Weyerhaeuser Prince Albert

Forest Management Agreement Area

STANDARDS AND GUIDELINES

May 2005

Key Definitions Used in Development of FMA Standards & Guidelines

Topic/Subject
FMA standards and guidelines have been organized from an operational perspective into key topic areas (such as roads and harvesting practices). Each topic area is further broken down into various subject areas (such as slash management), each of which will be related to various objectives from higher-level plans. Each subject area will then have a number of required standards associated with it (such as spreading of slash).

Objective
An objective states a desirable forest practice or future condition of a forest resource or forest use, which is attainable through actions of the licensee. The intent of the objective should be specific and its link to forest management plan objectives and targets must be described. The objective sets the context and rationale for developing standards and operating guidelines. Where useful, a discussion of intent, pertinent knowledge, definitions, and applicable laws and policies should be included.

Objectives will change from time to time in response to new public values and licensee needs as expressed in planning processes and also in response to what is learned from new knowledge, much of which will come from monitoring the results of management practices.

Standards
A standard is a specific measurable activity, result or unit of measure. Good standards are measurable, scientifically sound, operationally feasible, linked to management objectives, and integrated with other standards. SE will enforce a licensee's adherence to the standards and can modify standards when the monitoring of results or new knowledge indicates a change is required.

Guidelines
Guidelines are recommended practices and are options for achieving standards and objectives given expected conditions. A licensee may deviate from the guideline when unforeseen or site-specific circumstances require an alternate approach. Although SE will not enforce guidelines, their effectiveness or use of alternate practices will be considered in audits.

Procedures
A procedure is the sequence of actions used to ensure consistent assessment of standards across the province and concentrates on methods rather than results. SE may make it a requirement to follow a specific procedure.

May 2005

FMA Standard Review and Amendment Process

1) Approvals by Area Foresters

Some standards note that the Area Forester on a case-by-case basis may approve an exception. In these cases the licensee shall send their request in writing directly to the Area Forester for approval. The Provincial Operations Forester must be copied on all correspondence in these regards, to ensure that consistent area decisions are made, and to maintain a list of issues for annual review of the standards.

Note that the intent of exceptions is made to provide warranted flexibility to certain standards due to extraordinary site conditions or circumstances. The standards are developed as a rule to suit most circumstances, and as such, the amount of approved exceptions should be minimal.

2) Approvals by Executive Director of SE Forest Service

a) Critical amendments during an Operating Year

Where a standard does not specifically state that exceptions may be approved by the Area Forester on a case-by-case basis, and the licensee feels it cannot wait until the end of the operating year to review the standard, the following process must be followed:

i. The licensee will make a written request for the amendment to the Executive Director and copy the Provincial Operations Forester. The Provincial Operations Forester will consider the merits of the amendment across all FMA's and will discuss the matter with the Area Forester(s).

ii. If a decision to pursue amendment of the standard is reached, the Provincial Operations Forester will electronically mail the Forest Policy Analyst responsible for development of standards and guidelines with the request. The request will be evaluated by the Forest Standards Analyst and if feasible, will be recommended for amendment by the Executive Director.

iii. If the Executive Director denies the request for amendment, a letter will be sent to the licensee explaining the reasons, and will be copied to applicable SE Forest Service staff.

If the Executive Director approves the request for amendment, a revised copy of the standard will be sent to all applicable licensees and SE Forest Service staff.

b) Annual Review of FMA Standards

Saskatchewan Environment staff and FMA Holders shall meet annually in January to review the FMA standards and amend them where deemed necessary by the Department. The Forest Policy Analyst shall coordinate any amendments of the standards accordingly, and the Executive Director shall send a revised copy of the standards to all licensees, and applicable Department staff annually by April.

May 2005

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Implementation Schedule for FMA Standards & Guidelines

Standard and Guideline Subject Area	**Implementation Date**
Multi-Scale Planning	2007-2008 Operating Year (Submission due date December 2006, unless superceded by elements of the Forest Planning Manual).
Pre-Harvest Site Prescription	Weyerhaeuser PA FMA – July 1, 2002 Where Site Assessment work has taken place prior to July 2002, a list of all blocks assessed must be submitted to Area (Regional) Foresters in an Operating Plan. 2003/04 Operating Year all other FMA's
Road & Block Layout	July 1, 2002
Visual Resource Management	February 23, 2004
Roads	July 1, 2002 - Except for signage, which will be implemented July 1, 2003
Slash Management	July 1, 2002
Silviculture and Harvest Systems	Silviculture Systems - October 1, 2002 Harvest Systems – July 1, 2002
Spruce Understory Protection	April 1, 2004
Conifer Seed Supply	April 1, 2004
Environmental Protection	July 1, 2002
Soil Protection	October 3, 2003

May 2005

Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: PLANNING

SUBJECT: MULTI-SCALE PLANNING

OBJECTIVES:

1. To ensure that Forest Management Agreement (FMA) areas are partitioned into useful landscape level and sub-landscape level units for forest-level and operational planning and reporting.

2. To promote the operational implementation of broad objectives and strategies outlined in Twenty-Year Forest Management Plans by identifying linkages between the Twenty-Year Forest Management Plan and the Operating Plan.

3. To provide context and relevant information (e.g. landforms, cultural and non-timber values) at the operating area or sub-landscape unit level for all active harvest areas.

4. To ensure that forest operations emulate, within the bounds of silvicultural requirements, natural disturbances and landscape patterns.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4):

- Strive for a future forest structure that is within the range of natural variability.
- Maintain ecosystem diversity at all levels – landscape, stand, species and genetic

STANDARDS:

1. Operating areas must be spatially defined in operating and forest management plans and remain constant over time.

2. All potentially merchantable stands (i.e. ≥ 15 meters in height) in an operating area contributing

to the HVS shall be included in the harvest design. Operating area harvest designs must be included with operating plan submissions.

3. Each licensee (where applicable) must stipulate how collective operating area designs enable old age retention targets at the management unit scale are to be achieved (i.e. how much retained). This must be demonstrated spatially through providing a map of the areas and providing a tabular summary compiling how much each operating area contributes within a management unit.

Table 1. Current old age management unit retention targets by FMA (from approved Forest Management Plans)

Licensee	**Old Age Management Unit Retention Target**	
	Late Seral Stage	Very Late Seral Stage
Weyerhaeuser Canada, Prince Albert	10% - White Spruce 5% for all other Species Associations	2% - White Spruce 1% for all other Species Associations
Weyerhaeuser Canada, Pasquia Porcupine	Refer to Table 4 in FMP	Refer to Table 4 in FMP
Mistik Management Ltd.	n/a	
L & M Wood Products (1985) Ltd.	n/a	

4. Within an operating area, old seral stage retention patch size and shape, including site, tree species associations, tree canopy density, interior habitat, and location must demonstrate representativeness of natural stands located in the management unit[1].

GUIDELINES:

1. Operating area road development should take into account future access requirements to harvest current and future merchantable stands.

2. Table 1 describes the linkages between the Twenty-Year Forest Management Plan and Operating Plan, which are to be considered while developing the Operating Plan and reporting on the previous year's activities.

Table 2:

1 The "Forest Management Guide for Natural Disturbance Pattern Emulation" (OMNR, 2001), offers practical solutions for creating natural landscape patterns as a result of forest operations.

Operating Plan Descriptions	Twenty-Year Management Plan Linkage Considerations
HVS Assumptions	* Key model reserve factors (such as retention, fire, cull, riparian areas, permanent roads, forest types harvested, withdrawals/ dispositions)
Harvesting	* Temporal and spatial targets for harvesting * Status of actual harvest volume and area for the FMA area compared with the HVS/AAC and the periodic cut * Other landscape level targets such as age class distribution harvested, species associations harvested * Size and shape of harvest blocks * Wood utilization, including salvage
Reforestation & Stand Tending	* Details of reforestation activities (site preparation, planting, natural regeneration) * Details of stand tending activities * Details of silviculture surveys
Protection	* Area disturbed by fire * Mitigative measures taken for insect and disease activity
Road development, closure, and reclamation activities	* Temporal and spatial targets for road development * km and class of roads developed * Number and location of road closures * km of road reclaimed
Public Consultation	* Type and kind of public consultations
Research Activities	* Type and kind of research projects * Research recommendations affecting Twenty-Year Forest Management Plan strategies or activities
Monitoring	* Type and kind of monitoring activities * Monitoring recommendations affecting Twenty-Year Forest Management Plan strategies or activities

3. Preference for the planning of all operating areas shall be given to a 'one-pass' harvest design. Situations where a multi-pass system may need to be used include:
    - the mosaic of stand locations and sizes, and tree age and size within an operating area is not conducive to a single pass design;
    - area-specific ecological concerns such as critical wildlife habitat;
    - local stakeholder/recreational concerns; and
    - the licensee can demonstrate that their forest product needs in an operating area over time is not conducive to a single pass design.

Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: PLANNING

SUBJECT: PRE-HARVEST SITE PRESCRIPTION

OBJECTIVES:

The Pre-Harvest Site Prescription (PHSP) integrates the ecology of the forest stand with both the harvest and the silviculture management objectives. The Pre-Harvest Site Prescription serves to ensure that:

1. The inherent productivity of a harvested forest site is maintained.
2. A forest stand is regenerated on the post-harvest site.
3. All forest resources are considered.
4. The overall objectives of the Twenty-Year Forest Management Plan and the assumptions of the timber supply analysis are met.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4):

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms.
- Maintain ecosystem diversity at all levels – landscape, stand, species and genetic.
- Maintain productivity of forest soils except on areas needed for permanent roads or other permanent infrastructure.
- Protect rare and endangered species and special places (unique landforms, critical wildlife habitat).
- Anticipate and respond to concerns about potential and actual impacts of forest management activities on other forest uses, users and managers.

STANDARDS:

1. All harvest blocks must have a PHSP conducted prior to harvest. If a licensee is unable to conduct PHSPs in certain harvest blocks prior to harvest, they must provide a list of all such harvest blocks for approval in the Operating Plan, with appropriate justification for each harvest block.

2. Saskatchewan Environment may designate certain areas[1] to have PHSP's submitted within operating plans.

1 Weyerhaeuser PA only – Pre-harvest Site Prescriptions must be submitted with five year operating plans for each harvest block located within the area identified in Weyerhaeuser Prince Albert FMA 20 year Forest Management Plan approval condition, section 3.3 (a).

3. Completed PHSP (with amendments) shall be submitted to SE Area Forester prior to harvest.

4. PHSP's shall include the following information:

   (a) Rutting and compaction hazard for the harvest block.
   (b) Season of harvest including frozen or non-frozen ground conditions.
   (c) Silvicultural system (including spruce understory protection)
   (d) Recommended harvesting system and equipment.
   (e) Slash management technique.
   (f) Site preparation objectives and technique (e.g. – objective - may be an elevated microsite for a spruce site with moist soils and high grass competition potential, technique – excavator hoe mound).
   (g) Species association/composition target at Free to Grow and rotation.
   (h) Methods to address recreational, cultural/traditional, and stakeholder concerns.
   (i) Methods to address wildlife concerns within and directly adjacent to harvest block including rare and endangered flora and fauna.
   (j) Plans to address identified forest health related issues (e.g. blowdown, fire, insect and disease related issues)
   (k) Residual tree retention objective (i.e. islands, clumps or individual trees).
   (l) Ecosite and ecosite phase(s) located in the harvest block.
   (m) Noted differences between species association and forest inventory cover types must be documented in the PHSP (to be used for comparison with regeneration assessment results).

GUIDELINES:

1. Pre-fieldwork information to be gathered and assessed include aerial photography and large-scale forest inventory maps. Field data cards and a large-scale forest inventory map of the harvest unit comprise the field package. A walkthrough, consisting of a transect through the harvest unit, should be completed. Other target areas to be visited in the field include riparian areas, suspected areas of high wildlife value and significant geomorphological features such as eskers or gullies. The location of each plot should be identified on the harvest unit map (and have a GPS location, where possible). At each plot location, the information required on the field cards should be recorded (except in the case of winter harvesting operations). Additional information and general comments should be written directly on the harvest unit map or field cards.

2. Site Assessments[2] (SA) should be conducted, and the data collected for development of the PHSP should include:

2 The following field guide must be followed in determining Standards 4 a and 5, and should be used for Guidelines 2 b – e: Beckingham, J.D; Nielsen., D.G.; Futoransky, V.A. 1996. Field guide to ecosites of

(a) General block topography[3], including slope for Riparian Management Areas
(b) Nutrient regime.
(c) Moisture regime.
(d) Drainage characteristics.
(e) Soil analysis with the following details:
    i. Organic soil depth
    ii. Humus form
    iii. Mineral Soil Texture
    iv. Depth to mottles or gleying
    v. Restrictive Layer
    vi. Depth to water table if # 60 cm.
(f) Estimate of distribution and density of advanced spruce regeneration
(g) Riparian management area category as defined in Riparian Area Management Standards and Guidelines (applicable currently only to Weyerhaeuser Prince Albert).
(h) Identification of recreational/cultural/traditional uses, and other stakeholder concerns located within or directly adjacent to the harvest block.
(i) Visual impact assessment, as described in the FMA Visual Resource Management standards and guidelines (to be submitted for approval in July 2003).
(j) Species at risk requiring special management consideration.
(k) Other wildlife considerations (e.g. raptor and colonial bird nests, salt licks, ungulate calving grounds, etc.) within or directly adjacent to the harvest block.
(l) Tree retention opportunities (which include green trees and snags).
(m) Forest health related issues

3. At least one survey plot should be located in each harvest block greater than 10 hectares in size. As well, at least one survey plot should be located in each (merchantable species association type (ie. H, HS, SH and S) greater than 10 hectares within a harvest block. All survey plots should be located on the SA map. In harvest blocks containing Riparian Management Areas, one survey plot should be located within each RMA.

