SAFEWOODS

Woodlot Licence & Community Forest Agreement Safety Committee

Rainfall Shutdown Procedures - Overview for Licensees

Hazardous geotechnical processes are more likely to occur under some environmental conditions than others. Specifically, many mass movement processes, such as landslides and debris flows, occur when the ground is unusually wet, and slope instability is elevated. As part of their duty to ensure worker safety, Licensees have responsibilities to make sure workers are aware of the risks and have a plan to respond. One might ask why a Rainfall Shutdown Procedure is necessary now, if one has not been needed in the past. In a world of changing weather, think of it as a seat belt. As a safe driver, you may have never needed it to save your life, but when the unexpected happens, you sure appreciate you have it. Having a simple process to monitor rainfall and to train crews in recognizing when conditions are changing for the worse can save lives.

Elements of a Rainfall Shutdown Procedure

An effective Rainfall Shutdown Procedure has several essential elements.

- Drainage Rate – This is a measure of how fast water passes through the terrain in a region. It is specific to the area in which you are located and is the land base's response to typical rainfall levels. This should be available from the MoF for your area. See below link for a document with guidelines for rainfall amounts.
- 24-hour, 48-hour rainfall – These reports on rainfall accumulations as measured by a weather station, typically an established MoF weather station but can be an airport, municipal or in-site station. The weather station data you use must be representative of the area where you are operating.
- Immediate Rainfall – Rainfall measured with a rain gauge located at or near the operating location. Monitoring on-site changes to the local water balance helps crews make decisions to help ensure their safety.
- Soil Water Balance – Based primarily on the volume of rainfall inputs and the drainage rate, this is a measure of the how much water is in the soil. Soil water balance is a key indicator of landslide risk. Sites with an elevated and increasing soil water balance have greater potential risk of slides.
- Hazards associated with access routes versus on-site hazards – Planners and workers need to be aware of the risks at their immediate worksite as well as along their travel routes. Even though a work site might be safe, roads into and out of the area can be at risk of being impacted by terrain instability.
- Triggers – During and following peak rainfall events when the soil water balance is high, there are

several triggers that can initiate slides. These include but are not limited to:

- Increasing soil water balance
- Machinery on slopes – during road building or harvesting
- Blasting
- Wind generated tree action
- Impounded water (blocked culverts)
- High stream flow mobilizing bed loads

- Stream flow as an indicator – Remind workers to check stream levels in their work areas. Particularly high stream flows and streams with a great deal of suspended material (colour) are often indicators of a system that is approaching its limit with regards to handling incoming water.
- Rain on snow - While immediate rainfall and soil water balance are helpful indicators of terrain stability hazards, workers must be aware of snow in and above their work area and access route. Rising freezing levels and rain-on-snow can significantly increase stream flows and the risk of slides and debris flows. Workers should be aware of potential impacts if there is snow above them.

Post-Event Best Management Practices

Following a significant rainfall event, there are safety matters to address before workers re-start work. Typically, if none of the triggers above are present, it is usually safe to re-enter areas once the soil water balance is declining and it is at least 24 hours since the peaks in rainfall and soil water balance.

An effective Rainfall Shutdown Procedure includes a plan to resume work safely. Apply the following best management practices.

1) **Access** – Before resuming work, check the access route to verify there are no washed-out roads, slides or destabilized areas.
2) **Drainage structures** – After major events, conduct a detailed inspection of drainage structures. Make sure they have not been compromised during high rainfall / stream flow. Failure to check structures can lead to ongoing / increasing damage and eventual loss of access.
3) **Destabilized timber** – High rainfall accompanied by heavy winds can de-stabilize standing trees. Have a close look, especially at trees that are exposed or immediately beside road cut banks.

Summary

Each Licensee is not necessarily responsible to develop a Rainfall Shutdown Procedure for their crews, but they are responsible to ensure that an appropriate procedure is available, that it has been communicated to crews and that they follow it. Identification of site-specific hazards is an important responsibility. Failure to properly assess and mitigate hazards can lead to injury and death. In a world with changing climate conditions, it pays to be prepared even for issues which are uncommon.

Links:

- Wet weather safety shutdown landslide prone terrain definition
- Wet weather safety shutdown criteria harmonization
- Wet weather safety shutdown field table
- Wet weather safety shutdown calculation spreadsheet