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GREENING OF A SMELTER FOR SUSTAINABLE STORMWATER MANAGEMENT

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Roux Associates recently completed installation of a multi-faceted Engineered Natural System (ENS®) for the treatment and management of stormwater runoff from a 200-acre metal smelter in Iceland. The ENS® was designed to treat stormwater runoff from the facility to meet the Environmental Operating Permit.

Our client targeted the use of sustainable "green" technologies to lower the rates and volumes of stormwater runoff and more importantly, remove low level contaminants (i.e., suspended solids, metals and fluoride) prior to discharge to the fjord. A major objective of the project and commitment to the community was to change the facilities footprint from a typical 75% "brown" to 75% "green".

The ENS® collects stormwater runoff from production/industrial areas and provides pre-treatment via vegetated filter strips, swales and engineered soil profiles. Water is then conveyed to two Constructed Treatment Wetlands (CTWs) for detention and treatment. Each CTW includes a sediment forebay for removal of suspended solids, a series of high and low wetland marshes for contaminate removal via filtration, adsorption, and degradation, followed by an open water micropool for final polishing.

Due to the lack of plant nurseries in Iceland, the vegetated areas were seeded and planted with native vegetation collected and transplanted from farms in the surrounding region. Care was taken to ensure only native species (both plant and seed) would be utilized within the system to minimize the spread of non-natives/invasives through Iceland.

Keywords: stormwater, vegetative filter strip, metals, fluoride, treatment wetland

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