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the mid-boreal ecoregions of Saskatchewan. Nat. Res. Can., Can. For. Serv., Northwest Reg., North. For. Cent., Edmonton, Alberta. Spec. Rep. 6

3 Described as per the licensee's Forest Vegetation Inventory Manual or the Saskatchewan Forest Vegetation Inventory (Table 7)

Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: PLANNING

SUBJECT: ROAD AND HARVEST BLOCK LAYOUT

OBJECTIVES:

When carrying out harvesting and road construction activities:

1. To identify for protection, environmentally sensitive features of forest resources, such as salt licks, steep slopes, and buffers and

2. To ensure compliance with approved operating plans, including identification for the logging contractor of harvest boundaries, non-harvest areas and stream crossings.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (p. 17 of the Twenty-Year Forest Management Plan and Environmental Impact Assessment Summary Document):

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms.
- Manage activities to protect and maintain water quality in FMA area lakes and rivers
- Maintain productivity of forest soils.
- Protect rare and endangered species and special places.

STANDARDS:

1. Marking Colour Scheme:
   Each Licensee shall use consistent marking colours[1] distinguishing harvest block boundaries, roads and any other delineation to be identified in a harvesting operation. The licensee will in advance of marking advise Saskatchewan Environment of its colouring scheme in operating plans.
2. Harvest Block Boundaries:
   a. Prior to harvesting the block boundary, that portion of the block boundary being harvested must be ribboned or identified by marking all boundary perimeters in areas where adjacent vegetation is greater than or equal to 15 metres in height, unless the boundary is clearly delineated by a change in species association type

1 The colour red (either red markings or red flagging) has been reserved for use by the Crown (Forest Resources Management Regulations).

(i.e. H, HS, SH, S).

b. Block boundary marking must be clearly visible and adequate marking must remain post-harvest to easily distinguish the boundary.

3. Road Locations:

   a. Prior to construction, the Licensee will ribbon either the centerline or one sideline of a section of all planned inter-block roads, as identified in an operating plan.

   b. Crossing locations of permanent streams and rivers must be clearly marked in advance of the crossing for all roads.

4. Mapping Requirements and Allowance for Deviations:

   a. All block boundaries; inter-block roads and in-block road locations must be presented in an Operating Plan for approval.

   b. Harvest block boundaries may deviate from their planned boundaries, according on the following allowances:

      i. Harvest block boundary locations may vary up to a maximum of 50 metres from the approved Operating Plan maps, providing the harvest block area allowance does not exceed 10 % of the approved area, or a maximum of five hectares (whichever is less).

      ii. This standard does not apply when there is a change in stand type.

   c. Inter-block road locations may deviate up to 100 metres from the centerline of the approved Operating Plan map, without approval. This standard does not apply to stream crossings approved either by Saskatchewan Environment or the Department of Fisheries and Oceans Canada.

   d. Deviation from planned in-block road locations does not require approval.

GUIDELINES:

1. Separate identification should be used to indicate:
   a. The beginning and end of roads (which can be achieved through hanging multiple ribbons or using tree-marking paint).
   b. Sensitive features or retention patches of merchantable timber greater than 2 hectares within a harvest block perimeter.
2. Marking should be clearly visible from one tie point to another and should be placed sufficiently high so as to be clearly visible.

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CATEGORY: **PLANNING**

SUBJECT: **VISUAL RESOURCE MANAGEMENT**

OBJECTIVES:

To incorporate visual quality objectives into the management of forest resources.

LINKAGES TO 20-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert 20-Year Plan (Section 4.3 Plan Strategies - page 4-38): Harvest in areas adjacent to resort lakes, recreational rivers, and major highways on the basis of visually sensitive harvesting plans.

STANDARDS:

1. a) When submitting forest management plans and operating plans, the licensee will identify visually sensitive areas on an FMA map, in consultation with regional staff from Saskatchewan Environment.

   b) The initial map must be submitted for approval by March 31, 2004. If any changes to this map occur, a new map must be submitted for approval with the next operating plan.

2. When submitting an operating plan for approval that contains a VSA, visual quality objectives must be developed and categorized for each VSA.

GUIDELINES:

The licensee should:

1. Use public consultation processes to identify and map landscape features considered to have high scenic value.

2. Where significant topographic relief exists, use visual impact assessments to effectively design and locate roads and harvest blocks to minimize the visual impact of forest operations in areas with high or moderate aesthetic priority VQOs.

3. Use strategic placement of variable retention to help meet VQO's. Consider maintaining existing forest structural diversity within harvest

blocks adjacent to major road corridors and waterways to provide scenic diversity.

4. Consider using two or three-pass harvest planning to minimize the visual impact of harvesting within VSAs, where necessary.

5. Taking into account all resource values (economic, biophysical, ecological and social), the licensee will design and implement its forest management activities to minimize interference with the quality of the VSA in areas with high or moderate aesthetic VQO.

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CATEGORY: ROADS AND HARVESTING PRACTICES

SUBJECT: ROADS

OBJECTIVES:

To provide standards and specifications for all aspects of forest management activities that pertain to roads, including road construction & maintenance, closure and reclamation.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4):

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms
- Plan a safe and efficient road system
- Meet contractual and legal obligations

PERMITS & APPROVALS REQUIRED:

The following permits and approvals shall be obtained by a licensee for the work indicated in Table 1 below:

Table 1 – OPERATIONAL PERMITS & APPROVALS

Approval Type	Required
Five year Operating Plan Approval.	For construction, maintenance, reclamation, or closure of roads included in an Operating Plan .
Highways Approach Permit (from Sask. Highways and Transportation).	When building roads that enter any numbered Provincial highway.
Pesticide Service License and Pesticide Applicator License (from Sask. Agriculture & Food, issued through the Pest Control Products Regulations).	To use or apply pesticides on vegetation growing in a road right-of-way. An individual who applies the pesticide must have a Pesticide Applicator License, and which would be under the *industrial* category.
Aquatic Nuisance Permit (from Sask. Environment, issued through Environmental Management Protection Act).	Required when applying pesticides in or near water.
Nuisance Wildlife Control Permit (from Sask. Environment, issued through the Wildlife Act).	Required when removing nuisance wildlife. This will include when beaver dams or houses are to be removed.
Navigable Waters Protection Act approval (from Transport Canada - Coast Guard).	For roads that require construction (or removal) of structures over navigable waters.
Aquatic Habitat Protection Permit Environmental Management Protection Act.	When installing and removing all lake, river, stream and creek crossings including winter crossings that use culverts, log or ice bridges, snow fills, skid bridges and alterations of waterways.
Letter of Advice or Section 35.2	For water crossings.

Approval Type	Required
Authorization Letter required from DFO.	
Borrow Pit Approvals - Borrow pits inside a road right-of-way do not require any special approval. - Approval from Saskatchewan Environment is required for pits outside of right-of-ways providing that the fill taken is less than 350 m^3 or where the area disturbed is less than 0.5 ha. (Note: This requirement may vary from area to area.) - If a borrow pit exceeds these dimensions, then an application must be made for a Sand & Gravel Quarry Surface Lease (see below). - An officer at the field office, in consultation with the area forester, can issue a forest products permit.	When building roads with insufficient construction materials in the right-of-way. These materials could consist of sand, gravel or clay. Location of borrow pits is ideally identified in an operating plan. A FMA licensee will have potential borrow pits identified in the operating plan and will have authority to remove trees over the pit through an approved operating plan. A forest products permit is required to remove trees over proposed borrow pits for a licensee other than a FMA holder.
Heritage Screening – Heritage Branch, Sask. Culture, Youth and Recreation (through the Heritage Property Act).	Heritage Branch Screening is required prior to building roads. This screening may result in a determination that a Heritage Resources Impact Assessment (HRIA) is required from a qualified archaeologist.
Underground Hazards.	When crossing any underground infrastructure such as pipelines (Sask Energy and private), power lines (Sask Power), utility (will vary) and telephone lines (SaskTel), appropriate permissions or authorizations must be obtained.
Sand & Gravel Quarry Surface Lease (Saskatchewan Environment – through the Conservation Officer at the nearest field office, then it is referred to the local Lands Manager). An officer at the field office, in consultation with the area forester, can issue a forest products permit.	When obtaining gravel from pits other than Rural Municipalities or Saskatchewan Highways and Transportation gravel pits. A FMA licensee will have potential pits identified in the operating plan and will have authority to remove trees over the pit through an approved operating plan or amendment. A forest products permit is required to remove trees over pits for a licensee other than an FMA holder.

PART I: CONSTRUCTION AND MAINTENANCE

OBJECTIVES:

To ensure that all approved roads are constructed in a manner that minimizes the impact on the environment but allows for the safe and efficient transport of forest products.

A. SPECIFICATIONS FOR CONSTRUCTION

STANDARDS: (Specifications for Construction)

1. The specifications in Table 1 must be adhered to when undertaking road planning and construction activities within the FMA.

2. Any merchantable timber used for brush mat construction shall be scaled for payment of dues and fees.

Table 1. FMA Road Construction Standards

	Road Class		
	1	**2**	**3**
Licensee Name Examples	Weyerhaeuser - Major Improved Bush Road Mistik - Forest Resource Road	Weyerhaeuser - Minor Improved Bush Road Mistik - Improved Bush Road	Weyerhaeuser - Bush Road & Bush Spur Mistik - Bush Road
Access	All Weather Primary access roads to multiple operating areas containing long-term timber supplies	Winter or Summer Typically accessing one or more operating areas	Winter or Summer Typically accessing one or more harvest blocks in an operating area
Life Expectancy	Permanent	5 -20 years	1-15 years
Maximum Right-of-Way Width [1]	40 m	30 m	20 – 30 m [2]
Road Driving Surface Width (Grade)	8.0m – 10.0 m	7.0 – 8.0 m	≤ 7.0 m
Travel Surface	Gravel	Gravel Winter Road – Existing Soil	Existing Soil
Minimum Road Side Slope	2:1	2:1	2:1
Minimum Ditch Back Slope	2:1	2:1	2:1
Maximum Vegetation Control Width on Either Side of Road Driving Surface	15m	6 m	4 m

1 To achieve cut and fill requirements necessary to meet the specified road and ditch slopes, right-of-way widths may be widened at the licensee's discretion. Right-of-way widths may be widened to address site-specific environmental and safety concerns on a case-by-case basis, as approved by the Area Forester. Application of this standard for the Weyerhaeuser Pasquia Porcupine FMA is approved on an interim basis subject to compliance with the Environmental Assessment Approval.

2 20 m for well drained soil types (i.e. sand) and winter roads, 20-30m as required for poor and moderately drained soils.

3. In areas of tall timber, greater than 20 metres, landings may be constructed during road construction of Class 2 or 3 roads. Landings will be no greater than 0.2 hectares outside of the original right of way width, and shall be spaced at minimum 400 metres apart. Class 3 winter roads, with a 20 meter right of way will have landings 0.3 hectares in size, and are located outside of original right of way

width and will be spaced at a minimum 400 meters apart. No portion of the landing constructed outside of the approved right of way may be stumped. No landing will be constructed within 100 metres of a waterbody crossing unless authorized by the Area Forester.

GUIDELINES: (Specifications for Construction)

In constructing roads, the practices recommended in the Saskatchewan Environment / DFO Fish Habitat and Protection Guidelines on Road Construction and Stream Crossings should be followed, including:

1. Planning Roads:
   a. Where practical, roads will be located to:
      - Avoid unstable areas and water-source areas (springs and seepages).
      - Follow natural benches and other topographic features to minimize cuts and fills.
      - Minimize the number of stream crossings.
      - Use existing trails, where possible.
      - Avoid environmentally significant or sensitive areas.
      - Avoid areas with known species at risk.

2. Advance Construction
   Where possible, roads should be constructed one year in advance of their intended use, in order to allow for settling of roadbeds and options for the layout and scheduling of harvest blocks.

3. Right-of-Way Clearing
   During clearing of timber and vegetation for road right-of-way, leave adequate root mat in place to prevent site damage. Where road is to be reclaimed at a later date, the layer of slash and organic soil materials should be piled for future rollback.

4. Drainage and Erosion Control
   Cross-drainage devices should be installed to:
   i. Reduce water movement in ditches.
   ii. To help prevent sedimentation into streams, divert water from the ditch into the surrounding forest.
   iii. Provide cross-movement spillways or down-spouts where the drainage occurs on unstable or bare soil.

   A variety of erosion control methods may be used, including geotextiles, mulches, spreading slash, straw bales and revegetating. The height of any erosion control devices should not exceed the top edge of the ditch. A grass seed mix, approved by Saskatchewan Environment and made up of native species, should be used for erosion control where needed along ditches and stream crossings.

B. STREAM CROSSINGS

OBJECTIVE:

To ensure stream crossings are built in a responsible manner which will minimize impacts to aquatic ecosystems and water quality.

