

Northeast

Alberta Timber Harvest Planning and Operating Ground Rules

NOVEMBER 2018

Alberta ■

2018

Northeast Alberta Operating Ground Rules

ALBERTA-PACIFIC FOREST INDUSTRIES
INC.

ALBERTA
AGRICULTURE and FORESTRY

ENDORSEMENTS

The Alberta-Pacific FMA Area Timber Harvest Planning and Operating Ground Rules, having been prepared in accordance with Section 11 (2) of FMA 9100029, and hereby endorsed this 29th day of October, 2018. The Executive Director of Forest Management Branch has determined these ground rules will apply to all operations within FMA 9100029 as well as FMU's A6, A10, A11, A12, LO1, L9, and SO1.

Alberta-Pacific Forest Industries Inc.

HER MAJESTY THE QUEEN in right of Alberta as
represented by the Minister of Agriculture and
Forestry

Per:

Original Signed

Per:

Original Signed

Ray Cloutier

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Business Unit Leader – Forest Resources

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Northeast Alberta Timber Harvest Planning and Operating Ground Rules

Revisions from 2015 to 2018

(Effective Date: October 31, 2018)

2018 Revisions

Ground Rule Number	2015 Version of the Ground Rule	2018 Version of the Ground Rule
General	Some edits were made outside of the joint review that included deletion of word(s), correction of spelling & grammar, changes to bolded text, etc. that did not change the intent, meaning or requirements of the OGRs, but rather to provide clarification. These changes are not documented in this table.	
3.3.4	When a change in a company's GDP strategy is proposed an amendment shall be required by Alberta. This may include additional or amended Indigenous Consultation.	When a major change in a company's general development strategy is proposed after the GDP is approved, a revision may be requested by Alberta. The nature of the change may require additional or amended Indigenous Consultation.
3.3.5	1. (f) structure retention summary by FMU for the current quadrant	1. (f) structure retention summary by FMU as per 7.4.8, 7.4.9, and 7.4.10; and
3.4.8	k) class IV road location shall be described for all inter block roads to be constructed for extraction of timber from all proposed harvest areas; and	Deleted
3.4.9	j) important wildlife sites as defined in section 7.7.6.2 (this information can be accessed by using the Fisheries and Wildlife Management Information System (FWMIS), available for resource planning purposes only);	j) important wildlife sites as defined in section 7.7.5.2;
3.4.12	The company shall request a FWMIS search annually with identified sites as listed in 7.7.6.2 incorporated into new FHPs , if applicable and/or relevant to current OGRs	Deleted
3.5.4 (c)	Added	VI. location(s) of any existing or proposed temporary camps as per Section 11.6.

3.4.11	Where a Temporary Field Authority is required to open access for the layout of harvest areas, this access should be incorporated into the road system of the FHP.	Deleted
4.1 (Discussion)	Within the FHP planning unit, the operator will address all the 1-10 year SHS assigned to that operator, deciding on either a harvest prescription, or a decision to not harvest at all (deletion) to delay harvest outside the first 10 year period (deferral) or to delay harvest till later in the first period (bypassed stand).	Within the FHP planning unit, the operator will address all the 1-10 year SHS assigned to that operator, deciding on either a harvest prescription, or a decision to not harvest at all (deletion) or to delay harvest outside the first 10 year period (deferral)
4.1 (Definitions)	Additions – Any area planned for harvest, or which has been harvested that is not part of the 10 year SHS in the approved FMP. Additions will be divided into two categories: substantial and slivers.	Additions – Any area planned for harvest, or which has been harvested that is not part of the current operational 10 year SHS (1-10) in the approved FMP. Additions will be divided into two categories: substantial and slivers.
4.1 (Definitions)	Provincial Base 10 Yield Stratum- One of ten Alberta yield stratum defined in the yield projection Interpretive Bulletin in the Alberta Forest Management Planning Standard (AFMPS)	Provincial Base 10 Yield Stratum- One of ten Alberta yield stratum defined in the yield projection Interpretive Bulletin in the Alberta Forest Management Planning Standard (AFMPS). Note that there are only 9 yield stratum in the Alberta-Pacific FMA.
4.2.3	Where stumps are left to delineate areas (e.g. harvest areas, create rub posts for understorey protection, or to delineate poorly defined watercourses) they shall be no less than 30m apart and no higher than 2m.	Where stumps are left to delineate areas (e.g. harvest areas, create rub posts for understorey protection, or to delineate poorly defined watercourses) they shall be an average of 30m apart and no higher than 2m.
5.2.3	Blocks and roads should be planned to avoid recreation sites. Roads shall be designed to ensure they can be used safely while minimizing their impact on the recreation values of the area.	Roads should be planned to avoid recreation sites. Roads shall be designed to ensure they can be used safely while minimizing their impact on the recreation values of the area.
5.3.2	At least ten days prior to commencing operations, the forest operator shall notify the appropriate trapper(s) referred in 5.3.1, preferably by personal contact that timber harvest operations are beginning in the RFMA.	At least ten calendar days prior to commencing operations, the forest operator shall notify the appropriate trapper(s) referred in 5.3.1, preferably by personal contact that timber harvest operations are beginning in the RFMA.
6.0.7	Sediment, logging debris or deleterious materials (e.g., fuels, oils, greases, industrial or household chemicals or refuse) shall not be deposited into the water or onto the ice of any watercourse or water body during road construction, maintenance, harvesting, reclamation, or silviculture operations.	Sediment, logging debris that impedes water flow or any deleterious materials (e.g., fuels, oils, greases, industrial or household chemicals or refuse) shall not be deposited into the water or onto the ice of any watercourse or water body during road construction, maintenance, harvesting, reclamation, or silviculture operations.

Table 2. Watercourse Classification	Class 'A' and 'B' waterbodies	Deleted – Water Act and Regulations apply
Table 3. Standards and Guidelines for Operating Beside Watercourses	Class 'A' and 'B' waterbodies	Deleted – Water Act and Regulations apply
Table 3. Standards and Guidelines for Operating Beside Watercourses	Lakes (with recreational, waterfowl or sport fish potential)	Lakes – removed test for “potential”
Table 3. Standards and Guidelines for Operating Beside Watercourses (Roads, Landings, Decking and Bared Areas – Lakes)	For shorelines not located within reserved areas, no disturbances shall be permitted within 200 m of the high water mark unless specifically approved in the AOP.	For shorelines not located within reserved areas, no disturbances shall be permitted within 100 m of the high water mark unless specifically approved in the AOP.
Table 3. Standards and Guidelines for Operating Beside Watercourses (Equipment Operation – Lakes)	If timber removal is approved, no machinery to operate within 40 m of the high water mark. Consideration must be given to aesthetics when harvesting adjacent to lakes with recreational potential.	If timber removal is approved within 100 m, no machinery to operate within 40 m of the high water mark.
7.1.1	Converging watersheds of small permanent watercourses shall have wildlife corridors of 100m around the converging point. This corridor should be focused on natural travel corridors and may contribute towards structure retention targets.	Converging watersheds of small permanent watercourses shall have buffers of 100m around the converging point to enhance wildlife corridors.
7.2.1	A preliminary harvest plan, PHP, shall be developed and submitted for approval by Alberta which incorporates a two-pass harvest system, or multiple entry system where agreed to.	A preliminary harvest plan, PHP, shall be developed and submitted for approval by Alberta.
7.2.2 (7.2.2.1 to 7.2.2.3)	PHP two-pass harvest system references	Deleted

7.4.1	For Alberta-Pacific and MTU, an average of 5% representative of all harvested area at the FMU level by quadrant will be retained.	For Alberta-Pacific and Commercial Timber Permits, an average of 5% representative of all harvested area at the FMU level by stewardship reporting period will be retained.
7.4.3	Proximal retention can be utilized for wind firming stands, protection of understorey or for defined purposes/values (TLU, sensitive sites, etc.) and is identified in the FHP. Proximal retention is defined as touching the boundary and it will not make up more than 30% of the total retention per FMU level by quadrant. It must be excluded from being sequenced for at least 30 years from the skid clearance of the block it is in.	Deleted
7.4.5	<p>Forest companies shall retain structure in the following manner:</p> <p>a) leave as many individual stems of non-merchantable trees, shrubs and snags as operationally and silviculturally feasible.</p> <ul style="list-style-type: none"> • Leaning snags or trees of non-merchantable species that are greater than 6 m in height that create a safety hazard may be felled to create safe working conditions. • Snags within 2.5 tree lengths of roads, camps, landings, fence lines, power lines and machine maintenance areas may be felled to create safe working conditions 	Deleted
7.4.6 (re-numbered as 7.4.4)	Forest companies may create high stumps within the harvested area to distinguish harvest area boundaries or for use as rub posts.	High stumps created within the harvested area to distinguish harvest area boundaries or for use as rub posts (as per 4.2.3) do not count towards the overall retention target.

7.4.9 (re-numbered as 7.4.7)	Stand structure monitoring results will be reported annually by FMU in the forest companies' GDP and/or AOP. Alberta is responsible for MTU monitoring through their AOPs.	Stand structure monitoring results will be reported annually by FMU in the forest companies' GDP and/or AOP, effective as of the Forest Management Plan approval date (May 17, 2018). Alberta is responsible for CTP monitoring through their AOPs.
7.4.11	The actual area left will be reconciled with the targets over a 5 year Cut-Control-Quadrant, allowing variation between years.	Deleted
7.5.2	Understorey discovered in the field, but not previously identified in the SHS shall be protected as per 7.5.3 and 7.5.4.	Sw Understorey stands (>600sph) discovered in the field, but not previously identified in the SHS shall be protected as per 7.5.3 and 7.5.4.
7.7.1.5	Except where identified and agreed upon within the FHP, only temporary access roads shall be used.	Deleted
7.7.1.6	Roads shall be built no sooner than one year prior to harvesting operations. Temporary roads shall be re-contoured and reclaimed (and potentially reforested) within 18 months of completion of harvesting and hauling operations, unless otherwise agreed to in the operating schedule.	Deleted
7.7.2.3	A sufficient amount of habitat (considering both habitat quality and effectiveness) must be maintained at all times within the caribou ranges. The FMP shall provide direction of the amount, configuration and location/adjacency of harvest areas and older seral stage retention areas, and on rate of harvest.	Deleted
7.7.3	Grizzly Bear Section	Deleted – no identified Grizzly Bear Zones or Core Area in FMA
8.1.1	The conditions outlined by Alberta must be met prior to planning reforestation of balsam fir or alpine fir as an acceptable species. See Directive 2001-01 or successors.	Deleted
9.1	Areas susceptible to rutting, puddling or compaction shall be avoided when planning temporary roads, decks, landings and skidding patterns.	Areas susceptible to rutting, puddling or compaction shall be avoided when planning decks, landings and skidding patterns.

9.6	Class IV roads and seismic lines within harvest areas that are no longer required shall be reforested. Treatments acceptable to Alberta are required on compacted soils. Acceptable treatments may be decompaction if required, roll back of debris, and re-vegetation	Class IV roads and seismic lines within harvest areas that are no longer required shall be reforested or regenerated. Treatments acceptable to Alberta are required on compacted soils. Acceptable treatments may be decompaction if required, roll back of debris, and re-vegetation (or as described in silviculture matrix)
11.3.4.4	<p>(e) reforesting disturbed areas outside of the harvest area as per the following;</p> <ul style="list-style-type: none"> • Reclaiming, and planting inter block roads: <ul style="list-style-type: none"> ○ where the road has been developed through a reforested cutblock; or ○ an existing access that has been widened to facilitate access; or ○ the road was built through standing timber. • Planting shall be to a density to support future stand growth. Where the road passes through non-productive landbase, planting is not required. 	<p>(e) regenerating disturbed areas outside of the harvest area as per the following;</p> <ul style="list-style-type: none"> • Reclaiming, planting, or revegetating inter block roads to the pre-existing condition prior to use: <ul style="list-style-type: none"> ○ where the road has been developed through a reforested cutblock; or ○ an existing access that has been widened to facilitate access; or ○ the road was built through standing timber.
11.4.11	During timber operations measures must be implemented to prevent the deposition of soil, logging debris or other deleterious substances and materials that are toxic, or an immediate threat to fish and other aquatic organisms into any watercourse.	During timber operations measures must be implemented to prevent the deposition of soil, logging debris that restricts water flow or other deleterious substances and materials that are toxic, or an immediate threat to fish and other aquatic organisms into any watercourse.

11.6.1	Added	<p>A temporary camp can be approved under an AOP provided that:</p> <p>a) The location or proposed location is provided in a manner acceptable to Alberta (map, table);</p> <p>b) There are no new clearings or harvesting required for the proposed location; and</p> <p>c) The camp and/or the associated location will not be used past the end of the Timber Year in which it is approved.</p>
11.6.1.1	<p>Any facility or camp that shall be in place for more than twelve consecutive months requires an appropriate disposition under the Public Lands Act.</p>	<p>Any facility, camp or site that is used or designated for use for more than twelve consecutive months or past the end of the Timber Year in which it is approved will require an appropriate disposition under the Public Lands Act.</p>
12.0	Added	New Section – Surface Mineable Area (SMA)

Table of Contents

1.0 GROUND RULE SCOPE	13
1.1 REGULAR REVIEWS	13
2.0 THE TOPICS	13
3.0 OPERATIONAL PLANNING.....	14
3.1 PLANNING PROCESS	14
3.2 COMPARTMENT ASSESSMENT	15
3.3 GENERAL DEVELOPMENT PLAN (GDP)	16
3.4 FOREST HARVEST PLAN (FHP)	18
3.5 ANNUAL OPERATING PLAN (AOP).....	24
3.6 SALVAGE PLANNING	29
4.0 UTILIZATION	30
4.1 STAND UTILIZATION	30
4.2 TREE UTILIZATION	35
5.0 INTEGRATION WITH OTHER USERS	37
5.1 DECIDUOUS/CONIFEROUS INTEGRATION.....	37
5.2 FOREST RECREATION AND TOURISM	38
5.3 TRAPPING.....	38
5.4 RANGE MANAGEMENT	39
5.5 FOREST AESTHETICS.....	40
5.6 HISTORICAL RESOURCES.....	41
6.0 WATERSHED PROTECTION.....	42
7.0 HABITAT MANAGEMENT.....	50
7.1 LANDSCAPE PLANNING AND HARVEST AREA DESIGN	50
7.2 HARVEST AREA DESIGN AND LAYOUT	51
7.3 DEBRIS MANAGEMENT AND WILDFIRE PROTECTION	55

7.4 STRUCTURE RETENTION	56
7.5 UNDERSTOREY PROTECTION.....	59
7.6 FISHERIES AND THE AQUATIC ENVIRONMENT	61
7.7 SPECIES OF SPECIAL MANAGEMENT CONCERN	63
8.0 SILVICULTURE	71
8.1 PLANNING.....	71
8.2 REFORESTATION PROGRAM.....	72
8.3 SILVICULTURE OPERATIONS.....	75
9.0 SOILS	76
10.0 FOREST HEALTH/PROTECTION.....	79
10.1 INSECT AND DISEASE.....	79
10.2 WEED MANAGEMENT	81
11.0 ROADS.....	82
11.1 ROAD CLASSIFICATION	82
11.2 ROAD PLANNING AND DESIGN.....	88
11.3 ROAD CONSTRUCTION, MAINTENANCE, AND RECLAMATION	89
11.4 WATERCOURSE CROSSINGS	94
11.5 ACCESS CONTROL.....	100
11.6 CAMPS AND FACILITIES	101
12.0 SURFACE MINEABLE AREA (SMA).....	103
13.0 REPORTING	105
Appendix 1 - Glossary	106
Appendix 2 - AOP/FHP Checklists	132
Figure 1.Wildlife Corridor Diagram	51
Figure 2.Soil Moisture.....	78
Table 1.SHS Assessment.....	34

Table 2. Watercourse Classification	45
Table 3. Standards and Guidelines for Operating Beside Watercourses.....	47
Table 4. Road Classification and Design	83
Table 5. Acceptable Crossing Structures	95

1.0 GROUND RULE SCOPE

Ground rules are the practices used in planning and conducting timber harvesting operations which constitute the methods used to implement decisions made in the FMP and other higher level plans such as Integrated Resource Plans (IRP). In the event that these strategic plans do not exist, the ground rules shall establish practices that minimize the chance of negative impacts from roads, timber harvesting and forest management operations and activities. Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act and Migratory Birds Convention Act. The proponent must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans, Environment Canada) regarding federal legislation requirements.

Authorization of the Annual Operating Plan (AOP) does not constitute waiver or exemption from the ground rules, nor is authorization of the AOP verification of compliance with the ground rules or other Alberta Statutes.

The Delegated Authority has the authority to approve Annual Operating Plans and may also waive or amend the application of specific ground rules in unusual or special circumstances. However, request for ground rule waivers shall be in writing and must conform to departmental policy, the Forests Act, the Timber Management Regulation, the Public Lands Act and all other applicable provincial legislation or statutes.

1.1 REGULAR REVIEWS

The intent is to have an annual review of ground rules if requested by either forest disposition holders or Alberta. This is not meant to be a complete redevelopment but rather an opportunity to fine-tune the ground rules. It is expected that regular reviews will allow participants to plan revisions more systematically and to correct any inconsistencies or problems. It will also create the ability to regularly consider modifications that reflect the best and most current knowledge and tools available.

2.0 THE TOPICS

This template provides a list of topics that must be addressed in all ground rules. Each topic includes a purpose, discussion, and ground rule heading. All ground rules shall be written following this format. Bolded text is mandatory and would only be changed if, in Alberta's opinion, the result is a higher standard of practice. Non-bolded text may be modified where in Alberta's opinion it doesn't apply to an area, or the issue is handled differently to meet local needs while still meeting Alberta's expectations.

PURPOSE: A statement of what the topic is designed to accomplish.

DISCUSSION

Include background information, research knowledge, and reasons for the concern. The discussion shall focus on why a ground rule is needed. Alternative actions or solutions could also be discussed here.

GROUND RULES

These are definitive statements of the desired results to be achieved and a clear indication of what is expected. **The ground rules shall be relevant, measurable, understandable and achievable.**

3.0 OPERATIONAL PLANNING

3.1 PLANNING PROCESS

PURPOSE

The operational planning process is designed to expedite the implementation of the FMP. Where management direction has not been established through an approved FMP, then required decisions shall be made during this operational planning process.

DISCUSSION

The planning process includes five main components:

1. Approved Forest Management Plan (FMP)
 - Spatial Harvest Sequence (SHS) for first two 10-year periods;
 - Proposed Long Term Road Network.
2. Compartment Assessment (CA) – A CA shall be required when information or major issues are identified that in Alberta’s opinion, have not been addressed in the FMP. In the event that the SHS is deemed by Alberta to be inappropriate due to a significant change in circumstances since the approval of the FMP, a compartment assessment describing current issues, shall be required. (See section 3.2)

3. General Development Plan (GDP) - The GDP gives a comprehensive description of a forest operator's proposed harvest strategy, road building plans, and reclamation operations for a five-year period, and includes all licenses and permits. The GDP is used to guide integration of activities. (See section 3.3)
4. Forest Harvest Plan (FHP) – The FHP is a map and associated report describing the laid out harvest plan. (See section 3.4)
5. Annual Operating Plan (AOP) – The AOP describes operations in detail through a series of components that shall be submitted together at the same time, or as individual submissions on a schedule approved by Alberta (see section 3.5):
 - a) Operating Schedule and Timber Production;
 - b) Applicable Forest Harvest Plans;
 - c) General Development Plan;
 - d) Compartment Assessments as required;
 - e) Reforestation Program;
 - f) Fire Control Plan;
 - g) Road Plan.

3.2 COMPARTMENT ASSESSMENT

PURPOSE

To address significant issues that have arisen since the approval of the FMP.

DISCUSSION

It is recognized that circumstances change over time and it is possible that the SHS approved in the FMP may prove to be inappropriate. Where Alberta deems it necessary, a CA shall be completed to adjust the operational plan for the area. CAs are necessary when major new issues or information that have been identified since FMP approval make the SHS inappropriate. (e.g. forest fire, insect or disease, species of special management concern, a major change in land use direction or an unacceptable variance of >20% of the SHS/compartment/decade as determined by the Forestry Area Manager. The CA shall describe how the new issues will be incorporated into the FHP. In completing the CA, operators must consult in a meaningful way with

stakeholders and strive to reach general agreement on issues. The CA provides an opportunity to reconsider management strategies at the time of operational planning if warranted.

GROUND RULES

- 3.2.1 Alberta shall decide on the boundaries of the area on which a CA is required and the requirements of the CA after consultation with the forest disposition holder.**
- 3.2.2 If a CA is required, the operator must receive Alberta's approval of the CA prior to the approval of a FHP.**
- 3.2.3 A CA is considered current if it has been approved by Alberta and the FHP is submitted to Alberta within three years of approval.**
- 3.2.4 The CA shall include any maps, analyses, and reports deemed necessary by Alberta to adequately address the issues.**

3.3 GENERAL DEVELOPMENT PLAN (GDP)

PURPOSE

To provide a projection of activities for the next five years to:

- Guide the integration of activities;
- Schedule timber disposition administration activities;
- Predict cut control status;
- Co-ordinate the development and reclamation of roads.

DISCUSSION

The primary components of the GDP include a forecast of the areas scheduled for harvest for a five year period and a summary of variance from the SHS for existing FHPs or long-term road plans outlined in the FMP. The GDP must also include the current status and forecast of the respective AACs and cut control period for each of the operators within the planning area. This

could be either a joint submission by all operators or separate submissions containing consistent information between operators.

In addition to outlining the projected wood supply forecast, the GDP shall also include details regarding road requirements and fish and wildlife issues within the planning area. It is expected that there will be substantial discussion on significant issues with Alberta before the GDP is submitted. Aboriginal consultation of the GDP is currently a requirement of the Aboriginal Consultation Guidelines.

- 3.3.1 The GDP submission date is June 1 of each year unless otherwise approved by Alberta. Alberta shall respond within 30 days. The GDP shall be approved subject to an appraisal by Alberta.**
- 3.3.2 Other forest companies affected by the GDP must agree in writing (e-mail notification acceptable) to the GDP before it will be approved (see section 5.1.1).**
- 3.3.3 It is the responsibility of the operator to ensure that they do not exceed the allowable quadrant cut level as specified in their tenure document.**
- 3.3.4 When a major change in a company's general development strategy is proposed after the GDP is approved, a revision may be requested by Alberta. The nature of the change may require additional or amended Indigenous Consultation.**
- 3.3.5 The GDP consists of the following:**
 - 1. Schedules with the following information:**
 - a) the areas to be harvested each year of the next five-year period;**
 - b) timber production summary table for all dispositions (by year);**
 - c) all planned Class I, II and III road developments as per 11.2.1;**

- d) all class IV roads that are to be monitored, and all outstanding and anticipated reclamation work related to these roads and their stream crossings as per 11.2.3.2;
- e) proposed and actual volumes in satellite yards as per Directive 2016-01;
- f) structure retention summary by FMU as per 7.4.8, 7.4.9, and 7.4.10; and
- g) annual SHS variance summary.

2. A map (of appropriate scale) that shows the following:

- a) the mill site location;
- b) satellite yard locations as per directive 2016-01;
- c) the timber dispositions to be operated; and
- d) Key Wildlife Biodiversity Zones and provincially defined caribou ranges.

3.4 FOREST HARVEST PLAN (FHP)

PURPOSE

To describe the laid out harvest and road design.

DISCUSSION

The primary components of a Forest Harvest Plan (FHP) are a map and report that clearly show and document the harvest area boundaries, roads and water crossings for the compartment. The design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during this period.

FHP's are approved through acceptance and will be considered approved on the date Alberta acknowledges receipt of the work. The notification or approval date will be documented by Alberta as the start date for FHP approval. Alberta shall periodically check the work and supporting documentation to verify its accuracy.

GROUND RULES

3.4.1 An FHP shall be approved by acceptance if:

- a) validated by a RFP;**
- b) additions less than 20% of the area sequenced in the SHS by strata by compartment per decade;**
- c) the harvest area (ha) does not exceed 100% of the total area in the SHS or strata description table by compartment per decade as tracked in the GDP; and**
- d) it adheres to all ground rules as per the FHP checklist (See Appendix 2)**

Any deviations from the ground rules shall be listed and justification provided for Alberta review. Alberta shall respond within 30 days through written approval from the Delegated Authority

Where the FHP does not meet a, b, c or d above, the FHP shall undergo a review by Alberta of the variance detailed in a, b, c and d.

