



Survey of hydrogeological moving deformation of abandoned mine and numerical simulation of environmental control in collapse area

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ABSTRACT

The hydrogeological movement and deformation caused by the abandoned mine settlement area have a significant impact on the mine construction and ecological environment. The hydrological geological movement and ecological environmental governance in the region have certain importance. On the basis of consulting a large number of literature and on-site investigation, the deformation of the hydrological geology of the sedimentation area is studied by surface monitoring and numerical simulation. Fuzzy mathematics method is used to carry out the environmental impact assessment of abandoned land mines from the mine hydrological environmental environment and geological disaster distribution density. The monitoring results show that there is almost no change in mine levels in this region, and the maximum cumulative offset of X coordinates is –27 mm; the maximum accumulation displacement of Y coordinates is –35 mm; the maximum cumulative settlement of Z coordinate is –13 mm. The simulation results of the fast Lagrange analysis of the Continua (FLAC3D) software show that the maximum displacement of the X forward is 0.168 meters, and the maximum displacement in the X negative direction is –0.197 m. The evaluation results show that the mine area has a slight impact about 219.14 km², the more severe the area of about 53.78 km². This indicates that the settlement of the mine tends to be stable, the horizontal movement is relatively active; the surface can form a depressed basin; most of the mines in the region have a slight effect on the area, the main environmental problems are open-pit and damaged mountains. On the basis of environmental impact assessment, environmental protection and ecological repair countermeasures were proposed for the hydrogeological and damaged mountain environments of mines.

Keywords: Geological deformation; Numerical simulation; Environmental governance; Environmental impact assessment; Ecological restoration

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