STANDARDS: (Stream Crossings)

1. No licensee shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water[1.]

2. No licensee shall, without a valid and subsisting permit authorizing the activity[2]:
    a. Alter or cause to be altered the configuration of the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body; or
    b. Remove, displace or add any sand, gravel or other material from, in or to the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body; or
    c. Remove vegetation from the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or water body.

GUIDELINES: (Stream Crossings)

1. In constructing stream crossings, the practices recommended in the *Saskatchewan Environment / DFO Fish Habitat and Protection Guidelines on Road Construction and Stream Crossings* should be followed, including:

    a. The number of road crossings and skid crossings should be minimized.
    b. Crossings should not be constructed during peak stream flows and
    c. Where feasible, crossings should be located:
        i. High in the watershed of rivers and streams.
        ii. Away from lake inlets and outlets.
        iii. Upstream from barriers to fish passage, such as waterfalls and steep gradients.
        iv. Away from important fish habitat, such as riffle areas, rapids and areas with gravel bottoms.
        v. Where the approach to the structure is on a flat or shallow slope.
        vi. Perpendicular to the stream.
        vii. At the location where the stream is narrowest.
        viii. Where they will accommodate peak stream flows.

2. Types of structures used to cross streams can include bridges, culverts, ice crossings, and temporary equipment crossings, such as log fills. Temporary crossing structures should be removed by the end of the operating year in which they were constructed, or as specified in the Aquatic Habitat Protection Permit.

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1 Federal Fisheries Act, Chapter f-14

2 The Environmental Management and Protection Act, Saskatchewan. Further details and conditions can be found in both this Act and the associated Water Regulations.

C. SIGNAGE

STANDARDS :

1. On active class 1 and 2 licensee roads:
   - Erect Bridge Ahead sign in advance of bridges, and specify if bridge is single lane.
   - Erect STOP signs where they intersect a provincial numbered highway.
2. At the beginning of each Class 1 and RTA road network install a sign, which identifies road name**,** warns users that the road is a logging road and is not maintained.

GUIDELINES:

1. On class 1 and 2 licensee roads, install kilometer markers every 10 kilometres or as required.
2. On licensee roads install haul route arrows placed to indicate direction of loading area.
3. Erect signs in advance of extraordinary road situations where the company feels safety is a concern, such as sharp curves, steep hills, washouts and construction/maintenance activity.

PART II CLOSURE OF ROADS

OBJECTIVES:

To close, for the protection of forest resources and public safety, roads constructed by the licensee as soon as possible after their use is complete.

STANDARDS:

1. Road closure locations and types shall be in accordance with approved operating plans, or as directed by an Inspecting Officer. These roads shall be deemed closed in accordance with Section 58 of the *Forest Resources Management Act*.

2. Reclaimed in-blocks roads that have more than 1 km of ATV trail, which are accessed from a class 1 or 2 road, must be closed with an acceptable road closure type, unless otherwise approved in an operating plan.

3. Acceptable Road Closure Types (unless approved otherwise by the Area Forester on a case by case basis in an operating plan):

   a) <u>Roads abandoned for one year or less.</u>

      i) A padlocked gate with an earthen (soil) berm a minimum of two metres in height (measured above the existing ditch), located across the remainder of the road right-of-way on either side of the gate (i.e. excluding the road driving surface).

      or

      ii) An earthen (soil) berm or slash a minimum of two metres in height (measured above the existing ditch and road grade level), constructed right across the

entire road right-of-way. Any portion of the earthern berm extending outside of the road right-of-way may be at a height less than 2m.

iii) Extending for two hundred metres down the road, all available logging slash and road building debris from landings will be spread evenly across the entire road right of way in a manner that prevents vehicle traffic.

b) Roads abandoned for more than one year

i) A padlocked gate with an earthen (soil) berm a minimum of two metres in height (measured above the existing ditch), located across the remainder of the road right-of-way on either side of the gate (i.e. excluding the road driving surface).

or

ii) An earthen (soil) berm a minimum of two metres in height, (measured above the existing ditch and road grade level) located across the entire road right-of-way. Extending for two hundred metres behind the berm, all available logging slash and road building debris will be spread evenly across the entire road right-of-way. In situations where these materials do not exist to adequately cover the entire road right-of-way, the road right-of-way shall be ripped to a minimum depth of 50 cm, at a maximum spacing of 1.5m. Any portion of the earthern berm extending outside of the road right-of-way may be at a height less than 2m.

4. Licensees may open previously closed roads during forest management activities approved in an operating plan. These closures must be reinstalled to the road closure standards immediately after the activities are completed.

5. Closed roads requiring ATV access to the harvest block may have a trail extending from behind the berm for that purpose. Access to the ATV trail behind the berm must be constructed in a manner that does not alter the berm. The ATV trail and access to the trail must be constructed and maintained in a manner that allows for ATV travel only.

GUIDELINES:

1. In all circumstances the preferred closure is earthen berms.

2. The closure should be placed as close as possible to the open road which the closed road intersects. The placement of closures should also consider safety concerns and the blockage of water flow.

3. All gates should have reflective marking on either side.

PART III RECLAMATION

OBJECTIVES:

To return road surfaces, landings, stream and non-stream crossings to their original or near-original landform, drainage and productivity.

STANDARDS:

1. In-block Roads

a. In-block roads shall be reclaimed within two years after harvesting, as follows:

i. Winter Season

Unless approved otherwise by the Area Forester on a case-by-case basis, all surface slash, stumps and organic soils from windrows or piles created during the road construction process must be rolled back evenly across the entire road surface.

ii. Non-Winter Season

The road surface shall be ripped with spacing intervals less than two metres and decompacted under frost-free soil conditions to an average minimum depth of thirty (30) centimetres, except soil types which comprise more than 50% sand[3]. All surface slash, stumps and organic soils from windrows or piles created during the road construction process must be rolled back evenly across the entire road surface.

b. In blocks planned for tree planting, a trail down to the road surface may be left open to accommodate access by an ATV only. This trail shall not extend to within 200m of the harvest block boundary.

c. All reclaimed roads must be reforested to meet provincial regeneration standards associated with the site.

2. Landings

All stumped landings shall be reclaimed within two years after harvesting and reforested to meet provincial regeneration standards associated with the site.

3. Stream Crossings

When undertaking reclamation of any stream crossings, the following standards must be followed:

a. No licensee shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water[4].

b. No licensee shall, without a valid and subsisting permit authorizing the activity[5]:

3 Field Guide to the Ecosites of the Mid-Boreal Upland Ecoregion of Saskatchewan (p. 5-12)

4 Federal Fisheries Act, Chapter f-14

5 The Environmental Management and Protection Act, Saskatchewan

i. Alter or cause to be altered the configuration of the bed, bank or boundary.
ii. Remove, displace or add any sand, gravel or other material from, in or to the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or body of water.
iii. Remove aquatic vegetation from the bed, bank or boundary of any river, stream, lake, creek, marsh or other watercourse or body of water.

4. Non-Stream Drainage Crossings

Reclamation of non-stream drainage crossings must not obstruct surface water flow or interflow.

GUIDELINES:

1. All stream crossings should be removed in accordance with the specifications in the Saskatchewan Environment/DFO Fish Habitat Protection Guidelines - Road Construction and Stream Crossings.

2. Decompaction may be accomplished through the use of subsoiling attachments (whale-tail attachment instead of ripper tooth) that extend the fracturing zone around the ripping shank (on a bulldozer).

3. Contouring is used when reclaiming gravel pits, burrow pits, road cuts and water crossing areas. The goal is to re-contour altered landforms to a stable slope, which is normally a 3:1 slope. Upon completion of contouring, rollback (as described above) should be completed. Reference may be made to the document "Guidelines for Environmental Protection During Development and Restoration of Sand and Gravel Pits, 1983".

4. On sites with sandy soils, or areas which were harvested during frozen soil conditions, adequate road reclamation and reforestation may be achieved by undertaking scarification of the road surface - dragging anchor chains and distributing logging debris across the road surface.

5. Standard practice will be to establish an acceptable tree species throughout the reclaimed rights-of-way in order to assist in prompt establishment of tree species within a harvest unit. Areas that were not previously treed, such as stream crossings, should be seeded to native vegetation. All organizations doing restoration in the forest should use the guide by Kowsowan and Smith, "Native Species Recommended for Site Restoration within the Mid-Boreal Upland, Mid-Boreal Lowland."

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Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: ROADS AND HARVESTING PRACTICES

SUBJECT: SLASH MANAGEMENT

OBJECTIVES:

1. To assist in maintaining the productivity of forest sites.

2. To manage slash derived from road and harvesting operations in a manner which:
   a. Minimizes impacts on wildlife habitat and travel.
   b. Assists in meeting reforestation objectives.
   c. Takes into account soil protection.
   d. Considers aesthetics.
   e. Reduces the potential for escape fires or fire spread.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (p. 17 of the Twenty-Year Forest Management Plan and Environmental Impact Assessment Summary Document):

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms.
- Maintain and/or enhance the timber productivity of forests.
- Maintain productivity of forest soils.

STANDARDS:

1. Slash must be either spread, burned, or a combination of these methods, based on site-specific objectives.

Spreading of Slash:

1. Harvest Block: After harvest completion, slash will be spread evenly throughout the harvest block within the same operating year, unless otherwise approved by the Area Forester.

2. Inter-block Road Right-of-Ways (R.O.W.): Slash and road-building debris shall be spread evenly throughout the R.O.W (except for the road surface and ditch) within two years after

the road is constructed.

Burning of Slash:

1. Burning of slash piles must be completed within two years after harvest completion.

2. All slash pile ignition shall take place between November 1 and February 28 each year, and:
   a. All piles must be extinguished by March 31.
   b. Only the burning of woody debris as a result of forestry operations will be permitted.
   c. Documentation indicating the dates of ignition and extinguishment for piles shall be available for inspection by Saskatchewan Environment officers upon request.
   d. Maps (at the operating area level of detail), showing the location of all harvest blocks and road right-of-ways on which slash piles were burned during the past operating year, shall be submitted to the local Saskatchewan Environment Forest Protection Officer on an annual basis in the licensee's fire protection and suppression plan.
   e. Burning of slash shall not damage or destroy adjacent forest products.

3. Slash (or any other material), shall not be burnt within 30 metres of a sawdust pile[1].

GUIDELINES:

Priority should be placed on the spreading versus burning of slash. Table 1 provides appropriate slash management techniques for various stand types or situations. When determining how to manage slash within the harvest block, consider the type of reforestation method to be used (i.e. natural or artificial regeneration), site sensitivity to nutrient loss, and slash loading impacts on regeneration, wildlife habitat and travel, and potential for escaped fires or fire spread.

Spreading of Slash
The following guidelines are recommended to ensure that slash is spread evenly across the harvest block/road right-of-way:

1. De-limb at roadside and re-distribute slash and/or
2. De-limb in the harvest block at the stump and re-distribute slash.

Burning of Slash
The following guidelines are recommended for the burning of slash from forestry operations:

1 The Prairie and Forest Fires Act, Saskatchewan -1982

1. Burn piles as soon as feasible so that land is put back into production. Piles may be left until the year following piling to allow adequate drying for clean burning.

2. All piles should be burned on mineral soil or on areas having an average maximum depth of less than 15 cm of duff.

3. All reasonable efforts must be made to avoid placing mineral soil within a slash pile.

4. Where stakeholder commitments regarding burning have been made (including commitments for firewood gathering), notify the appropriate stakeholders.

5. Post signs at the burning site if it is visible to public or where the safety of others may be jeopardized.

6. Ensure there is a safe escape route planned before lighting a pile, and that vehicles are parked a safe distance from burning piles.

7. Ensure shovels, fire extinguishers, and emergency communications are available.

8. Piles to be burned should be a minimum of 20 metres from standing timber.

9. All reasonable efforts should be made to minimize impacts of smoke near communities, residences, and active roads.

10. The size of piles should be adequate to protect soils, adjacent forest products, allow passage of wildlife and consider aesthetics.

11. Slash should be piled in a manner, which allows for clean, efficient burning of all materials. Any residue or unburnt materials remaining post-burn should be spread evenly into the harvest block.

Table 1. Slash Management Options for Various Site Conditions

Stand Type	**Slash Disposal / Re-distribution Method**

Stand Type	Slash Disposal / Re-distribution Method
Jack Pine Stands	Consider re-distributing slash back into the cutblock (where delimbing is done at roadside) or leaving slash in the cutblock (where delimbing is done "at the stump") on sites where natural -regeneration is prescribed in the Site Prescription. Note: Where harvesting has been conducted during the winter, de-limbing at the stump or re-distribution of the slash may not be necessary for natural regeneration if an adequate supply and distribution of cones has been left on site.
Hardwood Stands	Where roadside de-limbing/topping occurs, the slash can be spread evenly throughout the harvest block(provided future and advanced regeneration is not impeded) and/or be piled and burnt. Hardwood sites that have been de-limbed/topped at the stump will be assessed to determine if further re-distribution of top piles is required to ensure that stocking standards are achieved.
Mixed-wood Stands	Where artificial regeneration is prescribed, consider: – Piling and burning slash. – Re-distributing slash onto roads, landings, and/or across the cut-block. – A combination of these methods.
Low Nutrient Sites	Low nutrient sites, such as shallow soils over bedrock or coarse soils, will be assessed to determine if further re-distribution of slash throughout the cutover is required to return nutrients to the site.
Limbing/ Topping at Roadside	In areas where limbing and topping is done at roadside or in a landing, re-distribute or pile and burn slash accumulations that limit regeneration.