3.4.2 If a CA was completed, the FHP shall undergo a full Alberta referral and review to ensure the direction in the CA has been implemented.

3.4.3 All FHPs submitted by operators who harvest more than 30,000 m³ each year from crown land, must be validated by a RFP. Validation means that, the OGRs were followed, the SHS was followed or variances identified, and all affected operators have agreed to the design. (see section 5.1.1)

3.4.4 All block boundaries and inter-block roads shall be laid out before submission of the FHP.

3.4.5 There shall be discussion to resolve significant issues with Alberta before the FHP is submitted, preferably before harvest block layout has occurred. Topics to be discussed may include (but not be limited to) the following:

- **Potential SHS variance**
- **Integration with other operators**
- **Watercourse concerns/Riparian Areas**
- **Wildlife concerns**
- **Trapper Concerns**
- **Land Use**
- **Access management**
- **Historical resources**
- **Visual resources**
- **Public/Recreational concerns**
- **Retention strategies**
- **Understorey protection**
- **Slope or other topographical concerns**
- **Forest Health concerns**

3.4.6 Other forest companies affected by the FHP must agree, in writing, with the FHP before it will be approved (see section 5.1.1). Affected means forest companies with timber dispositions operating within the same forest management unit (FMU).

Where agreed to by Alberta, the information required by 3.4.6, 3.4.7 and 3.4.8 may be submitted within any of those sections. The information requested in those three sections must be submitted in a format acceptable to Alberta.

3.4.7 Maps shall accurately show the following information:

- a) the approved forest inventory;
- b) approved SHS and variances from the SHS;
- c) all existing Class I, II, III roads within harvest areas and harvest area boundaries for all timber operators;
- d) all proposed Class IV inter-block roads;
- e) uniquely numbered planned watercourse crossing locations on inter-block roads;
- f) current dispositions and reserves, e.g., Registered Trapline boundaries, Alberta permanent sample plot locations;
- g) identified watercourses, springs, water source and seepage areas;
- h) locations of access control measures (if required);
- i) company current information on previously harvested areas, existing trails, seismic lines, power lines, pipelines and access routes; and
- j) applicable wildlife zones.

3.4.8 In addition to the FHP map, the following information is required:

- a) area (ha), and coniferous and deciduous volume for each proposed harvest area;
- b) summary table of variances from the SHS by harvest area for each FHP (see Table 1);
- c) all Public Lands Act dispositions;
- d) digital shape files for all laid out harvest area boundaries, inter-block roads, and watercourse crossing locations;
- e) description of how the CA is addressed in the FHP;
- f) list of uniquely numbered planned watercourse crossing locations
- g) description of the access control methods employed if required;

- h) description of integration with other users and how their concerns may be addressed (see section 5.0);**
- i) summary of harvest design considerations for identified non-timber values; and**
- j) location of sensitive wildlife sites as per section 7.7.5.2.**

3.4.9 Where applicable the following comments shall be mapped and/or described for each harvest area:

- a) block comments may be included on the individual block map;**
- b) layout bordering and encompassing riparian management zones when different than the standards in section 6.0;**
- c) watercourse classification and protective buffer;**
- d) layout bordering restricted areas, e.g. permanent sample plots (PSPs), private land;**
- e) identification of coniferous understorey (see section 7.5);**
- f) harvest area-specific structure retention;**
- g) tactics to address forest health issues;**
- h) protection of roadside vegetation - applicable or not, and how to be done;**
- i) strategies to address sight distance concerns with an attempt to maintain sight distance of 400 m or less from Class I II or III roads;**
- j) important wildlife sites as defined in section 7.7.5.2;**
- k) historical site considerations;**
- l) soil protection measures when any of the following are present:**

- identified unstable areas, water-source areas, springs or seepages;
- steep or sustained slopes or grades (>30%).

3.4.10 Detailed block plans (DBPs) are required when there is higher than average potential for environmental damage. Circumstances that merit DBPs are:

- a) areas of steep topography requiring specific road location and construction or specialized harvesting equipment;
- b) unstable slopes are generally to be avoided but if this is not possible it is necessary to plan operations carefully to minimize impacts;
- c) harvest areas with numerous water source areas, seepages, intermittent, or ephemeral watercourses;
- d) harvest areas that contain or border sensitive wildlife areas;
- e) harvest areas requiring understorey protection using protection techniques (see section 7.5);
- f) harvest areas located near high-value recreation areas, tourism areas, and facilities;
- g) partial harvests, excluding commercial thinning (CT) and pre-commercial thinning (PCT);
- h) when harvesting is used as a tool to control insects and disease infestations.

The DBPs shall include a map of appropriate scale to the issue(s) and describe how the concern will be addressed in operations. DBPs must be available to Alberta upon request.

3.5 ANNUAL OPERATING PLAN (AOP)

PURPOSE

To annually authorize all road, harvest and forest management activities for the operator.

DISCUSSION

The AOP articulates in detail the activities proposed for the current year and must be approved by Alberta before timber operations shall commence. The AOP components include:

- a) Operating Schedule and Timber Production - appraised – Alberta has 30 days to respond
- b) Applicable Forest Harvest Plans - accepted
- c) Compartment Assessments (if applicable) - appraised
- d) Reforestation Program - accepted
- e) Fire Control Plan - accepted
- f) Road Plan - accepted
- g) General Development Plan - appraised

Alberta's approval does not transfer the accountability for the plan or its implementation from the organization or the submitting RFP to Alberta or its staff. Government RFPs who review submissions are accountable for their reviews and any direction provided to the Organization.

For timber permit operators and small quota holders who harvest less than 30,000 m³ annually, Alberta has alternate AOP submission requirements.¹

GROUND RULES

- 3.5.1 The AOP submission date is May 1 of each year unless otherwise approved by Alberta. Alberta shall respond within 30 days. The AOP shall be**

¹ TM118 form

appraised by Alberta in accordance to the AOP checklist, (see Appendix 2) with approval subject to the outcome of the appraisal.

3.5.2 The Operating Schedule and Timber Production, Reforestation Program, Fire Control Plan, and Road Plan, are submitted as in 3.5.1 above, unless otherwise agreed to by Alberta. The schedule for submitting any necessary CA, GDP and FHPs may be different.

3.5.3 Only harvest areas and roads with FHP approval shall be scheduled for operations in the AOP submission.

3.5.4 The Annual Operating Plan shall contain the following components:

a) If requested by Alberta, The map(s) referred to in 3.4.7 above including shape files of approved FHP harvest areas where not already submitted. Shape files or other digital format approved by Alberta will be submitted.

b) Administrative and Timber Production Information:

I. name of disposition holder(s);

II. number of the disposition(s);

III. date of submission and effective period;

IV. location of mill where timber will be manufactured or processed, unless alternative reporting has been approved;

V. where all volumes (deciduous and coniferous) will be charged (quota, deciduous timber allocation, FMA, Commercial Timber Permit);

VI. proposed harvest volume to be harvested by timber disposition;

VII. Community Timber Program Operators shall include all road use agreements;

VIII. scaling methodology, e.g. weigh scale, other arrangements, (not necessary if otherwise submitted);

IX. utilization standards;

X. declaration or list of resource user notifications, and date of notification (see Section 5.0 i.e. Trapper, grazing, public etc.);

XI. annual update of the progress of each FHP.

c) Operating Schedule – a table which outlines:

I. list of harvest areas proposed for harvest (including opening number, area and volume by deciduous and coniferous, with totals, and approval date of FHP blocks);

II. lists of non- DLO roads proposed for construction and reclamation, except in-harvest area roads. It includes watercourse crossings to be built or installed or removed/maintained;

III. declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items;

IV. debris disposal.

V. identification of blocks within wildlife zones with recommended timing restrictions, including a strategy to mitigate impacts if these timelines are exceeded.

VI. location(s) of any existing or proposed temporary camps as per Section 11.6.

d) Annual Reforestation Program (see section 8.2)

e) Fire Control Plan which covers suppression equipment (see section 7.3)

f) Road Plan (see section 11.2)

g) GDP and CA if applicable.

3.5.5 All amendments to harvest plans must be justified and submitted to Alberta in writing. RFP validation of all amendments is required. Any changes must be incorporated into the as-built plan.

3.5.5.1 Changes meeting the following criteria are considered ‘Minor Amendments’, and require only company RFP validation and notification to Alberta. Minor Amendments don’t require Alberta’s approval, provided all appropriate background checks have been made and rationale for the change has been provided (changes can be implemented prior to notification but must be reported bi-weekly unless otherwise stated). A

company supervisor shall approve amendments prior to the change being carried out. Changes shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, or aesthetic values.

Any change to the approved AOP not listed in 3.5.5.1 shall be treated as a major amendment and requires the approval of Alberta prior to implementation. Alberta will provide the company feedback and/or approval of the AOP amendment within 10 working days of the submission:

	Minor Amendments (Reportable/Notification Required)	Major Amendments (Delegated Authority Approval)
a.	Additions to the approved AOP harvest area boundary where the final gross area does not vary from the area in the approved FHP by more than 5% for blocks greater than 10 ha, or more than .5 ha for blocks less than or equal to 10 ha.	For blocks >10 ha, final gross area varies $\geq 5\%$ from FHP; for blocks ≤ 10 ha, final gross area varies >0.5ha from FHP.
b.	Operational deletions that exceed 2 ha to the approved FHP harvest area boundary.	N/A
c.	Equipment access or exterior block roads moved to existing access or conventional seismic lines where re-growth is less than 3 m.	Equipment access or exterior block roads moved to existing access or conventional seismic lines where re-growth is greater than 3 m.

d.	Exterior block roads requiring the development of new right-of-way (ROW) clearing moved up to 150 m.	Exterior block roads requiring the development of new right-of-way (ROW) clearing moved more than 150 m.
e.	Added crossings on ephemeral or intermittent watercourses	Added crossings on watercourses with higher classification than intermittent
f.	Change in scheduled season of harvest for blocks and associated roads	Change in scheduled season of harvest for blocks and associated roads with wildlife timing restrictions
g.	N/A	Total soil disturbance exceeds 5% block area as per OGR 9.0.3.
h.	Movement of work camp within an approved FHP block boundary.	Movement or addition of a work camp.

3.5.5.2. Any amendments resulting in variances from the approved SHS must be categorized and reported as per 4.1.1. This ground rule does not apply to Commercial Timber Permits. All additions to a harvest area must be within the company's disposition and landbase.

3.6 SALVAGE PLANNING

PURPOSE

Salvage planning shall be implemented when necessary to reduce the potential for loss of fibre.

DISCUSSION

Under certain circumstances, planning shall be expedited to reduce the loss of fibre from fire; disease or insect infestation; blowdown, industrial activity or other such unforeseen disturbances. Other requirements for Mountain Pine Beetle can be found in the Action Plan for Mountain Pine Beetle, the Interpretive Bulletin: Planning Mountain Pine Beetle Response Operations and the MPB Operating Ground Rules Addendum.

Salvage planning shall not be used when:

- a) the disturbance regime is slow moving and can be accommodated under conventional planning timeframes and protocols;
- b) the regime is not an imminent threat to green fibre;
- c) fibre loss is deemed to be within an acceptable range.

Salvage planning does not confer rights to the planner to ignore other values, or the inherent value of a natural disturbance. It does allow for consideration of all values and for prompt, qualified, professional opinion to drive the process. See Directive 2007-01 for further direction on Salvage Planning for natural disturbance.

GROUND RULES

- 3.6.1 Salvage planning is initiated on the natural disturbance when deemed appropriate by Alberta.**
- 3.6.2 FHPs for the salvage area must be developed, and shall form part of the AOP. Modified timelines and content for the FHP shall be considered by Alberta. Detailed requirements may be published from time to time by Alberta. It is expected that there will be substantial discussion to resolve significant issues with Alberta before the FHP is submitted.**

4.0 UTILIZATION

4.1 STAND UTILIZATION

PURPOSE

Track variance from the approved Forest Management Plan (FMP) SHS as well as total area harvested in order to:

- Ensure a sustainable harvest level and future forest objectives are maintained through operations adhering to the FMP;
- Improve information for the next FMP, (e.g. landbase, yields);
- Make decisions around Forest Harvest Plan Acceptance

DISCUSSION

The *Alberta Forest Management Planning Standard, Annex 1, Section 6.0 Harvest Planning Standards* indicates scheduling of stands through the FMP - SHS is dependent upon the timber merchantability criteria allocated in the disposition holder's tenure document (e.g., FMA, quota certificate) and the management assumptions used in the timber supply analysis (TSA). Pertinent assumptions are comprised of deletions from the net landbase (e.g., subjective deletions, stream buffers, protected areas) and parameters that determine a stand's eligibility for harvest (e.g. earliest age of harvest). The SHS results from the analysis of these TSA inputs coupled with basic field reconnaissance. The SHS identifies spatially (subunit and location) and temporally (period) the queue of stands that will produce the sustainable timber harvest level (AAC) and desired future forest condition.

Adhering to the SHS is imperative to achieving the timber supply forecasts and the forest conditions expected. With increased levels of variance from the SHS, there is greater risk that the operational harvesting will not allow the FMP to realize its objectives and forecasted outcomes. Operational variance is unavoidable but must be effectively managed.

During the FHP planning process, an operator will select an area over which to plan a series of harvest areas (blocks) for a period of up to 5 years. This is considered the FHP planning unit and is typically smaller than an FMA defined compartment or subunit. Within the FHP planning unit, the operator will address all the 1-10 year SHS assigned to that operator, deciding on either a harvest prescription, or a decision to not harvest at all (deletion) or to delay harvest outside the

first 10 year period (deferral) Where deletions or deferred stands consist of entire AVI polygons, specific justification is required.

Variance shall be monitored and reported where:

1) SHS Stands scheduled in the first decade of the SHS are not harvested in that decade; and

2) Special Features not identified in the FMP net landbase are encountered during layout or harvesting and are deleted from the SHS.

Timber Harvest Planning and Operating Ground Rules require timber operators to protect special features through detailed harvest planning and careful operations. (e.g. riparian buffers, steep slopes, sensitive sites, cultural/heritage sites, areas with high aesthetic value shall be removed from the SHS.)

Disposition holders shall complete **Table 1** as they monitor the operational implementation of their plans against the SHS.

Definitions:

Additions – Any area planned for harvest, or which has been harvested that is not part of the current operational 10 year SHS (1-10) in the approved FMP. Additions will be divided into two categories: substantial and slivers.

Actual Harvested Area is the as-built harvested area in the FHP.

Approved FMP 10 Year SHS – Is the total SHS area within the compartment for the first 10 years of the approved Spatial Harvest Sequence.

Deferral – any area included in the 1-10-year SHS that will not be harvested during the current FMP. Deferrals are not removed from the contributing landbase, as there is an expectation they will be harvested later in a future FMP. Deferrals will be divided into two categories: Substantial or Slivers. Deferrals are those stands or portions of which are operable, not isolated, and should be available under current technological and economic constraints for future harvest.

Deletion - Any area included in the 1-10 year SHS that will never be harvested under current planning assumptions and technical constraints. This area shall be tracked spatially and removed from the contributing landbase in the subsequent FMP. Deletions are divided into two categories: Substantial or slivers. Deletions can only be included as part of future productive landbase if rationale for each deletion has been provided to and approved by Alberta, during the relevant phase of the Forest Management Plan development.

Planned Area For Harvest - Is the total area of the SHS laid out in the FHP, and includes the information for all previously approved FHPs (either planned or as-built) information for the same compartment.

Provincial Base 10 Yield Stratum- One of ten Alberta yield stratum defined in the yield projection Interpretive Bulletin in the Alberta Forest Management Planning Standard (AFMPS).

Note that there are only 9 yield stratum in the Alberta-Pacific FMA.

Slivers- any polygon component of variance (addition, deferral or deletion) less than 2ha in size. Generally these are long, narrow features along the edge of a block. Slivers exclude stand-alone features (blocks not bordering or not being adjacent to SHS polygons). Slivers do not contribute to variance calculations but shall be tracked and reported separately. Sliver deletions and sliver deferrals can be aggregated together (e.g. Sliver Deletions & Deferrals)

Compartment - Operational subunits of a Forest Management Unit (FMU) delineated by environmental, operational or watershed characteristics.

FHP Planning Unit- Operational subunit of an FMU, delineated by environmental, operational, or watershed characteristics. An FHP is the operational plan for a planning unit, and may be a compartment, sub-unit or an area of a smaller scale. FHP Planning units are discrete, and FHPs for the same operator cannot overlap spatially with the exception of access routes.

Substantial- any polygon component of variance (addition, deferral or deletion) other than Slivers

Variance – any deviation from the 1-10year Spatial Harvest Sequence (SHS) in the approved Forest Management Plan (FMP). Variance is classified into one of these three categories: Additions, Deletions or Deferrals.

GROUND RULES

4.1.1 For the FHP submission, the company shall submit a map to show the comparison of the 1-10 year SHS to the laid out harvest areas. The map shall distinguish using symbology between:

- **substantial deletions;**
- **substantial deferrals; and**
- **substantial additions.**

4.1.2 Variance shall be reported by Alberta Base 10 stratum for each FHP. The table shall include the minimum information as per Table 1. A Forest Harvest Plan will be appraised when additions exceed 20% of planned SHS 1-10 year by compartment for the particular FHP. Table 1 shall include cumulative information from all previously approved FHP's in the compartment.

4.1.3 Variance from the SHS shall be monitored and reported by compartment. The cumulative as-built ("actual" or most up to date based on current harvest data) variance for all FHPs shall be compiled by compartment and reported annually in the GDP. The table shall include information as per Table 1 for all compartments operated within the current FMP effective period.

Total FHP variance shall be calculated using the following:

$$SHS \text{ Variance (Additions \%)} = \frac{\text{Area of Substantial Additions}}{\text{Area of Approved 10 yr SHS}} \times 100$$

4.1.4 Where stands are added for harvest, preference should be for stands in the 11-20 year period. Stands currently not part of the net landbase that are found to be productive merchantable landbase may be considered for addition with Alberta's approval. Stands shall not be added without evaluating why the stand is not within in the net landbase (e.g. Meeting wildlife VOIT).

4.1.5 All deletions and deferrals ≥ 2 ha from the SHS must be coded and tracked spatially by company to allow for compartment level roll-up, and incorporation into the next Forest Management Plan. Deletions will be removed from the harvestable landbase or addressed in the TSA.

4.1.6 All FHP stands must be harvested, or tracked as variance, within 20 years of first being listed in the SHS.

4.2 TREE UTILIZATION

PURPOSE

To utilize all merchantable trees and pieces in a merchantable stand as defined by the timber disposition and the FMP.

DISCUSSION

Tree utilization assumptions in the FMP must be followed so that sustainability is not affected.

GROUND RULES

- 4.2.1 The tree/piece utilization standards are stated in the applicable timber disposition and shall normally be one of the following standards:**

Coniferous Utilization Standards

15/10 Utilization

- Merchantable Tree: one that has a minimum diameter of 15 cm outside bark at stump height (30 cm) and a usable length of 3.66m to a 10 cm diameter (inside bark).

Deciduous Utilization Standards

15/10 Utilization

- Merchantable Tree: one that has a minimum stump diameter of 15 cm outside bark and a merchantable length of 3.66 m or greater to a 10 cm top diameter (inside bark), or to the point where the stem is unusable or there is no central stem due to heavy branching.

- 4.2.2 Coniferous and deciduous log butts or large ends exhibiting advanced decay greater than 50% in area of the cut surface (basal area) may be bucked at 0.61 m intervals or less to 50% sound wood.**

- 4.2.3** Maximum stump height when measured from ground level shall be no more than 30 cm or that used in the timber supply analysis for the FMP (e.g., 15 cm.). Exceptions may be approved in the FHP. (e.g. to delineate harvest areas, create rub posts for understorey protection) Where stumps are left to delineate areas (e.g. harvest areas, create rub posts for understorey protection, or to delineate poorly defined watercourses) they shall be an average of 30m apart and no higher than 2m.
- 4.2.4** As per the Debris Management and Structure Retention ground rules, forest operators are permitted to leave merchantable volume in harvest areas if the approved FMP identifies specific stand structure retention strategies. In the absence of FMP guidance, the standards in section 7.4 apply.
- 4.2.5** All trees/pieces used in the construction of crossing structures may be scattered or piled along the ROW or in the harvest area, but they shall not be piled in riparian areas if any chance of re-entering the watercourse. It is acceptable to use these pieces for erosion control on the road bed.

5.0 INTEGRATION WITH OTHER USERS

5.1 DECIDUOUS/CONIFEROUS INTEGRATION

PURPOSE

To ensure that planning, harvesting and reforestation in overlapping dispositions are carried out efficiently and with a minimum of environmental impact.

DISCUSSION

Due to overlapping tenures, integration of activities between the various operators is essential. Alberta monitors the integration of roads and harvesting, but the responsibility for co-ordinating plans and operations lies with the operators.

Integration of activities is necessary to:

- a) reduce the amount of time roads are open;
- b) reduce disturbance of wildlife; and
- c) enable prompt reforestation .

GROUND RULES

- 5.1.1 All operators with timber dispositions in an area covered by an FHP/GDP must agree to the FHP and GDP before approval is granted. If agreement cannot be reached after all meaningful consultation has taken place, the following dispute resolution process can be implemented. Areas of disagreement will be documented and forwarded to the GoA Senior Forester for discussion with the reviewing forester. Depending on the exact nature of the disagreement, Alberta will either: 1) facilitate a dispute resolution process, or 2) direct the operators on areas of disagreement through conditions of approval. If either proponent disagrees with the determination of the Senior Forester, they may appeal the decision to the Forest Area Manager.**

- 5.1.2 All roading, harvesting and silviculture operations shall be completed at a time and in a manner that enables effective reforestation and minimizes road access. Where operations are returning on a previously reforested block road, the company using the road shall rollback and plant the road to an acceptable species as per the reforestation standard of Alberta.**

5.2 FOREST RECREATION AND TOURISM

PURPOSE

To manage the implications of forest management activities on forest recreation.

DISCUSSION

Forest management activities can impact recreational opportunities. Potential exists for increased public awareness and for increased recreational opportunities through co-ordination with forest management practices. The FMP may have addressed recreational issues through a variety of tactics such as deferrals or buffers around specific sites or access management strategies.

GROUND RULES

- 5.2.1 Operational tactics to mitigate impacts on recreation and tourism shall be described in the FHP.**
- 5.2.2 The forest operator shall work with groups that have raised concerns with the operator or have been identified by Alberta.**
- 5.2.3 Roads should be planned to avoid recreation sites. Roads shall be designed to ensure they can be used safely while minimizing their impact on the recreation values of the area.**

5.3 TRAPPING

PURPOSE

To avoid damage to the infrastructure associated with Registered Fur Management Areas (RFMA) and to reduce the impact on trapping opportunities.

DISCUSSION

Communication with the owner and/or operator of a trapline is a key element in minimizing the impact of timber operations. Discussions held early in the planning process allow both the trapper and the forest operator to work co-operatively, with the least amount of disruption to their individual operations.

To facilitate communication between forest operators and trappers, Fish and Wildlife will provide a list of RFMAs and owners. Upon request the local Fish and Wildlife office shall provide the relevant list of trappers to the forest operators before January 1 of each year.

GROUND RULES

- 5.3.1 A representative of the forest operator shall personally contact, or send a registered letter to the senior partners of a RFMA during the preparation of the FHP (within the RFMA). Information such as cabin locations, trails and other improvements, or concerns shall be noted at this stage. During the development of the FHP information and concerns may be integrated into the plan. The forest operator shall provide the trapper with a copy of the approved FHP map.**
- 5.3.2 At least ten calendar days prior to commencing operations, the forest operator shall notify the appropriate trapper(s) referred in 5.3.1, preferably by personal contact that timber harvest operations are beginning in the RFMA.**

5.4 RANGE MANAGEMENT

PURPOSE

To integrate forest and range management operations.

