

Contract No.: B2532536
Technology: Surface Seismic, "Forward Looking Seismic"
Contractor: Wright State University, Dr. Ernest Hauser

Summary of technology:

A line of vertical geophones was installed on the ground surface near an active mining area across the margin of old mine works (above both air-filled and water-filled mine voids). The seismic vibration associated with the underground mining was passively recorded across the line of geophones. Through a process of cross correlation, each seismic trace was used sequentially as the pilot sweep for correlation with other traces in the recording. Two distinct seismic wave arrival patterns were expected in the data - a direct arrival from the mining operation and an additional signal representing energy scattered to the surface at the interface with the abandoned mine. By processing the data, the location of the abandoned mine could be inferred. Since the method uses vibration from the active mining as the seismic source there is no adverse impact or interruption of the underground work.

Stated limitations of technology, if any:

None stated, however, air-filled abandoned mine entries were not detected in the demonstration.

Field demonstration results:

Field Demonstration Conditions	Goal of Demonstration	Results of Demonstration
Flat ground; 6-foot coal seam; 210 feet deep.	Locate mine entries filled with water.	Detected entries; predicted location off by 90 feet at a distance of 1200 feet.
Flat ground; 6-foot coal seam; 210 feet deep.	Locate mine entries filled with air.	Did not detect any entries.