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Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: **ROADS AND HARVESTING PRACTICES**

SUBJECT: **SILVICULTURE AND HARVEST SYSTEMS**

OBJECTIVES

To design a program of silvicultural treatments, including harvesting and renewal activities, which map out a managed life cycle of a forest stand or stand groupings in order to achieve a future structural objective based on goals stated in approved higher level plans.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (p. 17 of the Twenty-Year Forest Management Plan and Environmental Impact Assessment Summary Document):

- Maintain and/or enhance the timber productivity of forests.
- Promptly and effectively renew harvested areas.
- Maintain ecosystem diversity at all levels – landscape, stand, species and genetic.
- Management activities to protect and maintain water quality in FMA area lakes and rivers
- Maintain productivity of forest soils except on areas needed for permanent roads or other permanent infrastructure.
- Protect rare and endangered species and special places (unique landforms, critical wildlife habitat).

STANDARDS:

Silvicultural Systems

1. Silvicultural systems will be implemented in a manner that conforms to the objectives for future conditions of the forest established in the 20 Year Forest Management Plan and as prescribed in a Pre-Harvest Site Prescription.
2. Green tree retention percentages are accounted for in the licensee's Timber Supply Analysis within their 20 year Forest Management Plan, as shown in Table 1. These volumes must be retained as in-block structure and follow the standards below. This standard also applies to fire salvage operations. Where green tree retention targets cannot be met in fire salvage operations, the remainder of retained volume shall be comprised of burnt trees.

Table 1. Merchantable green tree retention percentages by licensee.

Licensee	Retention Volume Percentages
Weyerhaeuser Canada, Prince Albert	1-5 (Average 3)
Weyerhaeuser Canada, Pasquia Porcupine	2

Mistik Management Ltd.	1-6 (Average 3)
L & M Wood Products Ltd.	1-6 (Average 3)

a. Residual trees shall be representative of pre-harvest stand types, volumes and size classes and will be measured at the harvest block level. The following size classes will be used when determining representation. Each size class category will be left standing and contribute towards the retention volume percentage where available.

Species	**Small (cm) dbh**	**Medium (cm) dbh**	**Large (cm) dbh**
Deciduous	<15cm	15-30cm	>30cm
Conifer	<20cm	20-40cm	>40cm

See Guideline 5.

b. The proportion of volume retained shall be between 60% –80% for islands and clumps, and 20% – 40% for individual trees. The proportions of volume retained shall be measured annually at the FMA level.

Dwarf Mistletoe Management

a. In harvest blocks or portions of harvest blocks containing jack pine infected with dwarf mistletoe, all living jack pine shall be felled or completely girdled within 100 metres of the infected area. On harvest block perimeter edges where infected pine exists in inoperable areas (i.e. soft ground or steep slopes), the licensee may choose to use 3b**.** Maps clearly indicating where the portions of the infected areas are will be submitted to SE prior to harvest.
b. Upon block harvest completion, no jack pine shall be planted within 20 meters of an adjacent stand infected with dwarf mistletoe. Alternate species suitable for the site may be planted in this zone.
c. Dwarf mistletoe within Riparian Management Areas shall be addressed as per the Riparian Areas Management Standards and Guidelines.

Harvest Systems

1. All blocks must be harvested in a single entry, whereby all merchantable trees will be utilized, with the exception of the approved merchantable tree retention targets.
2. Blocks not completed by the end of the operating year shall be left with a clean standing boundary. All applicable operating standards shall be met for that portion of the block harvested.
3. Incomplete blocks shall be completed in the following operating year unless authorized by the Area Forester.
4. A summary list of incomplete harvest blocks is to be provided to the Area Forester by May 31st. The list will include the original harvest start date (month) for that block, reasons for not completing harvesting and the proposed completion date (month) of harvest.
5. All merchantable trees harvested shall be utilized as per the licensee's 20 Year Forest Management Plan, unless approved otherwise in an operating plan.

6. Notification in writing to the Area Forester will be made at the commencement and completion of block and for road right of way harvesting and construction of roads.

GUIDELINES:

Silvicultural Systems

1. Determine the desired landscape pattern, the future stand composition and structural objectives mandated by the goals identified in the higher level plans. (See Multi-Scale Planning Standard). Note: The Forest Management Guide for Natural Disturbance Pattern Emulation (OMNR, 2001), provides an excellent overview and description of 'operationalizing' the 'natural disturbance' planning model.
2. Silvicultural systems to be used should be based on silvics of the tree species to be harvested. Location of residual trees should utilize natural variations in topography, the use of non-productive forest stands, and non-merchantable trees in conjunction with the merchantable tree retention targets stated in Table 1. Preference should be given to low-lying wet ground, hardwood clumps containing spruce, sensitive areas, and the lee (normally eastern) shores of larger lakes and rivers[1].
3. Residual trees left for wildlife ideally should be large-diameter, windfirm and high quality for cavity trees or those with potential to form cavities. These trees will provide some semblance of the structure that would be left after a fire and provide a source of future dead and down woody debris.
4. Residual patches should include trees that are characteristic of good health, vigour and form.
5. For example, regarding the Table in 2(a), if the retention volume percentage was 1-5 (average 3), in a given block then 3% of each existing size class should be left standing. The distribution of post harvest size classes should approximate the original distribution of size classes.

Dwarf Mistletoe Management

1. Where plantations border non-merchantable jack pine stands infected with dwarf mistletoe, approved tree species not susceptible to dwarf mistletoe should be considered for planting in the 20 meter buffer zone.
2. Where plantations border merchantable jack pine stands infected with dwarf mistletoe, a progressive harvesting strategy should be implemented until all adjacent infected merchantable jack pine stands are harvested.

Harvest Systems

1.Notification to the Area Forester should occur at least 5 days in advance of operations in a memo, faxed or emailed.
2. Alternatively a weekly notification method may be used.

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CATEGORY: **ROADS AND HARVESTING PRACTICES**

SUBJECT: **SPRUCE UNDERSTORY PROTECTION**

OBJECTIVES:

To protect white and black spruce understory during forest operations in order to:

1. Maintain natural forest ecosystem attributes and succession pathways; and
2. To enhance long term spruce wood supply by protecting existing natural growing stock.

LINKAGES TO 20-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4)

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms
- Maintain and/or enhance the timber productivity of forests
- Promptly and effectively renew harvested areas
- Maintain ecosystem diversity at all levels – landscape, stand, species, and genetic.

STANDARDS:

1. a) When the density of spruce understory trees is greater than 400 stems per hectare (sph), and is distributed in an area greater than 2.0 hectares in the harvest block, the licensee shall retain a minimum of 50% undamaged spruce understory trees in each area retained in the harvest block.

   b) The licensee must advise the Area Forester of harvest blocks where the standard applied.

2. The standards do not apply to black spruce/jackpine mixedwood stand types.

GUIDELINES:

1. Use designated harvest/skid trails to carefully extract the overstory tree layer and leave as much of the spruce understory as possible in clumps and as single trees. Consider incorporating spruce understory into green tree retention clumps or islands.

2. Health and Vigour Assessment of Spruce Understory

When leaving understory spruce, there is a preference to retain healthy and vigorous trees that are free from frost damage, disease and insects, and which have a low risk of windthrow. Some useful criteria to assess the health and vigour of advanced spruce understory include: a) Live crown length of at least 50%; b) A terminal leader which at least which is at least 10 cm in height (for trees < 7 m); c) Ensure that the current year's foliage is not destroyed, especially where damage extends into previous year's foliage; d) Minimize impacts of windthrow by ensuring where retained spruce are > 7 m, that their height: diameter ratio (slenderness coefficient) is less than 100 and e) Ensure there are no terminal weevils present.

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Weyerhaeuser Prince Albert Forest Management Agreement Area
STANDARDS AND GUIDELINES

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CATEGORY: SILVICULTURE PRACTICES

SUBJECT: CONIFER SEED SUPPLY

OBJECTIVES:

To maintain a supply of wild conifer seed[1], in order to ensure that tree seed of the correct origin, species, and quality is available for reforestation needs.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (p. 17 of the Twenty-Year Forest Management Plan and Environmental Impact Assessment Summary Document):

- Promptly and effectively renew harvested areas
- Maintain and/or enhance the timber productivity of forests

STANDARDS:

1. Saskatchewan Tree Seed Zones:
   Tree seed zones within Saskatchewan will correspond with eco-region boundaries, as endorsed by Saskatchewan Environment (SE)[2]. All seed and stock used in artificial regeneration are to be acquired within their respective ecoregion, unless otherwise approved by the SE Forest Service.

2. Minimum Seed Supply:
   A licensee must maintain a minimum seed supply of seven years of viable white spruce, and five years for both black spruce and jack pine[3].

3. Seed Collection Database and Maps:
   a. <u>Conifer seed collected from within an FMA area and used within that FMA area:</u>
   The licensee shall maintain a database and map indicating the seed source and

1 Seed collected from seed orchards is exempted. These standards will be developed provincially.
2. Saskatchewan Environment and Resource Management. 1998. The Ecoregions of Saskatchewan. Canadian Plains Research Centre. University of Regina. 205 p.
3 Based on forecasted volume requirements, as stated in operating plans.

destination used in annual reforestation efforts. Seed origin must be tracked by stand level and seed destination at the harvest block level.

b. Conifer seed collected from outside an FMA area:
A licensee using collected seed from outside its license area shall maintain a database indicating the seed source and destination.

c. Tracking:
Seed origin must be tracked at the stand level and seed destination at the harvest block level.

GUIDELINES:

1. Collection of Seed from Natural Stands:
   a. Either dominant or co-dominant vigorous trees within natural stands should be targeted for cone collections.[4]

   b. Avoid isolated trees where self-pollination is very probable.

   c. Superior stands are those with a high proportion of phenotypically superior trees. Trees in these stands should have the following characteristics:[5]
      - Superior height.
      - Above average stem diameter.
      - Single stem.
      - Narrow thrifty Crown.
      - Low stem taper.
      - Small limb diameter.
      - Branches attached to the bole at a 90-degree angle.
      - Natural pruning, no evidence of disease, defect, insect, or physical damage

   d. Once favourable, mature, superior stands have been identified, they should be mapped and reserved as seed collection areas.[5] These mature stands can be identified from other inspections, such as special cruises, rare and exceptional stand surveys and local knowledge.[5]

   e. For additional detailed information on tree seed collection, the following publications may be referred to:

4 Ontario Ministry of Natural Resources. 1996. Guidelines for Tree Seed Crop Forecasting and Collecting. 226 p.
5 Alberta Environmental Protection, Alberta Forest Service. 1993. A Forest Tree Seed Manual for Alberta. 101p

i. B.C. Ministry of Forests. 1989. A Guide to Collecting Cones of British Columbia Conifers, FRDA Report 055; R.D. Eremko, D.G.W. Edwards and D. Wallinger. 114 p.
ii. Ontario Ministry of Natural Resources. 1996. Guidelines for Tree Seed Crop Forecasting and Collecting. 226 p.
iii. Alberta Environmental Protection, Alberta Forest Service. 1993. A Forest Tree Seed Manual for Alberta. 101 p.

2. The following are general guidelines for cone collection of primary species in the province:

White spruce

a. Monitor the development of white spruce cones within the targeted cone collection areas in early July.
b. Arrange for the availability of a helicopter and cone rake or other means of collection for the month of August.
c. Conduct aerial samples of current year cones from trees within the targeted cone collection areas on a weekly basis commencing in mid-July. Cone samples must be assessed by a knowledgeable person to determine potential seed harvest and the incidence/severity of impact of cone insects and diseases.
d. Based on assessment of seed embryo development and cone maturation, commence harvesting of white spruce cones (cone collection can commence early to mid-August).
e. Assign a seedlot name (e.g. use the operating area name and year of collection) for each cone collection area and ensure that all bags are tagged internally and externally with the seedlot name.
f. Burlap bags (70 litre) must be used to allow for air circulation around the cones. An individual bag should not contain more than 40 litres of cones (two-thirds full).
g. Store all bagged white spruce cones in a cool well-ventilated environment. Ensure that all bags get turned daily to minimize the chance of heating.
h. Deliver collected white spruce cones to a reputable seed extraction facility.

Black spruce

a. Monitor the development of black spruce cones within the targeted cone collection areas in early July.
b. Arrange for the availability of a helicopter and cone rake or handfalling and picking crews for the period October to March.
c. Conduct samples of current year cones from trees within the targeted cone collection areas in early September. Cone samples must be assessed by a knowledgeable person to determine potential seed harvest and the incidence/severity of impact of cone insects and diseases.

d. Based on assessment of seed embryo development and cone maturation, commence handfalling of black spruce trees (cone collection can commence generally around early October).
e. Assign a seedlot name (use the operating area name and year of collection) for each cone collection area and ensure that all bags are tagged internally and externally with the seedlot name.
f. Burlap bags (70 litres) must be used to allow for air circulation around the cones. An individual bag must not contain more than 40 litres of cones (two thirds full).
g. Store all bagged black spruce cones in a cool well-ventilated environment. Ensure that all bags get turned as required to minimize the chance of heating.
h. Deliver collected black spruce cones to a reputable seed extraction facility.

