

Geohazards Related To Coal Mining Along The Eastern Slope Of Turtle Mountain, Alberta

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ABSTRACT

The four main factors contributing to the instability of Turtle Mountain and possible causes of the 1903 Frank Slide, a deadly rock avalanche, are: 1) Geological Structure, 2) coal mining along the east slope of the mountain, 3) weather and 4) seismic activity in the area. This paper will discuss the affects of coal mining on the instability of Turtle Mountain.

Coal mining along the eastern slopes of Turtle Mountain took place from 1901 to 1918. Although the geological structure is generally considered the main instability factor, early investigators observed that it is almost impossible to avoid the conclusion that the opening of the coal mine must have weakened the mountain considerably. It is significant that the edge of the 1903 slide corresponds closely with the limits of mining at that time. The continuation of mining after the 1903 slide contributes to the present instability of the South Peak of Turtle Mountain. A strongly fractured part of the eastern limb of the Turtle Mountain Anticline is still hanging above the valley, just below South Peak. Extensive coal mining took place from 1903 to 1918 in the area below South Peak. A federal committee of geologists and a mining engineer (the so called Daly Commission) recommended in 1911 that no coal mining take place in this Danger Zone. This recommendation was ignored from 1911 till 1918, resulting in increased instability.

The instability of South Peak has been studied and monitored with interruptions since 1930. In early 2003, the Alberta Government announced an initiative to install a state-of-the-art monitoring system on South Peak. Installation is planned to be complete by March 2005. This system might provide early warnings for future rock slides from South Peak.