

## Long-Term Performance of In Situ Treatment of Sediment with AC at Two Pilot-Scale Study Locations

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**Background/Objectives.** The long-term efficacy and permanence of remedies is one of the nine National Contingency Plan criteria that are used in evaluating and selecting remedies. One of the key issues of concern in comparisons of removal/dredging to in situ remediation, such as AC treatment, is that in situ remediation is more vulnerable to changes in conditions that can compromise the performance of the remedy over time. The objective of this proposed study is to assess the long-term (6-10 yr) performance of AC at two pilot-scale demonstration sites and determine the relative importance of physical processes to long-term efficacy.

**Approach/Activities.** Sediment core samples were collected from two pilot-scale demonstration sites: Grasse River, New York, and Canal Creek, Aberdeen Proving Grounds, Maryland after 10 and 6 years of remedy implementation, respectively, at the two sites. Core samples were sectioned to determine the present location of AC and the persistence of the AC in the field. Concentration profile of PCBs in sediment porewater with depth was measured using passive sampling. Sediment samples from the untreated and AC-treated zones were assessed for bioaccumulation in benthic organisms.

**Results/Lessons Learned.** AC was found in treated sediments at anticipated concentration in both treated sites. The degree of burial with new clean sediment was higher in the depositional site in Grasse River (15 cm over 10 years) compared to very little deposition of new sediment in the vegetated wetland setting of the Canal Creek marsh in 6 years. Porewater concentrations of PCBs in sediment remained low at in the carbon-treated zones at both sites. Testing with intact sediment cores and a freshwater oligochaete, *Lumbriculus variegatus*, revealed the bioavailability of PCBs remains limited by the carbon-based remedies at both the riverine and wetland sites.