



US Army Corps of Engineers

Norfolk District

WELCOME



Craney Island Eastward Expansion Feasibility Study

Crumbley House, Norfolk, VA

May 23, 2001

Where We Have Been

Stakeholder Meetings	Location	Date
Recon Phase	HRPDC Chesapeake	July 1998
Feasibility Phase	Bide-A-Wee Portsmouth	Aug 1999
	Craney Island Portsmouth	Dec 1999
	Crumbley House Norfolk	Apr 2000
	Crumbley House Norfolk	Today

Technical Teams

Name	Role	Next Action
Alternatives Team	Identify on-site and off-site alternatives	May 2001
Hydrodynamic Modeling Team	Determine degree of changes in the estuary	June 2001
NEPA Team	Determine impacts on living resources	June 2001
Port Readiness Team	Determine national defense needs	July 2001



Norfolk District

Craney Island Dredged Material Area



UNIVERSITY OF CALIFORNIA DAVIS

FACTS

20 Year Design Life Until 1980

100 Million Cubic Yard Design Capacity

Received over 200 Million Cubic Yard

History

- June 1944 Congress: Determine Advisability of Disposal Area

OPERATIONS





CONSTRUCTION

Construction began in 1956





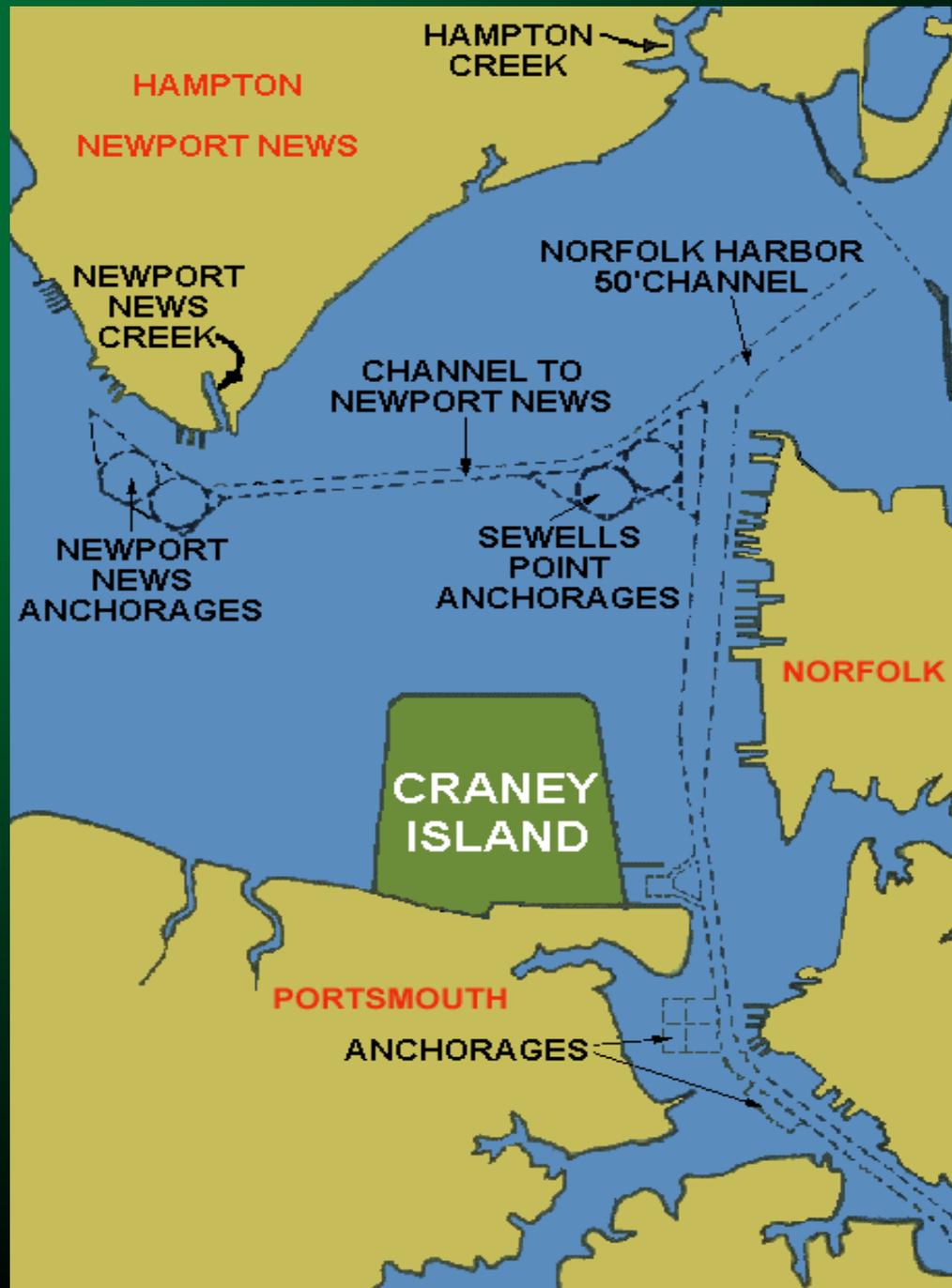
UNIVERSIDAD
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Completed in 1958



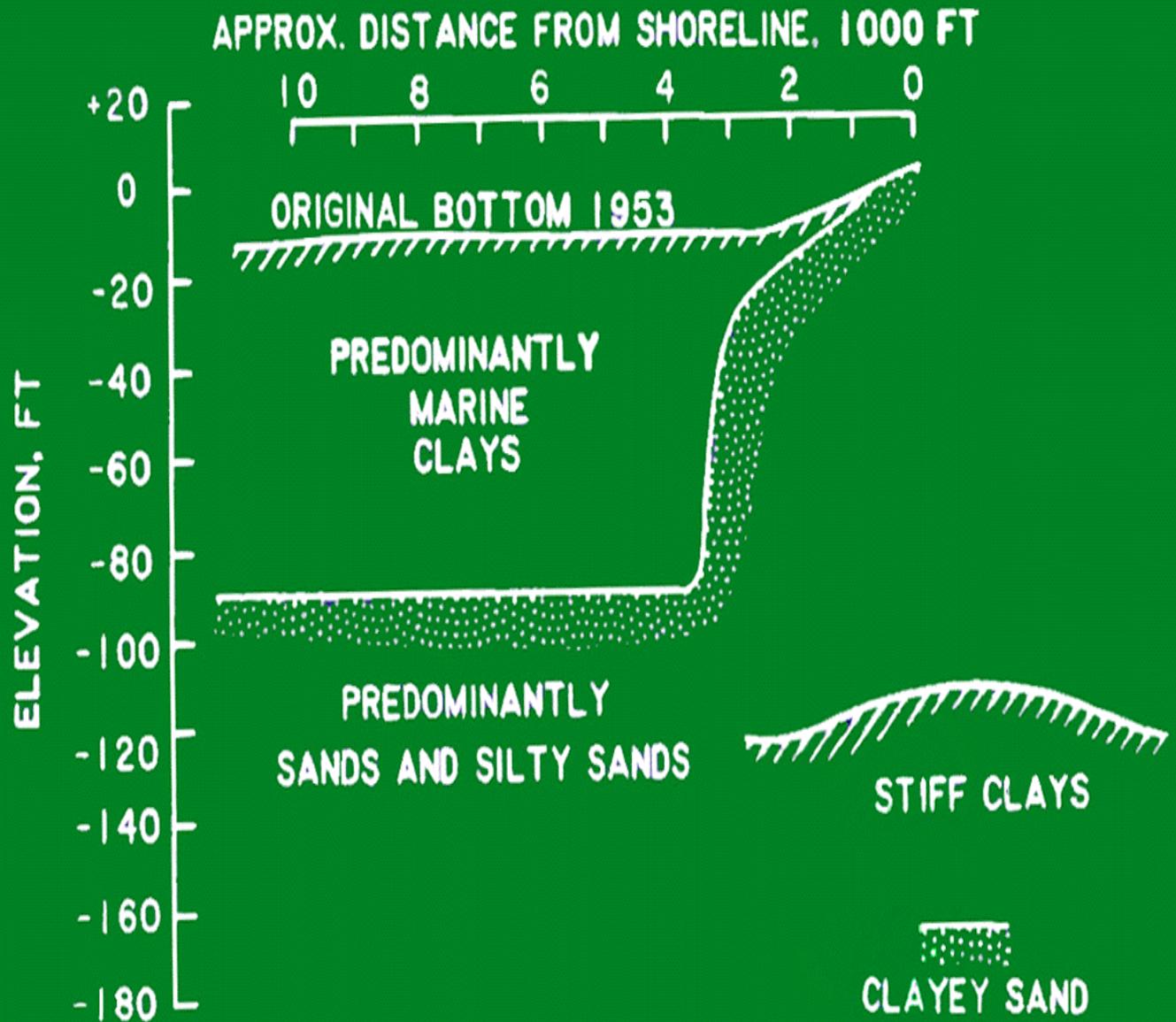


PROXIMITY





ZOHN WOOD





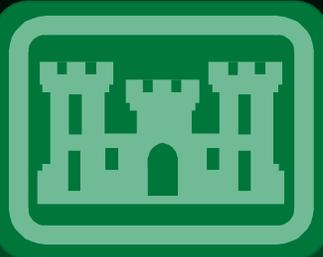
WREKALDZS





OLD ROAD

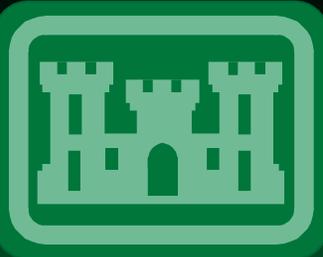




Section 148 of PL 94-587: Sec 148.

"Chief of Engineers, shall ... extend the capacity and useful life of dredged material disposal areas such that the need for new dredged material disposal areas is kept to a minimum."

