**comparision of predicted versus Measured potentiometric surface of room and pillar mine pools**

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**Abstract:**

Pennsylvania Department of Environmental Protection (PADEP) relies on the ability to predict the post-mining potentiometric surface of mine pools as part of their post-mining discharge prevention strategy for non-retreat room and pillar mines. The strategy entails using the mine pool prediction to identify “discharge risk areas” where the post-mining potentiometric surface of the mine pool is predicted to be greater than the land surface elevation. Typically, no-mining zones are developed around these areas to prevent the potential for a post-mining discharge.

PADEP and the Office Surface Mining Reclamation Enforcement (OSMRE) conducted a study that compared the pre-mining predictions developed in the permit application to the actual measured post-mining potentiometric surface of the mine pool to evaluate the effectiveness of the permitting strategy. The prediction for the post-mining potentiometric surface of the mine pool was based on the highest elevation of mining in the mine plan for the four mines reviewed. This prediction strategy produced a discrepancy between the predicted and the actual potentiometric surface of the mine pool that ranged from +20 to +87 feet. The discrepancies resulted in the hydrologic scenario (potentiometric surface > land surface elevation) that the permitting strategy was designed to prevent.

 All four mines reviewed included pre-mining piezometer data to establish the baseline condition of the potentiometric surface of the coal seam as part of the permit application. Using the pre-mining potentiometric head of the coal seam near the highest elevation in the mine plan would have improved the prediction for each of the mines and would have reduced the discrepancy to +/-20 feet for the four mines. PADEP is now using pre-mining piezometer data from the coal seam near the highest elevation proposed for mining as an improved method to predict the post-mining potentiometric surface of the mine pool as part of their discharge prevention permitting strategy.