DISCUSSION

The goal is to develop a co-operative, long-term relationship between grazing disposition holders and forest operators to sustain fibre and forage resources.

At the GDP, FHP and AOP stages of planning, the emphasis is to integrate harvesting, silviculture, and grazing schedules to ensure the sustainability of timber, forage, wildlife and watershed values (i.e. wildlife habitat, watershed protection). Specific harvesting and reforestation operations and grazing systems would be identified within components of the AOP.

Effective communication between the timber and grazing operators is necessary. Discussions held early in the planning process are intended to enable the grazing disposition holder and the forest operator to work co-operatively minimizing the disruption to their individual operations. Alberta has developed standards to guide the integration of timber and grazing. These standards will be used by the two industries to ensure effective communication and integration is occurring on overlapping dispositions.

GROUND RULES

- 5.4.1 The forest operator shall conduct all operations in accordance to the Grazing Timber Integration Manual as well as Directive SD 2011-03.**
- 5.4.2 The forest operator shall ensure that timber operations do not negatively impact the range management of the grazing disposition. Examples of these impacts include: damage or disruption to range improvements, infrastructure, roads, and bridges (e.g. fencing, water developments). The forest operator is responsible to repair and/or replace any damage to these improvements and infrastructure.**
- 5.4.3 The forest operator will contact the grazing disposition holder in person or by phone a minimum of 21 days prior to commencing timber operations to discuss access and any other issues affecting the range management of the grazing disposition.**

5.5 FOREST AESTHETICS

PURPOSE

To manage the visual impact of timber operations on the forest landscape.

DISCUSSION

The objective is to mitigate the impact of timber operations on the visual quality of the forest landscape by:

- identifying the location of forest landscapes and other areas of high visual and scenic value, and setting objectives for their management; and
- addressing visual quality issues in the FMP.

Areas considered highly sensitive are those:

- a) within, adjacent to or viewed from recreational sites and tourist developments;
- b) seen from elevated viewpoints;
- c) adjacent to or viewed from major travel corridors (roads, lakes and rivers), rural/urban forest interface and site-specific areas identified during the referral and public review process;
- d) adjacent to primary and secondary highways in Alberta.

Tactics to reduce the impacts of timber harvest and reforestation on visual quality may include: retention of forest structure and lesser vegetation at strategic vantage points in the harvest area, modification of harvest area design, low impact scarification techniques, vegetative buffers, and utilizing natural topography.

GROUND RULE

- 5.5.1 Highly Sensitive areas shall be assessed and tactics shall be employed in the FHP to mitigate the impacts of harvesting and reforestation on visual quality.**

5.6 HISTORICAL RESOURCES

PURPOSE

To ensure that forest operators identify and protect historical and cultural resources.

DISCUSSION

There are many thousands of historical resources (e.g. archaeological and paleontological sites) located on Alberta's Crown land. In keeping with the requirements of Alberta, forest operators shall develop and implement a process for identifying and protecting resources that are regulated by the Historical Resources Act.

GROUND RULES

- 5.6.1 All known historical resources shall be identified and managed in keeping with the requirements of Alberta.**

5.6.2 Historical resource records are confidential and shall not be shared with the public.

5.6.3 If a previously unknown historical resource is discovered during road building, harvesting, or silviculture operations, the operations that may directly affect the historical resource shall cease and Alberta shall be notified.

6.0 WATERSHED PROTECTION

PURPOSE

To manage the implications of timber operations on water quality, quantity, and flow regime by:

- minimizing the potential for sedimentation in watercourses;
- preventing soil, logging debris and deleterious substances from entering watercourses;
- maintaining aquatic and terrestrial habitat; and
- complying with the Water Act.

DISCUSSION

The FMP shall address watershed water quantity and flow issues. Ground rules define operating practices to protect water quality and riparian values.

Riparian areas adjacent to watercourses and water source areas perform a number of ecological functions. Riparian areas help to regulate stream flows (storage and release of surface and groundwater), reduce sheet, rill and gully erosion, and moderate stream temperature. Functional riparian areas provide bank stability, debris for creating aquatic habitats and provide a source of food and nutrients for aquatic organisms. Riparian areas also provide habitats supporting a high diversity of wildlife species and other terrestrial biota, and provide corridors that can link different landscape and habitat features.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans) regarding federal legislation requirements.

GROUND RULES

- 6.0.1 Watercourses shall be classified according to Table 2, Watercourse Classification. In the event the channel classification is not distinctly evident, the width shall be determined by the average of measurements taken at 50 m intervals at representative points of undisturbed stream channel over the length of the watercourse bordering the block.**
- a minimum of four measurements are required with the measurement location flagged for audit purposes;
 - the channel width is the horizontal width of the channel between high-water marks (mean or annual), or the rooted vegetation on the banks, measured at right angles to the direction of flow. Multiple channel widths are summed to represent total channel width. (Dictionary of Natural Resource Management) Measured from where the channel bank begins to slope down towards the channel bottom across to the same point on the opposite bank;
 - where the distance bordering the block is not enough for four measurements, reduce the measurement interval as required.
- 6.0.2 Where an approved FMP does not provide an estimate of increased water yield, the following applies. Watersheds shall not be unduly affected by large harvest areas or harvesting large amounts of timber in a watershed unless otherwise approved in the AOP.**
- 6.0.3 Measures must be implemented, including temporary and permanent erosion control measures, to minimize erosion and sedimentation into the watercourse or waterbody.**
- 6.0.4 Riparian protection standards shall be implemented as in Table 3, Standards and Guidelines for Operating beside Watercourses. Where uncertainty exists on the classification of the watercourse, the watercourse protection standard utilized shall be that required by the higher class of watercourse.**
- 6.0.5 All unmapped or incorrectly classified watercourses encountered during operations shall be given the appropriate protection as described in Table 3.**

- 6.0.6** Unless otherwise approved in a FMP, variances from the standards in Table 3, must demonstrate that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta as a component of the FHP review and are required to be approved by the Delegated Authority.
- 6.0.7** Sediment, logging debris that impedes water flow or any deleterious materials (e.g., fuels, oils, greases, industrial or household chemicals or refuse) shall not be deposited into the water or onto the ice of any watercourse or water body during road construction, maintenance, harvesting, reclamation, or silviculture operations.
- 6.0.8** Equipment shall cross watercourses only at approved crossings, see table 3.
- 6.0.9** Unless approved by Alberta, logs shall not be decked in watercourses, riparian areas, or seepage areas.
- 6.0.10** Authorized in-stream activities in fish-bearing watercourses shall be scheduled to avoid disturbing migration, spawning and incubation of fish species, and carried out in such a manner as to avoid stream sedimentation.
- 6.0.11** Beaver ponds shall have the same classification as the watercourse flowing out of the pond as measured at a representative width within 50 m of the dam.
- 6.0.12** Harvesting is not permitted within water source areas during non-frozen periods.
- 6.0.13** Channels on slopes greater than 20% which only flow during runoff events shall be protected as intermittent watercourses as per Table 3.

Table 2. Watercourse Classification

Classification	Physical Description	Portion of Year Water Flows	Channel Width for Classification	Fisheries/Wildlife Values	Potential Impacts
Large Permanent	Major streams or rivers; Well-defined flood plains; Often wide valley bottoms.	All year	Non-vegetated channel width > 5 m	Resident and migratory fish populations; Important over wintering, feeding and rearing habitat; Important wildlife feeding/travel corridors.	Water quality often reflects all upstream land use impacts and natural processes; Primarily sedimentation of stream channels; Loss of wildlife habitat, restriction of movement.
Small Permanent	Permanent streams; Often small valley bottoms; Bench floodplain development. Banks and Channel well defined.	All year but may freeze completely in the winter or dry up during periods of drought.	>.7 meters to 5 meters	Significant insect populations; Important spawning and rearing habitat; Resident and migratory fish populations; Over wintering for non-migratory species; Important wildlife feeding/travel corridors.	Primarily sedimentation of stream channels; Water quality and water yield; Fish population sensitive to siltation; Loss of stream bank fish habitat; Loss of wildlife habitat, restriction of movement.
Transitional	Often small valley bottoms; Bench floodplain development.	All year but may freeze completely in the winter or dry up seasonally or during periods of drought.	>0.4 meters to 0.7 meters	Significant insect populations; Important spawning and rearing habitat; Resident and migratory fish populations; Over wintering for non-migratory species; Important wildlife feeding/travel corridors.	Primarily sedimentation of stream channels; Water quality and water yield; Fish population sensitive to siltation; Loss of stream bank fish habitat; Loss of wildlife habitat, restriction of movement.

Classification	Physical Description	Portion of Year Water Flows	Channel Width for Classification	Fisheries/Wildlife Values	Potential Impacts
Intermittent	<p>Small stream channels</p> <p>Small springs are main source outside periods of spring runoff and heavy rainfall. Distinct channel development. Channel usually has no terrestrial vegetation; Usually some bank development.</p>	<p>During the wet season or storms</p> <p>Dries up seasonally and during drought</p>	=< 0.4 meters	<p>Food production areas;</p> <p>Potential spawning for spring spawning species;</p> <p>Drift invertebrate populations in pools and riffles;</p> <p>Spring fed areas may provide spawning potential for fall spawning species.</p>	<p>Sedimentation from bank and streambed damage will damage fish spawning and invertebrate habitat as well as downstream fish habitat;</p> <p>Water quality and water yield.</p>
Ephemeral	Often a vegetated draw connected to a higher order watercourse.	Flows only during or immediately after rainfall or snowmelt	<p>Little or no channel development;</p> <p>Flow area is usually vegetated.</p>	Siltation may impact fish habitat downstream.	Sedimentation downstream due to ground disturbance.
Water-Source Areas	Areas with saturated soils, surface flow or seepages contributing directly to stream flow	<p>All year</p> <p>May or may not freeze in winter</p>	No channel development, but may be pronounced vegetation changes.	<p>Year-round springs provide potential value to fall spawning fish;</p> <p>Potential high-use areas terrestrial wildlife.</p>	<p>Disturbance may cause downstream sedimentation;</p> <p>Interruption of winter flow may disrupt fish egg incubation;</p> <p>Loss of mineral licks.</p>
Lakes	Large water collection areas permanently filled with water	Normally frozen in winter	Shorelines defined by absence of permanent terrestrial vegetation.	<p>Important fish-bearing habitat;</p> <p>Important bird nesting/rearing areas.</p>	<p>Aesthetic values may be disrupted;</p> <p>Potential for wildlife disturbance;</p> <p>Local sedimentation.</p>
Oxbow Lakes	Large water collection area formed when oxbow cut off from main river channel	Normally frozen in winter	N/A	Important habitat for ungulates.	Thermal cover/grazing areas.

Table 3. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Large Permanent	Not permitted within 100 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 60 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark;	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 60 m is approved, no machinery is permitted within 20 m of the high water mark.
Small Permanent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 30 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark;	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 30 m is approved, no machinery is permitted within 20 m of the high water mark.

Watercourse Classification	Roads, Landings, and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Transitional	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 10 m from the high water mark or to the top of the break in slope where the break occurs within 15 m.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Heavy equipment may operate within 20 m during dry or frozen conditions (when soil condition is not susceptible to degradation). No skidding through watercourse except on approved crossing as per Table 5. Where fish and spawning movements have been identified, special crossings that do not obstruct upstream fish passage or cause stream siltation may be required.
Intermittent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	Buffer of brush and lesser vegetation to be left undisturbed along the channel. Width of buffer shall vary according to soils, topographical breaks, water source areas and fisheries values.	Trees shall be felled so they do not enter watercourses, unless otherwise approved by Alberta. If slash or debris enters the watercourse, immediate removal is required without the machine entering the watercourse.	Heavy equipment may operate within 20 m during dry or frozen conditions (when soil condition is not susceptible to degradation). No skidding through watercourse except on approved crossing as per Table 5. Where fish and spawning movements have been identified, special crossings that do not obstruct upstream fish passage or cause stream siltation may be required.
Ephemeral	Construction not permitted within a watercourse or water source area.	Buffer of undisturbed vegetation in wet gullies.	Accumulations of slash and debris to be removed progressively	Skidding shall only occur during frozen or dry periods (soil condition is not susceptible to degradation). Any crossing required as per Table 5 shall be approved and reported as per 11.4. Equipment crossing ephemeral watercourses shall be minimized.

Watercourse Classification	Roads, Landings, and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Lakes	For shorelines not located within reserved areas, no disturbances shall be permitted within 100 m of the high water mark unless specifically approved in the AOP.	<p>On lakes exceeding 4 ha in area, no disturbance or removal of timber within 100 m of the high-water mark. Alberta may require additional protection in the FHP;</p> <p>On lakes less than 4 ha, removal of timber prohibited within 30 m of the high-water mark and any removal within 100 m requires Alberta's approval.</p>	Trees shall be felled so they do not enter the waterbody, unless otherwise approved. If slash or debris enters the watercourse, immediate removal is required without the machine entering the watercourse.	If timber removal is approved, no machinery to operate within 40 m of the high water mark.
Water Source Areas	<p>Construction not permitted unless approved in the AOP;</p> <p>No log decks permitted;</p> <p>The number of stream crossings must be minimized;</p> <p>No disturbance of organic duff layers or removal of lesser vegetation.</p>	<p>Treed riparian management zone of at least 20 m on all water source areas;</p> <p>No harvest of merchantable trees or disturbances of lesser vegetation unless specifically approved in the AOP;</p> <p>Buffer width may be altered according to its potential to produce surface water, provided it is approved in the AOP</p>	<p>Heavy machinery not permitted with in water source areas during unfrozen soil conditions.</p> <p>Minimal disturbance or removal of duff or lesser vegetation.</p> <p>Timber may be harvested if stream sedimentation is the only resource concern, provided there is no disturbance of the organic soils and lesser vegetation when harvesting the trees.</p> <p>On unstable areas subject to blowdown, merchantable trees shall be carefully harvested from water source areas to minimize root disturbances of duff layers and watercourse damming.</p>	<p>Road construction, timber harvest, reforestation and reclamation shall be done with equipment capable of operating without causing excessive disturbance to the soil layers.</p> <p>Heavy equipment is not permitted during moist or wet soil conditions, but may be operated during frozen periods.</p> <p>No soil caps or depositing of soil permitted on roads in water source areas, unless a separation layer is incorporated or the road is designed to provide adequate surface and sub-surface drainage away from the road bed.</p> <p>Where a separation layer is used, the soil cap shall be removed as operations are completed.</p>
Oxbow Lake	Construction not permitted within 100 m of oxbow lake unless specifically approved in the FHP.	The buffer shall encompass the area from the high water mark of the main watercourse to 20 m beyond the high water mark of the oxbow lake. Oxbow lakes outside the buffer of the main watercourse shall be treated as water source areas.	Heavy equipment not permitted around oxbow lakes during unfrozen conditions. Trees shall be felled so they do not enter the waterbody, unless otherwise approved. If slash or debris enters the watercourse, immediate removal is required without the machine entering the watercourse.	Approved activities shall be done with equipment capable of operating without causing excessive disturbance.

7.0 HABITAT MANAGEMENT

7.1 LANDSCAPE PLANNING AND HARVEST AREA DESIGN

PURPOSE

To implement timber operations in a manner that ensures landscapes maintain biodiversity and ecosystem function.

DISCUSSION

Forest operators are expected to manage the forest cover in a manner that maintains biodiversity and ecological integrity. The SHS approved in the FMP is the mechanism by which the forest cover is managed.

Within landscapes managed for timber production, landscape patterns, cover types and seral stages can be managed to produce a desired future forest. The coarse filter approach to maintaining biodiversity in managed landscapes involves managing for suitable amounts and patterns of all forest cover types and all seral stages, along with managing for inherent natural spatial and temporal variability.

The variability of natural disturbances shall be considered when planning harvest area size and shape. This variability will help to provide habitat for species that are dependent on natural disturbance regimes. The use of Alberta Vegetation (AVI) polygon boundaries will help to plan this variability. Use of natural features as harvest area boundaries is consistent with natural disturbance and shall be used whenever possible.

Landscape planning requires that targets be set that are measurable. Targets describe the amount of each landscape element that will be created, maintained, or managed, as well as the spatial and temporal variability (expressed as a range) of each. Creating variability in natural landscapes is important because element amounts vary between landscapes, and the requirements of biota also vary. Targets will be refined over time using analysis based on natural disturbances, natural succession processes, current and historical conditions within the region, sub-region and ecodistrict or ecoregion.

Wildlife species of special management concern are major considerations in the selection of the SHS in the FMP.

Wildlife movement corridors are required to ensure that animals with large home ranges find passage between and within managed landscapes. When planning for wildlife habitat and movement corridors, the following factors shall be considered: watercourse classification/ profile/

pattern and associated valley definition, timber types and proximity to watercourses, travel corridor width, harvesting method, harvest area shape, continuity of forest cover or adjacency/size of forest patches.

Unless otherwise approved by Alberta, the size distribution of harvest areas within a compartment shall be representative of the natural variation of the landscape, which for the purpose of harvest planning, is the range of stand polygon sizes prior to harvest within the compartment boundary.

GROUND RULES

7.1.1 Converging watersheds of small permanent watercourses shall have buffers of 100m around the converging point to enhance wildlife corridors.

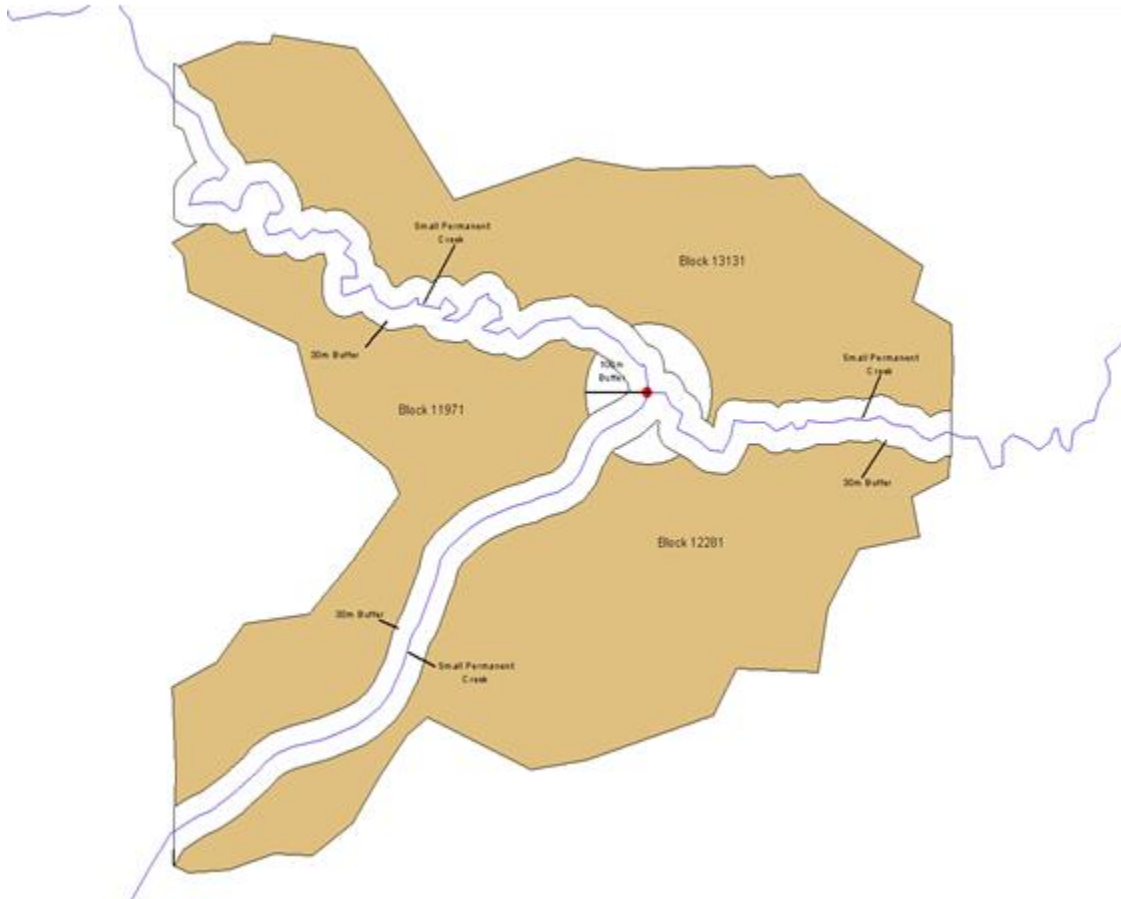


Figure 1. Wildlife Corridor Diagram

7.2 HARVEST AREA DESIGN AND LAYOUT

PURPOSE

To provide direction for designing harvest areas.

DISCUSSION

Detailed planning of harvest areas must address reforestation, wildlife habitat (e.g., line of site, hiding cover, and sensitive sites), watercourse protection, integration with other land uses, understorey protection, structure retention, road development and reclamation, and visual quality.

The following items affect harvest area size and shape:

- current inventory polygon boundaries;
- tree species, age and silviculture characteristics;
- identified habitat requirements of species of management concern and species at risk;
- wildlife zones as per section 7.7;
- amount and distribution of non-productive lands and immature treed lands;
- location and size of watercourses and buffers;
- location of roads, pipelines and power lines;
- topographic features;
- presence of viable white spruce understorey;
- retention of shrub and tree patches;
- accessibility to all or part of the compartment;
- potential blowdown of peripheral and within-harvest area trees;
- insects and diseases;
- visually sensitive areas as per section 5.5

In the absence of a SHS, a preliminary harvest plan will be required in addition to the Forest Harvest Plan.

PRELIMINARY HARVEST PLAN

The primary components of the Preliminary Harvest Plan (PHP) includes a verification of timber merchantability, accessibility, and condition and outlines a preliminary harvest design showing all existing and proposed harvesting activity within a defined area.

The defined area, which should be consistent with the approved General Development Plan (GDP), should also identify and classify all watercourses, critical wildlife habitat, as well as existing trails, seismic, power lines, and access within the planning area.

During the development of the PHP, efforts shall be made by the operator to notify all overlapping disposition holders and stakeholders that may be affected by the proposed development.

GROUND RULES

In the absence of an SHS the following ground rules apply:

7.2.1 A preliminary harvest plan, PHP, shall be developed and submitted for approval by Alberta.

7.2.1.1 A PHP shall be completed and approved by Alberta in the absence of an SHS.

7.2.1.2 The preliminary harvest plan will verify merchantable and unmerchantable timber types.

7.2.1.3 Harvest area design and layout as in section 7.2.

7.2.1.4 Maps shall accurately show the following information:

- a) the approved forest inventory;**
- b) area (ha) and coniferous and deciduous volume for each proposed harvest and reserve area;**
- c) all proposed roads within the harvest area boundaries;**
- d) current dispositions and reserves, e.g. Registered Trapline Boundaries, permanent sample plot locations;**
- e) watercourses, their classifications and protective buffers;**
- f) the location of all known springs, water source, and seepage areas;**
- g) road corridors and DLO numbers and classes for both existing and proposed roads;**
- h) planned water course crossing locations;**
- i) current information on previous harvest areas, existing trails, seismic lines, power lines, pipelines and access routes;**
- j) sensitive wildlife areas as per section 7.7.5.2;**
- k) mark known important wildlife sites, e.g. mineral licks, nesting sites, denning and birthing sites;**
- l) proposed integrated harvest areas;**
- m) Key Wildlife Biodiversity Zones and provincially defined caribou ranges**

7.2.1.5 Road design and location shall be described for all roads joining harvest areas, and DLO roads to be constructed for extraction of timber from all proposed harvest areas. These road comments include the following:

- a) road design and classification;**
- b) choice of corridor location and width;**
- c) considerations made for other road users;**
- d) considerations made for non-timber users;**
- e) integration of existing roads into the design.**

7.2.1.6 Where two or more overlapping timber dispositions shall be harvested, the respective companies shall cooperatively develop an integrated harvest plan. (see section 5.1.1)

7.2.3 Irregular or natural boundaries shall be employed in the FHP harvest area design. New harvest designs in areas previously harvested shall create natural boundaries.

Ground rules 7.2.4 – 7.2.7 apply to both a spatial and non-spatial harvest plan.