U.S. Army Corps of Engineers



Engineering Research & Development
Center (Corps of Engineers Research Laboratory, formerly
Waterways Experiment Station)

- Studied Craney Island
- Developed a Management Plan for the Site
- Technical Report EL-81-II

U.S. Army Corps of Engineers



50%

WATER





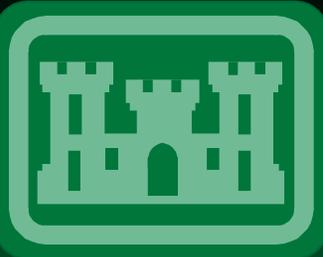
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WATER MANAGEMENT





Engineering Research & Development Center Management Plan

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- "...lift thicknesses in excess of 5 ft begin to significantly affect desiccation and consolidation behavior."
- "The lift thickness applied over any annual period should therefore be limited to approximately 6 ft or less to avoid significant reduction in dewatering benefits"
- NAO limits inflow to approximately 5 mcy/year



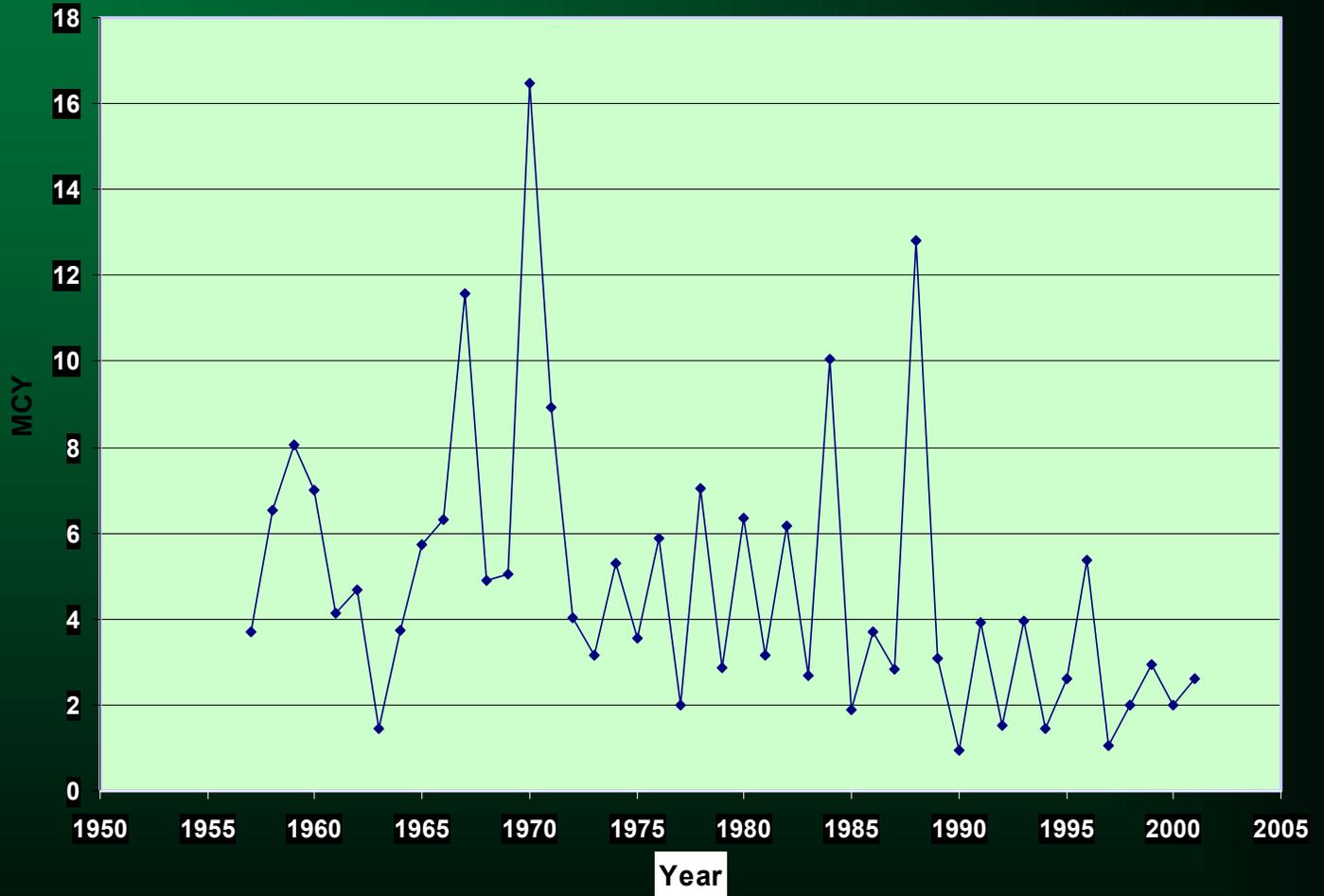
SHIFFS
BENEFITS

Management Plan

Benefit:

- Creates 25% more storage volume in Craney Island

CRANEY ISLAND INFLOW



IN
FLOW
RATE





TOLLS

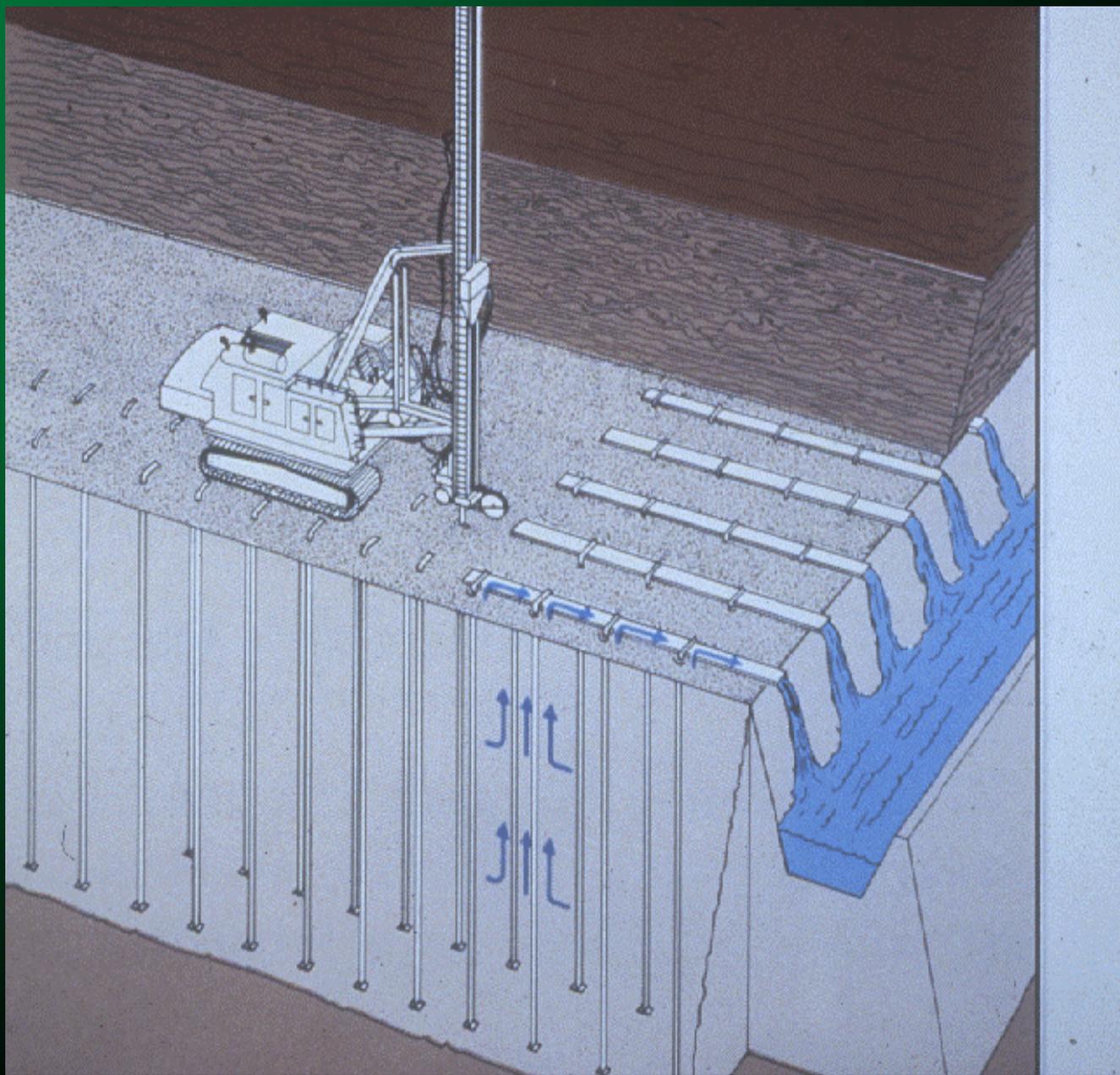
Direct Pump	\$0.86 Per Cubic Yard
Cost to Rehandle	<u>+\$1.44</u> Per Cubic Yard
Rehandling Basin	\$2.30 Per Cubic Yard



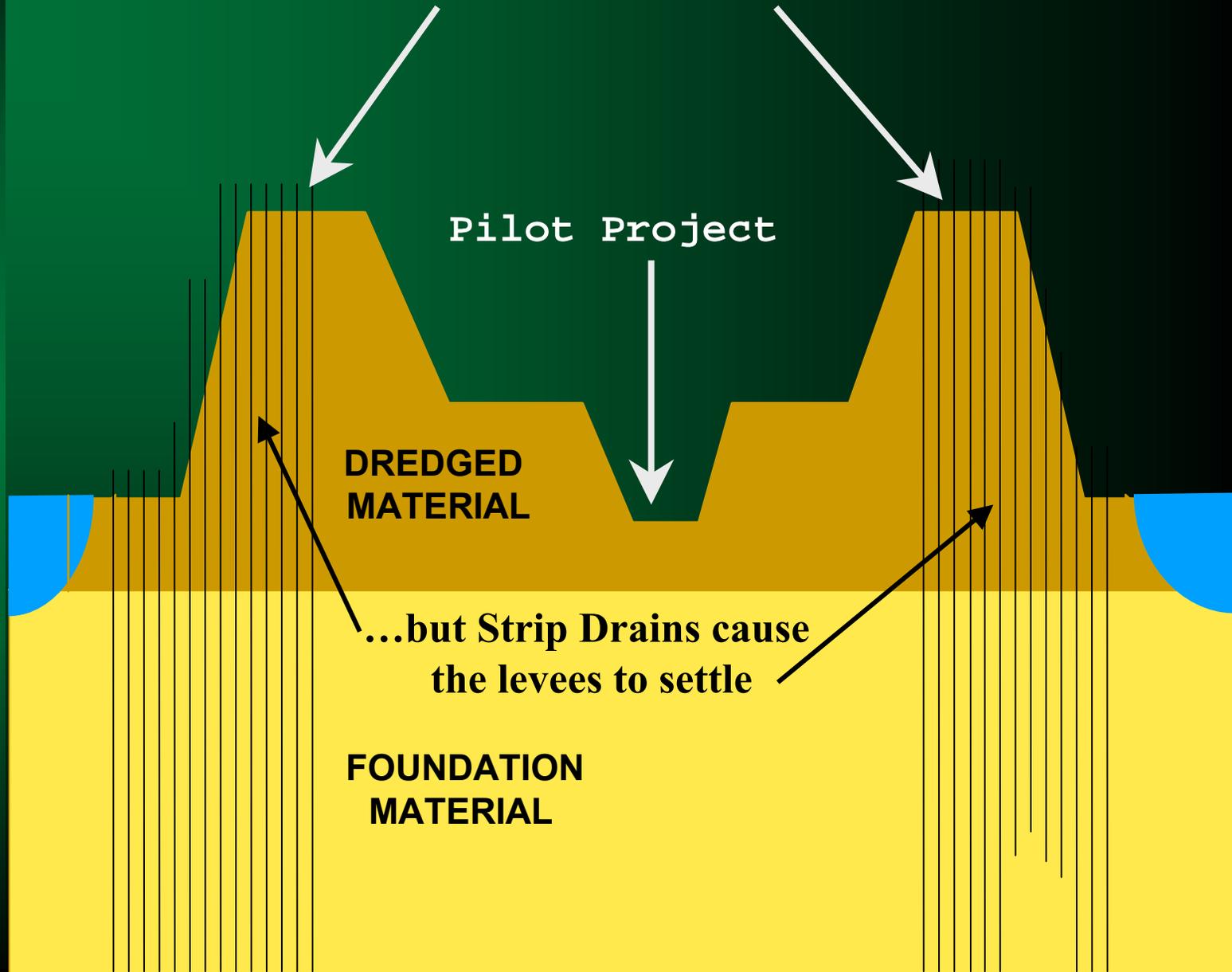
DZL S H I
V E Z A R C

Foundation Improvements to Raise Craney Island Levees

SWARD PITS



PLACE STRIPS IN LEVEES TO
ALLOW RAISING LEVELS...



