Contract No.: **B2532531**
Technology: **In-seam seismic reflection**
Contractor: **Marshall Miller and Associates and Virginia Polytechnic Institute**

Summary of technology:

An array of geophones and seismic sources (explosives) are placed into the face of an exposed coal outcrop. Seismic channel waves emanate from the source and propagate through the coal seam. The channel waves reflect from the mine void and return to the geophones. The recorded reflection data is collected and processed to determine location of void. Since the test is conducted in-seam, the results are not affected by surface topography.

Stated limitations of technology:

Faults or changes in seam thickness can reflect the channel waves and make it difficult or impossible to distinguish from a void. The use of heavy machinery needs to be stopped in the vicinity of the test when the test is performed. Variations in the seismic velocity of a material can result in inaccurate distance determinations. A smooth, intact outcrop face is required for placement of the geophones.

Field demonstration results:

Field Demonstration Conditions	Goal of Demonstration	Results of Demonstration
30-inch-thick gently dipping coal seam; target (void) distance about 1200 feet.	Locate mine entries filled with water	Definitive mine boundary was not detected. Corner of mine workings was detected.
30-inch-thick gently dipping coal seam; target (void) distance about 800 feet.	Locate mine entries filled with air	Entries detected, but distance was inaccurate, possibly due to angle between seismic line and mine boundary.