Onondaga Lake Remediation: From Construction/Restoration to Maintenance and Monitoring

Katarzyna Krzanowska (katarzyna.krzanowska@aecom.com) and Michael L. Spera (AECOM, New York, NY, USA)
Marleiah O'Neill (AECOM, East Syracuse, NY, USA)

Background/Objectives. In July 2005, the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (EPA) issued a Record of Decision (ROD) for a remediation program to address hazardous waste and substances in Onondaga Lake in the Syracuse, New York area utilizing both dredging and capping technologies as well as monitored natural recovery. The ROD included dredging and on-site containment of over 2 million cubic yards of contaminated sediments as well as placement of a multi-layered cap over approximately 425 acres of the littoral zone of the lake and a thin-layer sand cap in a portion of the deeper profundal zone. Multiple pre-design investigations and remedial design phases were completed in 2012. Construction of the sediment consolidation area (SCA) in an existing wastebed began in 2010 with dredging/capping commencing in July 2012 and completed in 2016. A third Explanation of Significant Differences (ESD) was prepared in 2017 to document the modified cap designs which were necessary during the construction period for limited areas where cap disturbances occurred during construction and in areas where additional soft sediments were identified. A long-term maintenance and monitoring plan for the cap and other components of the remedy was also finalized.

Approach/Activities. Following completion of the remedial investigation, risk assessments, and development of site-specific criteria and remedial alternatives, AECOM engineers, geologists, and scientists also provided NYSDEC with additional expertise during the remedial design phase in multiple subject areas including cap modeling and design, development of cap modeling approaches and acceptability criteria, geotechnical evaluations, and emissions and odors modeling, among others. AECOM staff provided oversight of the construction of the SCA, dredging and capping activities and dredged material management operations, and habitat restoration, as well as maintenance and monitoring activities. Examples of the value added to the design, construction, and monitoring phases will be presented.

Results/Lessons Learned. During the construction/operations period, revisions to the dredge prisms and cap designs including carbon dosages and layer thicknesses were necessary to address soft sediments, dredge/cap stability, shoreline/structural stability, and presence of utilities. These revisions required preparation of an ESD as well as review and finalization of several Design Addenda. AECOM staff that participated in the design phase assisted NYSDEC during the remedy implementation period to allow for expedited review and refinement of the design modifications, including revisions to carbon dosages and thickness of cap layers in certain areas. A summary of the ESD (finalized in March 2018) and supporting modeling documenting the protectiveness of the modified cap designs, including limited areas of mono-layer caps and direct application of GAC, will also be presented. An overview of the requirements for long-term monitoring and maintenance for capping and other components of the remedy (e.g., fish, surface water), which commenced in 2017, will also be presented.