Pilot Project

DREDGED
MATERIAL

...but Strip Drains cause
the levees to settle

FOUNDATION
MATERIAL

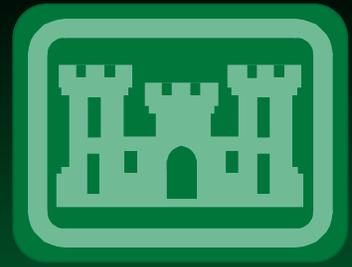
WARD
PIERS
STRIPS





STWARD PARTS SZAARD PARTS





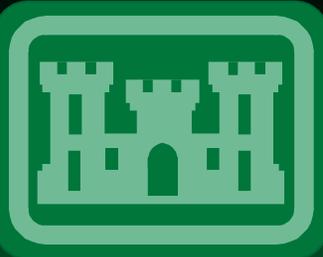
CRANEY ISLAND INFLOW



Methodology for Projecting Deposits:

- Detailed Study
 - design the channels
 - determine what the harbor looks like
- Look at past inflows & make broad assumptions
- Combination

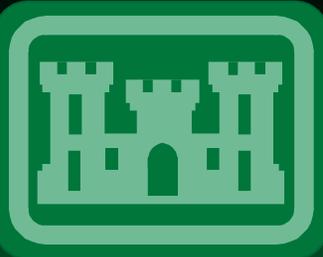
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Methodology for Projecting Deposits:

- 2000-2020: Educated Estimate
- 2021 and beyond: Look at past inflows & make broad assumptions

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2000-2020 Estimate

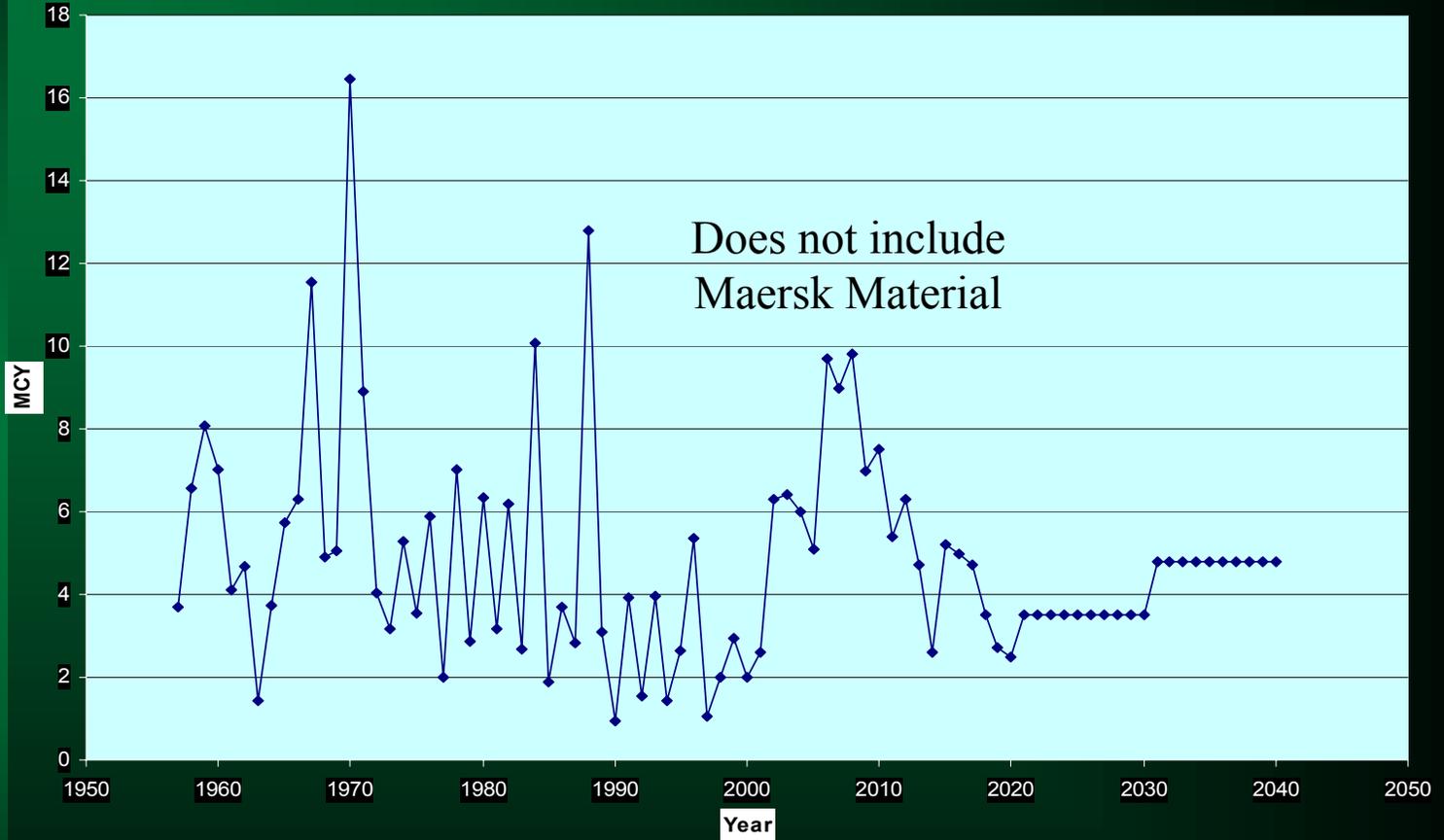
– Surveyed Large Users: Navy, VPA, VDOT, USACE

- Determine Significant: New Work Projects
- Timing of New Work
- Annual Maintenance Dredging volume:
2.5 mcy/year

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Million Cubic Yards per Year vs. Year



2001-2010: 2.5 mcy maintenance + 1 mcy new work

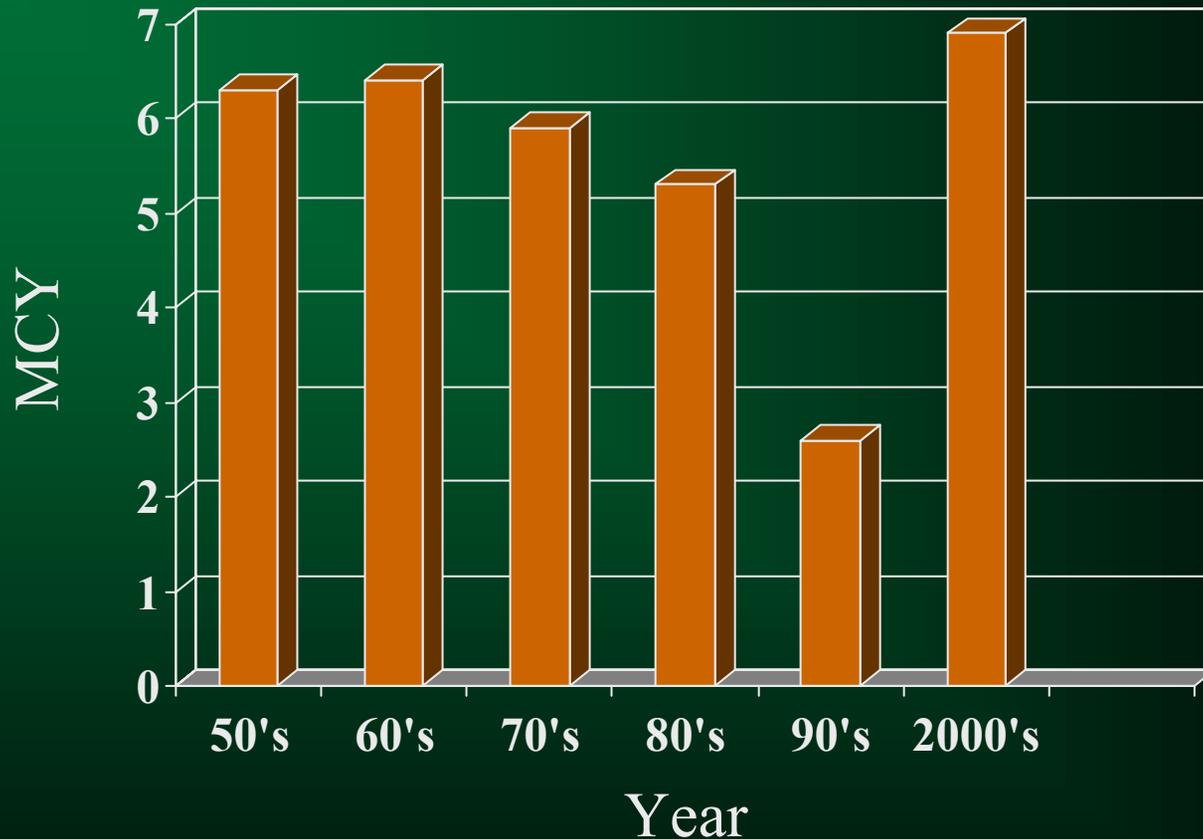
2011-2020: 4.8 mcy/yr = long term avg. inflow

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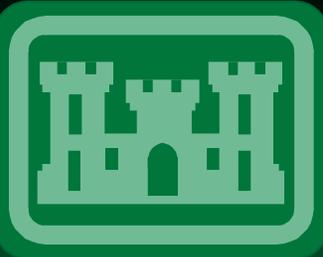


