

**WEATHERING CHARACTERISTICS OF SPOIL MATERIALS  
AT LA PLATA MINE, NORTHWESTERN NEW MEXICO.  
AN EIGHT YEAR STUDY<sup>1</sup>**

by

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**Abstract.** In coal mining operations, overburden is often exposed as spoil for extended periods before reclamation is initiated. The overburden rock is stable insitu. However these same materials are generally unstable when exposed by mining. Physical changes result from mechanical forces of excavation, exfoliation, freeze-thaw, and grading with heavy equipment. In addition, substantial chemical changes occur from exposure to water, oxygen, carbon dioxide, and organic compounds. Often, these changes continue after reclamation is complete resulting in backfill materials that are more suitable for reclamation than the relatively non-weathered overburden. This self-mitigation process is particularly evident with non-acid or toxic forming spoil materials. In this study, regraded spoil materials from non-reclaimed areas were sampled in 30 cm increments to a 120 cm depth at 25 locations in 1992. Identical sampling was repeated at 19 of these same locations again in 1996 and in 1999. Statistically significant differences were found with sample depth and with sample time for electrical conductivity, calcium, magnesium, and sodium. There is evidence supporting the hypothesis that spoil quality improves with weathering. There were reductions in sodium adsorption ratio (SAR) and electrical conductivity (EC) with time at La Plata Mine.

Additional Key Words: Surface coal mine, Sodium adsorption rate, and Electrical conductivity

<sup>1</sup>Paper presented at the 2001 National Meeting of the American Society for Surface Mining and Reclamation, Albuquerque, New Mexico, June 3-7, 2001. Pub. By ASSMR, 3134 Montavesta Rd., Lexington KY 40502

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