Innovative Approaches to Port Challenges

Masonville Dredged Material Containment Facility Project

September 23, 2010

GreenPort of Baltimore

The Need For Masonville

(Harbor maintenance dredging average 1.0 Mcy/yr)

- By mandate of the Dredged Material Management Act of 2001, the Hart-Miller Island Dredged Material Containment Site would cease operations at COB, December 31, 2009

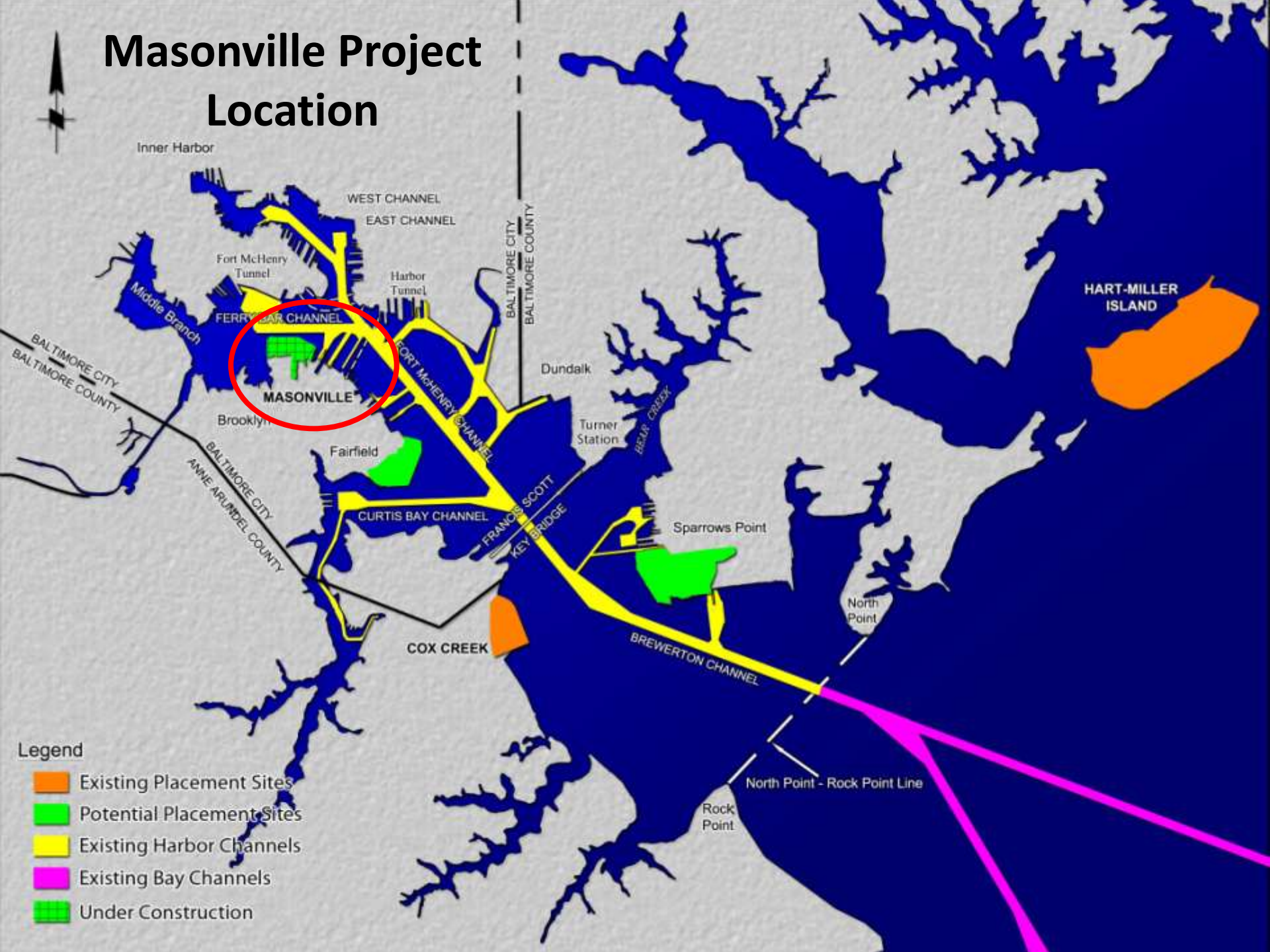
- Without a new option, the only site remaining to accept dredged material from Baltimore Harbor would be the Cox Creek Containment Site, with an annual capacity of 0.5 Mcy/yr, about half of the annual maintenance need