7.2.4 Line of sight shall be minimized where harvest areas are adjacent to accessible permanent Class I, II or III roads. Targets for the limits of sight distance are 400 m, but may be exceeded if justified in FHP.

7.2.5 Roadside vegetation shall be protected in harvest areas to limit the line-of-sight distance across the harvest area. To minimize breaks in the vegetation screen, only one road entry point shall be commonly allowed into the harvest area.

7.2.6 Direct distance to wildlife hiding cover should not exceed 200 m.

7.2.7 Alberta permanent sample plots and protective notations as enabled by the Public Lands Act shall not be disturbed or harvested unless such action is approved by Alberta. PSP's shall be protected by protection of the existing painted buffer.

7.3 DEBRIS MANAGEMENT AND WILDFIRE PROTECTION

PURPOSE

To manage the amount and distribution of woody debris left in harvest areas to:

- minimize wildfire risk, particularly near communities
- optimize ecological benefits
- minimize the loss of productive landbase
- to minimize the risk of wildfires, and to improve fire suppression capability.

DISCUSSION

Debris or slash accumulation resulting from timber harvest operations must, as a priority, be redistributed or disposed of to minimize the risk of wildfire ignition and spread. However, it is recognized that some retention of debris is valuable from an ecological perspective, and that a reasonable amount of debris retention shall occur to emulate natural forest floor accumulations. Ecological benefits include microtine habitat, furbearer habitat (when piled), and soil nutrient inputs. When debris is maintained, it must be in such a distribution and amount to: 1) minimize wildfire risk as a priority, 2) minimize the amount of productive landbase loss by limiting lost area available for deciduous species suckering, or tree planting, and 3) provide ecological benefit (coarse filter vs. fine filter).

Landscape-level issues regarding the risk of large fires are addressed in the development of the SHS. The FMP shall develop objectives, strategies and tactics that consider the risk of occurrence and spread of fire at the stand and landscape levels.

Opportunities may exist to implement fuel reduction, isolation and conversion on the landscape while accounting for other values. Where applicable, forest operators shall follow the guidelines in the FireSmart Protecting Your Community from Wildfire manual.

Acceptable methods of reducing slash hazards are defined in Directive AF-FDP-2017-07, Debris Management Standards for Timber Harvest Operations.

GROUND RULES

- 7.3.1 Slash accumulations resulting from timber harvesting, road, and campsite construction shall be disposed of as per the Directive.**
- 7.3.2 Slash fuel accumulation is not permitted within 5 metres of the perimeter of the harvest area. The bordering undisturbed forest floor shall be used as a benchmark to determine what constitutes a significant accumulation.**

Unacceptable accumulations include piles of trees or non-merchantable timber, and tops or branches deposited during logging that could create fuel ladders for fire bordering the stand.

7.3.3 Burning operations shall :

- a) not be conducted during the fire season, unless otherwise approved in the Fire Control Plan, burning during the fire season requires a fire permit**
- b) require a post burning survey to ensure all holdover fires are extinguished;**
- c) have 80 percent of the pile consumed with attempts to burn all piles; and**
- d) have the locations of all burning reported in acceptable format.**

7.3.4 The FHP shall comply with direction provided in Community FireSmart Plans.

7.3.5 A fire control plan, consistent with ‘schedule A’ of a company’s Fire Control Agreement shall be submitted as part of the AOP.

In absence of a Fire Control Agreement, the company shall fill out and submit the TM118C Fire Control Supplement form.

7.4 STRUCTURE RETENTION

PURPOSE

- To create temporary refuges for forest biota to re-colonize harvest areas.
- To maintain snags and live residual trees in harvested areas for biota that depend on these structures following natural disturbances.
- To provide wildlife thermal and hiding cover within harvest areas throughout the rotation.
- To provide wildlife travel corridors within large harvest areas and compartments.

DISCUSSION

Although many types of natural disturbance (fire, floods, avalanches, wind events, insects and disease infestations, and slumps) occur within Alberta’s forests, fire is the most common. Virtually all trees within intense fires are killed, but following low and moderate-intensity fires many scattered live trees are present. In addition, within all fire types, fire “skips” or “islands” result in residual patches of live trees remaining within larger burned areas. Following other types of natural disturbances, even higher densities of live trees, and patches of live trees, are present. Approximately 30% of the birds and mammals living in Alberta’s forests nest, forage or find shelter within live trees that have a basal diameter greater than 20 cm. Many of these species are

able to use single large live trees and residual patches of large live trees that remain after natural disturbances.

The retention of single trees and patches of large live trees in harvest areas makes the harvested areas more similar to burned areas. In addition, residual live trees may create some old forest attributes in young regenerating harvest areas. Many of the birds, mammals, insects, beetles, fungi and nonvascular plant species that live in recently disturbed forests require large snags for food and shelter. This unique biotic community changes rapidly as the snags fall and the downed logs are incorporated into the forest floor. Some biota become rare within ten years following a fire, and many of the early colonizing species have disappeared by the time the stand is twenty years old.

Retaining some large snags within harvest areas creates habitat for some biota associated with naturally disturbed habitat. Additional large snags may be created, by retaining large live trees, as some of these trees will die throughout the rotation. To a large extent, however, it will be necessary to rely on natural disturbances to create abundant large snags for biota that depend on this dead woody material.

Where larger harvest areas are created, it is important to retain a number of individual trees, snags and residual tree patches distributed across the harvest area. These residual tree patches shall be located such that natural features, riparian areas, wildlife features, stand structure and composition, and proximity to standing forests are taken into account to maximize their utility or usefulness by the biotic community.

These ground rules describe the average number of patches per hectare of residual material that will be left within harvested areas of a landscape unit for those where this is not defined in an FMP. There may be zero patches of residual structure in any particular harvest area as long as the amount identified in the TSA is met across the landscape over time.

Current information suggests that ecological benefits are directly proportional to the amount of structure retention; ecological benefits increase with greater levels of structure retention. Larger patches of residual structure generally have more benefits than smaller patches (lower blowdown probability, interior forest characteristics, hiding and thermal cover) and patches generally have more benefit than individual stems.

GROUND RULES

- 7.4.1 For Alberta-Pacific and Commercial Timber Permits, an average of 5% representative of all harvested area at the FMU level by stewardship reporting period will be retained. A harvest area may have zero structure but the FMU average shall be 5%. Non merchantable structure is not to be tracked as part of the 5%.**
- 7.4.2 Each company will have a standard operating procedure for structure retention that has been provided for information purposes.**

Coniferous Quota Holders

- 7.4.3 For Quota Holders, an average of 3% representative of all harvested area at the FMU level by stewardship reporting period will be retained. A harvest area may have zero structure but the FMU average shall be 3%. Non merchantable structure is not to be tracked as part of the 3%.**
- 7.4.4 High stumps created within the harvested area to distinguish harvest area boundaries or for use as rub posts (as per 4.2.3) do not count towards the overall retention target.**
- 7.4.5 Stand structure shall not be retained in harvest areas where forest health issues warrant eradication of all affected mature tree species to combat infestations and diseases (e.g., pine beetle and mistletoe).**

Stand Structure Monitoring and Analysis

- 7.4.6 Each company shall have a monitoring program acceptable to Alberta for determining the area retained within blocks.**

Stand Structure Reporting

- 7.4.7 Stand structure monitoring results will be reported annually by FMU in the forest companies' GDP and/or AOP, effective as of the Forest Management Plan approval date (May 17, 2018). Alberta is responsible for CTP monitoring through their AOPs.**
- 7.4.8 Each company and the CTP program will independently report their annual results.**
- 7.4.9 The forest companies' stand structure monitoring results will also be collated and reported every 5 years in the FMA Area Forest Companies' Stewardship report.**

7.5 UNDERSTOREY PROTECTION

PURPOSE

To protect coniferous understorey during timber harvesting and reforestation operations.

DISCUSSION

The main objective of this ground rule is to protect coniferous understories (understorey) that may contribute to future forest values. Understorey protection must be practiced in all stand types containing white spruce understorey, and balsam fir where approved by Alberta. Techniques will vary depending on stems per hectare (sph) of pre-harvest acceptable stems (see 7.5.1).

Two understorey protection techniques will be utilized:

- **Avoidance Method** – Used in deciduous harvesting containing 400 – 599 sph of pre-harvest acceptable stems or harvesting that contain greater than or equal to 600 sph of pre-harvest acceptable stems or in coniferous harvesting containing understorey. Wind buffering tactics and pre-planning not specifically required. The objective is to identify and retain understories through either non-harvesting areas with understorey, or harvesting of the overstorey with protection from direct harvest impact of the understories at the harvest, skidding and reforestation phases.
- **Protection Method (High Effort Understorey Protection)**– Used in deciduous harvesting containing patches greater than or equal to 600 sph of pre-harvest acceptable stems that are in blocks 10 hectares or larger. Wind buffering tactics utilizing structure retention, pre-planned strip harvest/skid trails.

High stumps may be left around clumps of understorey or along skid trails as rub stumps to protect the understorey during operations. Merchantable understorey (15 metres or greater in height) will be harvested and treated as incidental volume or left on site within stand structure.

The “protection method” will retain at least 50% of the pre-harvest acceptable stems in the understorey without harvest damage (see 7.5.2) when the opening will be declared post-harvest to Coniferous/Deciduous, CD. When the opening will be declared post - harvest to Deciduous/Coniferous, DC, the “protection method” will retain at least 30% but less than 50% of the pre-harvest acceptable stems in the understorey without harvest damage. “Protection method” will be performed in the areas where a pre-harvest survey has verified that it contains the acceptable stems of understorey and density. A monitoring program sampling a portion of stands harvested using understorey protection will be done to provide information on the success. Success of understorey protection will be reviewed for the stewardship report to verify that TSA assumptions in the FMP are being achieved.

Photo interpretation of all FHP harvest areas using imagery will specify which deciduous openings are targeted for understorey protection. This method will only be used where acceptable imagery exists. Otherwise, the SHS will specify which deciduous openings are targeted for understorey protection and confirmed through ground survey plots. Deciduous

openings identified through the Alberta Vegetation Inventory (AVI) and photo interpretation processes as containing understories sufficient for “protection methods” are assumed based on area to transition post-harvest to; 15 percent to CD, 15 percent to DC and 70 percent to Deciduous, D. This is a Timber Supply Analysis (TSA) assumption.

Post-harvest acceptable stems have 50% or more live crown and less than 25% of the crown lost due to top breakage, bole scars (bark removed to the cambium) less than 10 cm (vertical length) and less than 20% of the bole circumference, and are white spruce.

The following factors shall be considered when planning for protection of white spruce understories:

1. **Landbase Assignment From Approved FMP** – coniferous or deciduous
2. **Understorey Characteristics** - density and height, distribution, the health and vigour of the understorey, the size and wind permeability of the crown, height-diameter ratio (slenderness coefficient)
3. **Site Conditions** – soil conditions that may limit rooting (e.g., depth to water table), topographic features that may enhance or diminish wind-firmness or hamper effectiveness of operations, adjacent stand features and impacts on understorey wind firmness.
4. **Harvest Design** – harvest block size and shape that may limit ability to operate, road design and decking space limitations.

GROUND RULES

- 7.5.1 **Pre-harvest acceptable stems are non-merchantable, two metres or more in height, are within 75% of the average understorey stand height, have 50% or more live crown, are of good health and vigour, and are white spruce as determined by the understorey assessment survey. For blocks meeting 7.5.4, the results of this assessment are to be provided for information at least 10 days prior to harvest.**
- 7.5.2 **Sw Understorey stands (>600sph) discovered in the field, but not previously identified in the SHS shall be protected as per 7.5.3 and 7.5.4.**
- 7.5.3 **Avoidance methods’ shall be used to protect the white spruce understorey in deciduous harvesting containing 400 to 599 stems per hectare (sph) of pre-harvest acceptable stems or where they contain greater than or equal to 600 sph of pre-harvest acceptable stems but the blocks are less than 10**

hectares in size; or of an irregular shape where roads and processing areas or topography and/or soil conditions do not allow sufficient area to use High Effort Understorey Protection; or in coniferous blocks containing understorey.

7.5.4 Unless approved by Alberta, deciduous blocks 10 hectares or larger in size containing patches greater than 2ha with at least 600 sph of pre-harvest acceptable stems, shall utilize 'protection methods' to protect the white spruce understorey.

7.5.5 The FHP shall specify harvest areas that require a detailed block plan for coniferous understorey as per 3.4.10.

7.6 FISHERIES AND THE AQUATIC ENVIRONMENT

PURPOSE

To conduct timber operations in a manner that shall minimally affect:

- the health, diversity and natural distribution of aquatic biota;
- the quantity and productive capacity of the aquatic environment, including fish habitat; and
- fisheries management objectives identified in the FMP.

DISCUSSION

Current provincial and federal legislation require that the aquatic environment and fisheries resources in Alberta must be protected.

Timber operations can directly affect the aquatic environment and fish habitat in a number of ways. Tree removal in riparian areas and along stream banks can alter light intensity, nutrient supply, sediment inputs, water temperatures, stream bank stability and recruitment of large woody debris to the watercourse. Watercourse crossings, if not properly designed, can create physical barriers to the movement of fish and other aquatic biota along watercourses. Roads and ditches can intercept and transport sediments from the upland source to crossing sites where they are deposited in the watercourse. Upland timber harvesting can also affect watershed water yield and flow regimes. These effects can lead to changes in aquatic primary productivity, food-web pathways, aquatic species abundance and distribution, and channel morphology.

The primary strategy for maintenance and protection of the aquatic environment and fish habitat values is to maintain treed buffers along watercourses and water bodies and adopt rigorous watercourse crossing and erosion control measures. Alternate management proposals for riparian areas would be considered to support aquatic environment and fisheries management objectives in the area, where acceptable to Alberta.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans) regarding federal legislation requirements.

Additional ground rules for any work carried out in and around watercourses are found in section 11.4 – Watercourse Crossings.

GROUND RULES

- 7.6.1 All waterbodies and watercourses are presumed to be fish bearing or support fish-bearing habitat. However, the company may confirm the distribution of fish and fish habitat within the planning areas by:**
- a) checking the Fisheries and Wildlife Management Information System (FWMIS), Water Act Codes of Practice and fisheries inventory data;**
 - b) conducting new inventories; or**
 - c) consulting with the appropriate Area Fisheries Management Biologist.**
- 7.6.2 For any activity that disturbs or alters the bed and banks of a fish-bearing waterbody, an assessment of the potential effects on fish and fish habitat must be conducted by an individual with expertise in fisheries and aquatic assessment methods and habitat mitigation measures. For assessment requirements and methods, refer to Schedule 4 of the Code of Practice for Watercourse Crossings.**

7.7 SPECIES OF SPECIAL MANAGEMENT CONCERN

PURPOSE

To conduct planning and timber operations in a manner that shall:

- Conserve and plan for an agreed upon level of effective habitat for species of special management concern including woodland caribou, trumpeter swan and others as determined by Alberta from time to time.
- Maintain the effective habitats for ungulates in river valley environments.

GROUND RULES

7.7.1 Access management within Woodland Caribou and Key Wildlife and Biodiversity Zones:

7.7.1.1 To the extent possible, all new access roads must follow existing disturbances, unless doing so will compromise options for subsequent access management (i.e. “traditional access” issues).

7.7.1.2 Preference shall be given to development and use of winter (frozen ground) roads since this reduces negative impacts on wildlife, permits minimization of long-term infrastructure, and facilities reclamation.

7.7.1.3 It is recognized that in some cases work will occur throughout the winter season to take advantage of frozen ground access. Completing operations in ungulate habitat areas early in the winter season remains a management objective.

7.7.1.4 As an alternative to winter (frozen ground) roads, summer roads may be developed and used, subject to the following:

- a) Road width and grade shall be minimized. Preferentially, summer roads shall be temporary “dry weather” routes, with use suspended when ground conditions are unfavourable.**
- b) Summer harvesting areas shall preferentially be located outside of caribou as well as outside of ungulate habitat in river valleys, or as an alternative, in proximity to previously existing all-weather access roads to assist in reducing the need for new summer access routes. As an**

alternative, summer harvesting in more remote areas shall have hauling deferred to take advantage of frozen ground conditions.

7.7.1.5 As agreed to between the company and Alberta, effective forms of public access control for highway vehicles shall be maintained. Control of highway vehicle use of any open temporary or permanent access route may be required. All “non-traditional” (define in glossary) access routes that are open must have measures in place to prevent highway vehicle traffic. Options for access management on “traditional” routes must be considered during the CA or FHP. The need for options to manage off highway vehicle traffic must be considered in the CA or FHP. (see section 11.5 for more detail on Access Management)

7.7.1.6 Reclamation techniques used on access routes must strive to prevent highway vehicle use and limit off-highway vehicle use. i.e. a section of rollback, earth berm, etc.

Woodland Caribou

DISCUSSION

The FMP strategies and SHS shall describe the harvesting program that will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern.

Woodland caribou are protected as a “Threatened” species under Alberta’s Wildlife Act and the Federal Species at Risk Act. “A Woodland Caribou Policy for Alberta” provides Government of Alberta intent and direction for recovery of woodland caribou populations and habitat, including managing industrial work on caribou range. Both national and provincial woodland caribou recovery processes have been initiated which may have implications for timber harvesting and access development in Alberta. The following ground rules apply to Woodland caribou range as delineated by Alberta.

Timber operations and management in caribou range can affect caribou populations and habitat directly or indirectly and in four main ways: 1) creating and maintaining public access routes; 2) altering natural and human-caused mortality rates on caribou populations (both through access route development and habitat changes); 3) altering the amount, quality, and effectiveness of caribou habitat; and 4) displacing and causing undue sensory disturbance to individual caribou. All of the four factors are consequential for caribou conservation; however, predation rates and habitat changes are of primary concern.

The negative effects of creating and maintaining access routes (public travel, predation, reduced habitat effectiveness, disturbance and displacement) shall be managed by planning the amount, tenure and class of new access routes (roads), and by reviewing and acting upon management options (i.e. access management, abandonment, reclamation) for existing routes.

7.7.2 Woodland Caribou

Planning

- 7.7.2.1** If not addressed in the approved FMP and SHS strategies, a CA must be completed that addresses the following issues (if applicable):
- a) provide an agreed upon habitat supply forecast including the amount, type, and spatial arrangement of caribou habitat;
 - b) the location of all proposed harvest areas;
 - c) options for partial harvest systems;
 - d) the amount, alignment, standard (road type) and longevity (tenure) of all access roads;
 - e) use of, and improvements to existing access roads;
 - f) access road reclamation plan and schedule, which shall also consider options for reforestation of roads. This shall take into account reclamation options for existing “traditional” access routes;
 - g) measures to achieve public and industrial access management;
 - h) operating schedule (road construction, harvesting, silviculture);
 - i) protection of key caribou habitat features (as identified by Alberta and company);
 - j) terrestrial lichen management strategies (in relation to both harvesting system and silviculture prescription);
 - k) proposed summer operations.
- 7.7.2.2** Silviculture prescriptions shall strive to limit non-coniferous shrub and tree regeneration in habitats dominated by coniferous species prior to harvest, and where regeneration to coniferous-dominant stands is planned. Silviculture prescriptions shall strive to protect existing terrestrial lichens, and facilitate terrestrial lichen regeneration.
- 7.7.2.3** Retention patches shall be used in large harvest areas to protect areas of concentrated terrestrial lichen growth, and reduce, watershed, aesthetic, and wildlife related concerns.
- 7.7.2.4** Areas of concentrated terrestrial lichen growth (where terrestrial lichens are the predominant ground cover) within proposed harvest areas must be delineated in the FHP. DHAPs which identify protection measures

must be provided to the operator for these areas. Structure retention in harvest areas within the Caribou range should focus on these lichen areas.

7.7.2.5 Winter operations are preferred to protect existing terrestrial lichen growth within harvest areas, and to retain lichen propagules.

7.7.2.6 Harvest area boundaries shall be based upon natural stand edges, breaks in topography, and other natural features.

7.7.2.7 Summer harvesting areas shall preferentially be located outside of caribou range or if within caribou range, be located in proximity to previously existing all-weather access roads to assist in reducing the need for new summer access routes. As an alternative, summer harvesting in more remote areas shall have hauling deferred to take advantage of frozen ground conditions.

Trumpeter Swan

DISCUSSION

The FMP shall describe the harvesting program that is agreed will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern.

Trumpeter swans are classified as a “Species of Special Concern” species under the Alberta Wildlife Act. The “Recommended Land Use Guidelines for Trumpeter Swan Habitat in Alberta” provides background, intent, and specific direction for managing industrial work near trumpeter swan breeding wetlands. Locations of breeding wetlands are found on provincial land use referral maps.

Trumpeter swans are sensitive to human disturbance, and human activity in breeding areas may decrease survival of eggs or cygnets. Trumpeter swans that are disturbed may not nest or may abandon an existing nest. Therefore, the breeding population continues to be dependent on current management practices and habitat protection.

Timber harvest planning and operating ground rules must reflect the sensitive nature of this species. These operating rules serve three primary purposes:

- a) protection of the long-term integrity and productivity of trumpeter swan breeding habitat;
- b) avoidance of industrial disturbance to trumpeter swans during nesting and rearing of cygnets; and
- c) minimize the access created near swan lakes to reduce the potential for secondary disturbance of trumpeter swans from recreational use.

During the breeding season (April 1 to Sept. 30), low-level (<2000') aircraft flights may disturb trumpeter swans. Low-level aircraft flights are discouraged over identified trumpeter swan lakes or water bodies.

GROUND RULES

7.7.3 Trumpeter Swan

7.7.3.1 From April 1 to Sept. 30, there shall be no harvesting, hauling, road building or scarification activity within 800 m of the high water mark on identified trumpeter swan lakes or water bodies.

7.7.3.2 There shall be no timber harvesting within 200 m of the high water mark on identified Trumpeter Swan lakes or water bodies.

7.7.3.3 An area 200-500 m from the high water mark on identified trumpeter swan water bodies shall be managed in a manner that provides additional protection for the swans. Special measures shall be determined on a site-specific basis during the FHP. Special measures within this zone shall include site preparation that reduces the potential for future vehicular access, no aerial application of herbicides unless approved by Alberta, and attempts to limit maximum line of sight to 100 m. Attempts to retain sufficient structure to contribute to a “forested” habitat in this zone are encouraged. Techniques that limit line of sight and contribute to the treed buffer of the wetland are encouraged.

7.7.3.4 There shall be no development of long-term infrastructure (roads and camps) within 500 m of the high water mark on identified trumpeter swan water bodies. Only seasonal winter routes shall be permitted within the 500 m buffer.

Key Wildlife and Biodiversity Zone

DISCUSSION

The FMP shall describe the harvesting program that is agreed will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern.

For deer, elk and moose in Alberta, key winter range is often found in river valleys. These landforms contain the topographic variation and site productivity conditions that provide winter foraging conditions in proximity to forest and topographic cover. Also, south-facing valley slopes have relatively lower snow accumulations and warmer bedding sites. The valley landform itself provides protection from high wind chills, and travel corridors for landscape-scale habitat connectivity. Traditional, high use and high quality winter ranges have been identified and

mapped (provincial land use referral maps) on the basis of several decades of winter aerial population surveys, supplemented by habitat assessments using aerial photo interpretation and ground surveys.

Key ungulate winter ranges play a disproportionately large role, given their localized size and distribution, in maintaining the overall productivity of regional ungulate populations during seasons of negative or vulnerable animal energy balance. These ranges ensure that a significant proportion of the breeding population survives to the next year. Females not only have to survive, they have to be in good enough shape in the spring to provide a healthy new crop of young.

Outside ungulate winter range, a number of areas of upland (Upland Special Habitat areas or Special Access zones) have been identified and mapped on provincial land use referral maps. They too have been deemed important by Alberta as secondary habitat areas for ungulates, although they are not tied to any particular season of vulnerability.

The Landscape Analysis Tool (LAT) spatially identifies specific habitat locations that industry within Alberta operate within. Specific operating rules relative to these specialized habitat areas are provided in the ground rules. The FMP and SHS shall provide direction on the location/adjacency of harvest areas and retention areas, and on rate of harvest.

