including site-assessments, planning, road construction, harvesting, reclamation and reforestation.

Timber Supply Analysis: (TSA) models growth characteristics of a forest to predict sustainable harvest levels. Ecological considerations, operational capabilities of the forest industry and public priorities for forest use are applied to the TSA model. A TSA is used to determine sustainable harvest levels. These may change depending on the characteristics and assumptions used in the analysis.

Timber Supply Plan: Term used to describe the scale or scope of harvest activity allowed in an area based on timber resource assessments and characteristics of the potential use. A timber supply plan may include a timber supply analysis, an estimate of long run sustained yield, or other assessment.

Understory [trees]: Trees growing under the main forest canopy.

Vigor: Healthy physical condition and growth.

Water body: A lake, stream, river, creek, pond, swamp, marsh, channel, gully, coulee or draw that continuously drains water.

Watercourse: The bed, bank or shore of a river, stream, creek, draw or lake or other natural body of water, whether it contains or conveys water continuously or intermittently.

Water Source Area: The portion of a watershed where soils are water-saturated and/or surface flow occurs and contributes directly to stream flow.

Wildlife: Any vertebrate species found in a forest environment, excluding domestic animals.

Wildlife Tree: Any tree that provides an important or critical habitat element for the maintenance or enhancement of wildlife.

Wind-firm [tree]: A tree that is able to resist breakage and wind-throw, usually a function of tree form and structural root development.

Wind-firm Boundaries: Cutblock boundaries established at locations that are stable and minimize the potential for timber losses from wind.

Appendix II: Water Body Description and Classification

Appendix II: Waterbody Descriptions and Classification

Classification	Mapping Designation	Physical Description	Portion of Year Water Flows	Channel Development
Large Permanent	<ul style="list-style-type: none"> • Double line. 	<ul style="list-style-type: none"> • Major rivers. • Well defined floodplains. • Valley usually exceed 5 km in width. 	<ul style="list-style-type: none"> • All year. 	<ul style="list-style-type: none"> • Banks and channel well-defined. • Unvegetated channel width greater than 250 m.
Medium Permanent	<ul style="list-style-type: none"> • Usually double or solid line. 	<ul style="list-style-type: none"> • Large rivers and streams. • Usually well defined floodplain. • Valley usually exceed 400 m in width. 	<ul style="list-style-type: none"> • All year. 	<ul style="list-style-type: none"> • Banks and channel well-defined. • Unvegetated channel width 5-250 m.
Small Permanent	<ul style="list-style-type: none"> • Usually solid or heavy broken line. 	<ul style="list-style-type: none"> • Permanent streams. • Often small valleys. • Sometimes floodplain and bench development. 	<ul style="list-style-type: none"> • Generally all year. • Smaller streams may freeze completely in winter. 	<ul style="list-style-type: none"> • Banks and channel well-defined. • Unvegetated channel width 0.5 - 5 m.
Intermittent	<ul style="list-style-type: none"> • Usually broken light line. 	<ul style="list-style-type: none"> • Small stream channels. • Small springs are main source outside periods of spring runoff and heavy rainfall. 	<ul style="list-style-type: none"> • During wet season or storms. • Dries up during drought. 	<ul style="list-style-type: none"> • Distinct channel development. • Channel usually unvegetated. • Channel width to 0.5 m. • Some bank development.
Ephemeral	<ul style="list-style-type: none"> • Not normally mapped. 	<ul style="list-style-type: none"> • Often a vegetated draw. 	<ul style="list-style-type: none"> • Flows only during or immediately after rainfall and snowmelt. 	<ul style="list-style-type: none"> • Little or no channel development. • Channel is usually vegetated.
Watersource Areas (except bogs)	<ul style="list-style-type: none"> • Not mapped. 	<ul style="list-style-type: none"> • Areas with saturated soils or surface flow. • Seepages. 	<ul style="list-style-type: none"> • All year. • May freeze in winter. 	<ul style="list-style-type: none"> • N/A
Lakes and Ponds	<ul style="list-style-type: none"> • Solid line. 	<ul style="list-style-type: none"> • Water collection areas permanently filled with water. 	<ul style="list-style-type: none"> • Normally surface frozen completely in winter. 	<ul style="list-style-type: none"> • N/A

(Source: adapted from Alberta Timber Harvest Planning and Operating Ground Rules. 1994)