- Masonville, recommended by the Harbor Team for further study in October, 2003 was needed to be operational in six years, in time to meet the 2010 dredging season

Harbor Placement Options Selection

- Stakeholders participate in option selection (Harbor Team), provide options/ideas, community enhancement proposals
- MPA professional team provides technical support
- Stakeholder involvement continues throughout option design, construction, and operation
- Partnership; Harbor Team initiated in 2003, members represent local communities, local governments, maritime industry, environmental groups, and other stakeholder organizations

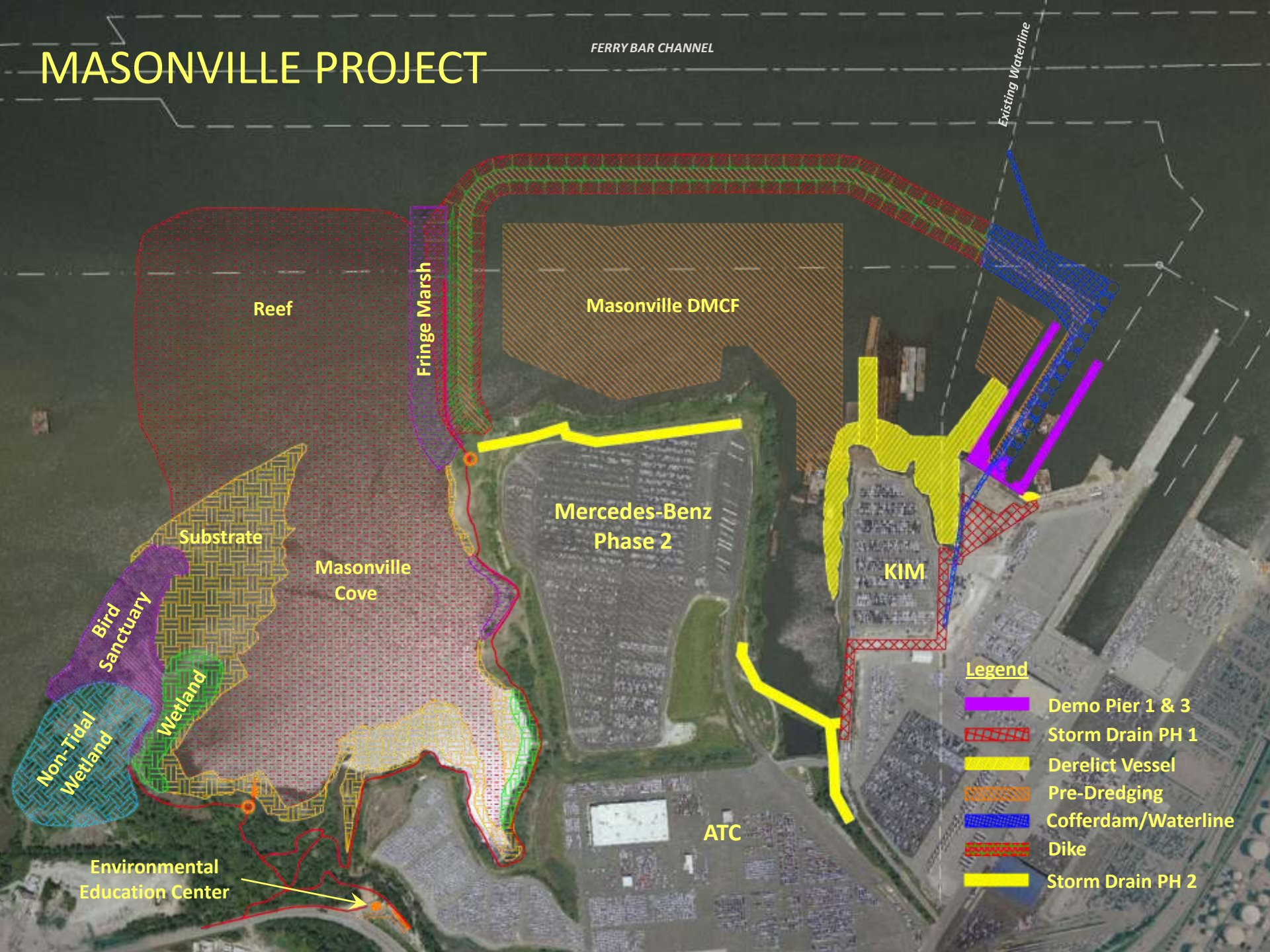
Masonville Project Location



Masonville Project Site Is Environmentally Degraded

- Former site of Maryland Shipbuilding & Drydock Company
- Former site of Kurt Iron and Metal facility, Coral Sea aircraft carrier ship-breaking
- Derelict vessels and barges (27)
- Contaminated bottom sediments; elevated concentrations of metals (including mercury), organic compounds (including polychlorinated biphenyls, polyaromatic hydrocarbons, and dioxins
- Extensive dumping of waste, trash and debris from many sources along the shoreline
- To date, total of over 61,000 tons of trash and debris removed from project site

MASONVILLE PROJECT



Masonville Environmental Benefits

- Cleaning up and restoring one of the worst brownfields in Baltimore Harbor
- Over 130 acres of seriously contaminated river bottom is being capped and contained within the DMCF footprint
- Over 50 acres of contaminated uplands are being capped, contained, and restored to beneficial biological productivity within Masonville Cove
- Over 100 acres of tidal and non-tidal wetlands are being restored or created in Masonville Cove
- A conservation easement on Masonville Cove held by a community trust to ensure that its function in support of wildlife and community access will not change
- Additionally, 5 trash interceptors, 2 major stream restoration projects, and 3 fish ladders are being implemented, monitored, and maintained in and around Baltimore Harbor and the Patapsco River watershed
- An Environmental Center for the communities, operated by Living Classrooms to provide environmental classes for students from local schools

