Success of Willow Grown in Amended Solvay Waste as a Landfill Cover System

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Project Goals
- Quantify the impact of shrub willow biomass crops on the water balance of the Solvay settling basins.
- Model and design an alternative evapotranspiration (ET) cover system to reduce percolation through the settling basin.
- Transform the settling basins into a productive area for renewable energy and improve its ecological function and value.

Site Description
Soda ash was produced near Syracuse, NY using locally-mined salt brine and limestone. Process residues (Ca, Mg, Na salts) were slurried and dewatered in approximately 600 ha of settling basins, adjacent to Onondaga Lake (Figures 1 & 2).

Willow Field Trials (2004 – 08)
Field trials were conducted on SB13 to assess the survival, growth and production of different shrub willow varieties planted in Solvay waste mixed with organic amendments.

An alternative evapotranspiration (ET) cover using fast growing shrub willows has been investigated since 2004 to reduce percolation.

Water Budget Monitoring and Modeling (2004 – 09)
The water budget is modeled using field data and the one-dimensional Simultaneous Heat and Water (SHAW) model to simulate growing conditions over a 30-year time period and to compare ET with conventional cover system designs and predicted performance using the HELP model.

Figure 8: Preliminary results from modified suction pan lysimeters indicate percolation from 45-cm depth is <5% of total precipitation for growing season. Percolation is responsive to soil moisture and short-duration, intense precipitation events.

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