Jack pine

a. Establish a cone collection area.
b. Collect jack pine cones from freshly harvested jack pine tree slash.
c. Ensure that collected jack pine cones are large, dark green, brown or greyish brown in color. Small or old (grey) cones should not be picked.
d. Assign a seedlot name (use the operating area name and year of collection) for each cone collection area and ensure that all bags are tagged internally and externally with the seedlot name.
e. An individual bag (70 liters) must not contain more than 40 litres of cones (two thirds full).
f. Deliver collected jack pine cones to a reputable seed extraction facility.

* * *

CATEGORY: HARVESTING

SUBJECT: RIPARIAN MANAGEMENT AREAS

OBJECTIVES:

Riparian areas shall be managed with the objectives of:

- protecting riparian dependant resources and aquatic ecosystems by maintaining, the diversity of ecological structures and functions in the riparian areas; and
- adopting a landscape perspective to:
    a) provide habitat connectivity and environmental requirements for riparian communities of plants and animals; and
    b) to minimize impacts on watershed hydrology.
- committing to continual improvement and the incorporation of new scientific knowledge in the revision of these standards and guidelines.

LINKAGES TO 20-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4):

- Manage activities to protect and maintain water quality in FMA area lakes and rivers
- Maintain diversity and quality of riparian habitats

STANDARDS:

Overview

The company shall plan and conduct forest management activities in riparian management areas with the objective of protecting and maintaining the structures and functions within the riparian area. Notwithstanding the objective, the company must meet the standards identified below. The following landscape-based categories of "Riparian Management Areas" and applicable standards identify the minimum levels of protection.

For all categories, zone widths are by "slope distance" measured perpendicular to the stream bank, shoreline or wetland edge, as the case may be (see Figure 1). Measurement is from the stem of the overstory tree species.

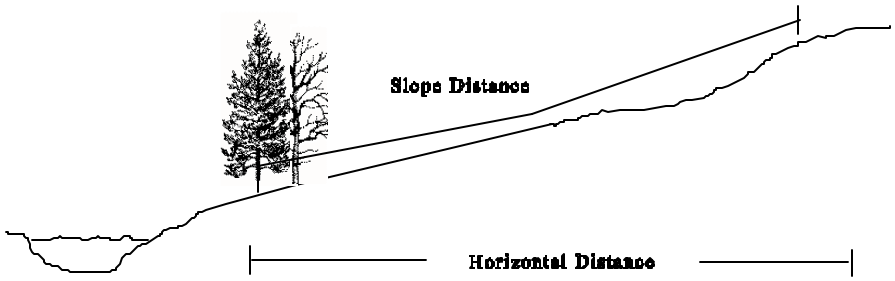

Figure 1. Illustration of "Slope Distance" (not to scale).

A. Riparian Management Area Categories:

1. Category 1 - Large Lakes, Rivers and Streams (Figure 2)

Description:

- Applies to lakes ≥ 5 ha in area, rivers and streams, as evident on 1:15,000 forest vegetation inventory maps, aerial photographs, or harvesting operations.

Standards:

a. 10 m no harvest/no equipment zone measured from the beginning of the overstory tree species. This line must be clearly marked as per the road and harvest block layout standards.

b. Limited harvest zone extending 30 metres from the upslope edge of the 10 m no harvest zone.

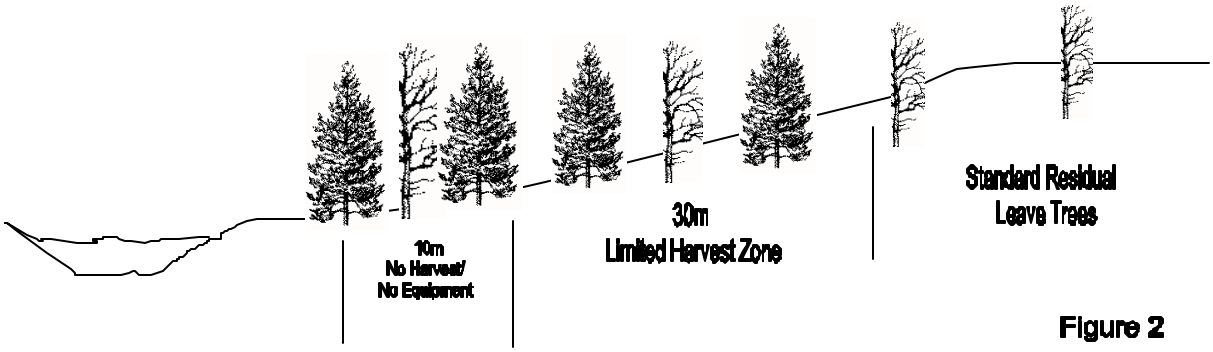

Figure 2

2. Category 2 - High Slope Areas on Small Lakes or Ponds (Figure 3)

Description:

- Between 0.5 and 5 ha waterbody surface area as evident on 1:15,000 forest vegetation inventory maps, aerial photographs, or harvesting operations.
- A high slope is defined as a slope greater than 15 percent within 20 m measured from the beginning of the overstory tree species.

Standards:

a. A limited harvest zone to the top of the slope, or a maximum distance of 40 m measured from the beginning of the overstory tree species.

b. The limited harvest zone includes a 10m no equipment zone measured from the beginning of the overstory tree species. This line must be clearly marked as per the road and harvest block layout standards.

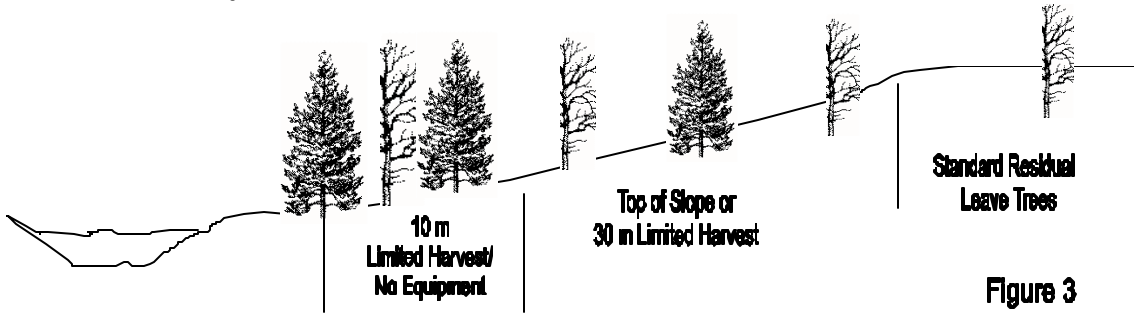

Figure 3

3. Category 3 - Low Slope Areas on Small Lakes or Ponds (Figure 4)

Description:

- Between 0.5 and 5 ha waterbody surface area as evident on 1:15,000 forest vegetation inventory maps, aerial photographs or harvesting operations.
- Have a slope less than 15 percent within 20 m measured from the beginning of the overstory tree species.

Standards:

- 10 m limited harvest / no equipment zone measured from the beginning of the overstory tree species. This line must be clearly marked as per the road and harvest block layout standards.

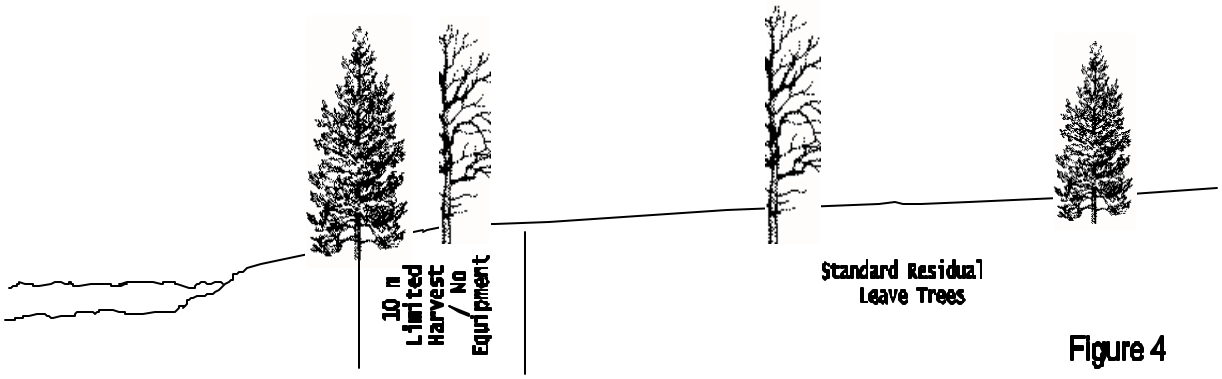

Figure 4

4. Category 4 - Intermittent Streams (Figure 5)

Description:

- Intermittent streams as evident on 1:15,000 forest vegetation inventory maps, aerial photographs, identified during preharvest site assessments, or harvesting operations.

Standards:

a. No impediment to surface or subsurface water flow (interflow).

b. Forest harvesting operations will leave single and clump leave trees adjacent to the stream, and ensure that equipment does not enter the stream channel.

- Harvesting equipment may cross intermittent streams on frozen ground, or using appropriate crossing structures. Crossing structures must be removed immediately following harvesting and site preparation activities, and stream banks must be stabilized.

Figure 5

5. Category 5 - Ephemeral Streams and Wetlands

Description:
- Ephemeral streams, wetlands (bog, fen, marsh, swamp and shallow open waters), and water bodies < 0.5 ha.

Standards:
- No impediment to surface or subsurface water flow

B. General Standards Applicable to All Categories

1. Forest Health and Blowdown:

Deviations to riparian management area standards, for the purpose of addressing forest health issues or blowdown salvage harvesting, shall be approved by the Area Forester on a case by case basis. As well, requests for deviation to RMA standards are to be included in the Site Assessment and Site Prescription for harvest blocks, or operating area write-ups for road right-of-ways outside of harvest blocks.

2. Tree Volume Retention

a) For all RMA categories, residual trees shall be representative of preharvest stand types and size classes in limited harvest zones.

b) A minimum, average volume retention level of 25% per operating year across the FMA is required within limited harvest zones, with a minimum volume retention requirement of 20% within each individual harvest block.

c) Riparian management area retention levels:
   i. do not include volumes in the no harvest zone; and
   ii. shall not be included as part of the retention levels in the non-riparian management portion of the harvest block.

3. Soil Protection

a. To minimize soil disturbance, organic and mineral soils shall be protected so that rutting does not exceed 12 cm in depth and 5 m in length for more than 1% of the limited harvest zone area.

b. Forest operations shall not cause rill and gully erosion, mass wasting, or waterbody sedimentation.

4. Roads and Landings

Roads and landings can be constructed in RMA's where no other viable option exists, and may only be approved by the Area Forester on a case by case basis.

5. Water Quality Protection

a. Saskatchewan Environment's "General Surface Water Quality Objectives" for suspended solids and turbidity are adopted and must be met. They are applicable to intermittent streams only during flow periods and are not applicable to ephemeral streams.

b. Total suspended solids are not to be increased by more than 10mg/L over existing background values for waters with levels less than 100mg/L, or not to be increased by more than 10 percent over existing values for waters with levels greater than 100mg/L.

c. Turbidity is not to be increased by more than 25 turbidity units above existing background levels.

6. Renewal

a. Site preparation and planting activities approved in an operating plan for riparian management areas shall be conducted within 2 growing seasons following harvest.

b. Only drag scarification, and discontinuous (patch) forms of site preparation can be used in riparian management areas. Examples of discontinuous site preparation techniques include screefing, mixing, and inverting.

7. Overlapping RMA Categories

a. In areas where riparian systems meet, the standards relating to the RMA category with the higher level of protection takes precedent, and shall be applied in the area of the overlap.

b. In harvest blocks with multiple RMA categories, where the company feels that it is operationally constraining to layout each individual RMA category, the category with the highest level of protection may be used across the entire RMA.

c. In cases where two or more RMA categories overlap within 100 metres of the shoreline of a waterbody or watercourse, the RMA category with the highest level of protection shall take precedence. To establish which RMA category applies, a line is extended from the edge of the waterbody or watercourse towards the block boundary. If the edge of the overstory tree species is encountered within 100 metres, then the riparian category applying to the waterbody or watercourse is applied. If the overlap occurs more than 100 metres from the shoreline of a waterbody or watercourse, the RMA category adjacent to the overstory tree species applies.

8. Skid Trails and Topographic Constraints

Under special circumstances, development of limited skidder/forwarder trails within the no equipment and no harvest zones may be necessary in order to harvest otherwise inaccessible wood (within the limited harvest zone) and may only be approved by the Area Forester, on a case by case basis.

GUIDELINES FOR OPERATING IN RIPARIAN MANAGEMENT AREAS:

1. Tree Volume Retention

a. Retention left within the limited harvest area should be retained in, clumps and individual trees, bearing in mind operational constraints. In softwood RMAs, larger clumps of softwood retained which are connected to the RMA no harvest zone may be more resistant to windthrow. Refer to Silvicultural Systems Standards and Guidelines for further information on variable retention.

b. Damage to advance regeneration of all merchantable tree species should be minimized wherever it is compatible with silviculture objectives.

c. All reasonable efforts should be made to retain standing dead trees in riparian management areas.

2. Roads and Landings

Requests, where feasible, to construct roads and landings within RMAs should be made in the operating plan submission.