Habitat effectiveness, including maintenance of thermal cover, foraging areas, connectivity for animal dispersal and escape cover is important for ungulates. Timber operations within and adjacent to key wintering areas adds stress and increases energy drain for animals. They may be forced to move about unnecessarily and even relocate to less favourable habitat. This becomes an increasingly significant factor as winter progresses. In both types of ungulate habitat, activities associated with timber harvest may also create temporary and permanent access that exposes animals to additional non-industrial disturbances, increased levels of harvest from licensed and non-licensed hunting, and to increased predator efficiency.

In the interest of maintaining productive ungulate populations, operating ground rules must reflect an understanding of the biology of these animals and the importance of their key winter ranges. These must serve two primary purposes:

- a. protection of the long term integrity and productivity of key ungulate winter ranges; and
- b. avoidance of direct and indirect sensory disturbance to animals that are using these winter ranges during the mid-to late-winter period.

Best Management Practices

7.7.4 Key Wildlife and Biodiversity Zone

7.7.4.1 The amount, tenure and class of new access roads shall be minimized and consistent with the land use objectives in regionally defined key wildlife zones (wildlife sensitivity maps). Access development will strive to minimize new human infrastructure.

7.7.4.2 The alignment and standard of new long-term and permanent access roads must be identified and agreed upon within the long-term access plan. New long-term and permanent access roads shall not be developed below the valley “breaks” of rivers, except in isolated cases for river crossings.

7.7.4.3 Any proposed new crossings of rivers and dominant creeks must be identified and agreed upon within the Access Management Plan; new permanent crossings shall be avoided.

7.7.4.4 Where possible all access roads shall avoid known key ungulate habitat features.

7.7.4.5 Use of existing access roads must be described in the FHP, with particular reference to public access management, any proposed road improvements and ongoing maintenance. Potential opportunities for partial or complete route closure and/or reclamation following planned harvesting and silviculture shall be discussed.

7.7.4.6 Unless otherwise agreed to in the AOP, timber operations within Key Wildlife and Biodiversity Zones should be conducted outside of the period Jan. 15 to April 30. No activity timing restrictions apply to upland ungulate habitat designated as Special Access Zones. Operations that are approved in an AOP are not subject to this timing restriction.

7.7.4.7 Stand tending activities (mechanical or herbicide) may occur in this zone and shall remove competing vegetative growth that interferes with conifer seedling survival and establishment or free to grow standards. Effect on browse will be minimized understanding that stand tending activities will be authorized where required to meet legislated reforestation requirements. Wildlife browse shall be maintained whenever it does not interfere with reforestation objectives.

Other Species

DISCUSSION

Additional habitats of selected wildlife species require maintenance of undisturbed habitats, e.g. breeding or denning locations. These species require specific sites in order to complete all or part of their life cycles.

7.7.5 Other Species

7.7.5.1 Sensitive sites listed below shall be protected by retention of an undisturbed, forested buffer (or other management technique) from the edge of the opening associated with these sites, or from the centre of sites without openings. Both Alberta and the forest operator shall make a reasonable effort to identify sensitive sites in the FHP. Sites discovered in the field shall receive the same buffer as those sites previously identified in planning. Buffer widths and duration shall be agreed to in the FHP.

7.7.5.2 In the event that site-specific buffers or other management techniques are not agreed to in the FMP and FHP, the following buffer widths shall apply. In the event that a sensitive site not previously identified during layout and is found during harvest activities it shall be identified on the self-reporting form and buffered as appropriate and feasible.

<u>Sensitive Site</u>	<u>Width of Forested Buffer</u>
Breeding Sites and Hibernacula of Species at Risk Salamanders, Amphibians and Reptiles	100 m
Bat Hibernacula	100 m
Colonial Bird Nesting Area	100 m
Sandhill Crane Nesting Area	100 m
Wolverine Den	100 m
Mineral Licks	100 m
Raptor Nest Tree	100 m
Natural Springs and Beaver Ponds with no outflow channel	20 m-vegetated

8.0 SILVICULTURE

PURPOSE

To plan and implement silviculture practices that result in reforested stands that meet approved regeneration standards.

DISCUSSION

A reforestation program is required by Alberta under TMR 143.1. The reforestation program is a component of the Annual Operating Plan and contains reforestation prescriptions by strata, and a schedule of treatments for the upcoming year. The proposed reforestation program provides a link between reforestation operations and the FMP. The reforestation program must be based on the most current knowledge of treatments (by strata) which lead to reforestation success in terms of reforestation standards. Reforestation prescriptions are a critical point in the sustainable forest management planning system where growth and yield strata targets from the FMP are delivered through well-planned silviculture treatments. Knowledge of how sites respond to different treatments result in better treatments, and greater probability of success in meeting growth and yield strata targets, for height, stocking, density and ultimately, strata volumes.

An acceptable silviculture process includes:

- site assessment (pre or post-harvest) based on ecosite classification;
- a table or 'matrix' of silviculture treatments or tactics for specific strata;
- developing regeneration standards based on yield curve strata targets;
- an annual treatment schedule of activities;
- an assessment/survey system, and feedback mechanisms to ensure regeneration data is used to refine the prescription matrix and, in conjunction with all data sources (including permanent sample plot information), the regeneration standards and post-harvest growth and yield assumptions.

8.1 PLANNING

GROUND RULES

- 8.1.1 Harvest layouts bordering previously harvested areas should avoid damaging regeneration, including reopening of reforested access (see 5.1.2).**
- 8.1.2 Reforestation timelines prescribed by Alberta shall begin at the start of the timber year following the end of the timber year when the harvest area has received skid clearance from Alberta, or from a company representative pursuant to a self-inspection agreement between the company and Alberta.**

- 8.1.3** Reforestation prescriptions shall be based on site assessments (pre or post-harvest) that include considerations specific to the site (e.g. Ecosite field guide for Alberta). These assessments must subsequently align with the silviculture matrix in the FMP.
- 8.1.4** The 'Alberta Forest Genetics Resource Management and Conservation Standards' (FGRMS) shall be adhered to in all silviculture planning and operations. The standards specify rules for seed and vegetative material collection, registration, storage, handling, and improved stock testing.
- 8.1.5** Notification shall be provided on the AOP checklist that FGRMS section 11.2 has been met.

8.2 REFORESTATION PROGRAM

- 8.2.1** The reforestation program shall be submitted:
 - a) before March 1, if the reforestation is to commence between the following May 1 and October 31, or
 - b) before September 1, if the reforestation is to commence between the following November 1 and April 30.
- 8.2.2** Harvest areas (openings) shall be clearly identified (e.g. maps, spatial files, or delineation on the ground through visual markings). Where stumps are left to delineate areas (e.g. harvest areas) they shall be approximately 30 m apart and no higher than 2 m.
- 8.2.3** The reforestation program shall include the following components and information:
 - a) silviculture prescription;
 - b) proposed silviculture treatment schedule;
 - c) maps as requested by Alberta; and
 - d) proposed blocks for declaration in lieu of survey and re-treatment.

a) Silviculture Prescription

The Forest Management Plan contains a Silviculture Matrix for prescriptions specific to different forest stratum. Changes to the approved strategy in the FMP are outlined in the AOP.

Proposals for herbicide application shall be submitted for approval in accordance with approved vegetation management strategies and Alberta requirements. (See Herbicide Reference Manual). Herbicide proposals are a component of the reforestation program in the AOP, but may be submitted separately from the AOP.

Commercial thinning proposals shall be submitted for approval as part of the AOP unless otherwise agreed by Alberta, in accordance with Alberta's requirements.

b) Proposed Silviculture Treatment Schedule

The Silviculture Treatment Schedule shall contain the following information:

- opening number;
- a list of harvest areas and the estimated area (ha) to be treated;
- the reforestation strata standard for each harvest area (see below for more detail);
- season or date of activity – summer vs. winter.

The following proposed reforestation activities for each harvest area (or stand) shall be listed:

- I. Site Preparation – mechanical or chemical treatment
- II. Planting – primary species, density range, and notification if outside approved seed zone
- III. Seeding – species and notification if outside approved seed zone
- IV. Leave for Natural –
- V. Manual Tending – type (cleaning vs spacing or combination)
- VI. Fertilization – type of fertilizer
- VII. Herbicide/Insecticide application – type of chemical and method (ground vs. aerial) and target species for insecticide
- VIII. Commercial Thinning

- IX. Regeneration Surveys – establishment and performance
- X. Cone/cuttings Collection – (if unknown, Alberta shall be notified regarding collections as per the ‘Standards for Tree Improvement in Alberta)
- XI. Let it grow as a retreatment strategy.

Should the proposed reforestation activities for a harvest area change after AOP approval, the following items require an amendment to the AOP:

- changing to a treatment not approved in the silviculture strategy table for the specific strata;
- additional harvest areas to be treated by any means of treatment;
- the remaining changes require notification to Alberta through ARIS reporting.

If a harvest area is declared sensitive, the forest operator shall provide additional information beyond the strategic and tactical levels (see section 3.4.10). This information shall include the actual techniques (e.g. type of site preparation machine) and their expected impact on the harvest area attribute(s) that make it a sensitive site (e.g. providing frequent furrow trenching breaks on downhill run to reduce erosion).

Note that proposals to deploy seed or vegetative material outside the seed zone or breeding region require prior approval of the Provincial Seed Officer at the Alberta Tree Improvement and Seed Centre.

Sample Silviculture Treatment Schedule

Opening Number (ARIS)	Harvest Area (ha)	Preliminary Strata Declaration	Activity	Activity Area (ha)	Season	Comment
5051002412A	10	C	Mounding	4	Winter	

c) Map

As part of the reforestation program, a map may be requested (at Alberta’s discretion, the FHP map may be used) that identifies:

- I. all harvest areas to be treated, and all roads and stream crossings to be constructed or used (designating their season of use);
- II. the reforestation map shall include all harvest areas from integrated operations.

d) A listing of harvest areas where a declaration is proposed in lieu of a survey for areas not likely to meet regeneration standards (per TM Reg 141.61(1) and harvest areas where re-treatment is proposed (per TM Reg 141.6(2.))

- I. blocks where 'let it grow' is the retreatment strategy will require survey information supporting re-treatment rationale;
- II. may be submitted for review and approval at any time throughout the year for approval to ensure timeliness of treatments.

See Section 12.0 REPORTING for reforestation activity reporting requirements.

8.3 SILVICULTURE OPERATIONS

- 8.3.1 Site preparation and other silviculture activities must follow the same AOP conditions and ground rule standards which apply to timber operations (i.e. stream crossing requirements, watercourse buffers, tree/understorey retention, and Forest Soils Conservation Guidelines).**
- 8.3.2 Herbicide, pesticide and fungicide use shall be performed in accordance with Alberta requirements.**
- 8.3.3 Site preparation equipment shall be cleaned and free of restricted and noxious weed seed or plant parts before entry into the working area or before mobilizing between projects according to Directive 2001-06.**
- 8.3.4 Planting boxes shall be disposed of within 24 months of logging (skid clearance) and are to be removed to an appropriate disposal facility if ground access exists or the block does not contain any debris piles. If ground access does not exist, boxes may be securely placed within existing debris piles for disposal by burning. All plastic shall be removed from boxes and disposed of at an approved waste disposal site prior to burning.**
- 8.3.5 Site preparation creating linear disturbance patterns shall be oriented to minimize channelling of water downslope and to ensure sediment is not directly entering watercourses.**

9.0 SOILS

PURPOSE

To conduct timber harvest, road construction, reforestation and reclamation operations in a way that shall:

- Minimize the potential for soil erosion
- Prevent soil, logging debris and deleterious substances from entering watercourses
- Ensure that the capability of the site to support healthy forest tree growth is maintained.

DISCUSSION

Minimizing soil displacement, compaction and rutting/puddling during road construction, harvesting, and silviculture operations are primary concerns. Soils are most at risk of compaction and rutting/puddling when the soil is moist or wet, with the more poorly drained soils remaining wetter longer. The soils are equally at risk in the winter months if they are wet and the soil has not frozen, which is a common occurrence. Rehabilitation of compacted soil in harvest areas (off – road) is seldom an option because they are generally wet and additional machine traffic will often cause more soil damage. Therefore, protection of soil is best achieved in choice of equipment, staff training and advanced planning of operations. In terms of advanced planning, it is recommended that a pre-harvest site assessment include the evaluation of soil drainage class across the harvest area delineating sensitive areas with imperfectly and poorly drained soils. Management of field operations shall involve operating on soils when they are as dry as possible. The weather and percentage of sensitive areas in the harvest area shall be taken into account when scheduling areas for harvesting. Following a long dry period in summer, the sensitive sites shall be scheduled accordingly.

GROUND RULES

Pre-harvest planning

- 9.1 Areas susceptible to rutting, puddling or compaction shall be avoided when planning decks, landings and skidding patterns.**
 - 9.1.1 Areas susceptible to rutting, puddling or compaction shall be harvested during dry or frozen conditions (when soil condition is**

not susceptible to degradation e.g. blocks with predominantly imperfectly-poorly drained soils, soils exceeding field capacity).

Harvesting

- 9.2 The total area covered by temporary roads, bared processing areas, and soil displaced during timber harvesting operations shall not exceed five percent of each harvest area without Alberta's approval. Blocks less than 7 ha may exceed 5%.
- 9.3 Operations shall not occur **during heavy rainfall** or when soil conditions are above field capacity (saturated).
- 9.4 Minimize the machine traffic on sensitive areas, depending on soil susceptibility to disturbance according to the results of a hand test (see figure 2).
- 9.5 Operations shall cease when instances of multiple ruts in a limited area are created that are clearly related to operations during unfavourable ground conditions.

Post-harvest reclamation/reforestation

- 9.6 Class IV roads and seismic lines within harvest areas that are no longer required shall be reforested or regenerated. Treatments acceptable to Alberta are required on compacted soils. Acceptable treatments may be decompaction if required, roll back of debris, and re-vegetation (or as described in silviculture matrix).

Change in soil moisture and susceptibility to compaction and rutting following rainfall

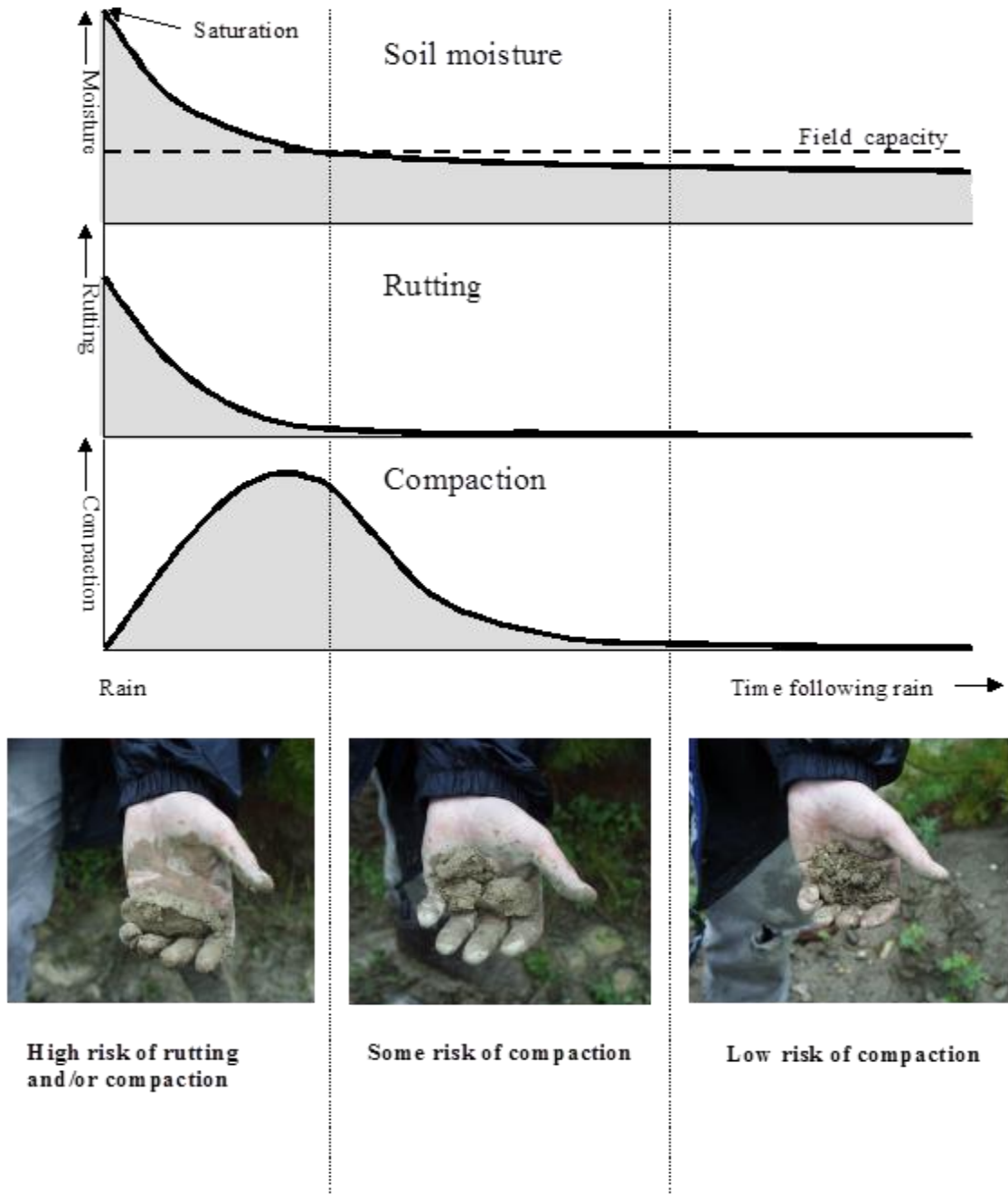


Figure 2. Soil Moisture

Courtesy of Andrei Startsev, Alberta Research Council

10.0 FOREST HEALTH/PROTECTION

10.1 INSECT AND DISEASE

PURPOSE

To minimize the risk of occurrence, and spread of insects and disease, which have the potential to impact forest management objectives.

To prioritize the salvage of timber damaged by insects and disease.

DISCUSSION

The impact of certain insects and diseases shall be addressed when planning harvesting, silviculture operations, and surveys. Several biotic and abiotic forest health agents affect the growth and survival of trees. Each agent poses a threat to the forest. Priority for management shall be given to those agents that have the greatest impact or could potentially cause the most damage by:

- a) increasing the wildfire hazard;
- b) reduction or loss of merchantable volume; and
- c) detracting from landscape aesthetics.

The following ground rules do not supersede the management strategies of species of special management concern. Alberta will provide direction where insects or disease concerns overlap with strategies for species of special management concern.

GROUND RULES

- 10.1.1 Harvest plans and operations shall be prioritized in stands with insect and disease issues. Variance from the SHS to address insect or disease issues may be acceptable if approved by Alberta. Infected and infested stands shall be ranked based on the type and intensity of insect and disease present, or the presence of dead trees. Stands or trees shall be ranked for treatment or harvest as follows:**

Rank 1: Stands or trees with the presence of mountain pine beetles or spruce beetles.

Rank 2: Stands with a significant number of dead or dying trees resulting from fire, insects or disease, and windthrow.

Rank 3: Stands infected with mistletoe, spruce budworm, forest tent caterpillar, root disease (Tomentosis, Armillaria) or jack pine budworm.

Rank 4: Stands infected with needle cast, Western gall rust, root collar weevils, Atropellis or other miscellaneous forest health agents.

10.1.2 Management tactics are based on the Forest Protection ranking as follows:

Rank 1 stands or trees: Control Measures must be undertaken before adult beetles take flight, either through harvest or single tree treatment. Alberta and forest operators shall work co-operatively to prevent spread through aggressive action.

Rank 2 stands: Shall be addressed through salvage planning process (see section 3.6, Salvage Planning). Highly unpredictable spread therefore, salvage planning is initiated.

Rank 3 stands: To manage dwarf mistletoe operators shall:

- create a 20 m wide mistletoe-free zone adjacent to the harvest area;
- create a 20 m wide non-host buffer beside the harvest area perimeter; or
- reforest the harvest area to a non-host species.

Any wildlife tree patches shall consist of non-pine species where possible. For other pests, contact Alberta.

Rank 4 stands: Generally, no control is required for mature stands. Regenerated stands affected by Western gall rust or root collar weevils may require site treatments. Contact Alberta.

10.1.3 Insect and disease assessment information shall be utilized in the CA. Where a CA is not required, the assessment information will be used to develop the GDP. Where new infestations are found, or for known infestations already sequenced through the SHS, they shall be addressed in the FHP.

10.1.4 Any infestation of Rank 1 agents and all data must be reported to Alberta immediately.

10.1.5 Where dues relief is requested, mistletoe infected stands must be surveyed using an acceptable rating system (e.g. Hawksworth system).

10.2 WEED MANAGEMENT

PURPOSE

To minimize the impact of non-native, prohibited noxious, and noxious weeds, in the Green Area.

DISCUSSION

The invasion of restricted and noxious weeds in the forested area of Alberta negatively affects the integrity of the ecosystem. The invasive weeds alter natural processes and displace organisms that naturally occur in the area.

Under Alberta statutes, the occupant (or owner if there is no occupant) must destroy all prohibited noxious weeds, control all noxious weeds and prevent the spread or scattering of nuisance seeds.

GROUND RULES

10.2.1 Forest operators shall follow Alberta's requirements (Directive 2001-06) for weed management in forestry operations.

11.0 ROADS

11.1 ROAD CLASSIFICATION

PURPOSE

To define a road classification system that provides guidelines to all forest operators and potentially all resource users in the Ground Rule Zones.

DISCUSSION

As roads are one of the most significant components of forest harvesting operations, forest operators along with Alberta shall co-ordinate and integrate road planning and construction plans with other resource operators. This classification system will provide consistent working guidelines to be used in planning and operations to facilitate integration. It is important to identify not only construction schedules but closure and reclamation timelines as well. Long term planning of access roads is a significant tactic to address landscape access issues.

GROUND RULES

- 11.1.1 The operator shall utilize the classification system described in Table 4 during planning and operations.**
- 11.1.2 All roads, regardless of class, with a lifespan of greater than three years shall be built under the authority of a DLO.**

Table 4. Road Classification and Design

Road Description and Tenure	Planning Requirements	Layout ¹	Design and Construction Descriptions ¹		Borrow Pits ¹	Timber Salvage ¹	Debris ¹	Erosion Control ¹
			Right of Way					
			Clearing Width	Road Surface Width				
<p>Class I</p> <p>Primary Permanent</p> <p>All Weather</p> <p>20+ Years</p>	<p>Identified in higher-order plans, i.e. long term access plans.</p> <p>Phased planning approach shall be followed.</p> <p>DLO required.</p> <p>Detailed design plan (see “guidelines”).</p>	<p>Centre line marked. Side ribbons required.</p>	<p>30-40 m</p>		<p>8 – 12 m</p>	<p>Location identified prior to construction (EFR) or as per submitted TFA.</p>	<p>As per TM Regulations and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>

Class II	Identified in higher-order plans, i.e. long term access plans.	Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.	20 – 30 m	5 – 10 m	Location identified prior to construction (EFR) or as per submitted TFA.	As per TM Regulations and EFR under DLO.	Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.
Secondary Permanent							
All Weather or Dry Weather	DLO required.						
5 – 20 + years	Detailed design plan: through route selection process a need for detail shall be assessed, i.e. need for cross-sectional profiles based on sensitive area identification.						

Road Description and Tenure	Planning Requirements	Layout ¹	Design and Construction Descriptions ¹		Borrow Pits ¹	Timber Salvage ¹	Debris ¹	Erosion Control ¹
			Right of Way					
			Clearing Width	Road Surface Width				
Class III Tertiary Permanent Winter or Dry Weather Up to 20 Years	Phased planning approach must be followed if road is to be used for more than three years. DLO Required if > than 3 years.	Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.	7 – 20 m		5-10 m	Location identified prior to construction (EFR) or as per submitted TFA.	As per TM Regulations and EFR under DLO.	Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.

Class IV Temporary Winter or Dry Conditions Up to three years	Details to be addressed in development plans. Approved under the cover of an AOP.	Centre line marked. As-built inside harvest area road locations submitted annually through air photo updates. Harvest area access roads mapped.	7 - 20 m	5 – 10 m	Location identified prior to construction or as per submitted TFA.	As per FHP.	Partial disposal. Mechanical or manual cutting of slash and debris to reduce fire hazard to acceptable levels.
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¹For Department License of Occupation (DLO) roads, actual requirements may be different in approved Disposition document.

