

### **PURPOSE**

This guide is intended to assist BCTS clients and staff in recognizing wet weather and ground conditions that may impact worker safety, damage to the environment and damage to road systems. The Guide also provides suggested operational shut down conditions when intense rain fall events occur, or when continuous periods of rain have occurred over several days.

The primary control mechanism to protect water quality is through operational controls such as BCTS Environmental Field Procedures (EFP's) as part of the Environmental Management System (EMS). The EMS plays a significant role in maintaining water quality as it requires licensees and contractors to manage erosion and sediment delivery into water features. If the operation controls cannot adequately maintain water quality and control, operations should cease immediately.

Operational conditions where shutdown guidelines can be used are where operations are identified in a Terrain Stability assessment area and issues have been noted in a report. Wet Weather Shutdown guidelines can also be used in areas where terrain classification is mapped as Class V, Class IV, Class III or operations are on slopes greater than 60%.

Site conditions where shutdown guidelines can be used are where Site Plans have identified sensitive soils where erosion, compaction and displacement are rated as very high and there is a 5% maximum soil displacement is identified.

Discontinue logging and road building activities during particularly intense rainstorms can reduce the risk of landslide, erosion events and landslides. If the total amount of rainfall over a specific time period is excessive, the operations should be halted to avoid environmental damage.

### **BCTS EMS Requirements**

The following are related operational requirements in BCTS EFP's # 4 and # 5 that apply to harvesting and road management activities:

- ❖ Operate during favourable weather and site conditions;
- ❖ Implement strategies to minimize impacts to soil productivity and water quality;
- ❖ Avoid excessive soil disturbance;
- ❖ Utilize sediment control measures (i.e. silt fences, hay bales, rock armouring, water bars and sediment ponds as appropriate);
- ❖ Clean introduced debris from ditches, culverts and streams on an ongoing basis.



### **STOP WORK**

**and contact your project supervisor and the BCTS representative if:**

- You experience unfavourable weather or site conditions that could cause environmental damage.
- You observe conditions that have the potential for immediate environmental damage.

Environmental indicators for shutdown and evacuation of worksite for safety purposes include:

- 1) Sudden muddy waters in creeks, gullies and ditches (FPPR 39) (FPPR 79 (6) (b) ;

- 2) Sudden lack of flow in creeks during wet weather;
- 3) Cracks appearing in the soil;
- 4) Sloughs  $\geq 1$  meter x 1 meter;
- 5) Anchor stumps pulling out of wet soil;
- 6) Landslides occurring in the general area, or sounds of landslides occurring;
- 7) Sloughs in road cuts, especially during road constructions or deactivation.
- 8) Rutting / Compaction is occurring due to ground based operations (FPPR 35) (Refer to FS759E).

**Harvesting and Road Activities: Also refer to related requirements outlined in BCTS EFP #04 Road Bridges and Major Culverts and EFP # 05 Harvesting.**

Activity	Recommended Practices	Recommended Shutdown Conditions
<p><b>Trail Construction</b> (this includes pilot trails for during road construction)</p>	<ul style="list-style-type: none"> <li>➤ Locate skid and pilot trails in areas that minimize excavation where possible (avoid steep cuts, seeps, and wet areas).</li> <li>➤ Maintain drainage concurrently with skid trail or pilot trail construction by utilizing cross-ditches/swale, skid culverts/log bundles including wood puncheon at all seeps and water courses (NCDs and classified water courses). Highly erodible materials may require temporary rock armouring. Water bars may be necessary on steeper grades especially when rutting occurs.</li> <li>➤ Install cross-ditches/swales and water bars during periods of inactivity.</li> <li>➤ Utilize sediment control measures where necessary at key control points.</li> <li>➤ Locate pilot trails in areas that minimize excavation and optimize material use, where possible (avoid steep cuts, seeps, and wet areas). Where possible, do not deviate from pre-located road locations.</li> <li>➤ In areas of significant wet ground, pre-construct this section with Excavator (i.e. install geotextile, rock ballast etc.) may be necessary.</li> <li>➤ Prior to any excavations on wet ground, consider utilizing techniques to minimize excessive disturbance such as using geotextile, matting, puncheon or rock ballast. Have a Plan prior to starting.</li> <li>➤ Ensure ruts are cross ditched to allow drainage.</li> <li>➤ Maintain natural drainage concurrent with trail construction.</li> <li>➤ If surface becomes rutted to the extent that water begins to pool or road surfaces become saturated from a lack of drainage, install drainage controls such as cross ditches, swales and/or water bars.</li> <li>➤ Back blade to remove ruts and hasten materials to dry when conditions allow.</li> </ul>	<p>1) Ground based operations should cease if the following conditions develop:</p> <ul style="list-style-type: none"> <li>• Water is transporting visible siltation or sediment towards streams;</li> <li>• Excessive rutting of 15cm or greater depth is occurring.</li> </ul> <p>2) Operations should be modified or suspended where there is abundant hill slope runoff i.e. during spring freshet or periods of high runoff from prolonged heavy precipitation.</p> <p>3) Suspend operations if wet weather causes excessive erosion and rutting particularly where sediment flow is noticeable or when construction material (soils/parent material) loses its stability to hold its shape.</p>

