

Sustainable, Combined Remedies and Restoration of the Onondaga Lake Shoreline, Syracuse, New York

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Background/Objectives. The Solvay Settling Basins 1-8 Site is a 400-acre former industrial property along the shoreline of Onondaga Lake. The Site is located at the western nexus for the City of Syracuse and adjacent suburbs with the New York State Fairgrounds nearby as well as numerous industries and businesses, municipal facilities, and natural features. An interstate and extensive overflow parking areas have been built on the consolidated waste tailings ("Solvay waste") that make up the site. Solvay Settling Basins 1-8 is a subsite of the Onondaga Lake Superfund Site, and, because these locations are adjacent to each other and hydrologically connected, successful remediation of each relied on combining remedies in a holistic manner. Because of the size and complexity of the Settling Basins 1-8 Site, similar holistic efforts were required to combine groundwater, stormwater, and surface soil remedies while meeting ecological and recreational end uses.

Approach/Activities. Over the last five years, the site has grown to be a hub of activity with over \$100M of investment in the design and implementation of numerous remedial measures, ecological restoration and enhancement efforts, the Lakeview Amphitheater, Western Shore Bike Trail extension and boat dock, redevelopment of a 65-acre parking area and upgrades to the Onondaga County sanitary sewer pump station. While the bike trail is a popular recreational feature, the Amphitheater now frequently sells out its 17,500-patron capacity. Remedial activities included the installation of 10,000 linear feet of groundwater collection systems, rehabilitation of 45 culverts totaling 6,000 linear feet of stormwater pipes, stabilization of 1,600 linear feet of Solvay waste bluffs that were sloughing into Onondaga Lake, leachate seep collection and remediation along a 7,000-foot stormwater ditch tributary to Onondaga Lake, as well as the ongoing installation of vegetated cover systems totaling 171 acres. Remedial measures were integrated with restored ecosystems such that the designs were integrated and resulting ecological processes assisted with aspects of the remediation.

Results/Lessons Learned. Successfully combining the site remedies and integrating them into the broader ecological/human use context needed a holistic approach including collaboration among stakeholders and schedule management across multiple public and private sector contracts. Remediation of the site shoreline, which entailed groundwater controls, restored wetlands, as well as dredging and capping of adjacent portions of Onondaga Lake required a hydrologic design that isolated impacted surface and groundwater but also provided sufficient clean water to support the restored wetlands. To provide a smooth transition between the shoreline and dredging/capping projects and to accommodate the groundwater collection system, a consistent soil profile, grading plan and planting design was developed for the interface of these projects. The shoreline restoration included wetlands that were connected to Onondaga Lake; to capitalize on construction efficiencies, the connected wetland construction was scheduled and completed within the Onondaga Lake dredging and capping program. Elsewhere on the site, the culvert rehabilitation project utilized a UV curing process which allowed the project to meet a demanding schedule by allowing winter installation, in temperatures that prevent traditional liners from curing. An in-lake access road used to construct the bluff stabilization revetment was recycled in place as a capping material. Cover

systems were combined with the recreational end uses of the site by providing varying cover thicknesses according to use type (e.g., passive versus active recreation) and the establishment of groundwater controls at the site boundaries relieved the need for a low permeability cover.