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Techniques to Reduce Soil Compaction in Reclaimed Soils



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**Techniques to Reduce Soil Compaction
in Reclaimed Soils**

Final Report

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The views and conclusions contained in this document are those of the author/s and should not be interpreted as necessarily representing the official policies or recommendations of the U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, or of the United States Government.

FOREWORD

This report was prepared by the Department of Mining Engineering, the Department of Agricultural Engineering, and the Department of Agronomy of the University of Kentucky for the Office of Surface Mining Reclamation and Enforcement, under Contract Number GR896211. The contract was administered under the technical direction of Mr. Milton Allen acting as the Contracting Officer's Technical Representative. Ms. Debra E. Ball was the Contract Specialist for OSMRE. This report is a summary of the work that was performed during the period October 1988 to September 1991. We extend our grateful appreciation to OSMRE for supporting this research effort.

ABSTRACT

An innovative technique to reduce soil compaction and prevent recompaction simultaneously is presented for application to reconstructed soil on surface-mined land. This method employs conventional deep tillage technology in conjunction with pneumatic injection of organic soil amendments. The concept was tested extensively in the laboratory with a series of experiments performed on soil bins that had been compacted, treated, and then subjected to recompaction. The success of the technique was evaluated by analyzing various soil properties at each stage of the tests. The soil properties considered were bulk density, core penetrometer resistance, and hydraulic conductivity. There was also a field component of the investigation that monitored the bulk density of reclaimed prime farmland soil. The culmination of this effort is a conceptual design of a system that can be used for future prototype development.

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