Pilot trail construction to be completed to address rain events, erosion control in conjunction with road building.



<p><b>Ground Skidding</b></p>	<ul style="list-style-type: none"> <li>➤ Machine use should be limited to areas where excessive scour, rutting, or compaction is avoidable. This would generally restrict machine use from areas of moderately steep slopes as well as any localized areas of wet, soft, or very loose soils. This is intended to reduce the likelihood of concentrated or redirected drainage, as well as shallow subsurface water interception.</li> <li>➤ Maintain drainage features clean out introduce debris concurrent with operations.</li> <li>➤ Utilize sediment control measures where necessary at key control points.</li> </ul>	<ol style="list-style-type: none"> <li>1. Ground based operations should cease if the following conditions develop:             <ul style="list-style-type: none"> <li>● Water is transporting visible siltation or sediment towards streams,</li> <li>● Excessive rutting of 15cm or greater depth is occurring.</li> </ul> </li> <li>2. Operations should be modified or suspended where there is abundant hill slope runoff i.e. during spring freshet or periods of high runoff from prolonged heavy precipitation.</li> <li>3. Suspend operations if wet weather causes excessive erosion and rutting particularly to the extent where sediment flow is noticeable or when construction material (soils/parent material) loses its ability to hold its shape.</li> </ol>
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Repetitive machine traffic while skidding can create rutting. During or after rain events saturated soils are vulnerable to compaction and rutting.

### Cable Skidding

- Fall, skid, and yard away from all streams and NCDs where practicable.
- Avoid cross-stream yarding and keep all riparian features clear of debris.
- Where possible, avoid excessive repetitive scouring.
- Maintain drainage features clean out introduce debris concurrent with operations.
- Utilize sediment control measures at key control points.



### Hauling and Road Use

- Operate during favourable weather and site conditions
- If hauling during marginal conditions prolong haul window and minimize road damage by daily tending of the road surface.
- Utilize sediment control measures at key control points.
- Minimize accumulation of moisture to road surface, install temporary waterbars (well skewed) and spot surfacing of short sections.
- Operate during favourable weather and site conditions.

1. Road use should be suspended if:
  - Road surface runoff is transporting visible siltation or sediment into streams,
  - Road surface becomes soupy
  - Ruts become sloppy and deformed
 Acceptable depth of ruts is subject to discretion depending on site conditions. In general, pick-up truck access should be un-impeded.



Hauling while roads are saturated at the onset of break-up, during or after significant rain events can lead to rutting. This creates the possibility for erosion and sediment deposition into ditches and stream.

<p><b>Road Maintenance / Deactivation</b></p>	<p>➤ Schedule road works required in fine textured soils during dry weather condition i.e.: summer/fall dry.</p>	<ol style="list-style-type: none"> <li>1) Material does not hold intended shape or achieve desired compaction when handled.</li> <li>2) Proceed with grading only under dry or slightly damp conditions.</li> </ol>
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Complete road maintenance / grading to be completed when roads are dry. Fines on roads will be easily transported in a rain event.

