

Kennecott Utah Copper Bingham Canyon Mine monitoring system



*Above:
GroundProbe
geotechnical
monitoring
equipment at
Bingham Canyon
Mine*

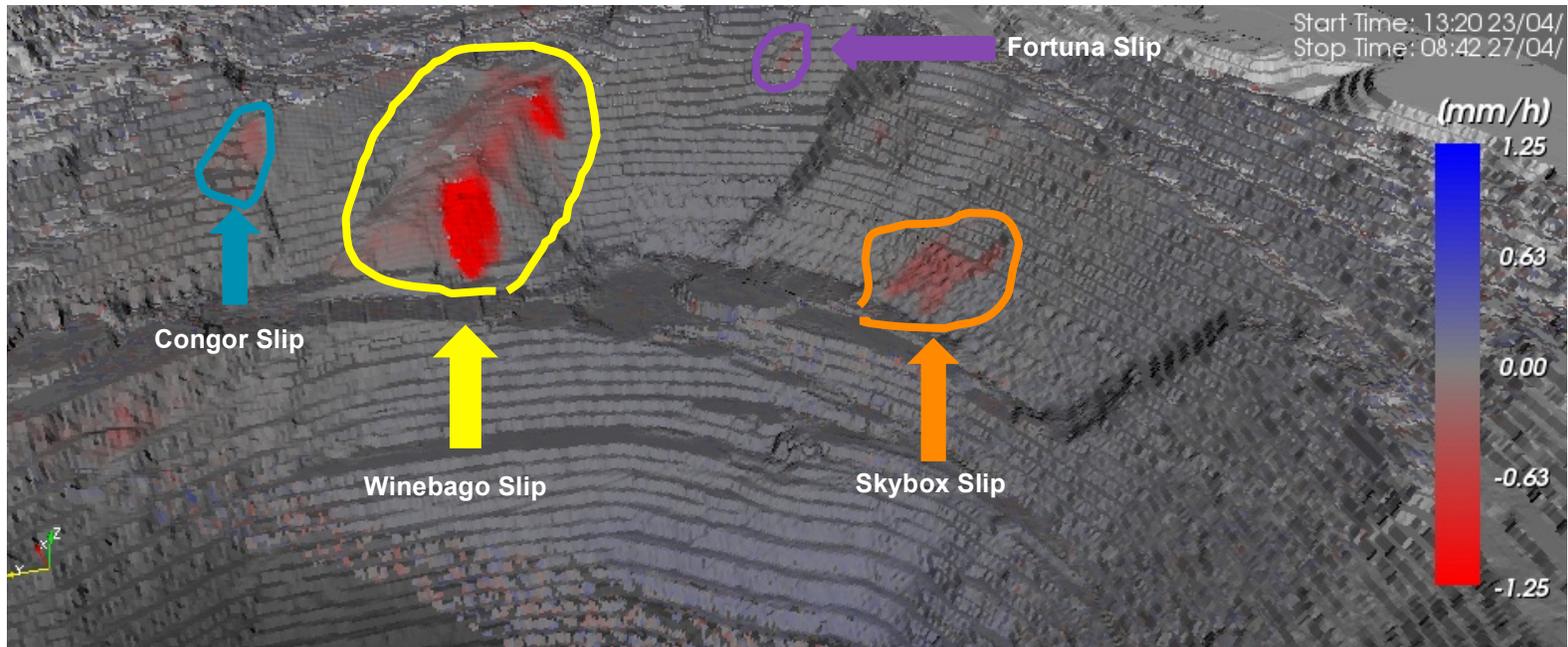
*Find additional
images of our
equipment at
Kennecott.com
newsroom*

Kennecott Utah Copper's Bingham Canyon Mine experienced a slide of its northeast wall on the evening of April 10, 2013. This fact sheet provides an overview of the systems in place at Kennecott to help our highly trained geotechnical experts detect, monitor and plan for slides.

Pit wall movement is infrequent but something we monitor and plan for on an ongoing basis through sophisticated geotechnical equipment. Proactive monitoring allowed us to take preemptive measures to keep employees safe and to enact contingency plans following the slide that took place on April 10.

Our monitoring system includes the trained eyes of more than 800 employees, regular documented inspections of all areas of mining activity by geotechnical engineers, and state-of-the-art equipment.

Proactive monitoring allowed us to take preemptive measures to keep employees safe and enact contingency plans following the slide that took place on April 10.



Above: Sample survey image from Kennecott's IBIS radar system

Kennecott uses real-time data to anticipate movement. Our systems are capable of simultaneously monitoring and analyzing thousands of data points to capture slope movement trends.

Kennecott used geotechnical monitoring data for short-term and long-term mine planning and to maintain a safe and efficient operation before and after the slide. Our systems are capable of monitoring and analyzing thousands of data points to capture slope movement trends. Mine employees were also trained to competently observe and make slope stability determinations in areas that affected their work.

GroundProbe slope stability radars

GroundProbe reports its radars play a crucial role in slope stability monitoring in open pits. They have been developed to remotely monitor movement of slopes in an open pit mine. The slope stability radar depends on advanced survey technology and detects movement by comparing successive slope scans. The advanced analysis tool allows detection of both short and long term slope movement. The radars can be preprogrammed with specific alarm settings. If the alarm is triggered, then mine personnel are notified of the movement, allowing rapid evaluation of the surface deformation.

GroundProbe radar's accuracy level is up to 1/10th of an inch and range of 10,000 feet. The radars are very durable and capable of monitoring mine pit slopes in adverse weather conditions and during low visibility (white out conditions or cloud movement). Kennecott uses three GroundProbe radars.

Right: One of Kennecott's six extensometers

IBIS radar system

Similar to GroundProbe radar, IBIS radar system also incorporate advanced survey technology to monitor slope movement in open pit mines. The radar scans a portion of an open pit in six to eight minutes. IBIS reports the accuracy level of its radars to be 1/100th of an inch within a range of up to 10,000 feet.

IBIS radars are also equipped with alarming capabilities, notifying mine personnel of detected movement in open pit slopes. Like the GroundProbe the IBIS can work scanning the open pit slopes walls during inclement weather conditions.

Extensometer

Wire line cable under tension extends between a supply spool and an anchor to measure tension crack displacement in open pit slopes.

Additional equipment

Kennecott's monitoring system also includes:

- Prism network (220+) and Skyboxes (four robotic theodolites)
- Time Domain Reflectometry
- Microseismic systems
- GIS (geographic information system) data display