Table 4A – Road Classification for the Caribou Area

All other criteria from Table 4 applies to the roads in Table 4A

Road Description and Tenure	Season Of Operation	Clearing Width	Road Surface	Grade Description
Class III <3 years	Dry or Frozen Ground	Maximum of 20 m, with variable allowance for *terrain conditions, to a maximum of 30 m. Any request to exceed 30 m requires Alberta's approval.	6 to 8 m maximum. Less than 8 m will require pullouts. Spot gravelling acceptable. Blanket gravelling requires Alberta's approval.	Grade to be minimized. Maximum 1.0 m; depending on site specific *terrain conditions.
Class IV <3 years	Dry or Frozen Ground	Maximum of 15 m, with variable allowance for *terrain conditions to a maximum of 20 m. Any request to exceed 20 m requires Alberta's approval.	6 to 8 m maximum Less than 8 m will require pullouts. Spot gravelling acceptable. Blanket gravelling requires Alberta's approval.	Grade to be minimized. 0.5 m maximum

11.2 ROAD PLANNING AND DESIGN

PURPOSE

To outline the plan to construct, maintain and reclaim roads.

DISCUSSION

DLO roads are authorized under the Public Lands Act. The application process identified by Alberta is to be followed for all DLO roads.

GROUND RULES

Road Planning

11.2.1 Forest operators shall annually submit a proposed road development plan, with a proposed construction schedule, in the GDP. Proposed variances from the FMP long-term corridor plan require Alberta's approval. The minimum scope of the road construction schedule shall be a five-year forecast with the content requirements being:

Map showing:

- existing forest operator roads by class including un-reclaimed class IV roads;
- other existing roads if the digital information is available;
- proposed forest operator corridors;
- access control points – See section 11.5 Access Control.

11.2.2 Temporary Roads: Class III and Class IV (with lifespans up to three years from start of construction).

11.2.2.1 These roads shall be built as per the approved AOP. Only roads with FHP approvals shall be included in the AOP submission. Any road exceeding the timeline in 11.1.2 shall be put under DLO or reclaimed during that timber year.

11.2.2.2 The forest company shall submit a table or report tracking the status of all their class IV roads over two years old. These roads shall be reclaimed as soon as timber operations are complete or within three years of construction. This may be submitted as part of the Road Plan in the AOP.

11.3 ROAD CONSTRUCTION, MAINTENANCE, AND RECLAMATION

PURPOSE

The roads shall be constructed, maintained and reclaimed in a timely manner to minimize environmental impacts.

DISCUSSION

Existing access (e.g. seismic lines, trails, and existing roads) shall be used as a priority wherever practical and feasible. Road ROWs shall be cleared according to standards established in Table 4, road comments, and any additional conditions approved in the FHP.

GROUND RULES

11.3.1 General

11.3.1.1 Road ROWs shall be cleared according to standards established in Table 4, road comments, and any additional conditions approved in the FHP.

11.3.1.2 Roads and landings shall be constructed to avoid:

- a) unstable soils, water source areas, springs and seepage areas;
- b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3 – Soils

11.3.1.3 Temporary road construction activities that are required outside an approved ROW can be considered incidental to construction and will be approved as part of the AOP provided the following is met:

- a) Be immediately adjacent to AOP approved disposition (temporary road and associated ROW only);

- b) Be reclaimed or reforested in the same fashion as the adjacent AOP approved disposition (if applicable);
- c) Be without conflict of existing dispositions and/or adjacent land uses; and
- d) Be an activity type and within the parameters as described below:
 - Log Decks or Decking Areas:
 - i. ≤ 0.18 hectares in size;
 - ii. Located on average ≥400 metres apart
 - Bank Stabilization:
 - i. Related to hill cuts impacted during construction;
 - Push Outs:
 - i. ≤0.04 hectares in size;
 - ii. Located on average ≥800 metres apart. Where this distance is not feasible due to operational constraints, line of sight between push outs should be minimized.

11.3.2 Construction

11.3.2.1 Roads, skid trails and landings shall be placed in locations and constructed so that soil erosion, damage to streambeds and sedimentation of watercourses are minimized.

11.3.2.2 On those parts of the ROW not used for grade construction, disturbance to the duff and organic soil shall be minimized to reduce damage to the roots of bordering trees and to provide a protective soil cover.

11.3.2.3 Trees with root systems seriously damaged by road construction activities shall be removed from the edge of a road cut.

11.3.2.4 The fill required for road construction shall be taken from the ROW when feasible.

11.3.2.5 All borrow pits required off the ROW must be authorized by an appropriate land use disposition before they are developed.

11.3.2.6 All sand and gravel pits off the ROW must be authorized under an appropriate disposition.

11.3.2.7 Removal of sand and gravel from within the channel or floodplain of any watercourse is prohibited.

11.3.3 Erosion Control/Prevention

11.3.3.1 Erosion control shall be implemented as per Table 4.

11.3.3.2 Initial erosion control measures shall be concurrent with grade construction.

11.3.3.3 Constructed roads require erosion control and stabilization of disturbed soils.

11.3.3.4 Ditch backslopes shall have a regular profile from the top of the cut to the bottom with no hanging banks or vertical cuts.

11.3.3.5 Water from roads, ditches and bared soil surfaces shall not be permitted to drain directly into watercourses. Where vegetated buffers alone do not retard water and sediment movement effectively, appropriate obstructions (e.g. logs, rocks, mounds) or sediment control structures shall be installed to dissipate the flow of water and capture sediment prior to entering the watercourse.

11.3.3.6 Cross-drainage culverts and other drainage devices shall be installed as road sub-grade construction progresses. Cross-drainage structures shall:

- a) reduce water movement along ditches;**
- b) divert water from the ROW into the surrounding vegetation directly as possible;**
- c) provide cross movement for water from seeps and springs; and**
- d) be installed with adequate spillways or downspouts where they drain onto unstable or bare soil.**

11.3.3.7 Re-vegetation shall be completed concurrent with operations or as soon as soil conditions permit. Existing ditch vegetation shall be protected

during road maintenance wherever possible and re-established where necessary.

11.3.3.8 A portion of the debris from clearing, and strippings from road and landing construction shall be retained and used for re-vegetation and erosion control on disturbed areas.

11.3.4 Reclamation

11.3.4.1 Roads not under DLO that are no longer required shall be reclaimed, have crossings removed, and their condition monitored until they are considered satisfactorily stabilized (see 11.3.4.7).

11.3.4.2 Certified weed free seed shall be used when seeding is used for reclamation.

Seasonal Deactivation (Partial Reclamation)

11.3.4.3 Certain roads that are not used continuously throughout the year may require intermediate erosion control measures such as:

- a) shallow surface cross ditches based on slope and soil type;
- b) re-established drainage;
- c) slope stabilization;
- d) rut-free driving surface establishment;
- e) access control measures;
- f) watercourse crossing and drainage structures that have a high risk of erosion or failure are removed, and stream banks and approaches reclaimed;
- g) all potentially erodible slopes are stabilized through rollback, seeded to approved vegetation species, and cross-ditched to disperse runoff and suspended sediment into undisturbed areas;
- h) access closure structures are installed where required.

Total Reclamation

11.3.4.4 Class IV roads and associated bared areas shall be permanently reclaimed by completing all of the following:

- a) decompacting if required, and returning them to an acceptable landform (see 11.3.4.4 (e));**
- b) removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches (see section 11.4.27);**
- c) cross-ditching, rolling back topsoil (including slash and logging debris, if applicable) and re-vegetating a minimum of 80% crown coverage of bared surface areas;**
- d) reforesting disturbed areas inside harvest areas**
- e) regenerating disturbed areas outside of the harvest area as per the following;**
 - Reclaiming, planting, or revegetating inter block roads to the pre-existing condition prior to use:**
 - where the road has been developed through a reforested cutblock; or**
 - an existing access that has been widened to facilitate access; or**
 - the road was built through standing timber.**
- f) establishing access closures where required.**

11.4 WATERCOURSE CROSSINGS

PURPOSE

To provide guidance so that crossings are constructed, maintained and reclaimed in a manner that ensures negative environmental impacts are minimized and fish and fish habitat are protected.

DISCUSSION

It is important to implement watercourse crossings of acceptable standards to meet the needs of all users. Of primary importance is protection of the aquatic environment. It is intended that water quality, fish passage, bank stability and aquatic fauna habitat are not compromised during watercourse crossing construction, maintenance and reclamation.

The planning of watercourse crossings must consider tenure, user integration, timing constraints, existing plans and assessments, and pertinent policy and legislation. Watercourse crossings shall be designed, installed, maintained and deactivated in accordance with all applicable policy and legislation. See Section 7.6.2 and 7.6.3 for additional information on the implications of the Federal Fisheries Act.

GROUND RULES

11.4.1 The company shall require approval for any crossing structure not listed in Table 5 for the appropriate watercourse type.

- **All crossings must maintain flow.**
- **Unless previously identified in the AOP, notification of crossing type to Alberta is required on the first operations report after installation**
- **Low profile crossings are used where bank protection is achieved through simple freezing in during frozen conditions or levelling the road in non-frozen conditions.**
- **Modified log fill can be used on streams less than 1.5m wide. It consists of a pipe supported by logs and constructed as defined in 11.4.21.**
- **Bridge includes native timber bridge, temporary bridge decks and ice bridges.**
- **Any change within a category only requires notification to Alberta.**

Table 5. Acceptable Crossing Structures

Stream Classification	Acceptable Structure	
	Non-Frozen	Frozen
Ephemeral	Log Fill	Log Fill
	Culvert	Snow Fill
	Bridge	Culvert
	Low Profile Crossing	Bridge
		Low Profile Crossing
Intermittent	Log Fill	Log Fill
	Modified Log Fill	Snow Fill
	Culvert	Culvert
	Bridge	Bridge
		Low Profile Crossing
Transitional Small Permanent	Modified Log Fill	Log Fill
	Culvert	Snow Fill
	Bridge	Culvert
		Bridge
Small Permanent	Modified Log Fill	Snow Fill
	Culvert	Log Fill – no flow
	Bridge	Culvert
		Bridge

11.4.2 Intermittent and higher-order streams shall be classified in the FHP.

11.4.3 Proposed watercourse crossing locations shall be identified in the FHP.

11.4.4 Unless otherwise approved, watercourse crossings shall:

- a) maintain fish passage on fish bearing watercourses;
- b) minimize erosion and sedimentation;
- c) have stable approaches;
- d) be at locations where the channels are well defined, unobstructed and straight;
- e) be at a narrow point along the watercourse;
- f) allow room for direct gentle approaches;
- g) have no direct drainage from either the road surface or ditches; and

- 11.4.13 Stream crossings shall be kept free of accumulated debris. Culverts plugged with ice shall be reopened to prevent flooding during spring thaw.**
- 11.4.14 Interim erosion control measures (e.g., silt fences, matting, or gravel check dams) must be implemented and maintained until permanent vegetation and erosion control measures are established where necessary.**
- 11.4.15 Stream crossings that fail shall be reclaimed or replaced (if necessary) with more appropriate crossing structures as soon as possible.**
- 11.4.16 Bridge abutments shall not constrict the normal stream channel. Where stream banks must be built up to construct a bridge abutment, soil shall be brought in and deposited from the end of the grade – no equipment shall enter the stream channel. Bridge spans must extend beyond stream banks and abutment walls.**
- 11.4.17 The use of bridges is preferred on fish-bearing streams; however, steel culverts may be permitted where they will not restrict upstream passage of fish (see Table 5 for more information on watercourse crossings).**
- 11.4.18 Culverts for all classes of streams must be designed, properly sized and installed to prevent erosion at both the inflow and outflow ends of the structure. Culverts shall be of sufficient length beyond the fill with the overburden properly back-sloped and stabilized to prevent sediment from entering the watercourse, and the ends of the culvert open at all times. Any culvert that becomes a hanging culvert must be correctly re-installed as soon as possible.**
- 11.4.19 Properly constructed logfills (see 11.4.21 below) on temporary roads may be used as per Table 5. As soon as the temporary road is abandoned, logfills shall be removed so that no soil is allowed into the water channel. Logfills installed during frozen periods shall be removed before the spring thaw. A bottom layer of logs may be left in place when removing the logfill to provide for summer crossing of ephemeral watercourses.**
- 11.4.20 Crossing intermittent or ephemeral watercourses within harvest areas shall be avoided when possible. When the crossings are necessary, they shall be constructed at specified locations using appropriate watercourse crossing structures.**
- 11.4.21 A properly constructed logfill has all of the following:**

- a) flow is maintained;
- b) enough logs to adequately fill an ephemeral draw or watercourse channel so that when the logs are removed there is little or no damage to the banks or channel bottom;
- c) logs delimbed and bucked to at least 1.5 m longer than the grade fill at each end;
- d) logs covered by a layer of suitable material that separates the soil from the logs, which shall permit total removal of the soil cap; and
- e) provisions have been made to allow for easy removal, that do not disturb the banks or watercourse.

11.4.22 In fish-bearing watercourses, any negative impacts on the stability and fish habitat values of stream banks must be minimized. Any damage to streambanks and the corrective measures taken by the company shall be reported to Alberta within 7 days of the occurrence.

11.4.23 A native timber bridge may be used on watercourses as per Table 5 provided that all of these requirements are met:

- a) bridge abutments do not restrict stream channel;
- b) a brow log (or other structure) is installed on both sides of the bridge deck to prevent soil from entering the stream;
- c) no equipment enters the stream channel;
- d) it is of suitable size and strength is available for construction;
- e) the span extends beyond stream bank and abutment walls;
- f) a separation layer is used between soil cap and timber;
- g) the soil cap and separation layer is removed as soon as harvest and hauling is complete; and
- h) the remainder of the structure is removed as soon as harvest and hauling operations are completed unless a proposal to leave crossing structures in place after hauling is approved by Alberta and an acceptable monitoring program is in place.

11.4.23.1 Bridges may be used for silviculture access provided all of these requirements are met:

- a) they are designed specifically to accommodate ATV (All-Terrain Vehicle) load(s); and**
- b) measures are in place to prevent soil or deleterious material from entering the watercourse channel.**

11.4.24 Snow-fills may be used on watercourses as per Table 5 during frozen conditions provided that all of the following requirements are met:

- a) sufficient clean snow exists to fill creek channel;**
- b) bank integrity is maintained;**
- c) any soil cap installed over the snow is removed prior to break-up;**
- d) measures are in place to prevent soil or other debris from entering stream channel or ice surface; and**
- e) stream flows are not impeded.**

11.4.25 Ice bridges may be used during frozen conditions provided that all of the following requirements are met:

- a) no capping material is used on the bridge;**
- b) winter stream flows are not impeded;**
- c) approaches of snow and ice constructed of sufficient thickness to protect the stream bank;**
- d) appropriate ice thickness exists to bear necessary load requirements; and**
- e) no alterations to streambed or bank are required.**

11.4.26 Each operator shall establish a monitoring program acceptable to Alberta, for their watercourse crossings. Documentation as to current condition, repair requirements, or removal dates of the crossing structures must be maintained and made available to Alberta upon request.

11.4.27 Watercourse crossings that are no longer required shall be reclaimed with the objective of minimizing any sediment from entering the watercourse. Their condition shall be monitored annually until they are satisfactorily stabilized meeting the following requirements:

- **removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches;**
- **cross-ditching approaches, rolling back topsoil (including slash and logging debris) and within one year re-vegetating erodible bared surface areas with vegetation capable of maintaining bank stability, e.g. this may include the use of sedges and willow cuttings.**

11.4.28 Merchantable and non-merchantable timber may be used for corduroy with notification to Alberta upon installation as per Directive 2006-04. Associated merchantable volume will be reported in a format suitable to Alberta. With approval, corduroy can be left in place as long as water movement is not inhibited.

11.4.28.1 Placement of corduroy shall:

- a) only be used on ephemerals or wet areas with no water flow; and**
- b) be no more than 1 (one) layer of timber deep without specific approval.**

11.5 ACCESS CONTROL

PURPOSE

To manage existing and proposed surface access recognizing key resource values.

DISCUSSION

The impacts of roads on resource values may require mitigation through access control measures. Wildlife, sensitive areas (i.e. historical sites, soils), protection of road quality and safety are reasons for implementing access control. A number of strategies and tactics are available for controlling or restricting access.

Access control measures for long-term roads shall be identified through the submission and review of the phased planning process. For temporary roads, the CA or GDP, and FHP shall be the mechanisms used in identifying access control requirements.

The following list of access control methods identifies a number of options that may be implemented:

- physical barriers (e.g. gates; barricades, pilings, crossing removal);
- road condition (e.g. berms, ditches, road standard, selective grade removal, roll-back, no snow removal);
- regulatory (e.g. sanctuaries, timing restrictions, signage).

GROUND RULES

11.5.1 Where access control has been identified as an objective in strategic land use plans, Alberta shall consult with the forest operator to determine an access control strategy. In the event that a strategic land use plan has not been developed, the FHP shall describe specific access control measures identified in the GDP or FMP (see section 3.4).

11.5.2 In designated areas, Alberta may direct forest operators to restrict road access during specified periods, implemented in accordance with Alberta policy. Restricted access issues shall be dealt with differently depending on whether the road is new access or is existing access.

11.6 CAMPS AND FACILITIES

PURPOSE

To give guidance to forest operators so that the planning, construction, maintenance and reclamation of camps and miscellaneous facilities is done in a manner that minimizes negative impacts on the forest environment.

DISCUSSION

Camps and other facilities are often a necessary part of operations in remote areas. Forest operators require that such facilities operate in an efficient and cost-effective manner and are implemented without compromising the integrity of the environment.

Some of the best practices for camps and facilities include:

- place sites out of visual and auditory range from mineral licks and key wildlife areas or use a default of one kilometre;

- safe camp locations are a priority. Therefore, an evaluation of all potential risks shall be conducted prior to selecting a final camp location;
- camps and fuel storage sites shall be identified in the annual fire control plan when proposed locations are known;
- camps shall be kept clean. Proper mechanisms for the disposal of hazardous and non-hazardous waste shall be implemented; and
- camp food and garbage storage shall minimize the potential for problems with wildlife. Recommend following the Bear Smart guidelines for specific mitigation relating to bears. Problems with wildlife shall be dealt with in consultation with Alberta.

GROUND RULES

11.6.1 A temporary camp can be approved under an AOP provided that:

- a) The location or proposed location is provided in a manner acceptable to Alberta (map, table);**
- b) There are no new clearings or harvesting required for the proposed location; and**
- c) The camp and/or the associated location will not be used past the end of the Timber Year in which it is approved.**

11.6.1.1 Any facility, camp or site that is used or designated for use for more than twelve consecutive months or past the end of the Timber Year in which it is approved will require an appropriate disposition under the Public Lands Act.

11.6.2 Any facility or camp must adhere to all provincial and municipal regulations related to the camp (i.e. Public Health Act – *Work Camp Regulation, municipal development permit, etc.*).

11.6.3 Camps and all associated facilities shall not be located within 100 m of any channeled watercourse.

12.0 SURFACE MINEABLE AREA (SMA)

PURPOSE

To identify modifications to the Northeast Operating Ground Rules (NEOGR's) which are applicable within the land area where the Surface Mineable Area overlaps with any Alberta Pacific Forest Management Units (FMU).

DISCUSSION

The Surface Mineable Area (SMA) is defined by the Alberta Energy Regulator (AER) as that area where the primary oil sands resource recovery method will be surface mining rather than in-situ techniques. The SMA intersects a large area of Forest Management Unit (FMU) A15 within the Alberta-Pacific FMA 9100029 (approximately 389,000 ha).

Surface Mineable Area Planning and Guidelines are treated separately from other areas of the approved 2015 Forest Management Plan under Section 3.6. This is because the development of oil sands resources is a discrete land use which has led to the decision to liquidate the merchantable timber within the SMA over twenty years.

Modifications to the NEOGR's within the SMA are intended to address operational differences associated with the liquidation of the timber resource to accommodate the intended land use (mining).

GROUND RULES

Alignment to the Northeast Alberta Operating Ground Rules for the Surface Mineable Area (SMA)

As per point 8 under the Proposed SMA Operating Guidelines (Section 3.6, Chapter 7 AI-Pac FMA Forest Management Plan):

For all areas within the SMA

- 12.0.1 Section 8.0 (Silviculture) is modified such that 8.2 (Reforestation Program) does not apply.
- 12.0.2 Section 7.5 (Understorey Protection) does not apply. No understorey protection plans are to be enacted.

12.0.3 Section 3.0 (Operational Planning) applies within the SMA. A Forest Harvest Plan (FHP) must be submitted and any planned activity within the SMA is to be included in the annual General Development Plan (GDP) and Annual Operating Plan (AOP). It is recognised that a Spatial Harvest Sequence (SHS) has not been developed for the SMA, and Section 3.0 is modified accordingly.

For areas within the SMA for which Mine Plans have been submitted

If an Oil Sands Operator has submitted Mine Plans as defined in Section 30(1) of the Oil Sands Conservation Rules to the Alberta Energy Regulator (AER) for an area of land within the SMA, then:

12.0.4 Table 3 (Standards and Guidelines for Operating beside Watercourses/Waterbodies) is modified for that area of land such that:

- a) Timber may be harvested up to the high water mark for any Watercourse Classification. All buffers of brush and lesser vegetation specified in Table 3 must be maintained.**
- b) A machine free zone (MFZ) of at least 5 metres from the high water mark must be maintained for all Watercourse Classifications. Wider machine free zones should be maintained where it is not necessary to come within 5 metres of the high water mark to access merchantable timber.**
- c) If an Oil Sands Operator desires that the Standards and Guidelines for Operating beside Watercourses/Waterbodies (Table 3) are to be followed as they would be outside of the SMA for the area (or portion thereof) within their Mine Plans, then that is their prerogative.**

12.0.5 Section 5.5 (Forest Aesthetics) does not apply.

12.0.6 Section 7.0 (Habitat Management) does not apply.

12.0.7 Section 7.4 (Structure Retention) is modified for that area of land such that no retention (0%) is required. Any area for which Mine Plans have been submitted shall not be included in calculating the average structure retention for the FMU (A15) as otherwise required under Sections 7.4.1 and 7.4.4 of the NEOGRs.

12.0.8 Subsections 11.3.4.1 (Reclamation of non-DLO Roads), and 11.3.4.4 (Total Reclamation) of Section 11.3.4 (Reclamation) does not apply.

13.0 REPORTING

PURPOSE

To ensure that timber operation activities are reported to Alberta in order to maintain an accurate and current database across the Province.

DISCUSSION

Silviculture and harvest operations reporting and monitoring is necessary to ensure legislated requirements are met in all treatment areas. Ground rules governing operations reporting are required to ensure consistency among forest operators. The intent of activity reporting is to communicate that a given activity has occurred, where it occurred and when it occurred.