Average Annual Inflows per Decade

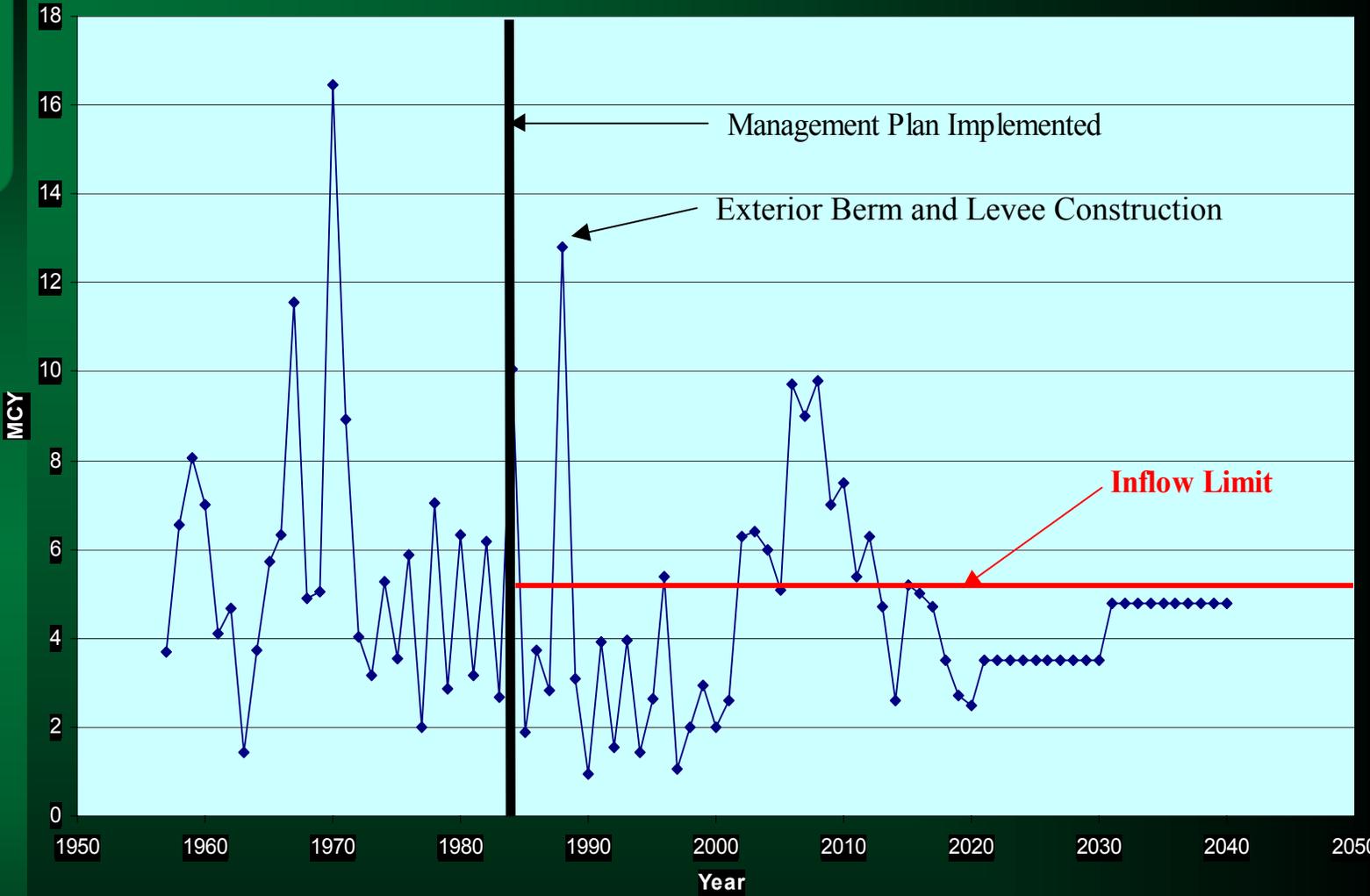
(50's includes 4 yrs of records)



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INFLOW LIMIT



2002 -2012: 25 mcy of demand in excess of inflow limit
(much higher if Maersk expansion is included)



ERDC

◆ TASKS UNDERWAY

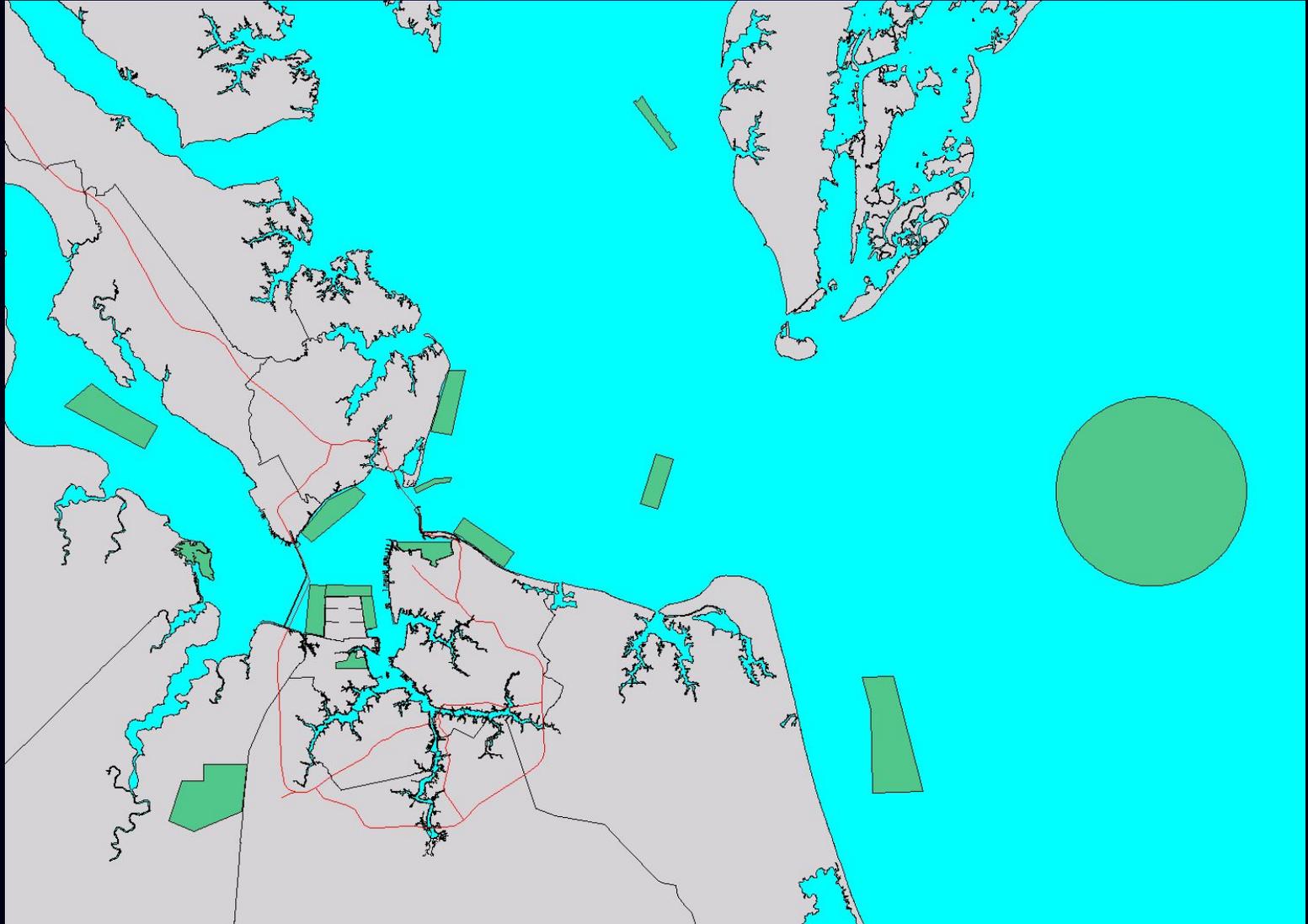
- Options for Port Expansion
- Effectiveness of Management Activities
- Contaminant Pathways for Screening
- Projecting Fill Capacities of Alternatives
- Site Management Plans



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E
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Questions?

ALTERNATIVES ANALYSIS





Use as Dredged Material Placement Facility



WEBSITE ADDRESS

<http://gisweb.nao.usace.army.mil/CraneyEE/>



US Army Corps of Engineers Norfolk District

Craney Island Eastward Expansion Footprint Options



History of Coordination

- ◆ April 2000 – Stakeholders Meeting
- ◆ April 2000 – January 2001 – Footprint Options created and reviewed
- ◆ November 2001 – Alternatives Technical Review Committee Created
- ◆ January 2001 – Footprints selected for VIMS and ERDC modeling

Hydraulics
&
Hydrology

Geotechnical
Engineering

Environmental

Regulatory

Senior
Technical
Review

**Alternatives Technical
Review Committee**

GIS

Economics

Craney Island
Operations

Social
&
Cultural

NEPA GUIDELINES

- ◆ ... “[r]igorously explore and objectively evaluate all reasonable alternatives...
- ◆ The agency is required to consider alternatives **NOT** within the jurisdiction of the lead agency and must consider the no action alternative.

Stakeholder Coordination

- ◆ Chesapeake Bay Foundation
- ◆ Chesapeake Bay Local Assistance Department
- ◆ The Elizabeth River Project
- ◆ National Marine Fisheries Service
- ◆ Old Dominion University
- ◆ U.S. Environmental Protection Agency
- ◆ U.S. Fish and Wildlife Service
- ◆ Virginia Department of Conservation and Recreation
- ◆ Virginia Department of Environmental Quality
- ◆ Virginia Department of Game and Inland Fisheries
- ◆ Virginia Department of Historic Resources
- ◆ Virginia Department of Transportation
- ◆ Virginia Institute of Marine Science
- ◆ Virginia Marine Resources Commission
- ◆ Virginia Pilots Association
- ◆ Virginia Port Authority

Existing
Facility

Craney
Island
Dredged
Material
Management
Area

Portsmouth



Option 1 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

Revised Third Crossing
(Shifted West & 1200' South)

