

An Innovative Geocomposite for Placing Activated Carbon-Sand Caps

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Background/Objectives. Contaminated sediment remediation projects have increasingly utilized amendments, such as activated carbon, for capping. The use of these amendments for capping has the potential to limit exposure to sediment contaminants and reduce risk. In some cases, a thick (e.g., 30 cm) carbon-sand layer is needed for sufficient contact time. One method that has been used is to wet the carbon for an extended period of time so that it will sink. The carbon is then mixed with sand and dropped through the water column. This method of placement results in an uneven surface. Consequently, it may be required to increase the thickness of the cap to account for this variability. If a certain water depth above the cap must be maintained, then a similar increase in amount of dredged sediment is required. In addition, the carbon/sand may be susceptible to erosional forces. A possible solution is to use geosynthetics to control the thickness of the carbon/sand mix and reduce erosion potential.

Approach/Activities. Permeable geotextiles were constructed into a six-sided mattress. The mattress is 5 m wide. Ties spaced every 10 cm connect the top and bottom geotextiles to provide a relatively uniform thickness. The mattress can be varied from 10 cm to 60 cm thick. The mattress is delivered to the site empty and filled on-site. Progressive cavity pumps have been used to pump a slurry into the mattress. Adjacent panels have been successfully sewn together using an industrial sewing machine.

Results/Lessons Learned. Results of a filling trial will be presented, including pumping rates, thickness variability and uniformity of the slurry. Methods of connecting adjacent panels will also be discussed. Geomembrane flaps can also be attached to sides when the adjacent panels cannot be aligned close enough to sew.