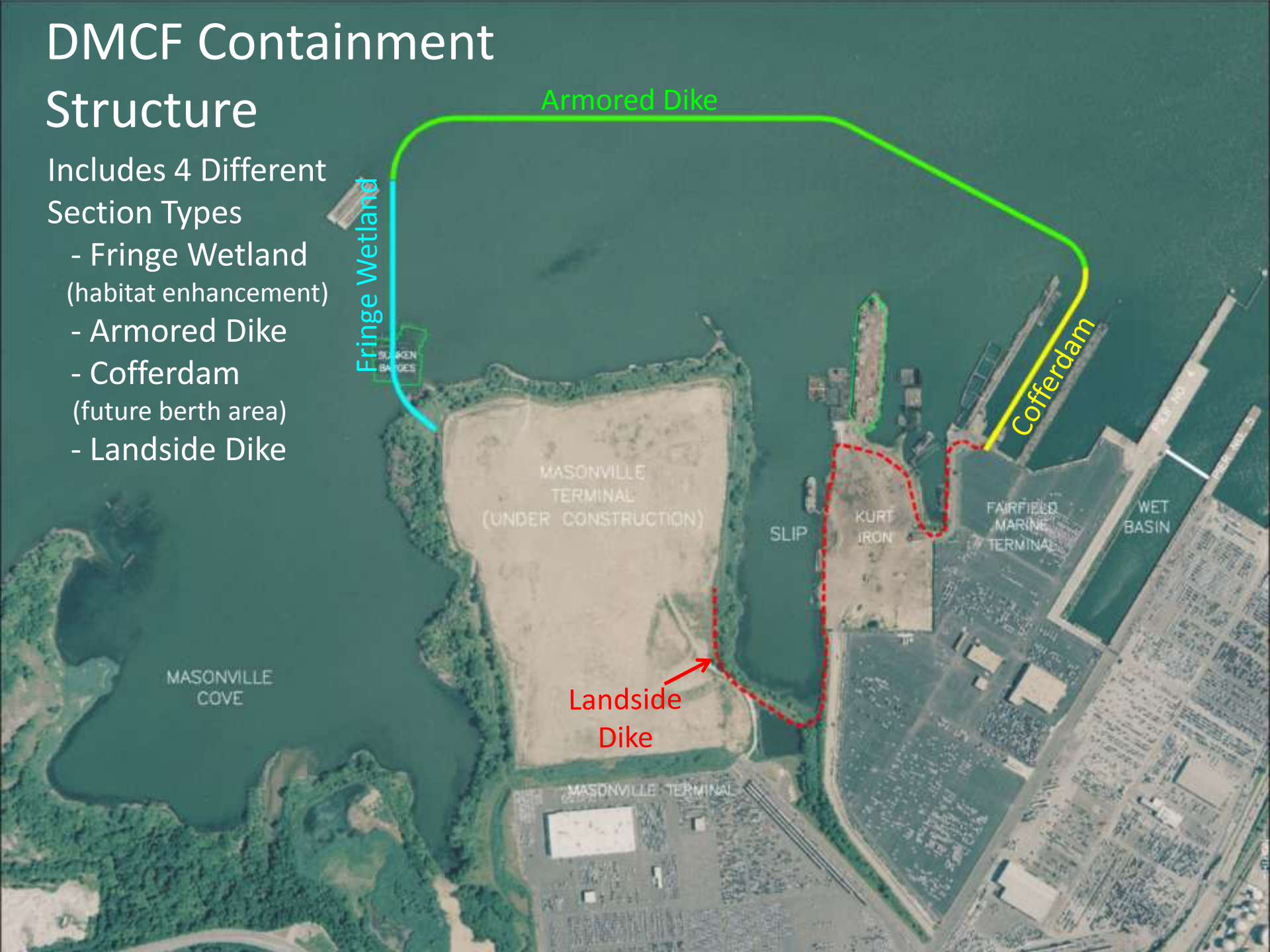
Former Shipyard, Ship Breaking Area


MARYLAND SHIPBUILDING
& DRYDOCK COMPANY
TANK CLEANING BY OLSON SYSTEM

DMCF Containment Structure

Includes 4 Different Section Types

- Fringe Wetland (habitat enhancement)
- Armored Dike
- Cofferdam (future berth area)
- Landside Dike

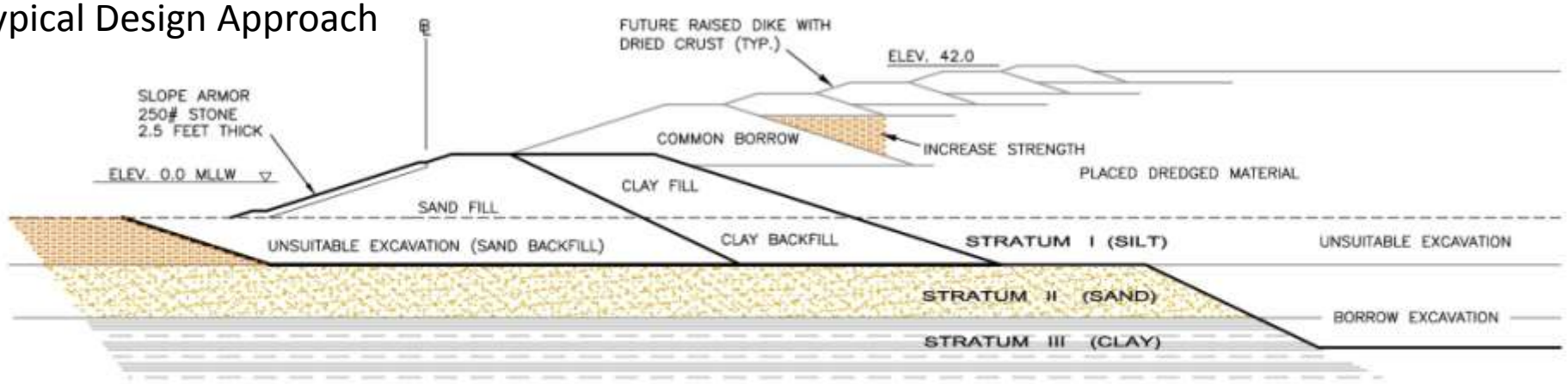


Borrow, Key to Project

- Upland borrow sources over 2 times cost of onsite ($30/cy vs $12/cy)
- Use of onsite borrow adds value to project as it creates capacity ($10/cy)
- Additional borrow was obtained by combining Masonville mechanical dredging of unsuitable material with channel deepening (a borrow source) at Seagirt