VDOT's Proposed
Third Crossing

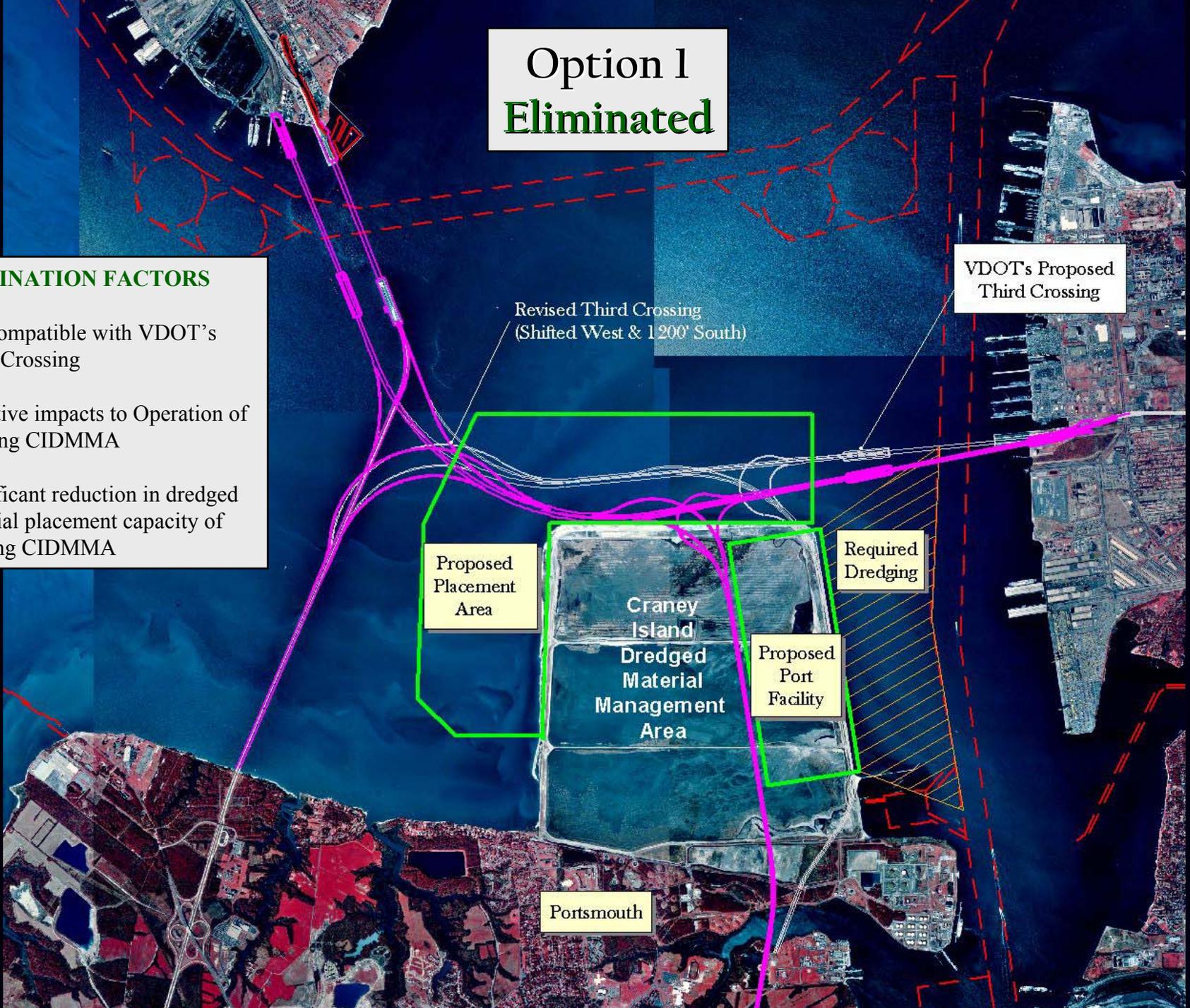
Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Required
Dredging

Proposed
Port
Facility

Portsmouth



Option 2 Eliminated

ELIMINATION FACTORS

- Significant Environmental / Social Concerns
- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

Revised Third Crossing
(Shifted West & 1200' South)

VDOT's Proposed
Third Crossing

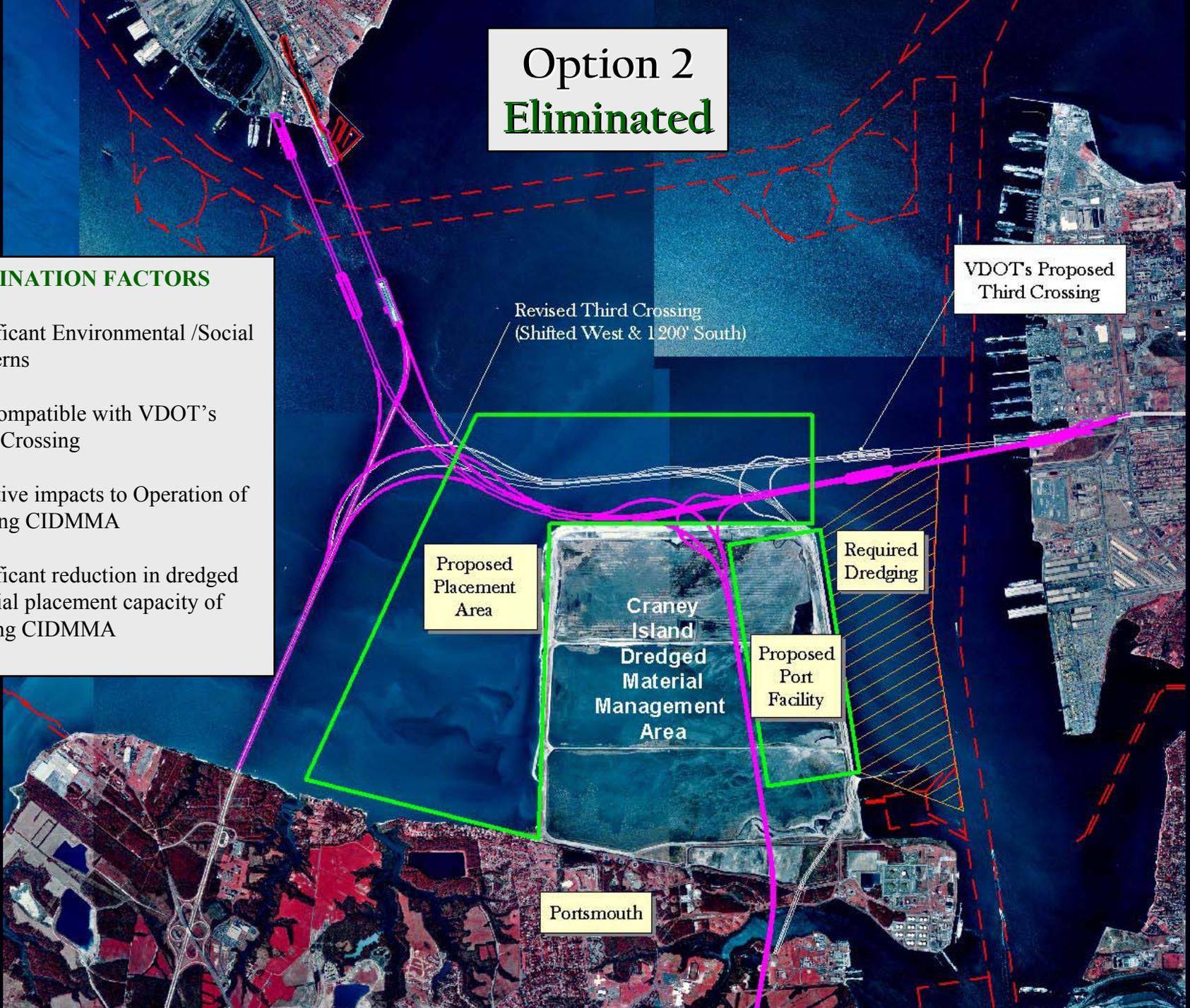
Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Required
Dredging

Proposed
Port
Facility

Portsmouth



Option 3 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

VDOT's Proposed Third Crossing

Revised Third Crossing (Shifted West)

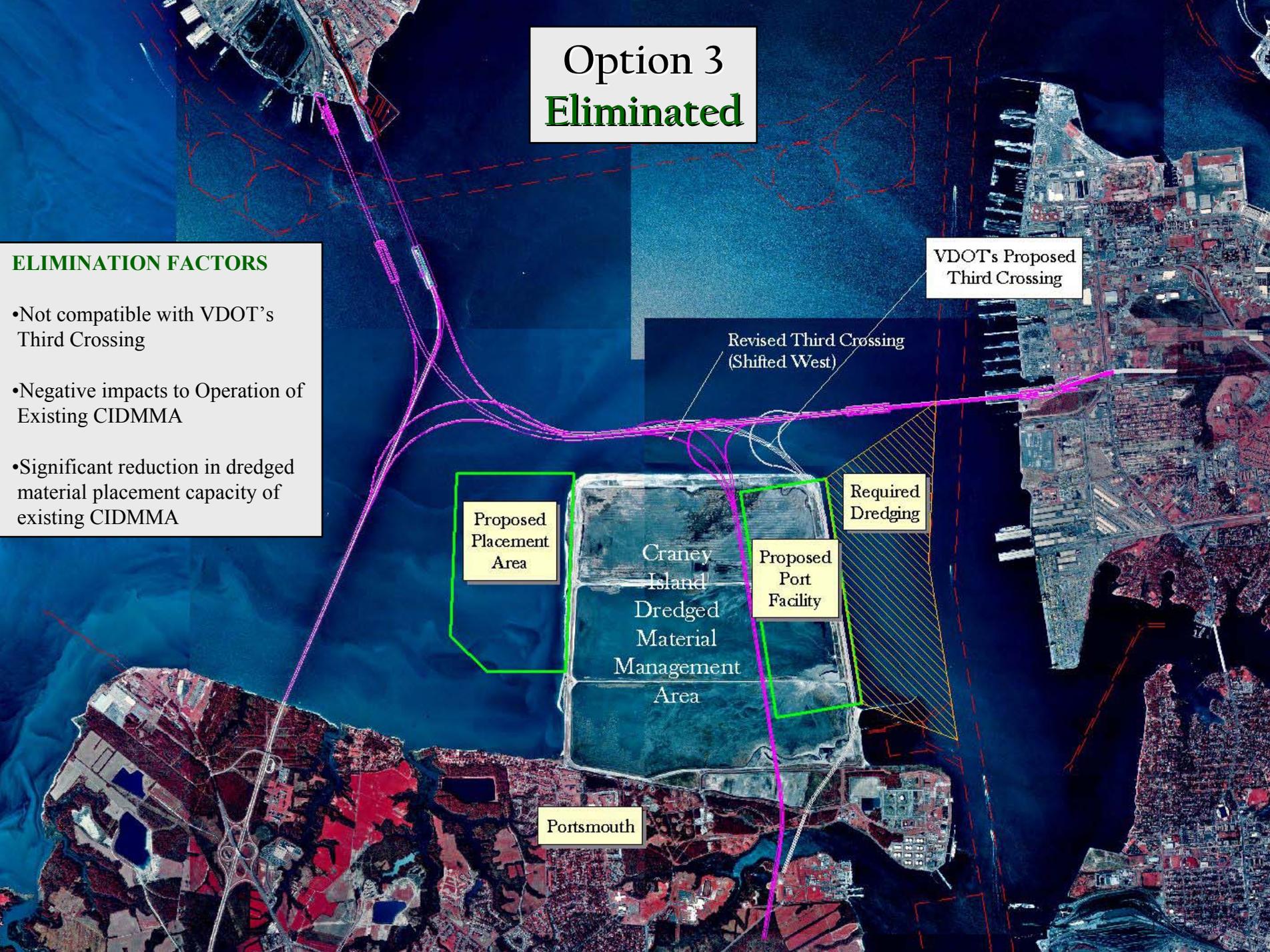
Proposed Placement Area

Craney Island Dredged Material Management Area

Required Dredging

Proposed Port Facility

Portsmouth



Option 4 Eliminated

Hampton Roads Crossing Study
Alternate 9 (Shifted West)

ELIMINATION FACTORS

- Significant Environmental / Social Concerns
- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

