

## Monitored Natural Recovery Evaluation of Cottonwood Bay Sediments (Dallas, TX)

**Kristin Searcy Bell** (ksbell@ramboll.com) and Victor Magar (Ramboll, Chicago, IL, USA)  
Phyllis Fuchsman (Ramboll, Cleveland, OH, USA)  
Lauren Brown (Ramboll, Portland, ME, USA)  
Charles Epperson (DGIC, Dallas, TX, USA)

**Background/Objectives.** Monitored natural recovery (MNR) is a sediment response action that involves leaving contaminated sediments in place and relying on ongoing natural processes to reduce environmental risks. MNR relies on physical, chemical, and biological processes to isolate, destroy, or reduce exposure to or toxicity of contaminants in sediment. At the Cottonwood Bay Site (Dallas, Texas), the Texas Commission on Environmental Quality (TCEQ) approved a 2009 Remedial Action Plan (RAP) for the Site; the RAP identified dredging as the approved remedy to address contaminated sediment. However, 2014 surface sediment sampling results and an initial evaluation of MNR processes suggested that current surface sediment conditions at the Site were approaching site-specific performance targets. Consequently, with TCEQ approval and under TCEQ supervision, the project team revisited the Site to determine whether MNR is a viable remedy alternative. The objective of this project was to evaluate MNR performance, and to determine whether MNR can achieve Site-specific remedial goals within a reasonable time frame. An MNR remedy would reduce the volume of sediment required for dredging, and thus would reduce the impacts of remediation on the existing ecology while also reducing remedy costs.

**Approach/Activities.** Multiple lines of evidence were evaluated to demonstrate MNR could achieve site-specific remedial goals for Cottonwood Bay in a reasonable time frame. These lines of evidence included temporal trends in surface sediment contaminant concentrations, vertical contaminant sediment profiles, sediment deposition rates and sediment stability, temporal trends in fish tissue concentrations, current surface sediment concentrations, and current ecological and human health risks. Historical data and additional data collected in 2015 were used to complete the evaluation of the MNR lines of evidence, including analysis of sediment chemistry and geochronology, surface sediment AVS/SEM, and fish tissue chemistry.

**Results/Lessons Learned.** Findings from the 2015 evaluation were combined with previous assessments to create a comprehensive conceptual site model that characterizes and quantifies MNR processes at the Site. This presentation will discuss how the historical and 2015 data were used to demonstrate natural surface sediment recovery processes, limited ecological and human health risks at the Site, and long-term stability of the remedy, such that MNR is an effective and reliable remedy for Cottonwood Bay. In addition, the long-term monitoring components of the remedy will be presented, including composite surface sediment sampling and analysis, and fish tissue sampling and analysis to demonstrate progress towards achieving site-specific performance targets; sampling and analysis of suspended sediments entering Cottonwood Bay; and bathymetric surveys to measure ongoing sediment stability. TCEQ has approved a revised RAP that relies on MNR as the selected remedy. TCEQ required a contingency remedy, using thin-cover placement in lieu of dredging. This is one of very few sites, nationally, that relies on MNR as the primary remedial response to address sediment contaminants.