

FIELD EVALUATION OF OVERBURDEN ANALYSIS METHODS FOR
PREDICTION OF SURFACE COAL MINE DRAINAGE QUALITY¹

by

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Abstract. Prediction of mining-induced water pollution and identification of potentially acid-producing strata are required of surface coal mine operators during the permitting process. In addition to other data, the evaluation often includes overburden analysis. The exact interpretive limits of overburden analytical results are unknown, since their use evolved without systematic verification at mine sites. The Bureau of Mines issued a research contract to Engineers International (Contract J0328037) to evaluate the use of the acid-base account and two simulated weathering methods of prediction of post-mining drainage quality. The experimental method consisted of collection of pre- and post-mining data at adjacent sections of 32 surface coal mine sites. Preserved cores were analyzed where available, but the preponderance of overburden samples were collected from fresh highwall surfaces determined to be as nearly representative of the backfill source material as possible. Post-mining sections consisted of regraded and revegetated spoil, generally reclaimed within four years of the initiation of this study. Drainage quality was monitored at all spoil seep locations over a one-year period. Based on averaged data from the two highest-volume seeps at each site, discharge water quality was evenly divided between acidic and alkaline, and ranged from 410 mg/L alkalinity to 1280 mg/L acidity. The simple relationships between overburden analytical results and drainage quality investigated thus far have not yielded correlations high enough for accurate numerical prediction. However, several overburden parameters were found to have moderate linear correlations ($r = 0.5$ to 0.8) with drainage quality and will be further analyzed.

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