GROUND RULES

SILVICULTURE AND HARVEST ACTIVITY REPORTING

- 13.0.1 Forest operators who conduct silviculture work on their disposition shall report the details of all work completed in the previous year annually into ARIS no later than May 15. The required information is outlined in the ARIS Industry Operations Manual. Information shall be submitted in accordance with all requirements of the manual and associated policy directives.**
- 13.0.2 Alberta may require additional reporting for forest management activities such as thinning, herbicide, pesticide spraying, or fertilization as per Alberta requirements.**
- 13.0.3 Companies harvesting more than 30,000 m³/yr shall have self-inspection agreements in place and shall carry out periodic inspections of active timber operations and report the information to Alberta in a format acceptable to Alberta. Accurate and complete reports, reflecting current operational status, based on the 2006-04 Directive shall be submitted to Alberta once per month or upon request.**
- 13.0.4 As built plan (includes digital shape files of harvest boundaries, road location, and all watercourse crossings) from the previous year's harvest shall be submitted to Alberta by September 1 the year following skid clearance or at a time agreed to by Alberta. Data submission standards will comply with the provincial Spatial Data Directives.**

Appendix 1 - Glossary

Alberta	The Department of Environment and Sustainable Resource Development or as amended from time to time.
Alberta Vegetation Inventory (AVI)	An inventory of vegetation and forest stands including non-vegetated areas.
Analysis	A detailed examination of a body of data, a series of decisions, or the implications of one or more policies, and a determination of what this examination reveals about the nature, function and/or relationships in effect.
Annual allowable cut (AAC)	The volume of timber that can be harvested under sustained-yield management in any one year, as stipulated in the pertinent approved forest management plan. In Alberta it is the quadrant cut divided by the number of years in that quadrant, usually five.
Annual Operating Plan (AOP)	A plan prepared and submitted by the forest operator each year, which provides the authorization to harvest. An AOP is a requirement of the Timber Management Regulation. (See section B 1.4)
Approval	Issued by Alberta. Approval Decision is prepared outlining significant items considered in plan approval and outlining conditions to be met within specified time periods by the Organization or a decision made by Alberta on an AOP.
Approval Review Committee	Committee comprised of senior Alberta staff that provides recommendations to the Executive Director of Forest Management Branch regarding FMPs.
Armillaria root rot	<i>Armillaria</i> spp.
As built harvest area map	An opening number accompanied by a spatial depiction of the harvest area generated either from cutover photography or from GPS technology capable of 3m or better accuracy
A-spatial Proxy	A non-spatial representation of a forest management activity that has real elements of space and time.

Assumptions	A judgmental decision made by a planner or decision maker that supplies missing values, relationships, or societal preferences for some informational component necessary for making a decision
Atropellis canker	<i>Atropellis piniphila</i>
Audit	An official examination and verification of records, activities, accounts, actions, operations, etc., against stated standards of performance and compliance.
Bared soil	Any soil where the organic layers and vegetation have been removed.
Barriers to fire spread	Those biophysical landscape features that either do not burn, or at certain times of the fire season are “fire resistant.” Some of the features that do not burn include water, rock, cultivated fields, and improved roads (with a grade). (Stegehuis)
Biological diversity (biodiversity)	The variety, distribution and abundance of different plants, animals and microorganisms, the ecological functions and processes they perform, and the genetic diversity they contain at local, regional or landscape levels of analysis. Biodiversity has five principal components: (1) genetic diversity (the genetic complement of all living things); (2) taxonomic diversity (the variety of organisms); (3) ecosystem diversity (the three-dimensional structures on the earth’s surface, including the organisms themselves); (4) functions or ecological services (what organisms and ecosystems do for each other, their immediate surroundings and for the ecosphere as a whole, i.e. processes and connectedness through time and space); and (5) the abiotic matrix within which the above exists, with each being interdependent on the continued existence of the other. [Dunster]
Borrow pit	A small quarry or excavation, which provides material for use in the construction project. [Revised from Dunster]
Buck	To cut a felled or downed tree into shorter lengths.
Buffer	Used in several contexts. 1 In protecting critical nesting habitat areas, the buffer is an area of forest land that reduces the impacts of adjacent activities on the critical area. The dangers associated with adjacent disturbances might include wind-throw or wind damage to nest trees and young birds in the nest, increased predation and loss of interior forest conditions. 2 A strip of land between two areas under different management regimes. Pesticide buffer zones are used to limit the possible drift, run-

	<p>off or leachate of pesticide from a site into other areas, such as waterbodies or creeks. Streamside buffers are used to limit the effects of logging on creeks, such as siltation, loss of shading, loss of nutrient inputs from trees and degradation of riparian zones. The size and composition of the buffer zone depends on its intended function. 3 An area maintained around a sample or experimental plot to ensure that the latter is not affected by any treatment applied to the area beyond the buffer. 4 In GIS work, a new polygon computed on distance from a point, line or existing polygon. 5 In managing biosphere reserves, an area or edge of a protected area. Examples of compatible activities might include tourism, forestry, agroforestry, etc. The objective of the buffer zone is to provide added protection for the core reserve area. [Dunster]</p>
Clearcutting	<p>A regeneration system where all or most of the merchantable trees in a defined area are harvested in one cutting with reproduction obtained through artificial or natural means.</p>
Coarse filter management	<p>Conservation of land areas and representative habitats with the assumption that the needs of all associated species, communities, environments and ecological processes will be met. [Dunster]</p>
College	<p>The College of Alberta Professional Foresters (CAPF) or the College of Alberta Professional Forest Technologists (CAPFT).</p>
Commercial Thinning	<p>A partial cut where trees of a merchantable size and value are removed to provide an interim harvest while maintaining a high rate of growth on the remaining, well-spaced, final crop trees. Used to capture volume likely to succumb to competition pressures and be lost to disease, insect, or dieback.</p>
Commercial timber permit (CTP)	<p>A timber disposition issued under Section 22 of the Forests Act authorizing the permittee to harvest public timber.</p>
Compaction	<p>A transfer of wheel pressure to soils causing collapse of large air-filled pores, a type of disturbance when tire imprint is often invisible under the duff layer. Soil susceptibility to compaction is maximal when soil is at field capacity, which can be detected by stability of hand cast. Most of soil compaction occurs during the first passes of equipment because soil gains strength with each additional pass.</p>
Compartment	<p>A subsection of an FMA for which operational plans are developed.</p>

Connectivity	A measure of how well different areas (patches or a landscape are connected by linkages, such as habitat patches, single or multiple corridors, or "stepping stones" of like vegetation. The extent to which conditions among late successional/climax forest areas provide habitat for breeding, feeding, dispersal and movement of late successional - or climax-dependent wildlife or fish species. Natural landscapes often tend to be better connected than those that have been heavily influenced and disturbed by human activities. Consequently, there is a body of opinion that the best way to avoid fragmentation of landscapes is to maintain, or re-establish, a network of landscape linkages. At a landscape level, the connectivity of ecosystem functions and processes is of equal importance to the connectivity of habitats. [Dunster]
Constraints	The restriction, limiting, or regulation of an activity, quality or state of being to a predetermined or prescribed course of action or inaction. Constraints can be a result of policies or political will; management direction, attitudes and perceptions; or budget, time personnel and data availability limitations; or, more typically, a complex interaction of all these factors. [Dunster]
Corrective Actions	May include one or more of the following: <ul style="list-style-type: none"> - Direct that the work be corrected and re-submitted; - Carry-out an appropriate enforcement response; - Refer the matter to the Complaints Director of the appropriate College to investigate the complaint.
Corridor	1 A physical linkage connecting two areas of habitat and differing from the habitat on either side. Corridors are used by organisms to move around without having to leave the preferred habitat. A linear habitat patch through which a species must travel to reach habitat more suitable for reproduction and other life sustaining needs. Many corridors, linking several patches of habitat, form a network of habitats. The functional effectiveness of corridors depends on the type of species, the type of movement, the strength of the edge effects and its shape. 2 An area of uniform width bordering both or one side of a lineal feature, such as a stream or route. [Dunster]
Cross-drainage structures	Culverts or other drainage structures that permit water to move from one side of a road to the other, normally under the road grade.

Culmination age	The age at which the stand, for the stated diameter limit and utilization standard, achieves its maximum average rate of volume production (the Mean Annual Increment, or MAI is maximized.
Deactivation	Taking a road out of active use through implementation of erosion control measures, road blocks and/or other methods.
Deciduous timber allocation (DTA)	A quota of deciduous timber.
Delegated Authority	The Government of Alberta personnel located at the Regional or Area level charged with supervision of all forest management activities in a defined Region or Area. It can also mean someone who is authorized to approve an AOP.
Deleterious material	Section 34(1) of the Fisheries Act defines “deleterious substance” as: (a) any substance that, if added to water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
Department Licence of Occupation (DLO)	A disposition issued by Alberta authorizing occupation of a linear corridor, often for an access road.
Desired Future Forest	A spatially explicit projected range of conditions of the forest landscape 100+ years into the future. The range of forest conditions defines the goal towards which forest management will be directed. It is our best guess today on the arrangement of forest age classes, roads and habitats that will provide for a set of objectives and desired outcomes that have been identified for the area.

Displaced soil	Mixed mineral, surface and sub-surface horizons that have been deposited off the road or disturbed surface to a depth of 15 cm or greater.
Disturbance patterns	The spatial and temporal arrangement of disturbances.
Ditch blocks	Barriers constructed across ditches to retard water flow, to redirect water from the ditch or to form a small catch basin.
Downed woody debris	Woody material >1cm in diameter, stumps and snags < 1.3 m tall and dead trees leaning >45 degrees. The woody material left on site after logging including both pre-existing and harvest-generated material (downed boles, limbs, tops and stumps). Includes highly decomposed and vegetated material as long as it is recognizable as woody.
Drought	Extended period of below average precipitation causing a lowering of the water table. Generally occurs over several years but locally may happen seasonally. Signs would be lowering of lake levels and drying of streams that would normally flow all year.
Due Diligence	<p>- taking and documenting steps to ensure that the desired outcome is achieved or that the chances of a negative consequence or outcome is minimized.</p> <ul style="list-style-type: none"> - ensuring completeness, correctness, consistency and repeatability. - demonstrating how conclusions were reached. - using mechanisms, such as but not limited to checklists and standard operating procedures, to demonstrate that appropriate procedures were followed and to ensure that no relevant steps or considerations were missed. - keeping and maintaining appropriate files and filing systems as well as document retention policies and practices.
Duff layer	The organic horizons of the soil profile (LFH). Commonly referred to as the forest floor.
Dwarf mistletoe	<i>Arceuthobium americanum</i> Nutt.
Early in/Early out	A philosophy and practice of ensuring that all activities associated with timber harvesting are completed by mid-winter. Companies plan activities to start immediately on freeze up, e.g. having blocks laid out or well sites surveyed before freeze up, then

	freezing in access lines as soon as possible. All activities should be concluded by late January with no disturbances in mid and late winter.
Ecological integrity	The quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future. [Dunster]
Embedded operators	Includes quota holders, permittees and other industrial operators with dispositions located within a Forest Management Agreement Area.
Enhanced Forest Management (EFM)	Enhanced forest management is defined as improvements in growth projections that result from thinning, fertilizing, tree improvement or drainage.
Environmental field report (EFR)	A document that must be submitted for most green area disposition applications as required under the Public Lands Act. The disposition applicant completes the EFR, which includes details on construction practices and environmental issues, and contains operating conditions that apply to the approved disposition. The EFR forms part of the approval for the Public Lands Act disposition.
Even-aged stands	A stand of trees in which the age differences among trees are small, usually less than 10 to 20 years, or 30% of the rotation age in stands more than 100 years old. Even-aged stands result from disturbances occurring at one point in time, such as wildfires, a clearcut, a seed tree cut, or a shelterwood cut or coppicing. [Dunster]
Features	The features represented on a map which describe the physical aspects of the harvest design. E.g. harvest area boundaries, roads, buffers, wildlife habitat.
Fire hazard evaluation	A conversion of forest inventory classifications to fire behaviour prediction fuel typing (AVI2FBP), crown fire threshold modeling (CROSUM) and determination of head fire intensity percentiles (spring, summer and fall).
Fire risk occurrence	Location of person-caused and lightning fires in relation to the fire hazard evaluation. It is used to represent “fire danger” in a spatial context.
FireSmart Community Zone	A standard 10 kilometre radius around the community extending from the Wildland Urban Interface Zone. A unique data set will be gathered for this zone for community

	protection planning to provide a fundamental linkage between FireSmart Communities and FireSmart Landscapes
FireSmart Landscape Zone	This zone extends beyond the FireSmart Community Zone overlapping multiple jurisdictions at a broad landscape level. This zone focuses on mitigating the likelihood of large, high intensity, high severity fires. Fire, Forest and Land Management planning are integrated and designed to reduce the negative ecological, economic and social impacts of wildfire while maximizing the positive attributes of wildfire.
FireSmart Landscapes	The philosophy that seeks to mitigate the likelihood of large, high intensity and high severity fires. FireSmart landscapes are designed to recognize the interaction between ecological, economic and social impacts, hence maximize the positive ecological impacts and minimize the negative economic and social impacts.
Floodplains	Flat land bordering a stream or river onto which a flood will spread. The underlying materials are typically unconsolidated and derived from past stream transportation activity. The extent of the floodplain varies according to the volume of water, and its 50-year-old floodplain would be defined by the largest flood that would, on average, occur once within a 50-year-period, estimated from historic stream flow records. [Dunster]
Forestry Program Manager	The senior Alberta manager located at a Forest Area charged with supervision of all forest management activities in a Forest Area. It may also mean someone else who is authorized to approve an AOP.
Forest Health	A condition of the forest; a forest is considered healthy if it can sustain itself to meet the specific forest land management objectives of today or in the future.
Forest Management Agreement (FMA)	A contract between the province of Alberta and the FMA holder whereby the province provides an area-based Crown timber supply. In return, the FMA holder commits to the following: Managing the timber resource on a perpetual sustained yield basis, taking into consideration a broad range of forest values in determining forest management practices. Meeting defined economic objectives, including capital investment and job creation, and seeking out new business opportunities that provide measurable economic benefits for both the province and the FMA holder.

	The FMA gives the FMA holder the right to access Crown fibre. In return, the FMA holder commits to forest management responsibilities, which may change from time to time.
Forest Management Plan	A long-term plan used to outline higher-level management objectives, sustainability and timber production assumptions for a Forest Management Agreement (FMA).
Forest Management Unit (FMU)	An administrative unit of forest land designated by the Minister, as authorized under Section 14(1) of the <i>Forests Act</i> .
Forest officer	An employee of Alberta appointed in accordance with the Public Service Act who represents the Minister in the administration of the Forests Act, the Timber Management Regulation, the Public Lands Act, and the Forest and Prairie Protection Act and Regulations on public forested lands.
Forest operations	Includes all activities related to timber harvesting, including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Forest operator	The timber disposition holder or person responsible for controlling harvest planning and operations in the timber disposition. It also refers to those persons working on behalf of the disposition holder while conducting forest operations.
Forest tent caterpillar	<i>Malacosoma disstria</i>
Forests Act, the	The legislative statute that authorizes the Minister to administer and manage the forested lands of Alberta.
Full Review	An evaluation of the acceptability for approval of a submitted document involving referrals to government departments, independent experts, or others as appropriate, and a risk analysis prior to Alberta granting approval to the submitting Organization.
Genetic Diversity	The genetic variability within a population or a species; the number and relative abundance of alleles. Genetic diversity can be assessed at three levels: Diversity within breeding populations, Diversity between breeding populations within any one geographic area, Diversity within the species

Grazing disposition	An authorization issued by Alberta for the purpose of domestic livestock grazing on public land (i.e., lease, license or permit).
Green-up period	The time needed to re-establish vegetation after a disturbance. Specific green-up periods may be established to satisfy visual objectives or hydrological requirements, or as a means of ensuring re-establishment of vegetation (for silviculture, wildlife habitat or hydrological reasons) before adjacent stands can be harvested.
Ground Rules	Standards for operational planning and field practices that must be measurable and auditable and based forest management plan objectives.
Growing Stock	The sum (by number, basal area or volume) of trees in a forest or a specified part of it.
Guideline	A preferred or advisable course of action respecting land and resource management. Guidelines imply a degree of flexibility, based on administrative judgment or feasibility of applying the guideline, and are consequently not normally enforceable through legal means.
Harvest area	A specified land area with defined boundaries where timber harvesting is scheduled, or has occurred. (commonly referred to as a cut block)
Harvest area form	A map and harvest area comments for each laid-out harvest area.
Hiding cover	See " <i>sight distance.</i> "
High-water mark	Stream course water levels corresponding to the top of the unvegetated channel or lakeshore.
Historical resource	Any work of nature or man that is primarily of value for its palaeontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including, but not limited to, the structure or object and its surrounding site.
Interpretive Bulletin	Document issued from time to time by Alberta describing protocols, standards, methods or other applicable to forest management planning.
Harvest area aesthetics	Overall quality of operations in respect to the real or imagined effect on visual quality and/or the environment within a particular harvest area.

Harvest Level	A volume or area of timber determined through timber supply analysis available for harvest on an annual sustainable basis within a DFA. A harvest level is not an AAC unless approved by the Minister.
Inoperable	Classification of a forest site based on the potential to harvest timber on that site, as affected by physiographic characteristics, moisture regime and harvesting equipment/technology.
Insects and Diseases	Biological, physiological, and environmental agents that have an adverse effect on the health of the forest. These agents include insects; nematodes; micro-organisms (viruses, bacteria, fungi); parasitic plants; mammals; birds; and non-infectious disorders caused by climate, soil, applied chemicals, air pollutants and other physiographic conditions.
Integrated resource management (IRM)	<p>IRM is an interdisciplinary and comprehensive approach to decision making for the management of natural resources. IRM integrates decisions, legislation, policies, programs and activities across sectors to gain the best overall long-term benefits for society and to minimize conflicts. This approach recognizes that the use of a resource for one purpose can affect both the use of a resource for other purposes and the management and use of other resources. IRM is based on:</p> <p>Co-operation, communication, co-ordination and the comprehensive consideration of all resource values. This philosophy is centered on the belief that efforts to manage natural resources will be more successful if they are co-ordinated at all levels within government; and</p> <p>Appropriate consultation before action. Those who are significantly affected by a decision should have the opportunity to participate in the decision making process.</p>
Integrated resource plan	A regional plan developed by provincial government agencies in consultation with the public and local government bodies. It provides strategic policy direction for the use of public land and its resources within the prescribed planning area. It is used as a guide for resource planners, industry and publics with responsibilities or interests in the area.
Interests	The wants, needs, concerns and desires of each party that provide motivation to be concerned about an issue or topic.

Interior forest conditions	The environmental conditions typical of the central or interior part of a habitat patch. They are usually relatively stable and are not influenced by the changing climatic conditions and other variables (noise, wind, sunlight, temperature, moisture) associated with edge conditions. [Dunster]
Issue	The topic to be discussed. The problem to be solved. The theme of the discussion.
Jack pine budworm	<i>Choristoneura pinus</i>
Laid Out	Field assessment of harvest blocks and roads (on the ground) required prior to submission of Forest Harvest Plan(s); also includes the delineation/markings of both harvest area boundaries and roads on the ground. Examples of delineation/markings include but are not limited to: ribbon, paint or other means approved by Alberta.
Landing	Any area where logs are gathered for processing or further transport to a mill site.
Landscape	A landscape (or LMU) is a heterogeneous area in which the pattern of the mosaic of local ecosystems or land uses is repeated in similar form throughout kilometres wide area (after Forman 1986). Landscapes may coincide with a climatic, physiographic or ecological boundary. However, landscapes are not strictly ecologically based and include human use and modification of the area.
Landscape fire assessment	Information on the effects of fire which may be used to influence forest management strategies and tactics over a landscape. The wildfire threat component of the landscape fire assessment handles the negative aspects of fire, and fire regime analysis handles the positive attributes. Both "wildfire threat" and "fire regime" need to be considered in order to provide a balanced "landscape fire assessment." [Stegehuis]
Large patch of residual trees	A 0.2 to 2 ha patch of undisturbed canopy forest surrounded by harvested area. At least half of the trees in the patch should be large residual trees.
Large residual tree	A residual tree with a diameter measured at breast height (DBH) greater than the approximate average merchantable tree DBH of the harvest area.
Letter(s) of Understanding	An agreement(s) signed between the Organization and the Crown outlining commitments and timelines for each party on future timber production audits as referenced in the "Timber Audit Framework."

License of occupation (LOC)	A disposition issued by Alberta authorizing occupation of a linear corridor, often for an access road.
Logfill	Stream crossings constructed with logs placed in a streambed parallel to the flow of the water.
Logging slash	The unusable trees, shrubs or portions thereof that result after tree felling, skidding and processing at the harvest site.
Machine-free zone	The area protected from machinery which would cause soil damage.
Mass-wasting	Movement of large masses of land, soil or regolith (i.e., slumping, landslides, rock slides and massive undercut erosion).
Mature stands	Stands that have reached rotation age or have a decreasing growth rate.
Mean Annual Increment	The average annual increase in volume of individual trees or stands up to the specified point in time. The MAI changes with different growth phases in a tree's life, being highest in the middle years and then slowly decreasing with age. The point at which the MAI peaks is commonly used to identify the biological maturity of the stand and its readiness for harvesting.
Maximum Mean Annual Increment	The volume available at the culmination of mean annual increment. The volume/ha described by the point on a volume/ha:age graph where the curve of mean annual increment crosses the curve of the current annual increment (CAI).
Mixedwood forest	A forest type in which the softwood component is between 20% and 80% by crown closure.
Model	An idealized representation of reality developed to describe, analyse or understand the behaviour of some aspect of this reality. A mathematical representation of relationships under study. The quest to find a subset of variables and a function between them that predicts one or more dependent variables.
Mountain pine beetle	<i>Dendroctonus ponderosae</i>
Noxious Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.

Organization	The proponent charged with developing the FMP. This may be a corporation, cooperative, or a public agency.
Partial cutting	A treatment where significantly less than 100% of the trees are harvested from a stand or area. It includes commercial thinning, even when the intention is leading to a final clearcut.
Pattern	The arrangement of forest stands or harvest units.
Permanent reserve	An area permanently excluded from harvesting in the FMP.
Permanent roads	Roads that will be in use for more than three years.
Permanent sample plots (PSP)	A fixed or variable area plot established for (forest) sampling and measurement purposes, and designed for remeasurement.
Planning Horizon	The length of time over which a series of defined management actions occur. For the purposes of modeling, usually equivalent to two full rotations.
Precautionary AAC	A level of harvest set that minimizes the risk of negatively impacting forest resources from an inadequately justified management assumption or in the absence of a comprehensive FMP for the DFA.
Pre-commercial Thinning	A silvicultural treatment to reduce tree density in young stands, carried out before the stems reach merchantable size. The intent is to concentrate the site's growth potential on fewer trees thereby accelerating stand development and reducing the time to final harvest, retaining more live crown, creating opportunities for future commercial thinning activities and improving stand operability.
Preliminary Forest Management Plan	A plan submitted by FMA holders within 12 months of signing a new agreement (includes a major revision to an existing agreement). It establishes an interim harvest level and cut sequence complete with justifications. This plan is the basis for harvest authorization until replaced by the Detailed Forest Management Plan.
Prescribed burn	The planned use of carefully controlled fire to accomplish predetermined management goals (e.g., site preparation for planting, reduction of fire hazards or pest problems, improvement of the ease with which the site can be traversed, and creation of better quality browse for wildlife). [Dunster]

Prohibited debris	Any flammable debris or waste material that, when burned, may result in the release of dense smoke, offensive odours or toxic air contaminants. It includes: (a) Garbage or refuse from commercial or industrial operations (b) Rubber or plastic, or anything containing or coated with rubber or plastic or similar substances (c) Used oil from internal combustion engines, hydraulic oil and lubricants (d) Motor vehicle tires.
Quadratic Diameter	The diameter of the tree with average basal area for a given stand.
Quota	The timber quota is a share of the allowable cut of coniferous timber within a forest management unit.
Reclamation of roads	Permanent removal of watercourse crossings; re-contouring of road crown and ditches; reseeding or planting of the former right-of-way.
Recreationalist	A person who participates in outdoor activities in the forest, such as horseback riding, ATV riding, snowmobiling, hiking, cross-country skiing, wilderness area experience, hunting, fishing, berry-picking, wildlife viewing, photography, camping, canoeing, etc.
Recreation Site	Includes areas designated by Alberta as Ecological Reserves, Wilderness Areas, Wildland Parks, Provincial Parks, Heritage Rangelands, Natural Areas, and Recreation areas.
Regeneration	The renewal of a tree crop by natural or artificial means. It may also refer to the young crop itself.
Regulated Forestry Professional	A Registered Professional Forester (RPF) on the Registered Professional Forester Register of the College of Alberta Professional Foresters (CAPF) or a Registered Professional Forest Technologist (RFPT) on the Registered Professional Forest Technologist Register of the College of Alberta Professional Forest Technologists (CAPFT).
Reserve	In its strictest sense, an area of land designated as being off-limits to any exploitive activities that might change the nature of the area. Not all reserves are so tightly controlled. [Dunster]

Residual structure	Standing structure that is taller than 2 m, within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes and small and large permanent streams are not included. This includes non-merchantable trees and shrubs, live merchantable trees, snags and stubs.
Residual tree	A live canopy tree that is spatially within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes, small and large permanent streams are not included.
Resources	Physical and intrinsic features of the land, including but not limited to timber, wildlife, water and soil.
Restricted Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.
Review	Acceptance or appraisal conducted by Alberta
Review Team	A group of senior Alberta officials and the Forest Management Planning Forester formed to review detailed forest management plans.
Right-of-way (ROW)	A cleared area, usually linear, containing a road and its associated features such as shoulders, ditches, cut and fill slopes, or the area cleared for the passage of utility corridors containing power lines or over- or under-ground pipelines. Typically, the right-of-way is a specially designated area of land having very specific rights of usage attached. Rights-of-way may be owned by someone else. [Dunster]
Riparian area or management zone	<p>(1) The band of land that has a significant influence on a stream ecosystem or is significantly affected by the stream. It often has specialized plant and animal communities associated with it. [Anon]</p> <p>(2) Terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows. The riparian zone is influenced by, and exerts an influence on, the associated aquatic ecosystem. [Dunster]</p>

Root collar weevils	<i>Hylobius</i> spp.
Rotation	The period of years required to establish and grow even-aged timber crops to a specified condition of maturity.
Ruts	<p>Machine depressions in the soil which are determined by depth and length: where the depth of the organic dark humus material is greater than 30 cm, a rut is a depression that shears the organic layer of soil (a sheared organic will expose a vertical face greater than 20 cm of the organic layer).</p> <p>Where the depth of the organic material is less than 30 cm, a rut is a depression exceeding 10 cm into the mineral soil.</p> <p>Length: An impacted area meeting the rut depth criteria that is greater than 4 m long.</p> <p>A continuous track with a rut less than 4 m because of stumps, logs or rocks lifting the vehicle will still count as a rut if the total length of the smaller holes is greater than 4 m.</p>
Rutting/ puddling	A paste-like behaviour of wet soil when most of the soil pores are filled with water and soil literally flows from underneath the wheel to the sides and upward forming visible tire imprint into the mineral soil. Intensity/depth of rutting is directly related to the number of equipment passes. Soil is considered susceptible to rutting when it forms a stable hand cast.
Selection Harvesting	A silvicultural system used to create or maintain uneven aged stands. Usually accomplished through the periodic removal of groups of trees or individual trees, while full residual stand growth rates are maintained and natural regeneration from overstorey trees is encouraged. Not to be confused with selective harvesting, or high-grading, where trees are selected and removed periodically based solely on economic criteria. Selective harvest is not designed to improve the growing conditions of the remaining crop trees as Selection harvest is.
Sensitive or Complex sites	Sites that have soil, water, slope, aesthetic, vegetation or wildlife characteristics that require special protection beyond the normal precautions described in the ground rules. They may be complex if many values or issues are involved.
Sensitive soil site	Any site that may be prone to soil movement, soil erosion, mass wasting or siltation due to steep slopes, wet ground, seepage areas, springs, fine textured soils or soils prone to mass wasting.

