

Contract No.: B2532535
Technology: Surface Seismic Reflection
Contractor: Blackhawk, a division of Zapata Engineering

Summary of technology:

The surface seismic reflection method employs an array of geophone receivers and a seismic source from the ground surface. The distance to the old mine workings is calculated by using the recorded two-way travel time for seismic energy to propagate from the surface down to the coal seam and reflect back to the geophones. The geophones were set at equally spaced intervals along the ground surface. The seismic source was created using Bay Geophysical's patented MicroVibrator. The electronic source unit can generate shear (S) waves or primary (P) waves independently. The seismic response data was recorded with an Oyo Geospace recording system and a laptop computer.

Stated limitations of technology:

Collapse zones and complex geologic features (such as faults and fractures) can make it difficult to differentiate between areas of voids and solid coal.

Field demonstration results:

Field Demonstration Conditions	Goal of Demonstration	Results of Demonstration
Flat open field	Locate old mine entries filled with water at an approximate depth of 250 feet	Mixed results. Boundary of mine works were detected. Anomalies, however, were also detected outside of the mapped mine workings that could not be fully explained.