

TECHNIQUES FOR ESTABLISHING AQUATIC VEGETATION IN PERMANENTLY FLOODED TAILINGS —A FIELD TEST

by

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Abstract. Several options currently exist for the decommissioning of acid generating tailings, including the containment of tailings under a permanent, engineered water cover by flooding or subaqueous disposal. Where sites allow, the flooding option has shown to be successful in eliminating acid mine drainage. Because substrates are saturated in the case of flooded tailings, and wetlands require such hydrological conditions, these sites provide the opportunity to enhance the site through the establishment of wetland and aquatic vegetation. As an organic cover over flooded tailings will further impede oxidation of the tailings, this treatment would be suitable in conjunction with an already existing water cover. Research taking place on flooded pyritic uranium tailings near the city of Elliot Lake, Ontario to establish deep water aquatic plants will be highlighted. In 1995, a large scale transplant was undertaken to establish vegetation in deeper water. White water lily, pickerel weed, pondweed, watershield, hardstem bulrush and bladderwort were planted in 50 locations ranging in depth from 0.34–4.53 m. Survival rates in 1996 near 40% were recorded for fragrant water lily, and 80% for pickerel weed and 60% for hardstem bulrush. Watershield survival was minimal at 10% and disappeared in 1997. Generally the production of leaves and biomass was reduced. There was little change in elemental, nutrient and radionuclide concentrations in plants introduced into the waste management area compared to the source sites. It is anticipated that the wetland eventually formed will produce organic matter that will hinder oxygen penetration into the tailings and help to keep acid production to a minimum.

Additional Key Words: wetland, submerged tailings, uranium, aquatic plants, plant growth, reclamation, radium

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