Activated carbon mat utilized in subaqueous cap on major superfund site

Stryker Bay was heavily polluted from the late 1800s through 1962. The harbor area was ringed with tar and coke plants, heavy industry and slaughterhouses that all discharged industrial waste into the water. Coal tar in some areas is 13 feet thick under the water. The sediment in the bay, slips and part of the river is contaminated with mercury, polyaromatic hydrocarbons, lead and other toxins as well as a NAPL seep on the east side.

PROJECT DETAILS

Stryker Bay

CQA Engineer:
Natural Resource Technology

General Contractor:
Hardhat Services, LLC

Installer: MCM Marine, Inc.

LOCATION

Duluth, Minnesota, USA

PRODUCTS USED

REACTIVE CORE MAT® filled with Granular Activated Carbon

In total, 500,000 square feet of REACTIVE CORE MAT® (RCM) filled with Granular Activated Carbon (GAC) was installed by a CETCO trained and certified installer. The RCM was installed on a reel fastened to the deck of a barge and unreeled over the advancing side of the barge using an idler roller. The starting end of the RCM was anchored at the shore and a guide float system was used to keep the RCM placement in the intended location. RCM was also deployed along the shoreline and covered with a sand layer.

CHALLENGE:

The challenge in any subaqueous sand cap project is to be able place the reactive mat and sand layer evenly and uniformly in a manner to where placement can be tracked and confirmed. Introducing slurry into the water at reduced velocities to minimize turbulence and sediment disruption is also a challenge so as to not redisperse contaminants back into the water.

Proper equipment must be used in order to allow the subaqueous sand cap materials to be placed according to the specifications. The control of the location and rate of placement of subaqueous cap materials using equipment that can precisely monitor and record the depth and location of the materials is also necessary.

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SOLUTION:

The solution included the installation of sheet piling around surcharge cap area and the placement of subaqueous reactive cap utilizing GAC REACTIVE CORE MAT®, a granular activated carbon mat, in addition to a six inch sand cap over the contaminated sediments. To ensure the contaminates are properly sequestered, placement of a 3.5' sand cover and 4.5'–6.5' surcharge load over was also placed over the reactive mat. Dredging of the remaining area and pump to CAD while allowing surcharge to consolidate sediments as well as removal of the surcharge sand to cap CAD was also part of the remediation solution.

RESULT:

Remediation of Stryker Bay was a proven success required a period of over 4 years to complete. In 2006, installation of the sheet pile and cap in was completed in Stryker Bay. In 2007, dredge of the remainder of the bay took place. In 2008, a period of time was allowed for the consolidation of sediments and in 2009, removal of the surcharge from the bay to cap CAD was in effect.

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