Deadly Mine 'Bump' was Recorded as Seismic Event

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The University of Utah Seismograph Stations recorded a magnitude-1.6 seismic event at the time of a Thursday, Aug. 16 "bump" that killed and injured rescuers at a Utah coal mine where six miners were trapped by an Aug. 6 collapse.

Seismic waves from the event at about 6:39 p.m. MDT Thursday indicate downward motion, consistent with further settling and collapse within the mountain where the Crandall Canyon mine is located.

The University of Utah Seismograph Stations recorded the original mine collapse as a magnitude-3.9 earthquake at 2:48 a.m. MDT Aug. 6. The downward motion of waves from that event - like subsequent "after events," including the one Thursday evening - are indicative of collapse, not of motion generated by natural or "tectonic" earthquakes.

Seismologists at the University of Utah, the U.S. Geological Survey and the University of California, Berkeley, have pointed to increasingly strong evidence that the magnitude-3.9 seismic event on Aug. 6 was the mine collapse itself, not a natural earthquake.

Thursday night's bump was very shallow. Initial seismograph recordings indicated it was less than one-tenth of a mile deep, but considering uncertainties in determining depths of such seismic events, indications are the seismic event happened at a depth of less than one mile. This is quite unlike natural earthquakes, which are deeper.

As of Friday morning, Aug. 17, 22 seismic "after-events" have been recorded within about 2 miles of the mine. Twelve of those were within two days of the original collapse. However, the University of Utah Seismograph Stations installed five new seismometers near the mine, so more of the small seismic waves now are being detected. Thursday night's deadly "bump" was detected both by the new seismometers and by part of the university's pre-existing seismic network.

"These events seem to be related to the ongoing settling of the rock mass following the main collapse on Aug. 6," said Relu Burlacu, network manager for the University of Utah Seismograph Stations.

Coal mining takes place in an arc-shaped area in eastern Utah. An analysis of years of seismicity in that area by Walter Arabasz, director of the University of Utah Seismograph Stations, and his colleagues indicates that less than 2 percent of all seismicity in the coal-mining region is due to natural or tectonic earthquakes, and that 98 percent of the seismicity is caused by mining activity.

Source: University of Utah