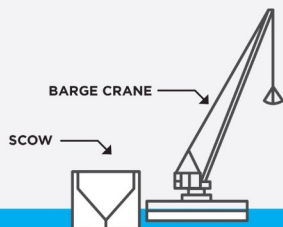


Confined Aquatic Disposal (CAD)

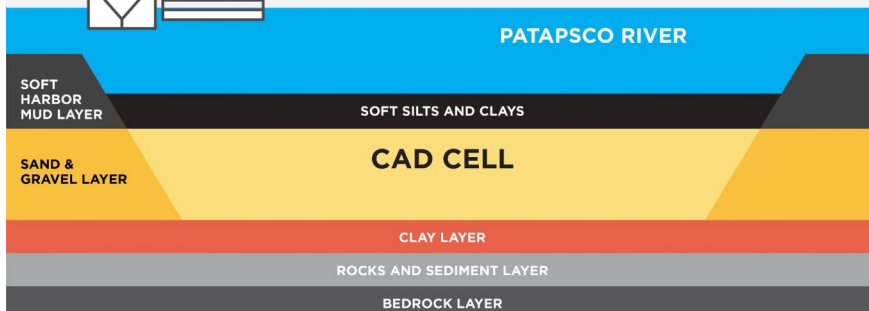
Dredging maintains safe passage for vessels making their way through the navigation channels that serve the Port of Baltimore, a key economic driver for waterborne commerce in Maryland. Removing sediment annually from the channels not only ensures the safety of our marine highway but also helps business at the Port continue to thrive.

Finding new placement capacity is a challenge in the Baltimore region. In addition to diked containment facilities or innovative and beneficial uses of dredged material, there remains a third management option called Confined Aquatic Disposal, or CAD.

How Does CAD Work?



For the Port of Baltimore, construction of a CAD cell would usually begin by dredging a thin layer of silt and clay on the river bottom and placing it in a DMCF. Next, a layer of sand and gravel would be removed to deepen the cell, but only in the areas underlain by a relatively thick impervious clay layer known as the Arundel Formation. The resulting cell (or depression) would then be filled with dredged material from the Baltimore Harbor. The nearly watertight clay underneath the cell creates a barrier, effectively eliminating the potential for deposited sediments to interact with aquifers that lay still deeper beneath the surface.

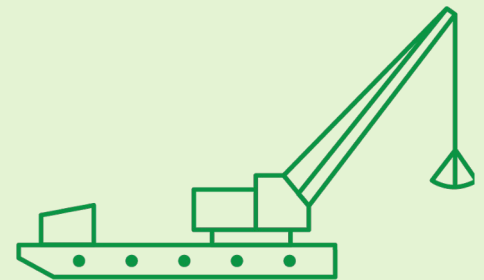


CAD identifies suitable underwater locations where sandy material can be recovered/dredged and innovatively or beneficially used. Sediment removed from the shipping channel is confined in the resulting depression.

A successful CAD Pilot Project was constructed in Baltimore Harbor in 2016 and studied extensively. CAD has been used nationwide, including Boston, Newark Bay, and multiple west coast locations.



MPA is responsible for waterborne commerce in the State of Maryland, which requires significant maintenance dredging of the navigation channel system.

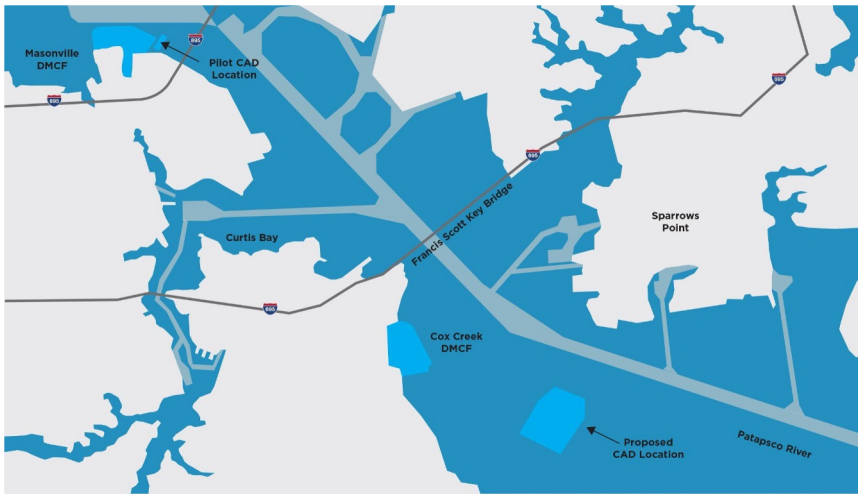


CAD is one solution used as part of the Maryland Port Administration (MPA) Dredged Material Management Program (DMMP) that identifies options for dredged material placement in Baltimore Harbor.

CAD has three key stages:

1. A depression (or cell) is excavated into the sand layer of the river bottom.
2. Excavated sand is used in a beneficial or innovative manner, such as wetland creation or structural fill.
3. The depression is then filled in with dredged material.

Confined Aquatic Disposal (CAD)



CAD Pilot Project a Success

The 2016 CAD Pilot Project identified planning goals to be taken into consideration while exploring a second CAD project: evaluate different site conditions that may influence other locations within the harbor region; operate a larger capacity cell with multi-use or multiple cells within an established area; and determine cost effectiveness.

Preliminary site analysis included an environmental assessment, hydrodynamic modeling, and geotechnical investigations. Potential sites were refined and focused for further study, ultimately resulting in a recommended location in the open water region southeast of the Cox Creek DMCF. The geotechnical investigations at the proposed location identified a large volume of sand near the surface, allowing easier access and better value for removal and reuse.

Additional sampling is currently refining extents, depth to sand, and thicknesses of overburden material and sand deposits in the area. Bathymetric surveying will be performed to better evaluate site conditions, as well as updated hydrodynamic modeling to study currents and wave effects in the proposed location.

GOAL

MPA aims to make CAD an implemented component of the DMMP in Maryland, and to promote the long-term viability of the Port of Baltimore.

NEXT STEPS

After many evaluations and studies, the next CAD project location is being proposed in an area of open water southeast of the Cox Creek Dredged Material Containment Facility (DMCF). Final design is anticipated in 2023.



After final design of the next CAD cell with input from stakeholders and regulators, future construction and filling operations are anticipated in 2024 and beyond.

CAD is an emerging dredged material management approach using underwater space created by newly excavated material to safely place Harbor dredged material and is a key component to the long-term success of the Port.



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