3. Landscape Harvest Block Planning

a. Specific consideration should be given to the orientation, size and shape of the harvest block to minimize the effects of wind damage on riparian management areas.

b. Retention of structure in riparian management areas should be planned in conjunction with retention in the remainder of the harvest block.

c. The number of crossings for intermittent streams should be minimized.

d. Harvesting in Riparian Management Areas should be conducted in conjunction with harvesting the adjacent non-RMA portion of the harvest block.

CATEGORY: **GENERAL OPERATING PRACTICES**

SUBJECT: **ENVIRONMENTAL PROTECTION**

OBJECTIVES:

1. To ensure a safe work environment for all employees, contractors and the public.
2. To responsibly manage activities to protect and maintain water quality, air quality and the productivity and quality of forest soils.

LINKAGES TO TWENTY-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (p. 17 of the Twenty-Year Forest Management Plan and Environmental Impact Assessment Summary Document):

- A safe working environment for all employees, contractors and the public.
- Manage activities to protect and maintain water quality in FMA area lakes and rivers.
- Maintain diversity and quality of riparian habitats.
- Maintain productivity of forest soils except on areas needed for permanent roads or other permanent infrastructure.
- Meet contractual and legal obligations.

PERMITS & APPROVALS REQUIRED:

The following permits shall be obtained by a licensee for the work or conditions indicated in Table 1 below:

Table 1 – PERMITS

Approval Type	Required
Temporary Work Camp Permit (TWCP)	For camps (whether identified in approved Operating Plans or not) in which vehicles, tents or other structures are to be assembled or set up to provide accommodation for personnel or for other purposes in connection with work projects of a non-permanent nature.
Burning Permit *(associated with both the Prairie and Forest Fires Act and Clean Air Act*)	When burning paper and wood during fire season.
Permission to draw water *(associated with the Water Corporation Act, and the Federal Fisheries Act).* An Aquatic Habitat Protection Permit may also be required to draw water (under *the Environmental Management and Protection Act).*	When drawing water from a known source or established drilled well for washing facilities. An Aquatic Habitat Protection Permit is required when working in or near water bodies.
Permission to retain camp structures in place for future use *(Lease– available through the local Lands Manager)*	When leaving camp structures in place for future use.

PART I: CAMPS

STANDARDS:

1. Identify and comply with all applicable Saskatchewan Environment legislation relating to the operation of camps related to forest operations, including those described in Appendix I (attached). The licensee is required to obtain all necessary permits. All permits will be in the name of the licensee.

2. The licensee shall comply with all conditions contained in any Temporary Work Camp Permit, approved operating plan and reclamation plan.

3. When a temporary work camp is established, an approval to establish the camp is required. Where required, an approval to store Hazardous Substances and Waste Dangerous Goods must be obtained.

4. Camps or fuel tanks shall not be located within **100 metres** of the high water mark of a lake, pond, stream, or river. Exemptions to this standard are permitted for temporary work camps used for small reconnaissance surveys by boat, with tenure of less than 30 person days.

5. To minimize conflicts with other land users and minimize potential pollution of water bodies, authorization will not be given except under special circumstances and at the discretion of Saskatchewan Environment for temporary work camp locations less than:

Feature	Recommended Distance
Centre-line of established tourist canoe routes	800 metres
Recreational leases or settlements	800 metres
Developed public beaches or waterfalls	800 metres
Centre-line of a numbered highway or primary company road	100 metres

   Exemptions to this standard are permitted for temporary work camps used for small reconnaissance surveys by boat, with a tenure of less than 30 person days.

6. Wastes arising from food preparation, laundry, bath and latrines shall be disposed of in a manner that will not adversely affect ground or surface water and will not create a nuisance, health, or environmental hazard. Methods of disposal will depend upon such variables as type of liquid waste, volume of liquid waste, soil characteristics, water table depth, distance from other dwellings, bodies of water and wells. Contact the local Saskatchewan Environment officer for procedures.

7. Locate solid waste in covered containers. Food waste should be kept in covered, fly/animal proof (i.e. bear proof garbage can) containers until removed to a designated legal landfill. It should be removed frequently – depending on the size

and containment, so as not to create a health or safety issue. Exemptions to this standard are permitted for temporary work camps used for small reconnaissance surveys by boat, with a tenure of less than 30 person days.

8. When camps are being reclaimed, all structures must be removed from the site, including septic systems, and latrines. All wells must be capped or decommissioned. The campsite must be reclaimed according to the conditions in the Temporary Work Camp Permit.

GUIDELINES:

1. Follow Saskatchewan Environment's *"Guidelines for the Establishment and Operation of Temporary Work Camps (TWCG's), 1999"* .

2. Waste paper and wood can be burnt. The burn permit (required when burning during fire season) will stipulate the fire tools that must be kept in the camp or at the location of the burn.

PART II: HANDLING AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS

DEFINITIONS (Examples):

The following are examples of hazardous, non-hazardous, and acutely hazardous materials.
See *the Hazardous Substances and Waste Dangerous Good Regulations (HSWDGR)* for a complete list of various substances based on their danger rating.

Hazardous Materials:	Petroleum products, petroleum containers and filters, pesticides, acids and bases, inorganic substances such as ammonia and fertilizers, metals such as lead.
Non-hazardous Materials	Tires, paint cans (only when completely cleaned of paint), grease tubes (only when completely cleaned of grease), culverts, planting boxes, kitchen waste and other domestic refuse, human waste.
Acutely Hazardous Materials	Reactive or toxic substance such as mercury, paraquat, furadan, chlorine.

STANDARDS:

1. Identify and comply with all applicable Saskatchewan Environment legislation relating to the handling and disposal of hazardous and non-hazardous materials on Crown Land, including those described in Appendix II.

2. All operational waste must be removed from the operating site and camp location, annually or upon completion of operations.

3. Do not fuel vehicles or machinery within **100 metres** of the high water mark of a lake, pond, stream, or river. In the case of Ice Bridges and Ice Roads, a pick-up with a slip tank is allowed to refuel pumps and augers used for flooding on the ice surface. This pick-up must have a small spill kit. All other equipment must not be refueled in this zone.

GUIDELINES:

Follow the principles of:
Reduce – before purchasing a product consider reusing items already held in inventory.
Reuse – Before returning or disposing of a product, consider reusing the product in other operations.
Recycle – Consider purchasing products that are recyclable and can be returned to the supplier.

See the publication entitled "*Reusing and Recycling in Sask*." distributed by the Sask. Waste Reduction Council, for locations for recycling products, or contact a local Saskatchewan Environment office.

Each fuel storage tank should have two shut-off valves, one of which may be the handle.

Fuel (Gasoline or Diesel) Storage and Handling:

1. Locate all tanks (including slip tanks, mobile, and permanent tanks) away from traffic-congested areas. Fuel should be stored at least six metres from a building and there should be a 30 metre minimum clearance from the fuel dock to sleeping accommodations. Occupational Health and Safety enforces this legislation.
2. Inspect and maintain all storage tanks. There should be no signs of corrosion and tanks must be painted. If required to register tanks, then a written record of weekly inspections on all fuel tanks must be maintained.
3. When fueling, never leave the nozzle unattended.
4. Use drip pans and/or nozzle holders to contain drips or spills. Nozzles should be mounted above the drip catchments.
5. Park mobile tanks outside of high traffic areas (in landings or push-outs away from traffic). High traffic does not include bunching, skidding, or delimbing/processing. High traffic does include loading and hauling.
6. Ensure slip tanks (tidy tanks) are secured into the vehicle, so that in the event of a roll over, a full slip tank will stay secured in the truck.
7. Install collision barricades surrounding the tanks to prevent accidental damage.
8. Fuel Pumps: Hand pumps are acceptable provided there are no leaks. Gravity feed pumps are acceptable.
9. Inspect equipment for worn hoses and fuel, oil, or fluid leaks. Repair equipment where required.
10. Inspect equipment prior to performing approved in-stream work.

Propane:

1. Propane is heavier than air and will drain into depressions. In case of a propane leak, extinguish all sources of ignition. Evacuate low-lying areas.
2. Liquid propane may cause a freeze burn similar to frostbite. Wear appropriate Personal Protective Equipment when handling.
3. Ensure that any appliances or equipment to be connected to propane have been approved for use with propane.
4. Never use a match, lighter, candle, flame or any other source of ignition to check for propane leaks. Use only a soap solution.

Fire Fighting Tools:

Have fire extinguisher and tools available on-site in the event of a fire, all year round. The intent is to be able to act on any fire threatening a fuel tank within two minutes of detection (locate a 10 lb. fire extinguisher and a shovel within 500 m of each fuel tank). These may be located on mobile equipment if the extinguisher is detachable from the machine.

PART III: SPILLS

STANDARDS:

Identify and comply with all applicable Saskatchewan Environment laws and regulations relating to spills of hazardous materials in the Provincial Forest, including those described in Appendix III attached.

GUIDELINES:

1. If it is SAFE to do so, STOP the spill, CONTAIN it, PROTECT the surrounding environment, and REPORT it if necessary.
2. Use absorbent material (i.e. spill kits, sawdust, dirt, snow) for clean up. Dispose of absorbent materials in an approved facility once they have been used to clean up a spill.
3. Spill Kits: Spill kits are suggested for fuel storage tanks and vehicles transporting fuel tanks. A minimum of one large spill kit (approximate absorbent capacity of 120 litres) is suggested for bush maintenance facilities. Each fuel location away from the bush maintenance facility, vehicles transporting fuel tanks (i.e. slip tanks, mobile tanks) and trucks regularly in the area should have a small spill kit (approximate absorbent capacity of 20 litres).

APPENDIX I: CAMPS - ENVIRONMENTAL RULES AND REGULATIONS

The following is a list of relevant sections of provincial legislation that pertain to the operation of forestry camps. This is not a complete list of applicable provincial legislation, nor does it cover any applicable federal or municipal legislation.

1. *The Sanitation Regulations*; proclaimed under *The Public Health Act:*
   a. No person shall deposit any garbage, refuse or waste along the banks of or in any body of water (sec 3).

2. *The Shoreland Pollution Control Regulations, 1976*, proclaimed under *The Public Health Act:*
   a. No sewage shall be discharged:
      i. Into surface or ground water.
      ii. Into the subsoil:
         - Within 25 feet of an occupied dwelling.
         - Within 50 feet of a properly constructed well (sec 9).
      iii. Within 1,500 feet of the high water mark of a lake, river, stream or other body of water upon which is situated an urban municipality, a summer resort or a recreational area, or part thereof (sec 6).
   b. Kitchen sink wastes may be discharged into the subsoil where the distance between the bottom of the seepage pit and the water table is 5 feet (clay soil) or 25 feet (sandy soil) (sec 9).
   c. Septic tanks (of watertight construction) must be located at least 10 feet vertically or 50 feet horizontally from normal surface water levels (sec 11).

3. *The Clean Air Act*, Section 11
   - No person shall cause or permit the burning of trash, garbage or industrial waste (or any other material) in an open fire or in an incinerator in a manner that causes air pollution. Specifically prohibited is the burning of waste oil, hazardous substances or wastes, motor vehicle tires or animal cadavers (sec 11).

4. The *Litter Control Act*
   - Solid wastes must be in a container with a lid.
   - It is an offence to abandon any "waste" on land owned by another person or by the Crown or into water. The definition of waste includes any product prescribed in the regulations.

5. *The Prairie and Forest Fires Act, Section 9.5*.
   - Upon request, every person carrying on an industrial or commercial operation within a provincial forest shall submit to the director a fire control plan for approval and shall have available and in good condition any fire fighting equipment required by the regulations.

APPENDIX II: HANDLING & DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS ENVIRONMENTAL RULES AND REGULATIONS

The following is a list of relevant sections of Saskatchewan Environment-related provincial legislation that pertain to the handling and disposal of hazardous and non-hazardous goods. This is not a complete list of applicable provincial regulations, nor does it cover any applicable federal or municipal legislation.

1. *Hazardous Substances and Waste Dangerous Goods Regulations (HSWDG)* proclaimed *under The Environmental Management and Protection Act;*

   Gasoline and Diesel Fuel are listed as Industrial Hazardous Substances and their handling and storage are subject to certain stringent regulations.
   - Any underground storage tank, regardless of capacity is regulated under HSWDG. The cost of meeting requirements generally prohibits this option.
   - Above ground fuel storage is exempt from HSWDG regulations if total storage capacity on site is less than 4,000 litres (881 Canadian gallons) (aggregate). (Section7), or if fuel tank is portable (tank mounted on trailer). The total volume of 4,000 litres does not apply to all products and storage types. Contact a local Environmental Protection Officer for further clarification.

   - If capacity exceeds 4,000 litres then all requirements of *HSWDG* apply. The tank must be constructed to the specifications found in Section 14, be coated with a rust resistant material, be equipped with a high level alarm or overfill protection system unless filled by a direct top-fill using a functional automatic shut-off nozzle, be clearly marked to identify the contents, be surrounded by an impermeable overflow system to contain leaks, etc. (see Section 14).

2. *Dangerous Goods Transportation Regulations* made pursuant to the *Dangerous Goods Transportation Act (Saskatchewan):*
   - The regulations made by the Federal government under *the Transportation of Dangerous Goods Act, 1992 (Canada)* regarding safety and safety standards for the handling and transportation of dangerous goods are expressly adopted by Saskatchewan and compliance with them is required as though they had been made under this Act.
   - A limited exemption is given for tanks manufactured before July 1, 1995, which are used for the storage or transportation of dangerous goods.

