LAND CAPABILITY CLASSIFICATION OF MINESOILS IN EAST TEXAS.

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Surface mining regulations require successful reclamation of areas disturbed by mining processes to a condition comparable to or better than the pre-mine soil. The regulations also require a plan for reclamation in which proposed uses must be set for the post-mine land. A land capability classification specific to minesoils will facilitate the design of appropriate land uses or alternative uses or alternative uses for reclaimed mine areas based on observed limitations. The proposed system is similar to the Land Capability Classification System (LCCS) used by the United States Department of Agriculture (USDA), National Resources Conservation Service (NRCS). Soil chemical and physical characteristics were measured to determine what limitations occur in minesoils; measurements included soil pH, potential acidity, exchangeable acidity, acid-base account, particle size distribution, available nutrients (N, P, K), amounts of basic cations, electrical conductivity, cation exchange capacity, permeability, cone index, moisture content, and available water-holding capacity. Comparisons were made between pre-mine soils and minesoils from the dragline and cross-pit spreader methods of overburden removal.

Segments of the study site from the dragline minesoil were limited by slope, texture extremes, low pH, and salinity. Based on averages across the entire study site, the capability class of the dragline soil is IIIe. Segments of the study site from the cross-pit spreader minesoil were liminted by slope. Based on averages across the entire study site, the capability class of the cross-pit spreader soil is IIe.

The land capability classes were improved in most cases compared to pre-mine soils due to less extreme slopes and decreased root-zone limitations by means of improved permeability, effective depth of rooting, and available water capacity. The problems presented by some areas of the minesoil (low pH, salinity, texture extremes) can be managed by future land owners if they are aware of the severity and scope of the problem in association with their intended land use.

Application of the LCCS can be useful to predict suitable land uses for minesoils. Allowances for variability of the soils and potential yield should be considered as part of the criteria for classification. Choosing an appropriate scale for classification is equally important, depending on the intended land use.