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In 2009, the lower portion of an ancient landslide was re-mobilized, threatening the integrity of the left abutment of Lower Cabin Creek Dam, a 95-foot-high zoned embankment and rockfill dam located at near Elevation 10,000 feet in the Colorado Rocky Mountains. The dam is part of the Cabin Creek Pump Storage Project owned and operated by Xcel Energy. The ancient landslide, which is located immediately upstream of the left abutment and extends to about 450 above the dam was previously re-mobilized during original dam construction in 1965, causing a landslide that resulted in construction fatalities. This paper discusses initial emergency actions that were taken in 2009-2010 to armor and protect the outlet valve house from potential landslide impact and burial, assess the potential for a seiche wave and reservoir overtopping caused by rapid deposition of up to 60,000 cubic yards of landslide material into the reservoir, and to stabilize a landslide that was moving up to 2 inches per day. A cooperative review process between several key State and federal agencies was enacted to allow for timely implementation of emergency measures while addressing dam safety, public safety, and access along Guanella Pass Road, an important high mountain recreation corridor. Geotechnical investigations to characterize the landslide, measures taken to stabilize the landslide, and instrumentation monitoring that continues to be implemented to provide for the safe operation of the Project are also discussed.