   Transportation of Dangerous Goods Regulations SOR/85-77 made pursuant to t*he Transportation of Dangerous Goods Act (Canada)*

   Overview
   - These regulations prohibit the transportation of any dangerous goods anywhere in Canada except in accordance with its provisions. Gasoline,

diesel fuel, aviation fuel, acetylene, pressurized gases, used oil and explosives are all described in the regulations as dangerous goods.

- The Regulations specify standards for safety requirements, documentation, safety marks, safety standards and training requirements.

The following categories of dangerous goods are exempt from certain provisions of the regulations:

Transportation of Gasoline, Diesel or Fuel Oil:

a. Transportation of fuel by road in slip tanks (tanks mounted in the bed of pick-up trucks) with a capacity of 454 litres or less is exempted from the general requirements of the regulations, except for the reporting requirements for spills and accidents in Part IX. However, the tank must be designed, constructed, filled and closed so that under normal conditions of transport there will be no leakage that could endanger public safety (sec 7.21(2) of the Regulations).
b. Transportation of gasoline, diesel or fuel oil by road is further exempted from the requirements of the regulations (except for the reporting of spills and accidents in Part IX), provided that:
    i. The product is transported in one or more containers with a total capacity of 2,000 litres or less (excluding the vehicle's own fuel tank).
    ii. Each container is stored in an open vehicle so that the containers' labels or placards are visible from outside the vehicle.
    iii. Each container is secured to the vehicle.
    iv. Each such tank is leak-tested at least every 30 months at a facility registered by Transport Canada for that purpose (Sec. 7.33.1 and 7.33.3).

Transportation of Pressure Cylinders (section 2.31)

Transportation by road of cylinders containing oxygen, acetylene or propane under pressure is exempted from the general provisions of the regulations (other than reporting of spills and accidents) providing:

a. The product is contained within not more than 5 cylinders with a total capacity not greater than 500 kg. gross mass.
b. The cylinders are transported in an open vehicle so that the label on each container
are visible from outside the vehicle.
c. Each cylinder or container is secured to the vehicle during transport. (Sec 2.31)

A "cylinder" is defined as being a container that is of cylindrical or spherical shape, has a water capacity not greater than 454 litres and is capable of withstanding an internal absolute pressure greater than 275 kPa.

General Exemption (section 2.21)

The regulations do not apply to the transporting of dangerous goods by road between a retail outlet and the residence of the Purchaser (or the place of consumption) providing:

a. The goods are contained in a packaging or in a small container (less than 454 litres) designed to contain them.
b. The goods are not flammable gases in a pressurized cylinder with a water capacity of more than 45 litres.
c. The goods are not explosives, other than safety explosives.

Transporting of Equipment or Power Tools by Road (Sec 2.25)

These regulations do not apply where a person transports equipment or power tools by road, provided that the gasoline or other fuel contained in the equipment being transported is less than 500 millilitres (for plastic fuel tanks) or 1 litre for metal tanks.

Transporting of Self-Propelled Vehicles by Road (sec 2.5)

The regulations (other than those in Part VIII relating to "Safety Requirements for the Transportation of Dangerous Goods) do not apply to the transporting of self-propelled vehicles by road providing such self-propelled vehicle is not enclosed nor carrying dangerous goods as cargo.

Explosives – Exemption from Placarding (section 5.19(a))
Explosives are classed as dangerous goods and every person transporting explosives is required to comply with the regulations. The placarding requirements of the Regulations do not apply to a vehicle which is used for the transporting of explosives, providing that the vehicle contains 25 kg or less of explosives that are to be transported from a retail outlet to a place where the explosives are to be used, if the explosives are in the possession of the individual who intends to use them.

3. *Used Oil Collection, and Scrap Tire Management Regulations* proclaimed under *The Environmental Management and Protection Act*;
   - Disposal of Oil and Oil Filters: (sec 19) Every person is prohibited from disposing of or discharging used oil, used oil filters or containers by: a) spreading them on roads; b) placing them in landfills c) pouring them in sewers; d) dumping them; e) open burning; f) using deep well injection; or g) using any other method.
   - Used oil or waste antifreeze may be stored on site in containers or 205 litre drums (up to aggregate capacity of 500 litres). In excess of 500 litres in containers or a tank in excess of 205 litres, requires the tank to be an approved Environmental Protection Tank (with secondary containment, collision protection, 6 foot fence, etc.) In either case, disposal must be to an approved receiver.
   - Oil filters are a waste dangerous good and must not be discarded in landfills. Place in a drum and transport to approved receiving site. Used oil consignees will generally also take filters and oil containers.
   - New oil containers should be taken to a receiver and not discarded in landfills.
   - Batteries and any waste dangerous goods other than waste oil or antifreeze may be stored on site up to 100 kilograms combined aggregate.
   - Scrap tires are subject to special rules for collection, disposal and recycling. Retailers of new tires are required to operate a program that meets certain specified requirements for the collecting, transporting and recycling of scrap tires.

4. The *Litter Control Act*
   - No person shall abandon any manufactured article, processed material or any waste: a) on land owned by another person; b) on Crown land; or c) into or upon any water (sec 3).

APPENDIX III: SPILLS - ENVIRONMENTAL RULES AND REGULATIONS

The Environmental Spill Control Regulations made pursuant to *The Environmental Management and Protection Act* and the provisions of the Act itself are the applicable legislation governing all instances of spills or discharges of pollutants, whether or not *HSWDG* applies. The following provisions are taken from the Regulations, but are not exhaustive.

Report all spills in a FMA operating area meeting or exceeding the amounts in Table 1 (taken from *the Environmental Spill Control Regulations*) to the provincial Spill Report Centre (1-800-667-7572) within 24 hours of the spill. (Note: This system automatically notifies Environment Canada if the spill has occurred in a fish-bearing stream or waterway). Follow any clean-up instructions given. Complete and submit the Spill Report Centre Written Spill Report form within 7 days.

Table 1:

Form, Character Concentration	**Examples**	**Legally Reportable Amounts (min. levels) in FMA areas**
Explosives – Any	TNT, Blasting Caps	Any amount
Compressed Gas: Flammable Gas	Propane, Acetylene	10 kg / 22 pounds
Flammable Liquids (Fuels)	Gasoline, Aviation Fuel, Diesel, Kerosene	100 litres / 22 gallons
Flammable Liquids (Lubricating oil)	Brake Fluid, Engine oil, Hydraulic Oil, Waste lubricating oils,	50 litres /10 Gallons
Flammable Liquids (Solvents)	Acetone	5 litres / 2 gallons
Poisons toxic by ingestion, inhalation, or absorption	Any poisons, Pesticides, 1,1,1 Trichloroethane	5 kg / 11 pounds
Waste containing a pest control product as defined in section 1 of the Special Waste Regulation	Glyphosate	20 kg / 45 pounds
Coolants	Engine Antifreeze	25 litres/5 gallons

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Weyerhaeuser Prince Albert Forest Management Agreement Area
FMA STANDARDS AND GUIDELINES

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CATEGORY: **GENERAL OPERATING PRACTICES**

SUBJECT: **SOIL PROTECTION**

OBJECTIVES:

To minimize impacts of forest soil disturbance caused by forest operations.

LINKAGES TO 20-YEAR PLAN OBJECTIVES:

Weyerhaeuser Prince Albert (Twenty-year Forest Management Plan and Environmental Impact Assessment Statement for the Prince Albert Forest Management Forest Management Area, p. 4-4)

- Meet customer mill needs (product mix, piece size, wood quality) in short and long terms
- Maintain and/or enhance the timber productivity of forests
- Maintain the productivity of forest soils except on areas needed for permanent roads or other permanent infrastructure

STANDARDS:

A. In Block Roads & Landings Disturbance.

1. Standards are applicable to blocks ≥20 hectares in size.
   a) The maximum level of soil disturbance created by all roads and landings (includes road driving surface, ditches, and landings) shall not exceed 5% of the harvest block area[1].

   b) The Area Forester, on a case-by-case basis, may approve exceptions to this standard, provided that reasons for the proposed deviation are presented in an operating plan. The FMA holder shall declare what soil disturbance percentage they will achieve and will be expected to meet that commitment.

B. Harvest Block Soil Disturbance.

1. Rutting into any soil type shall not exceed 15 cm in depth and 5 metres in length, and must not occupy more than 1% of the portion of harvest block area surveyed. The minimum survey size is 3 hectares.

2. For continuous forms of site preparation, alteration of mineral soil shall not be deeper

[1] Application of this standard for the Weyerhaeuser Pasquia Porcupine FMA is approved on an interim basis, subject to compliance with the Environmental Assessment Approval.

on average than 15 cm. For discontinuous (patch) forms of site preparation alteration of mineral soil shall not be deeper on average than 20 cm with a maximum depth of 30 cm.

GUIDELINES:

1. Minimize roads in harvest blocks using an average skid distance of 200 metres as a planning guide.
2. Target minimum levels of mineral soil exposure required to achieve silvicultural objectives during site preparation.
3. Use discontinuous site preparation methods (or none at all) to minimize excessive soil disturbance wherever this will meet silvicultural objectives.
4. Minimize soil compaction by limiting heavy equipment on soils during wet soil conditions.
5. Use high flotation tires on skidders or use low-ground pressure tracked machines to minimize soil compaction and disturbance.
6. Site preparation should be conducted perpendicular to the dominant slope of the terrain to minimize the potential for soil erosion.
7. Follow the PHSP, especially in regards to the rutting and compaction hazard for the harvest block, as well as the prescribed season of harvest.
8. Forest operations should be scheduled during the appropriate seasons, to minimize the potential of rutting and compaction to forest soils.

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Glossary

ATV Means any motorized vehicle designed for off-highway travel on or over unprepared surfaces, natural terrain, water, snow, ice, marsh or swamp land, and includes any of the following when designed for that type of travel:
(i) amphibious vehicles;
(ii) ground effect or air-cushion vehicles;
(iii) motorcycles and related two-wheel, three-wheel and four-wheel vehicles;
(iv) snow vehicles;
(v) track vehicles;
(vi) four-wheel drive vehicles;
(vii) low-pressure tire vehicles;
(viii) any toboggan, trailer or other attachment to an all-terrain vehicle;
(ix) any other means of transportation that is driven by power other than muscular power or wind;
but does not include:
(x) motor boats;
(xi) four-wheel drive vehicles classed as type A vehicles in accordance with The Vehicle Equipment Regulations, 1987 pursuant to The Vehicle Administration Act;
"type A vehicle" means a self-propelled vehicle designed for operation on highways and includes a car, truck, van, motorhome, multipurpose passenger vehicle, power unit and bus as defined in CMVSS and type A-1 to type A-3 vehicles, but does not include a vintage vehicle, all-terrain vehicle, motorcyle or special mobile machine;
"type A-1 vehicle" means a type A vehicle that is a car, truck, van, multipurpose passenger vehicle or truck that is 2060 millimetres or less in width;
"type A-2 vehicle" means a type A vehicle that is a bus, power unit, chassis cab or truck that is more than 2060 millimetres width;
"type A-3 vehicle" means a type A vehicle that is registered with the administrator as a school bus and is designed and used primarily for the transportation of school children.

Bank means the rising ground bordering a water body or watercourse that serves to confine the water to the channel or bed.

Bog (See Wetlands)

Clearcut (See Silvicultural Systems)

Clump (See Silvicultural Systems)

Ecotones are the transition zone where two structurally different plant communities meet (the edge)

(Dunster & Dunster, 1996)

Ephemeral Streams (see Stream)

Fen (See Wetlands)

Fish When used as a noun, means any species of fish and includes:

1. any aquatic crustaceans, aquatic mollusks or aquatic invertebrates;
2. any eggs or sperm from any fish; or
3. any part of parts of fish.

Fish Bearing Stream (See Stream)

Free to Grow is a state or condition assigned to a sampled unit (i.e., a tree, a group of trees, a stand, or a harvested area) as a result of its assessment against a set of regeneration standards that provide a reasonable assurance that the future forest condition defined by the standards will be achieved.

Harvest Block is a unique polygon that is defined by the operating year in which timber harvesting was completed, whereby all approved merchantable timber is skidded to roadside. A harvest block does not include inter-block roads, unless stated otherwise in a measurement protocol.

Harvest Design: One pass harvest design – All currently merchantable stands in an operating area are scheduled for harvest over a period of 1-5 years.
Two pass harvest design –All currently merchantable stands in an operating are scheduled for harvest over a period of 6-20 years.
Three pass harvest design – All currently merchantable stands in an operating area are scheduled for harvest over more than a 20 year period.

Harvest Systems: The harvesting method in which the trees are processed and brought to roadside. Harvest systems include:

Complete tree –includes roots, stump, top, and branches.
Whole tree - includes stump, top, and branches.
Full tree – includes top and branches.
Tree length – includes tree stem only, stem is limbed and cut to predetermined top sizes at stump-side.
Short wood – includes tree stem only, stem is cut to predetermined lengths and top sizes at stump-side

In-Block Road (See Roads)

Inter-Block Road (See Roads)

Individual Trees (See Silvicultural Systems)

Intermittent Streams (see Stream)

Island (See Silvicultural Systems)

Lake is a general term referring to all bodies of standing water without regard to size. (Fish Habitat Protection Guidelines, Road Construction and Stream Crossing, SERM/DFO, 1995).

