



Objective

- 1) To minimize the non- frozen operations impact on forest soils and return disturbed areas to pre-harvest productive capacity
- 2) To conduct non-frozen operations in accordance with the FERIC research project titled “Preventing Soil Compaction and Rutting in the Boreal Forest of Western Canada.”

For the purpose of this guideline “**disturbed area**” refers to roads, landings, and chipper sites.

Decompaction:

To minimize the impact of operations, the following strategies will be employed:

- Two Phase Road Construction:
 - I. Stumps and debris pushed off to one side of the road
 - II. Top soil separated and piled on the opposite side of the road from the stumps and debris
- Soil decompaction and rollback of disturbed areas
- Planting and/or seeding disturbed areas with approved native tree species
- Use of low ground pressure equipment (i.e. floatation tires on skidders) if required.

Monitoring:

Monitoring of roads and landings occurs several times prior to the establishment survey in the form of monitoring flights.

- DMI is committed to an annual monitoring program of all roads until final reclamation work has been completed.
- Where vegetation is found to be satisfactory, reclamation responsibilities have been met.

As these roads are within blocks, establishment surveys are also conducted 3 to 5 years after harvest to determine merchantable species regeneration.

- The company is legislated to reforest any cut over areas. Any deficiencies noted at the time of the establishment survey will be addressed through re-treatment of the block.

Pre-Harvest Assessments

Blocks will be selected for non-frozen ground harvest based on the following criteria:

- Proximity to all weather roads.
- Characteristics of soil, drainage, slope and species composition.
- Blocks dominated by aspen will be selected first due to the potential of higher, dry sites with lower soil moistures.
- Blocks containing aspen and balsam poplar will be selected second as these sites may have higher soil moistures but, should support low ground pressure equipment during non-frozen operations with minimal site disturbance.
- Although sites containing coniferous species may be selected as potential non-frozen ground sites, these sites will have higher soil moisture conditions and will be more prone to site degradation resulting from operations. As such, they typically will be scheduled to take advantage of overnight freezing conditions as much as possible.

Road Standard:

- New cut roads will be constructed to a **maximum** 5.0 m (average), running surface in harvest blocks.
- New cut roads and chipper landings within blocks will not exceed the Soil Conservation Strategy Guidelines of 5% of block area.
- Roads adjacent to chipper landings will be widened to a maximum of 10 m to allow traffic to pass Super ‘B’ Train chip trucks that are actively loading at the chipper.





Risk of Soil Rutting*:

Three factors affect the water content of soil that are important to rating soil according to its susceptibility to rutting: 1) texture 2) water content 3) position of the soil in the landscape. These three factors are the basis for rating the susceptibility to rutting. In general, organic soils tend to be wet; fine textured, mineral soils retain more water longer than coarse-textured soils. The strength of fine-textured soils is more affected by differences water content than are coarse-textured soils. Flat and concave slopes tend to accumulate water or drain more slowly than adjacent slopes. Steep slopes have a high susceptibility because wheel slip is more likely to cause ruts.

Soil texture, water content, and landscape position are given a numerical rating of between one and three as outlined in the following table. Multiplying the rating for soil, water, and landscape together causes water to have an exponential effect on the numerical rating. Limiting the rating to only two textures of inorganic soil, fine and coarse, also places more emphasis on soil water. The two textural classes are justified by current research, which is finding that differences in soil modification attributed to texture are smaller than previously thought.

CATEGORY/CLASS	RATING
Soil	
Coarse textured mineral soil (less than 20% silt and clay)	1
Fine textured mineral soil (greater than 20% silt and clay)	2
Organic soil	3
Soil Water Content	
Frozen soil with high water content	0
Dry (soil crumbles when crushed)	1
Moist (loose soil forms weak clod when compressed)	2
Wet (soil deforms when compressed)	3
Landscape	
Gentle slopes and convex slope positions	1
Flat and concave slope positions	2
Steep slopes (greater than 30%)	3

****Multiply Ratings Together****

RISK OF RUTS FORMING	RATING RANGE
Low	1-4
Moderate	5-11
High	12-27

* Alberta Forest Products Association and Alberta Land and Forest Service. 1999. *Forest Soils Conservation*. Task Force Report. Edmonton, Alberta.

SOILS are considered to be RUTTED when the impacted area is greater than one tire rotation (4 m in length), and where the depth is greater than 10 cm into the mineral soil. ORGANIC SOILS are considered to be RUTTED when the depth exceeds 20 cm below the surface of the forest floor.





Target Audience	VERIFICATION / NOTES
<p>SKIDDER & BUNCHER OPERATORS</p> <ul style="list-style-type: none"> A Pre Work Conference will be held with the operator, on-site foreman and a Forest Resources Supervisor to review the Work Plan and Soil Conservation Issues. <ul style="list-style-type: none"> Specific site issues such as soil rutting risk and soil drainage will be identified and discussed. 	<ul style="list-style-type: none"> Operators will follow the work plan. Operators will avoid localized wet areas. <ul style="list-style-type: none"> NOTE: Standing water will not always provide the indicator of a 'wet' area. Willow pockets, areas of dense sedge grass or riparian corridors are indicators of 'wet' areas. Where possible, operators will avoid multiple passes in a single track. If rutting occurs, equipment will shut down IMMEDIATELY and the on-site foreman will be contacted (operator shutdown). Once operations have been shut down, operators require approval for re-start. When in doubt about operating conditions, stop work and ask!
<p>ON – SITE FOREMAN</p> <ul style="list-style-type: none"> The Forest Resources Supervisor will field walk with the on-site foreman areas of higher risk soil disturbance identified on the Work Plan 	<ul style="list-style-type: none"> Upon operator 'shutdown', assess block for other areas to bunch or skid wood. <ul style="list-style-type: none"> Contact a Forest Resources Supervisor upon confirmation of 'shutdown' (foreman shutdown). Start up when there is no rutting risk from equipment. <ul style="list-style-type: none"> The soil 'ribbon test' will facilitate a recommencement decision or not. Review, with sign off, the work plan with all workers not present at the initial Pre-work conference.
<p>FOREST RESOURCES SUPERVISOR</p>	<ul style="list-style-type: none"> Forest Resources Supervisors will re-visit high-risk soil disturbance sites concurrent with operations' inspections. Site visits will be conducted for all identified shutdowns. <ul style="list-style-type: none"> Conduct and documented ribbons tests for the site Will consider risk of soil rutting and rate of soil drainage. Must approve operations 'start up' following an operator / on-site foreman shut down.

REVISION HISTORY

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APPROVAL:

Approved:	S. ELKINS	EMS Coordinator – Forest Resources
Approved:	J. GOETSCH	Business Unit Leader - Forest Resources