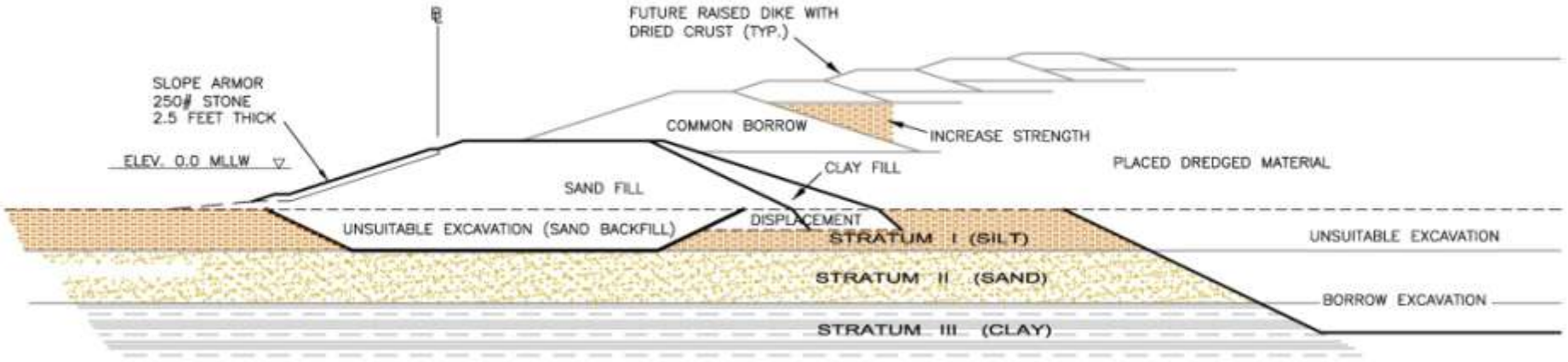
Borrow Material in Short Supply

Typical Design Approach



TYPICAL SECTION - PERIMETER DIKE FULL WIDTH UNSUITABLE EXCAVATION

Keyway Design Chosen – Saves significant amounts of excavation and borrow material



TYPICAL SECTION - PERIMETER DIKE AND KEYWAY UNSUITABLE EXCAVATION

Geotechnical Information Key to Project

- Investigations performed along alignment and in borrow area to allow 3D modeling of subsurface
  - Over 300 probings and 150 STP borings inside 150 acres
- Enabled removal of unsuitable without removing suitable borrow material
  - Contractor able to “see” suitable/unsuitable deposits of material, maximize volume of onsite borrow obtained
- Investigations continued during construction to refine dredging efficiency, maximize borrow

Bucket Dredge Removal of Unsuitable & Deepening of Seagirt Access Channels

WEST CHANNEL

EAST CHANNEL

P A T A P S C O R I V E R

FERRY BAR CHANNEL

MASONVILLE DMCF

FAIRFIELD MARINE TERMINAL

SEAGIRT MARINE TERMINAL

Deepened to 45’

FORT McHENRY CHANNEL

DUNDALK MARINE TERMINAL

DREDGING SECTION

DREDGING SECTION

Deepened to 50’

PHASE 1 – MES CONTRACT 07–07–15
CLAMSHELL DREDGING AT SEAGIRT/DUNDALK CHANNELS AND MASONVILLE WITH PLACEMENT AT HART–MILLER ISLAND.

Bucket Dredging of Borrow While Deepening Seagirt Berth 4 to 50’

WEST CHANNEL

EAST CHANNEL

P A T A P S C O R I V E R

FERRY BAR CHANNEL

SEAGIRT MARINE TERMINAL

Deepened to 50’

MASONVILLE DMCF

FAIRFIELD MARINE TERMINAL

FORT McHENRY CHANNEL

DUNDALK MARINE TERMINAL

DREDGING SECTION

PLACEMENT SECTION

PHASE 2 – MES CONTRACT 07–07–15
CLAMSHELL DREDGING AT SEAGIRT/DUNDALK CHANNELS WITH PLACEMENT BY SPLIT HULL BARGE AT MASONVILLE

Hydraulic Dredging/Placement for Dike Construction

Dike Construction

What the Community Gets from This Project

- Habitat restoration and urban environmental education experience (Living Classrooms)
- Conservation easement on restored Cove held by Shores of Baltimore Land Trust
- Community access to the shoreline and water
- Center for community meetings, environmental education classrooms in a green building
- Traffic improvements to provide community, pedestrian access to the environmental center and shoreline
- Connection to other park areas, Gwynns Falls Trail extended to Cove natural area
- Cleanup of neighborhood Brownfield area

Masonville Dredged Material Containment Facility

- Located in Baltimore City in the Patapsco River
- 141 acre footprint
  - 131 acres of open-water
- Capacity of DMCF: 15.4 Mcy
- Annual placement capacity: 0.5 Mcy
- Final elevation +36 feet (equivalent to adjacent land)
- End use: marine terminal

Proposed, Future Terminal