Landing is the area directly adjacent to a road used for the decking of timber.

Limited Harvest Zone means the portion of the riparian management area in which a predetermined volume of merchantable trees is retained subsequent to harvest.

Management Unit is a forest-level landscape unit within an FMA area. Management units are defined by permanent natural biophysical features (watersheds, ecological zones, etc.) socio-cultural features (administrative boundaries, FMA area boundaries, federal and provincial parks, furblocks, Cold Lake Air Weapons Range, etc.) and/or a combination of both. A Management Unit is used to track broad forest-level attributes. Weyerhaeuser Pasquia-Porcupine refers to management units as compartments.

Marsh (See Wetlands)

Merchantable Tree as defined in the licensee's Twenty Year Forest Management Plan.

No Equipment Zone means that portion of the riparian management area in which all equipment and mechanical devices shall not travel or otherwise come into contact with the ground cover; and is subject to the retention requirements identified in the adjacent limited harvest zone.

No Harvest Zone means that portion of the riparian management area in which no disturbance from forest operations is allowed.

Overstory Tree Species are species that form a continuous canopy forest of any age or size class with a minimum crown closure of 10% density, excluding treed muskeg.

Operating Area is a portion of land within a management unit. Operating areas are delineated by permanent natural biophysical features (water bodies, unproductive areas, etc.), socio-cultural features (administrative boundaries, FMA area boundaries, federal and provincial parks, fur blocks, Cold Lake Air Weapons Range, etc.) and/or a combination of both. An operating area comprises the functional landscape unit used in operational planning and harvest scheduling. Weyerhaeuser Pasquia-Porcupine refers to operating areas as sub-compartments.

Pre-Commercial Thinning (See Stand Tending)

Reclamation means the restoration, to standards acceptable to the Minister of Environment, of the ecosystem functions and processes of land disturbed by a licensee in the construction and maintenance or roads, processing facilities, camps, staging or timber storage areas or any other development used in connection with the harvesting of forest products (*Forest Resources Management Regulations*).

Reforestation is the natural or artificial restocking of an area with forest trees. Typically refers to planting (Dunster & Dunster, 1996)

Regeneration The renewal of a forest or stand of trees by natural or artificial means, or the stand of young trees under 1.3 metres high that results. (Dunster & Dunster, 1996)

Reservation is a strip of undisturbed vegetation along a stream or lake left to protect the water body from the effects of road construction and forest operations on adjacent land. Reservation width is measured on each side of the stream from the top of the actual streambed bank or on lakes from the lake ward edge of the terrestrial vegetation.

Riparian Areas are "ecotones" or interfaces between terrestrial and aquatic "ecosystems". Gradients in environmental conditions, ecological processes, and species composition make these areas some of the most structurally and functionally diverse and dynamic portions of forested landscapes.

Riparian Management Areas are distinct spatial boundaries designated to achieve specific management goals for riparian areas and may contain zonation or elements including both aquatic or terrestrial environments associated with or outside the riparian ecotone.

Riparian Reservation is a strip of undisturbed vegetation along a stream or lake left to protect the water body from the effects of road construction on adjacent land. Reservation width is measured on each side of the stream from the top of the actual streambed bank, or on lakes from the lakeward edge of the terrestrial vegetation. (Fish Habitat Protection Guidelines, Road Construction and Stream Crossing, SERM/DFO, 1995).

Road Closure (See Roads)

Roads

In-Block Road is a road constructed by a licensee that originates and terminates within the same harvest block, used exclusively for the decking of wood originating from within the block.
Inter-Block Road is a road constructed by a licensee, which connects operating areas and harvest blocks.
Road Building Debris is debris, which is created as a result of road construction. This

material will often consist of stumps, pieces of wood and rocks.

Road Closure is the effective blocking of a road by way of a barricade or other obstacle to prevent vehicular traffic.

Rutting is a depression resulting from machine traffic (excluding site preparation implements).

Selection (See Silvicultural Systems)

Shelterwood (see Silvicultural Systems)

Slash is the residue left on the ground as a result of forest and other vegetation being altered by forest operations or other land use activities

Silvicultural Systems

Planned programs of treatments throughout the life of the stand to achieve stand structural objectives based on integrated resource management goals. A silvicultural system includes harvesting, regeneration and stand-tending methods or phases. It covers all activities for the entire length of a rotation or cutting cycle. Silvicultural systems are classified according to the method of harvesting mature stands. (Silvicultural Systems Guidebook, Forest Practices Code of British Columbia, April 1995)

Types of Silvicultural Systems:

Clearcut is a type of silvicultural system, based on a harvesting method in which all merchantable timber in a designated area is harvested in a single entry. Clearcutting results in a new, even-aged stand of trees, which can be naturally or artificially created. Clearcutting can be implemented in blocks, strips, or patches. (adapted from Dunster & Dunster, 1996)

Variable Retention is a type of silvicultural system based on a harvesting method in which most merchantable timber within a designated area is harvested in a single entry. Some of the merchantable timber is retained in islands, clumps, and individual trees scattered throughout the block resulting in a new, even-aged stand of trees, which can be naturally or artificially created.

Island is a contiguous area at least 2 ha in size that is completely enclosed within a disturbance. (Modified - Vegetation Pattern Indicators, Version 6.3. Saskatchewan Environment and Resource Management. 2001).

Clump is a contiguous area of less than 2 ha that includes more than four trees, completely enclosed within a disturbance. Clumps are essentially small islands, and the distinction is a practical and computational convenience. (Modified - Vegetation Pattern Indicators, Version 6.3. Saskatchewan Environment and Resource Management. 2001).

Individual Trees are single trees or groups of four or less trees completely enclosed within a disturbance. (Modified - Vegetation Pattern Indicators, Version 6.3. Saskatchewan Environment and Resource Management. 2001).

Selection is a classification of silvicultural system based on a harvesting method used to create or maintain uneven-aged stands, usually by the periodic removal of groups of trees or individual trees. It is undertaken to provide periodic harvests while maintaining full residual stand growth rates. The cutting usually involves a mixture of regeneration and improvement cuts. Note that selection cutting is not the same as selective cutting. (adapted from Dunster & Dunster, 1996)

Shelterwood (includes Spruce Understory Protection) is a classification of silvicultural system based on a harvesting method in which mature trees are removed in a series of cuts to achieve a new even-aged stand under the shelter of remaining trees. Regeneration may be planted, be natural regeneration from seed, or be pre-established through advance regeneration from the pre-harvest stand. (Silvicultural Systems Guidebook, Forest Practices Code of British Columbia, April 1995)

Site Preparation is any action taken in conjunction with a reforestation effort (natural or artificial), to create an environment favourable for survival of acceptable trees. This environment can be created by altering the ground cover, soil, or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods. (Adapted from Dunster & Dunster, 1996).

Scarification is one form of site preparation which involves the mechanical disturbance of the forest floor (duff, litter, soils) … to create better seedbed conditions for the germination of seeds derived from standing trees or slash. (Dunster & Dunster, 1996).

Soils

L, F. and H-These organic horizons define the forest humus form and develop primarily from the accumulation of leaves, twigs, and woody materials. They are normally associated with upland forested soils with imperfect drainage or drier.

L- Often referred to as the litter layer, this organic horizon is characterized by an accumulation of organic matter in which the original structures are easily discernible.

F- Often referred to as the Fibric layer, this organic horizon is characterized by an accumulation of partly decomposed organic matter. Some of the original structures are difficult to recognize. The material may be partly broken down by soil fauna as in moder, or it may be a partly decomposed mat permeated by fungal hyphae as in mor.

H-Often referred to as the Humic layer, this organic horizon is characterized by an accumulation of decomposed organic matter in which the original structures are indiscernible.

This horizon differs from the F by having greater humification due chiefly to the action of organisms. It is frequently intermixed with mineral grains, especially near the junction with a mineral horizon

http://sis.agr.gc.ca/cansis/taxa/cssc3/chpt2.html The Canadian System of Soil Classification, 3rd ed. Agriculture and Agri-Food Canada Publication 1646, 187 pp

Organic soils: Organic soils are particularly susceptible to rutting and puddling. The very low load-bearing strength of these materials means that they have a high soil displacement hazard and a very high soil compaction and puddling hazard

B.C. Ministry of Forests. 1999. Hazard assessment keys for evaluating to soil degrading processes guidebook. 2nd ed., Version 2.1. For. Prac. Br., Victoria, B.C. Forest Practices Code of British Columbia Guidebook.

Soils are classified as Organic if they have a layer of fibric organic matter (Of) >60cm thick, or a layer of mesic or humic organic material (Om, Oh) .40cm thick. Organic order soils are largely composed of organic materials and include most of the soils commonly known as peat, muck, bog or fen soils. Most organic soils are saturated with water for prolonged periods. The Folisol great group of organic soils are the exception. Folsols consist of upland organic materials of forest origin and are well to imperfectly drained.

Soil Disturbance is area in which forest floor vegetation and/or tree stumps are removed exposing organic or mineral soil.

Stream is a general term referring to bodies of flowing water without regard to the volume of water transported, including intermittent and ephemeral streams. (Fish Habitat Protection Guidelines, Road Construction and Stream Crossing, SERM/DFO, 1995).

Ephemeral Streams are streams, which flow briefly, only in direct response to precipitation in the immediate locality and whose channel is at all times above the water table. (Dunster & Dunster 1996).

Fish Bearing Stream is any stream, including an intermittent stream that is used by migratory or resident fish at any time of the year, or has the potential for such use if stocked. (Fish Habitat Protection Guidelines, Road Construction and Stream Crossing, SERM/DFO, 1995).

Intermittent Streams are streams in contact with the groundwater table that flow only at certain times of the year, such as when the groundwater table is high and/or when the stream receives discharge from springs or from surface water sources. (Dunster & Dunster 1996) Intermittent streams are regular streams that carry flow for at least part of the year besides the spring runoff period. At the time of the site assessment or harvest, these streams may or may not be flowing, however they do have an identifiable stream channel.

Stream Bank the rising ground bordering a stream channel, below the level of rooted terrestrial

vegetation and above the normal streambed, which restricts lateral movement of water at normal water levels. (Dunster & Dunster 1996)

Stream Bank (see Stream)

Swamp (See Wetlands)

Top of slope is the first bench that occurs perpendicular to the no equipment zone that is less than 15% for a minimum of 10 metres.

Undamaged Tree is a straight tree remaining on the site post harvest with less than one-third bark scar damage to the bole circumference.

Understory Tree is a tree growing in the understory which is between 1.5 – 10 meters in height.

Variable Retention (See Silvicultural Systems)

Viewshed is a physiographic area composed of land, water, biotic, and cultural elements that may be viewed and mapped from one or more viewpoints and which has inherent scenic qualities and/or aesthetic values as determined by those who view it.

Visual Impact Assessment (VIA) - is an assessment that is carried out to demonstrate that forest operations are consistent with the established visual quality objective(s) for a visually sensitive area. A VIA simulates, in perspective view, the visual effects on the landscape of proposed forest operations, or modification operations (adapted from BC Visual Impact Assessment Guidebook, 2001)

Visually Sensitive Areas (VSA's)- are viewsheds that are visible from communities, public recreation areas and major travel corridors, including roadways and waterways, and any other significant viewpoint identified through the planning process;

Visual Quality Objectives (VQO's) are resource management objectives identified in Integrated Forest Land Use Plans, Forest Management Plans or in Operating Plans that reflect the desired level of protection of visually sensitive areas within the management area. VQOs also refer to the extent to which a defined landscape is to be managed for aesthetic values:

a. High aesthetic priority - Harvest blocks are designed to be minimally visible;
b. Moderate aesthetic priority - Harvest blocks are visible but designed to be subordinate in the viewscape;
c. Low aesthetic priority - Harvest blocks are dominant in the viewscape.

Wetlands areas of land that are inundated by surface water or groundwater, which normally supports a

prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction. In the Canadian Wetland Classification, the wetland classes are: bog, fen, marsh, swamp and shallow open waters. (Dunster & Dunster 1996)

Bog a wetland ecosystem made up of in-situ accumulations of peat, either moderately or only slightly decomposed, derived primarily of sphagnum moss. Bog water is acidic, usually at or near the surface and unaffected by the nutrient rich groundwater found in the adjacent mineral soils. (Dunster & Dunster 1996)

Fen a landscape of low lying peatland, made up of partly to well decomposed sedge materials, where the water is at or near the surface and fed by relatively fast moving, nutrient rich groundwater that is usually neutral or alkaline and rich in calcium. (Dunster & Dunster 1996)

Marsh an area of low lying land, poorly drained, periodically or permanently inundated with standing or slow moving nutrient rich water and subject to seasonal fluctuations. Marshes usually have a mineral soil base, are dominated by emergent, non-woody vegetation such as rushes, reeds, cattails and sedges and exhibit pronounced zonal or mosaic patterns of pools, channels and clumps of vegetation, surrounded by grassy meadow and bands of trees. (Dunster & Dunster 1996)

Swamp a type of wetland where trees or tall shrubs dominate a landscape characterized by periodic flooding. Swamps have a nearly permanent, subsurface, nutrient-rich water flow through the substrate of mineral sediments and organic materials. (Dunster & Dunster 1996)

Winter Season The time period from December 1 to March 31.

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