

Erosion Control on Tailings Dams Using Soil Bioengineering. Moreen Miller.

Abstract: Increased awareness of the complexity of ecosystems has generated the need to integrate all facets of mining into the development of sustainable environmental management plans. Environmental management goals that may previously have concentrated on final closure of the mine are now becoming part of the preliminary planning and day-to-day activities of new mines, and are being integrated into planning goals of established operations. These management goals must address all components of a mining operation, including those relating to long-term maintenance of tailings areas. The long-term maintenance of tailings dams presents a challenge to the operations and reclamation divisions of minesites. Reducing, and eventually eliminating long-term maintenance and monitoring of surface slope stability on tailings dams has been identified as a cost-effective measure that can lead to the diversification of natural systems. An application of bioengineering techniques on a tailings dam at the INCO Limited Copper Cliff tailings complex is the focus of this poster. Soil bioengineering is a slope stabilization technique that uses dormant live plant material as the major engineering component. Unrooted live vegetation is installed on the slope, which provides immediate stabilization. Roots and shoots then develop to form a permanent vegetative cover and root reinforcing matrix. Bioengineered slopes strengthen over time as the root matrix develops, and provide a microclimate for the invasion of natural species, thus encouraging biodiversity and successional development. Live fascines were installed in the fall of 1994 on the face of the dam to slow the velocity of surface water runoff and to facilitate subsurface water movement in saturated conditions. The structures performed extremely well during their first growing season, and are currently being monitored to assess long-term performance.

Additional Key Words: soil bioengineering, erosion control, fascine, biodiversity, live construction, slope stabilization