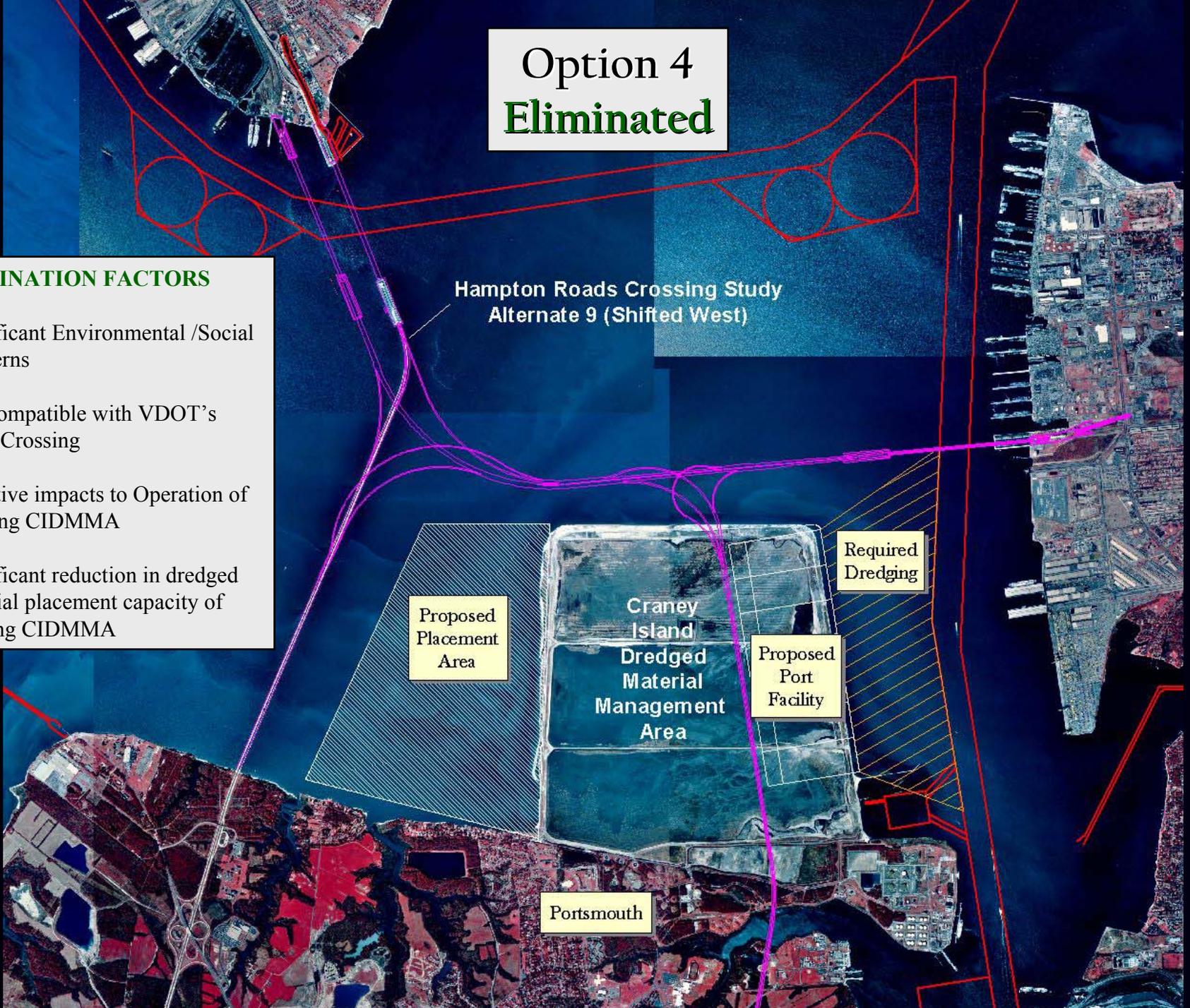
Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Required
Dredging

Proposed
Port
Facility

Portsmouth



Option 5 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

Hampton Roads Crossing Study
Alternate 9 (Shifted West)

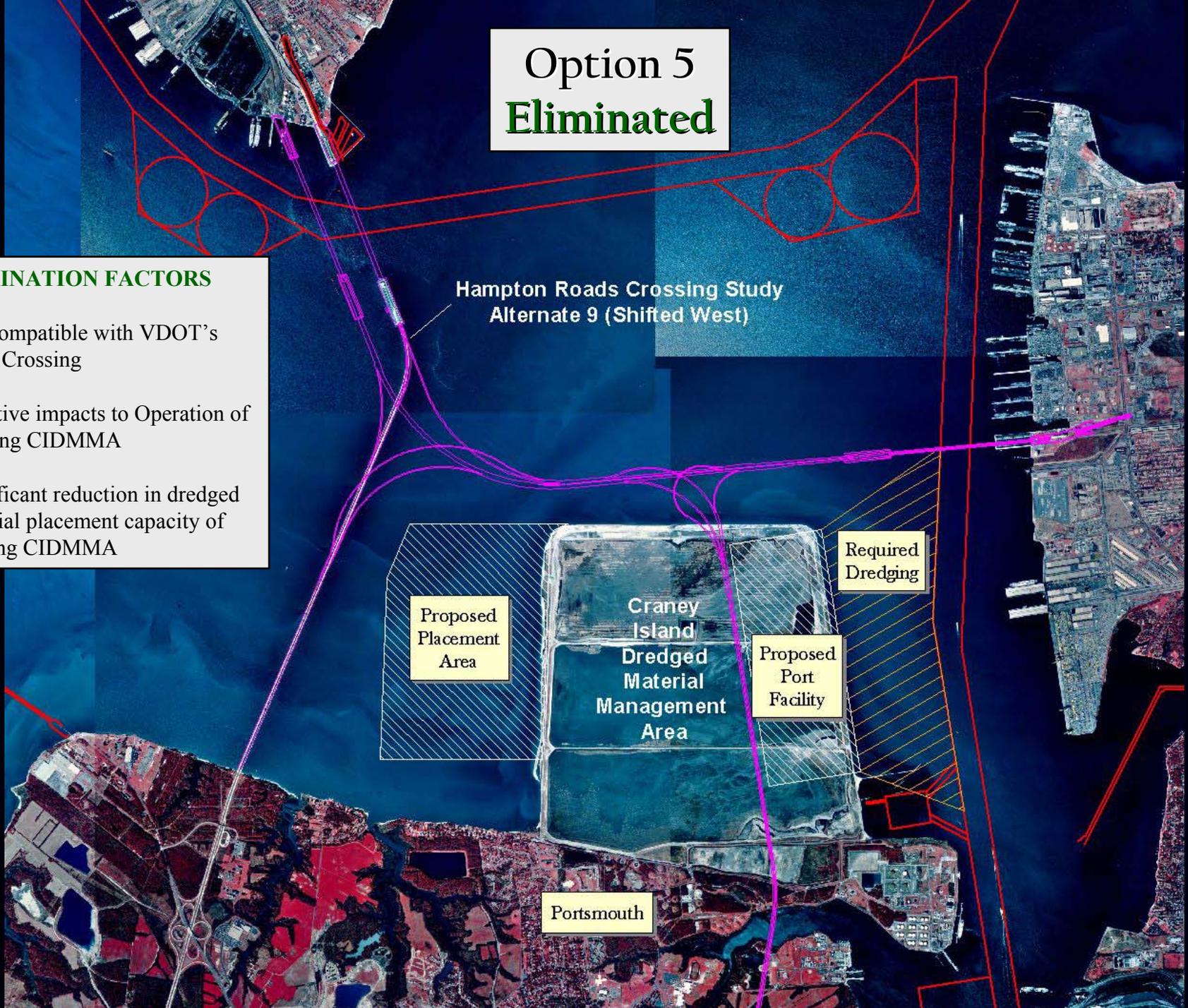
Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Required
Dredging

Proposed
Port
Facility

Portsmouth



Modified Option 5 Modeling

SELECTION FACTORS

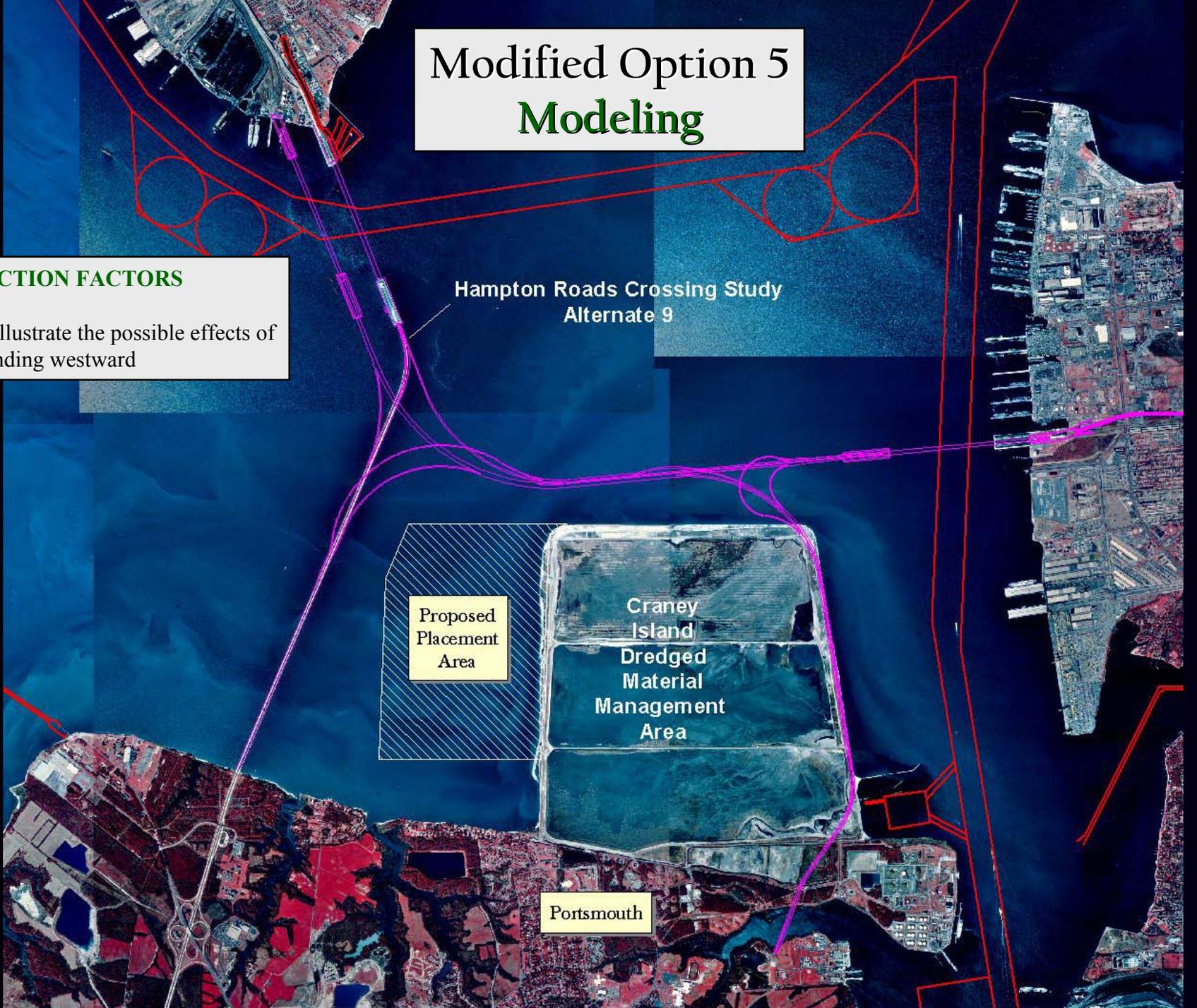
- Will illustrate the possible effects of expanding westward