Sensitivity Analysis	An analytical procedure in which the value of one or more parameters is varied; the changes that this produces are analysed in a series of iterative evaluations. If a small change in a parameter results in a proportionately larger change in the results, the results are said to be sensitive to the parameter.
Seral stages	A stage in succession. A series of plant community conditions that develop during ecological succession from a major disturbance to the climax stage. Most common characteristics/classifications include tree species and age.
Sight distance	The distance at which 90% or more of an adult big game animal is hidden from the view of a human. This distance may vary from one stand to another.
Silt fence	Permeable fabric barriers installed along the contour to filter surface water runoff and trap sediment from sheet or overland flow and prevent it from entering streams.
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. A planned program of silviculture treatments over the life of a stand, it includes the harvesting and the follow-up tending to the next rotation. [Smith, 1996]
Silvicultural Transitions	Stand type or cover type changes resulting from planned silvicultural practices on the DFA in natural and managed stands (i.e. natural to managed, managed to managed). Changes relate to species and species mixes, densities and growth trajectories from basic or enhanced management.
Silviculture	The theory and practice of controlling the establishment, composition, health, structure and growth of forests in order to achieve specified management objectives.
Site preparation	Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment favourable for survival of suitable trees during the first growing season. Altering the ground cover, soil or microsite conditions can create this environment; using biological, mechanical or manual clearing; prescribed burns; herbicides or a combination of methods. [Dunster]
Skid trail	An unimproved temporary forest trail suitable for use by equipment such as bulldozers and skidders in bringing trees or logs to a landing or road.

Slenderness Coefficient	The ratio of height to diameter at breast height. Used to estimate windthrow and breakage potential of a stand.
Small patch of residual trees	A patch of less than 0.2 ha of undisturbed canopy forest surrounded by harvested area. The patch must be composed of at least four canopy trees. At least two of the trees in the patch should be large residual trees.
Snag	A dead tree that is taller than 2 m.
Soil degradation	A reduction in soil quality caused by but not limited to the following conditions: rutting, compaction, puddling or soil displacement.
Soil Displacement	A loss of nutrient-rich organic layers, and top mineral soil as a result of harvesting activities. Bare mineral soil is susceptible to raindrop impact causing soil crusting, increased surface runoff, and erosion.
Soil disturbance	In the context of the 5% maximum allowable area within a harvest area, includes bared landing areas, temporary roads, displaced soils or ruts.
Soil productivity	The capacity of a soil to provide for growth.
Spacing Factor	Inter-tree distance expressed as a percentage of the stand's top height.
Spatial	Of, or existing in, space. [Webster's]
Species at risk	Any species known to be "at risk" after formal detailed status assessment and designation as "Endangered" or "Threatened" in Alberta. The list of species is maintained by Alberta.
Species of management concern	Species within the forest management planning area that have an identified value (social, economic, ecological) and are managed to ensure their continued protection and/or use. This includes species that are hunted or trapped, as well as those that are endangered or threatened.
Spruce beetle	<i>Dendroctonus rufipennis</i>

Stand	A community of trees sufficiently uniform in species, age, arrangement or condition as to be distinguishable as a group in the forest or other growth in the area. A stand may also be that polygon as defined in the AVI or Phase III inventory.
Stand Density Management Diagram (SDMD)	A stand model based on data from the $-3/2$ power law for self-thinning. Illustrates the relationships between diameter and height with stand density over time.
Strippings	Layers of humus-bearing topsoil and fine woody material above mineral soil that have been stripped off during road or landing construction.
Stub	A large residual tree that has been “topped off” at approximately 6 m to create an artificial snag.
Subgrade	The road base.
Subsequent pass	Any harvest occurring after the first harvest pass.
Suppression capability	The effectiveness of traditional fire suppression tactics. It is an objective evaluation of initial attack response time, access for ground support resources, water availability and terrain which might adversely impact movement of resources.
Sustainable forest management (SMF)	Management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social and cultural opportunities for the benefit of present and future generations.
Temporal	Of, or limited by, time. [Webster's]
Temporary field authority (TFA)	An authority issued under Section 19 of the Public Lands Act by an Alberta officer to grant short-term land use activities on public land in the White or Green Areas. The TFA may or may not be related to an existing disposition that has also been issued under the Public Lands Act. The concept is to provide field-level service to an applicant, with access to public land for a specific purpose/use/activity, for a term of less than or equal to one year.
Temporary road	Roads that are part of a harvest area or that connect harvest areas, and are built, used and reclaimed before expiry of the Annual Operating Plan (AOP) or reclaimed within three years of construction.

Thermal cover	Generally, an area of at least 10 ha having a coniferous canopy at least 10 m in height, with at least 70% crown closure and a minimum width of 200 m. This cover is used by animals to assist in their temperature regulation during extreme weather conditions.
Three-pass harvest	A harvest pattern in which all the available merchantable timber in an area is harvested in three separate passes. Normally it is done over approximately equal areas and in equal volumes.
Timber disposition	Licenses and permits that allow forest operators to harvest from Crown lands.
Timber Management Regulation	The legislative statute that describes the mechanism and regulations by which the forested lands of Alberta are managed. The Regulation is associated with the Forests Act.
Timber Operations	Includes all activities related to timber harvesting including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Timber supply analysis (TSA)	Calculations/computer models with built-in assumptions regarding forest growth patterns, used to determine the annual allowable cut (AAC).
Timing constraints	A restriction or limitation on when an activity may be carried out.
Tolerance Limits	Acceptable degree of change that can be allowed before corrective action is taken.
Trapper	Holder of a trapping license.
Two-pass harvest	A harvest pattern in which all the merchantable timber in an area is harvested in two harvest passes. Normally, the harvest is done over approximately equal areas and in equal volumes.
Understorey	The trees and other woody species growing under the canopies of larger adjacent trees and other woody growth. [Dunster]
Uneven-aged stand	Stands in which the trees differ markedly in age, usually with a span greater than 20 years.

Unstable slope	Slopes of loose or poorly consolidated materials beyond the angle of repose, geological features having a high probability of failure, or soils that will not support loads.
Utilization	The portion of the stand or individual tree used for manufacture of wood products, defined in terms of piece length and diameter at each end. Minimum standards for utilization are defined in the timber disposition.
Validated work (Validation)	Work that has been prepared by, or reviewed and approved by an RFP. These professionals are subject to an enforceable code of ethics and standards of practice and are expected to complete their work with due diligence to ensure such work is accurate. The RFPs who validate the work may have done the work themselves, contracted the work to be done, or supervised those who did the work, but in any case, the validating RFPs are accountable for the work being prepared with due diligence and being accurate. If more than one RFP is involved in preparing the work, the RFP that is most directly involved in the work is to validate the work.
Values at risk	A listing of values which may be at risk of being reduced by wildfire. In order to complete a spatial “priority” evaluation, information regarding values is required.
Variance (SHS)	Any deletion to a stand scheduled in the spatial harvest sequence. Additions to stands identified in the spatial harvest sequence are not considered variance but are tracked in section 3.4.1 of the ground rules.
Viable understorey	Trees of desirable merchantable species that are windfirm and of sufficient vigour that they will continue to grow after harvest.
Viewshed	The visible area, as it appears from one or more viewpoints.
Visual impact analysis (VIA)	Estimates visual impact potential, determines acceptable design and layout, and guides measures to be taken during and upon completion of operations to reduce visual contrast.
Visual quality objectives (VQO)	Broad objectives for visual resource management that set limits considered acceptable to the average viewer, as to the form and scale of visible alteration.
Visual resource assessment (VRA)	A relatively intensive reconnaissance of a landscape or parts of a landscape. A forest management planning framework for assessing Alberta’s visual resource base in a

	consistent and systematic manner. Consists of four planning phases: visual resource inventory, visual quality objectives, visual impact analysis and total resource design.
Visual resource inventory (VRI)	A quick and simple process of recording the expanses of viewable area, noting key features, their prominence and sensitivity in order to better direct proposed harvesting operations in scenic or visually important areas.
Visual Resource Management	A standardized process of identifying and assessing visual values to ensure that proposed industrial developments in visually sensitive areas of Alberta, are planned and developed in a consistent manner. The process used is called a Visual Resource Assessment.
Water availability	Availability of water which can be utilized for fire suppression.
Water regime	Timing of water flow.
Water source area	That portion of a watershed where soils are water-saturated and/or surface flow occurs and contributes directly to streamflow. The area of saturated interflow associated with a stream.
Watercourse	The bed, bank or shore of a river, stream, creek or lake or other natural body of water, whether it contains or conveys water continuously or intermittently.
Watershed	An area of land, which may or may not be under forest cover, that drains water, organic matter, dissolved nutrients and sediments into a lake or stream. The topographic boundary, usually a height of land, that marks the dividing line from which surface streams flow in two different directions. [Dunster]
Western gall rust	<i>Endocronartium harknesii</i>
Wildland Urban Interface Zone	The area where various structures and other human developments meet or are intermingled with the forest and other vegetative fuel types.
Wildlife	Any species of amphibian, bird, fish, mammal and reptile found in the wild, living unrestrained or free roaming and not domesticated. Some definitions include plants, fungi, algae and bacteria. [Dunster]

Wildlife corridor	A strip of forest with a minimum width of 100m or a series of forest retention patches that connect two forested areas. These may include merchantable or unmerchantable stems.
Wildlife zone	As defined on Fish and Wildlife Referral Maps.
Windfirm boundaries	Harvest area boundaries established at locations that are stable and that minimize the potential for timber losses from wind.
Yield Curve	Graphical representation of a yield table.
Yield Table	A summary table showing, for stands (usually even aged) of one or more species on different sites, characteristics at different ages of the stand.
Zone of Imminent Competition Mortality (ZICM)	The density at which mortality occurs due to intra-specific competition.

List of Initialisms

AAC	Annual Allowable Cut
AOP	Annual Operating Plan
ARC	Approval Review Committee
BOR	Basic Operating Rules
CAPF	College of Alberta Professional Foresters
CAPFT	College of Alberta Professional Forest Technologists
CCFM	Canadian Council of Forest Ministers
CT	Commercial Thinning

COP	Codes of Practice (Watercourse Crossings Codes of Practice, Water Act).
CSA	Canadian Standards Association
C&I	Criteria and Indicators
DHAP	Detailed Harvest Area Plan
EFM	Enhanced Forest Management
FGRMS	Forest Genetics Resource Management and Conservation Standards
FHP	Forest Harvest Plan
FLUZ	Forest Land Use Zone
FMA	Forest Management Agreement
FMP	Forest Management Plans
FMU	Forest Management Unit
G&Y	Growth and Yield
GDP	General Development Plan
GLIMPS	Geographical Land Information Management and Planning System
IRM	Integrated Resource Management
IRP	Integrated Resource Management Plan
MAI _{Max}	Maximum Mean Annual Increment
PCT	Pre-commercial Thinning
PDT	Plan Development Team

PFMP	Preliminary Forest Management Plan
PPG	Public Participation Group
RFP	Regulated Forestry Professional
RPF	Registered Professional Forester
RPFT	Registered Professional Forest Technologist
SFM	Sustainable Forest Management
SYU	Sustained Yield Unit
ToR	Terms of Reference
TMR	Timber Management Regulation made under the Forests Act
VOIT	Values, Objectives, Indicators and Targets

Appendix 2 - AOP/FHP Checklists

Forest Harvest Plan (FHP) Checklist		
Planning Unit _____	Disposition Number _____	
Company _____	Submission Date _____	
	APPROVAL ITEM	YES/NO
* Validated by RFP		
* Deletes <20% of SHS area by cover type within compartment for every 10 year period		
* Harvest Area does not exceed 100% of SHS by cover type for the planning unit or FMU in a 10 year period		
** Adheres to all Ground Rules (if "NO", see OGR Variance portion of the harvest design report)		
* Compartment assessment not completed		
* Appraisal of the FHP is required if "No" has been indicated on these Approval Items. ** Appraisal of deviations is required if "No" has been indicated on this Approval Item.		
		Company (Y,N,N/A)
Administrative Considerations		
<ul style="list-style-type: none"> - Digital and/or paper copies of FHP (including maps, and block/road shapefiles) submitted to appropriate Alberta representative(s) _____ - Copies distributed and available for public reference as per FMA, regional OGR or agreement with GoA (i.e Libraries, etc.) _____ - An explanation and justification is provided for all ground rule deviations _____ - All significant issues have been discussed with Alberta and resolved prior to submission of this FHP _____ - Required Timber Disposition has been issued and is active _____ - Utilization standard matches license document (if not, Company has approval documentation for temporary deviation) _____ - Intended Recipient of incidental volumes and chargeability is identified _____ 		
3.4 Final Harvest Plan Map and Report Content		
<ul style="list-style-type: none"> - FHP Map(s) contains the following information required as per _____ <ul style="list-style-type: none"> a) Approved Forest Inventory _____ b) SHS and Variances from the SHS _____ c) All existing and proposed Class I, II and III roads within planning unit _____ d) Proposed Class IV roads within planning unit _____ e) Current dispositions and reserves _____ f) Watercourses and protective buffers _____ g) Planned watercourse crossing locations _____ h) Current existing harvested areas, trails, seismic lines, powerlines, pipelines and access routes _____ i) Key Ungulate and Biodiversity Zone and caribou areas _____ - FHP Report contains the following information required as per _____ <ul style="list-style-type: none"> a) Harvest Area (block) listing including area (ha) and volumes by cover type (D, Sw, Pj, Sb) _____ b) Includes an SHS variance summary _____ d) All dispositions within the FHP unit boundary have been listed (PNT, CNT, ISP, Grazing and Trapper) _____ e) Describes how the Compartment Assessment is addressed (if required) _____ f) List of water course crossing locations _____ g) Access control methods _____ i) Describes integration with other users and how concerns will be addressed _____ j) Harvest design considers non-timber values summary _____ - Areas requiring Detailed block plans (DBPs) are identified and completed as per the OGRs and are available upon Alberta's request _____ 		
5.0 Integration with Other Users		
<ul style="list-style-type: none"> - Plan agreed to in writing by affected forest companies _____ - Implications to Forest Recreation and Tourism have been addressed (where appropriate) _____ - Trappers have been identified and contacted and concerns have been addressed (where appropriate) _____ - Grazing disposition holders have been contacted and concerns have been addressed (where appropriate) _____ - Forest Aesthetic concerns have been addressed (where appropriate) _____ - Known Historical resources/sites have been identified and integrated into plan _____ - Issues raised by other users or the public have been documented and addressed where appropriate _____ - Potential land use conflicts have been documented and mitigated (PNT, CNT, road use agreements, etc.) _____ 		
6.0 Watershed Protection		
<ul style="list-style-type: none"> - Watercourses and water source areas are identified and potential impacts mitigated _____ - Watercourse crossings maintained for silviculture purposes are identified (if "N/A", these crossings must be identified in the AOP) _____ 		
7.0 Habitat Management		
<ul style="list-style-type: none"> - Harvest area design and layout requirements have been addressed _____ - Line of sight has been minimized where harvest areas are adjacent to Class I, II and III roads _____ - Roadside vegetation is to be protected in harvest areas _____ - The harvest design strives to limit distance to wildlife hiding cover to less than 200m _____ - Debris disposal methods are identified and FHP complies with Community Firesmart Plans _____ - Structure Retention requirements are addressed _____ - Understorey Protection Harvest requirements are addressed _____ - Fisheries and the aquatic environment management objectives are identified _____ - Species of special management concern <ul style="list-style-type: none"> Woodland Caribou requirements have been addressed _____ Trumpeter swan requirements have been addressed _____ Key Wildlife Biodiversity concerns have been addressed _____ All known sensitive wildlife sites have been addressed (mineral licks, raptor nests, den sites, etc) _____ 		
10.0 Forest Health/Protection		
<ul style="list-style-type: none"> - Insect and Disease issues have been identified and addressed accordingly _____ - Weed management concerns have been addressed accordingly _____ <p>- FHP's are approved through acceptance and will be considered approved on the date Alberta acknowledges receipt of the work. - Alberta shall respond within 30 days through written approval from the Delegated Authority - At any time, approval can be revoked where Alberta learns the FHP is inaccurate or deficient in content.</p>		
Company Sign Off		
Submitting RFP Validation _____	Company _____	Date _____
Submitting RFP Validation _____ (for integrated plans)	Company _____ (Integrated operator)	Date _____

Annual Operating Plan (AOP) Checklist - Reforestation Program Component

Reforestation Program

<p>Silviculture Plan Components</p> <ul style="list-style-type: none"> - Openings clearly identified - Reforestation Program includes following components: <ul style="list-style-type: none"> Silviculture prescriptions are acceptable as per the Silviculture table and all variances are identified for appraisal _____ Herbicide Proposal follows Alberta requirements _____ Commercial Thinning proposal satisfies Alberta requirements _____ Planned out of zone Seedling or Seed Deployment variances have been approved _____ Seed amounts are sufficient as per STIA manual section 11.2 _____ Any requested silviculture map(s) have been submitted and meet requirement _____ - Forest Health concerns identified and mitigated (insect, disease, weed management) _____ <p>Silviculture Report Components</p> <ul style="list-style-type: none"> - Summaries of stratum declarations, stratum changes, final stratum, QAC adjustments _____ - Preliminary and Second Year declarations submitted _____ - Opening update verification submitted - all blocks logged in the previous year cross referenced against ARIS <u>N/A</u> - Includes stratum changes of openings establishment surveyed _____ - Includes final stratum for openings performance surveyed _____ - Includes summary of annual QAC adjustments _____ - Proposed blocks are listed for declaration in lieu of survey & re-treatment _____ - Watercourse crossings used for silviculture purposes are identified _____ - Includes a summary of all silviculture activities completed in the previous silviculture plan period _____ 	<p>Company (Y,N,N/A)</p>
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Company Sign Off

Submitting RFP Validation	Company	Date
Submitting RFP Validation (for integrated plans)	Company (Integrated operator)	Date

Annual Operating Plan (AOP) Checklist		
Administrative and Timber Production Information		
Company/Disposition Holder	_____	Disposition Number(s) _____
Submission Date	_____	QAAC _____
Effective Period	_____	Quadrant Production to date _____
Date Disposition Issued	_____	Quadrant Volume Remaining _____
Date Disposition Expires	_____	Proposed Production (this year) _____
Scaling Methodology	_____	
		Company (Y,N,N/A)
- Plan is signed off and validated by RFP	_____	
- Digital and/or paper copies of AOP (including maps) submitted to appropriate GoA representative(s)	_____	
- Delegation of signing authority included where required	_____	
- Company is requesting dues relief, explanation and justification provided.	_____	
- Utilization standard matches tenure document or documentation for other approvals has been provided	_____	
- Deviations from utilization standards are identified and justified (rub posts, high stumps, retention, etc)	_____	
- Proposed volumes to be harvested have been listed by disposition	_____	
- Road Use agreements have been included in plan (CTP's only)	_____	
Operating Schedule		
- Block table submitted for all blocks scheduled for harvest including area & covertype volumes (i.e. D, Sw, Pj, Sb) with totals	_____	
- List of non-LOC roads proposed for construction & reclamation, except spur roads	_____	
- List of watercourse crossings to be built or installed or removed/maintained	_____	
- Outstanding operational items have been declared, or there is an agreement with Alberta on reporting	_____	
- Debris disposal methods are identified and approved methods	_____	
Applicable Final harvest Plans		
- All Final harvest Plans identified in Operating Schedule have been submitted and approved	_____	
- Annual update on the progress of all FHP's is included	_____	
Reforestation Program		
Due to the submission timing of the spring and fall reforestation program schedules, the checklist content for the Reforestation Program section of the AOP checklist can be submitted as an addendum. A signed and validated Reforestation Program Checklist is to be included along with each silviculture plan submission.		
Fire Control Plan		
- Fire Control plan has been submitted and approved	_____	
Road Plan		
- Existing access and LOCs integrated into the plan are identified	_____	
- All roads regardless of class, with a lifespan of > 3 years have been built under the authority of a LOC	_____	
- All watercourse crossings are documented in a monitoring program	_____	
- Road reclamation/abandonment plan complete	_____	
- Roads identified for disturbance monitoring/outstanding and anticipated reclamation on Class III and IV roads	_____	
General Development Plan		
- GDP is signed off by all affected forest companies	_____	
- The GDP submission includes the following schedules & maps as per section	_____	
Planned five year volume supply by harvest area by year (eg. Planning Unit/Licence)	_____	
Timber Disposition Production Summary table by year	_____	
Class I, II and III road developments/requirements, corridor plan and construction schedule	_____	
Un-scaled volumes in satellite yards are identified	_____	
As-built SHS variance by compartment	_____	
- The GDP map(s) submitted include information required:	_____	
Mill site location(s)	_____	
Planning Units and Proposed Access	_____	
Satellite yard locations	_____	
Timber dispositions to be operated	_____	
Key Wildlife Biodiversity Zones and Caribou areas	_____	
- Stand Structure Reporting requirements have been addressed	_____	
- Consultation on the GDP as per the First Nations Consultation Guidelines has been done	_____	
- An as-built block map and shapefiles from the previous timber year's harvest was submitted prior to deadline	_____	
Company Sign Off		
Submitting RFP Validation	_____	Date
	Company	
Submitting RFP Validation (for integrated plans)	_____	Date
	Company (Integrated operator)	