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Evaluating the Use of C&D Waste Fines as Soil Amendments for pH Improvement and Airspace Reduction in Landfills

Abstract

Landfills face challenges in managing airspace for waste disposal and sourcing adequate soil for interim and final cover. Cover soils must meet engineering standards, and in some cases, suitable soils are not available on-site, requiring procurement and transportation. Currently, Waste Management (WM), a nationwide solid waste management company, is addressing these two issues First, WM's Southern Services Construction and Demolition (C&D) Landfill in Nashville, TN, operates a successful waste diversion and recycling but is left with C&D fines that may be suitable for beneficial reuse. Additionally, the WM's West Camden Landfill has encountered difficulties with acidic borrow soil, which is unsuitable for cover. This research evaluates the potential of using C&D waste fines to improve soil pH—an essential factor for plant growth—while simultaneously addressing the need for waste disposal and airspace reduction. The study explores the use of C&D fines as a soil amendment to correct soil acidity and enhance nutrient availability for vegetation growth in final cover applications. The research will identify optimal mixing ratios for effective soil improvement. The initial phase includes a comprehensive literature review on the use of C&D fines as soil amendments. Based on this review and input from WM, the study will develop a proposed soil and C&D fines mixing plan. Ultimately, this research aims to provide a viable, cost-effective strategy for utilizing C&D fines in soil amendment, contributing to sustainable waste management and landfill operation.