Hampton Roads Crossing Study
Alternate 9

Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Portsmouth



Option 6 Modeling

SELECTION FACTORS

- Will illustrate the possible effects of expanding northward
 - Plunging front
 - Clam sanctuary

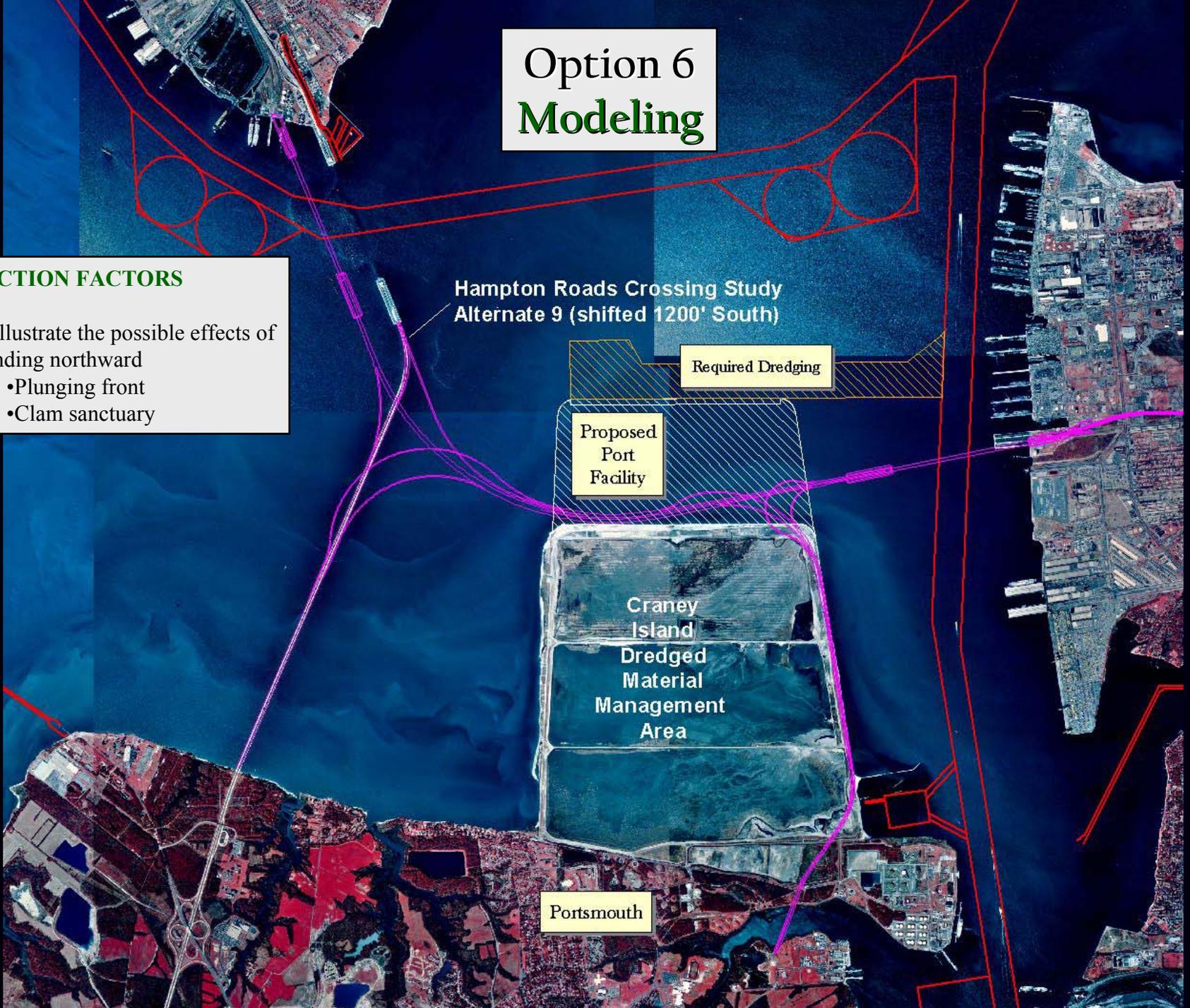
Hampton Roads Crossing Study
Alternate 9 (shifted 1200' South)

Required Dredging

Proposed
Port
Facility

Craney
Island
Dredged
Material
Management
Area

Portsmouth



Option 7 Modeling

SELECTION FACTORS

- Will illustrate the possible effects of expanding eastward
 - Flow
- Locally preferred plan

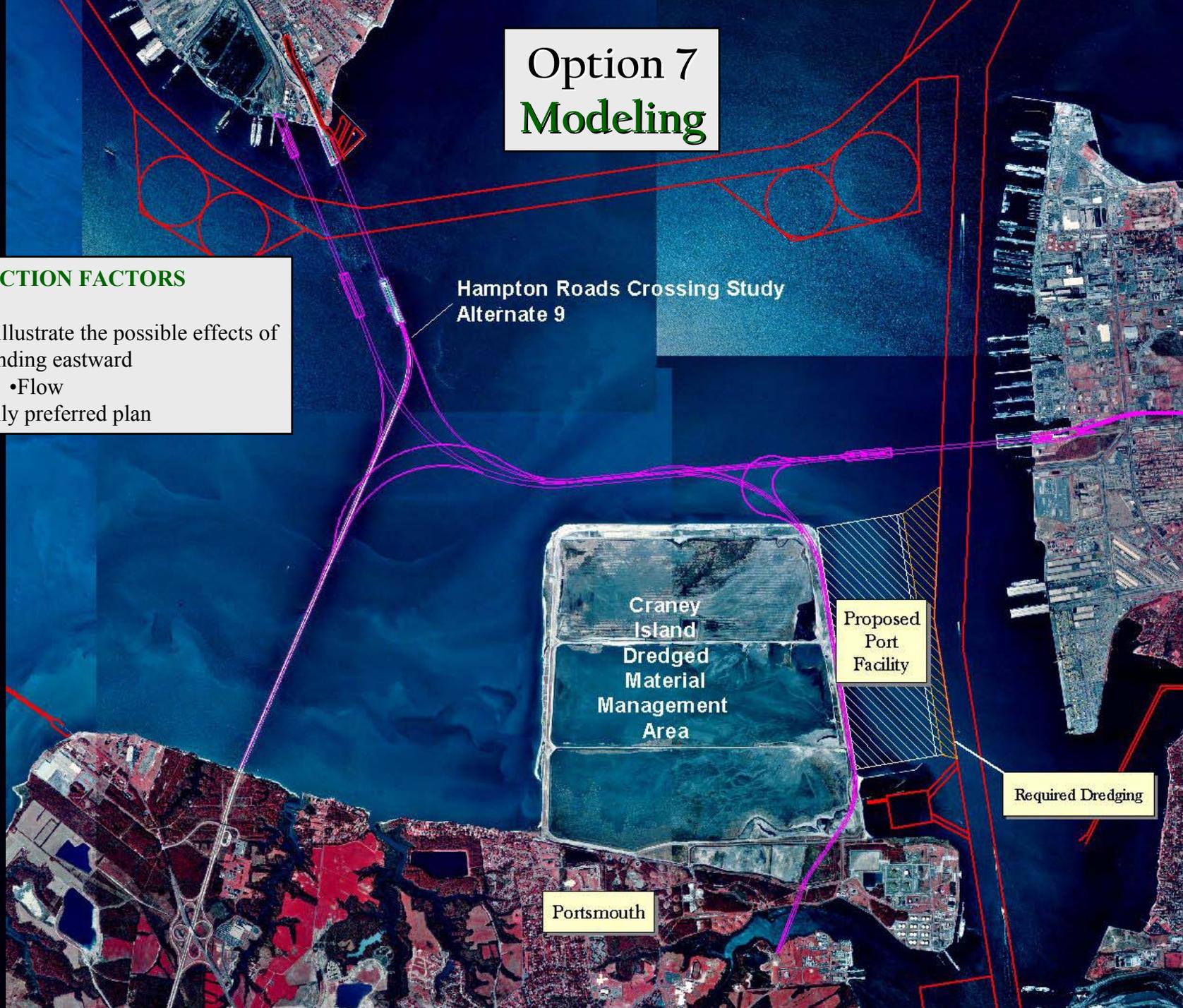
Hampton Roads Crossing Study
Alternate 9

