

# Utilization of Coal Combustion Byproducts as Capping Amendments for Heavy Metals Sequestration

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## ABSTRACT

Sediment serves as a contaminant reservoir for aquatic organisms that can accumulate toxic heavy metals that are then passed up the food chain. One of common approaches for contaminated sediment management is in situ capping. In situ capping can be done by placement of any type of clean layer, although sand is normally used due to its availability and ease of placement. Additives, such as industrial byproducts or geomembrane materials, to bolster degradations of degradable contaminants and to sequester non-degradable compounds have been studied as cap amendments. The current project is to investigate the feasibility for enhanced in situ capping of heavy metals in sediments through the use of low-cost, industrial byproducts as the cap amendment to separate and sequester the heavy metals and reduce their bioavailability. Both bottom ash and manufactured aggregate from a local coal-burning power plant are being used in the current study. Manufactured aggregate is an agglomerate of fly ash and bottom ash which are produced during the coal combustion process. For further sequestration of heavy metals, the effects of a biopolymer injection in addition to the capping amendment are also being tested. Heavy metals flux will be quantified and compared among various reactor set-ups; (1) no capping, (2) capping with clean sand, (3) capping with clean sand and capping amendments, and (4) capping with clean sand, capping amendments and biopolymer injection. This research effort will develop a low-cost in situ cap amendment to measurably reduce the bioavailability and mobility of heavy metals in sediment.

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