

Innovative Methods for Cost Effective Rehabilitation of Challenging Mining and Energy Sites¹

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Abstract: Rehabilitation of severely disturbed sites may require unique and out of the box approaches, particularly when sustainable soil sources are lacking, coupled with high erosion control potential. Mining and energy projects situated in remote and/or difficult to access areas pose additional challenges beyond the universal difficulties encountered in rehabilitating severely disturbed sites. From the ground up, sources of suitable onsite, imported or manufactured “topsoil” may be difficult and costly to obtain with massive hauling and placement costs. In absence of adequate sources of topsoil, new techniques have been developed to treat and revive depleted soils to render them more capable of accelerating and sustaining vegetative growth. Essentially, on-site soils can be “engineered” to improve their chemical and biological properties. The meticulous introduction of organic matter, agronomic amendments, plant biostimulants, and soil building components can effectively turn marginal soils into productive and sustainable growth media. Biotic Soil Technology (BST) is a generic term to describe the emerging field of manufactured growth media containing biodegradable fibers, biostimulants, biological inoculants, and other components engineered to cost-effectively increase organic content, accelerate sustainable vegetative establishment and promote regeneration of denuded soils. Next, erosion and sediment control can become quite challenging when dynamics such as poor soil structure, severe slope gradients, high intensity rainfall, and channelized flow events can occur. There is a growing toolbox of highly and cost effective erosion control techniques, but how can they be easily selected and installed in remote and/or difficult to access areas? This presentation will offer case studies of energy and mining projects in diverse ecosystems where deployment and installation of topsoil alternatives and erosion control materials were confronted with supply and access challenges. Examples include secluded sites where unique land and aerial application techniques were the only options to successfully rehabilitate challenging sites.³

Additional Key Words: erosion control, topsoil, energy, mining, pipelines, fires.

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3. Work reported here was conducted was conducted at various sites in North America, China, Australia and Papua/New Guinea.