Hudson River Post-Remediation: When Can We Expect to Achieve Remedial Goals and How Do We Measure it? The 2017 Five Year Review

Edward A. Garvey (egarvey@louisberger.com), Solomon Gbondo-Tugbawa, Juliana Atmadja, Michael Traynor, Ken Takagi, and Bruce Fidler (Louis Berger, Morristown, NJ, USA)
John Kern (Kern Statistical Associates, MI, USA)
John Wolfe (Limno-Tech, Ann Arbor, MI, USA)
Katherine Von Stackelberg (NEK Associates, Boston, MA, USA)
Gary Klawinski (U.S. Environmental Protection Agency, Albany, NY, USA)
Marc S. Greenberg (U.S. Environmental Protection Agency, Edison, NJ, USA)

Background/Objectives. The investigation and remediation of the Hudson River PCBs Site (New York) spans a period of nearly 30 years. With the completion of active remediation of the Hudson in 2016 and the extensive historical and post-remediation monitoring programs, the site provides the opportunity to track conditions through time and collect sufficient data to evaluate remedy effectiveness in a rigorous fashion. The Hudson remediation, involving the removal of 2.7 Myd^3 of sediment followed by backfilling, restoration and replanting, was completed in Oct. 2016, initiating a period of monitored natural attenuation across more than 150 river miles, as mandated by the 2002 Record of Decision. EPA recently released its second five-year review report for the site to assess the status of the remedy regarding protectiveness of public health and the environment.

Approach/Activities. The monitoring of PCB concentrations in water and fish throughout the Hudson began many years prior to the remediation, and is slated to continue for decades as PCB levels in fish tissue respond to the active remediation and then continue to decline under monitored natural attenuation toward the final remedial action objectives. Additionally after the remediation, EPA added a long term surface sediment monitoring program to track average surface sediment concentrations through time, and routine monitoring of Be-7 bearing sediments to track suspended matter transport and deposition over time. Taken together, these monitoring elements track not only the remedial endpoint (PCB levels in fish) but also PCB levels in the matrices responsible for fish exposure across nearly all of the impacted areas post-remediation.

Results/Lessons Learned. The most recent monitoring data suggest that PCB levels in fish tissue have begun to recover from dredging impacts and are generally declining throughout the Upper Hudson. Water column data have responded in a similar manner. The initial post-dredge long term sediment monitoring results in areas outside the dredging footprint are consistent with a continued declining trend suggested by the historical data. These data also suggest the absence of additional sediment contamination resulting from dredging-related sediment resuspension. EPA is using these data in combination with its earlier modeling work to assess recovery including approximate times to reach milestones and remedial goals in the Upper Hudson fish. Given the limited post-dredging data available, it is clear that more measurements must be obtained over time to assess the actual recovery rate. Fish trends in portions of the Lower Hudson suggest that this region of the river may be recovering more slowly than anticipated, which supports the need for further evaluation of the influence of remedial work in the Upper Hudson on the Lower Hudson. Also several factors related to project implementation may influence estimates to achieve remedial milestones. This presentation will summarize the results of the five-year review, including EPA's estimates for attainment of the remedial objectives.