

Contract No.: B2532532

Technology: In-seam Seismic Method

Contractor: Pennsylvania State University

Summary of technology:

The in-seam seismic method uses the travel time of reflected channel waves to determine the distance to reflection surfaces such as mine voids. Channel waves attenuate less rapidly than other waves in a typical coal seam, increasing the detection range.

Stated limitations of technology:

The detected signal is ambiguous because of its nature. The dispersive characteristics of the wave make data interpretation difficult. In addition, since the test equipment is not intrinsically safe, the test can only be set up in a fresh air entry. The method also requires installation of sensor pairs (at 90 degree orientation) in multiple boreholes, which is labor-intensive.

Field demonstration results:

Field Demonstration Conditions	Goal of Demonstration	Results of Demonstration
Anthracite Mine; 5-foot coal seam; 400 feet deep	Locate mine entries filled with air	Detected entries; predicted location within 30 feet over approximately 150 feet.
General Chemical; 10-foot-thick trona vein; 1700 feet deep	Locate mine entries filled with air	Detected entries; predicted location within 40 feet over approximately 330 feet
FMC Mine; 10-foot-thick trona vein; 1700 feet deep	Locate mine entries filled with water	Detected entries; predicted location within 40 feet over approximately 260 feet.
Agustus Mine; 4-foot-thick coal seam; 300 feet deep	Locate mine entries filled with air	Did not detect entries at 280 feet.
Nolo Mine; 4-foot-thick coal seam; 400 feet deep	Locate mine entries filled with air	Detected entries; predicted location within 20 feet over 180 feet.