Craney Island
Dredged
Material
Management
Area

Proposed
Port
Facility

Required Dredging

Portsmouth



Option 8 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

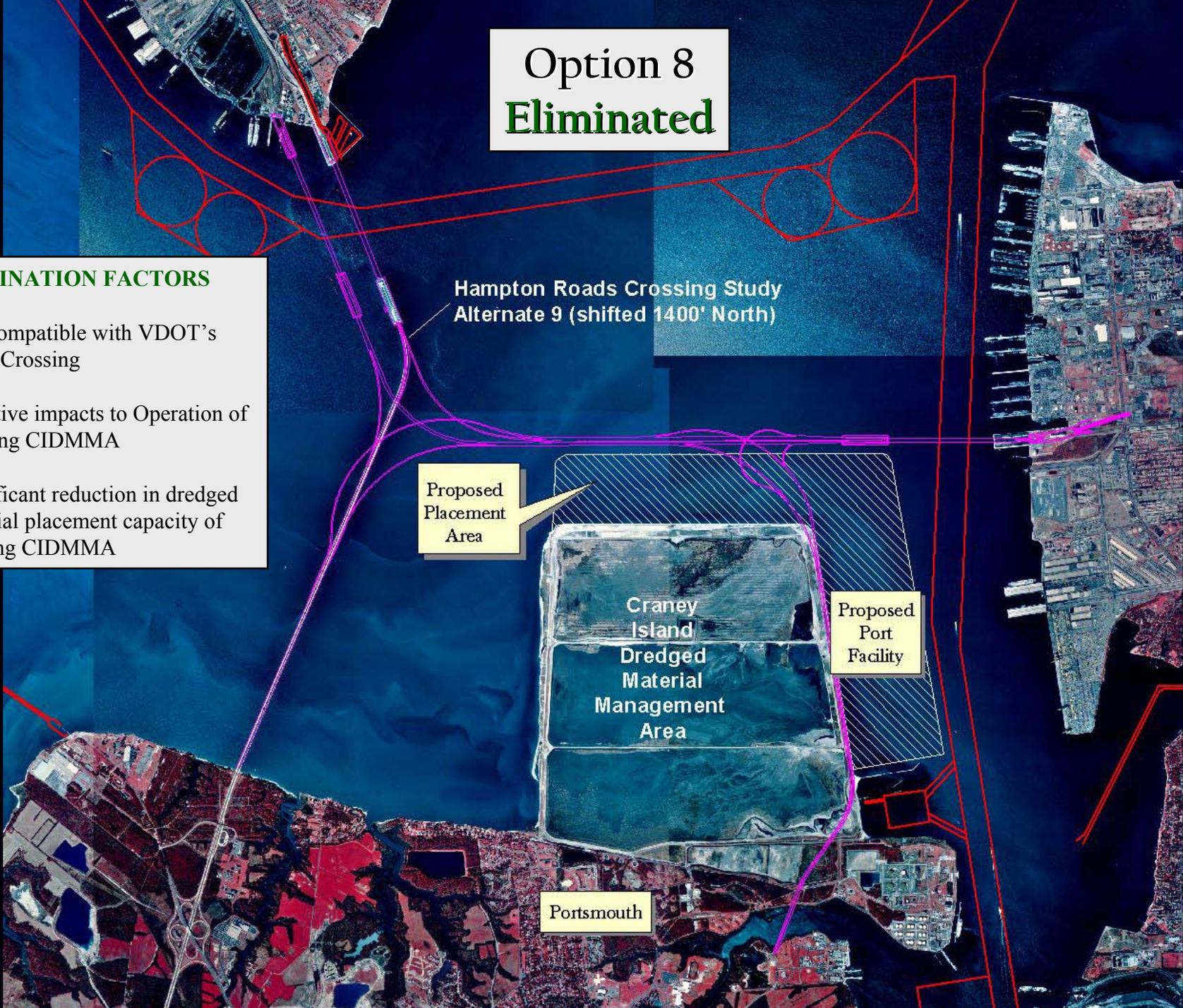
Hampton Roads Crossing Study
Alternate 9 (shifted 1400' North)

Proposed
Placement
Area

Craney
Island
Dredged
Material
Management
Area

Proposed
Port
Facility

Portsmouth



Option 9 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

Revised Third Crossing
(Shifted 1200' South)

Required Dredging

Proposed Port Facility

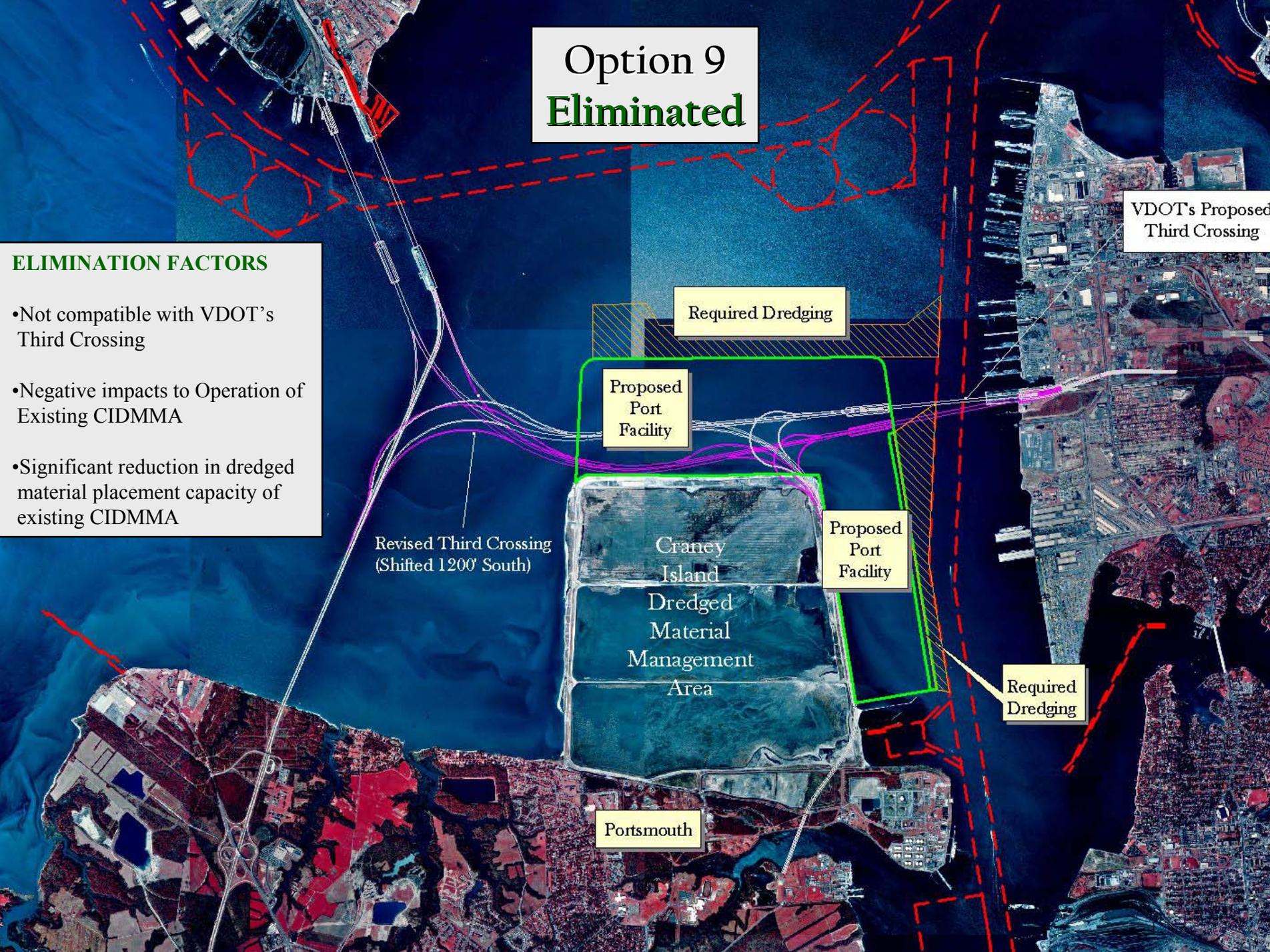
Craney Island
Dredged Material Management Area

Proposed Port Facility

Required Dredging

Portsmouth

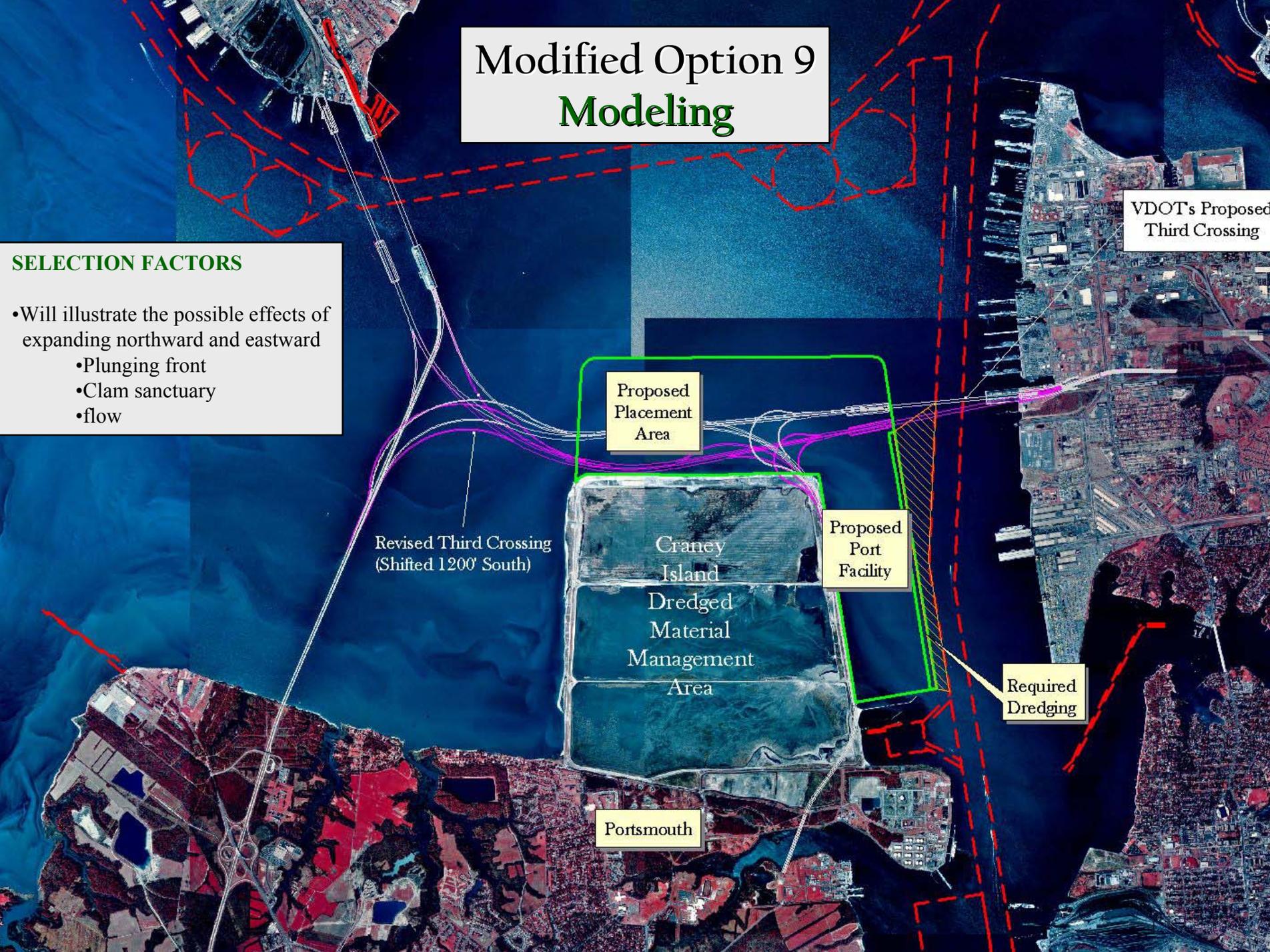
VDOT's Proposed Third Crossing



Modified Option 9 Modeling

SELECTION FACTORS

- Will illustrate the possible effects of expanding northward and eastward
 - Plunging front
 - Clam sanctuary
 - flow



VDOT's Proposed
Third Crossing

Proposed
Placement
Area

Revised Third Crossing
(Shifted 1200' South)

Craney
Island
Dredged
Material
Management
Area

Proposed
Port
Facility

Required
Dredging

Portsmouth

Option 10

Eliminated from Consideration

ERDC Modeling for Comparison

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

VDOT's Proposed Third Crossing

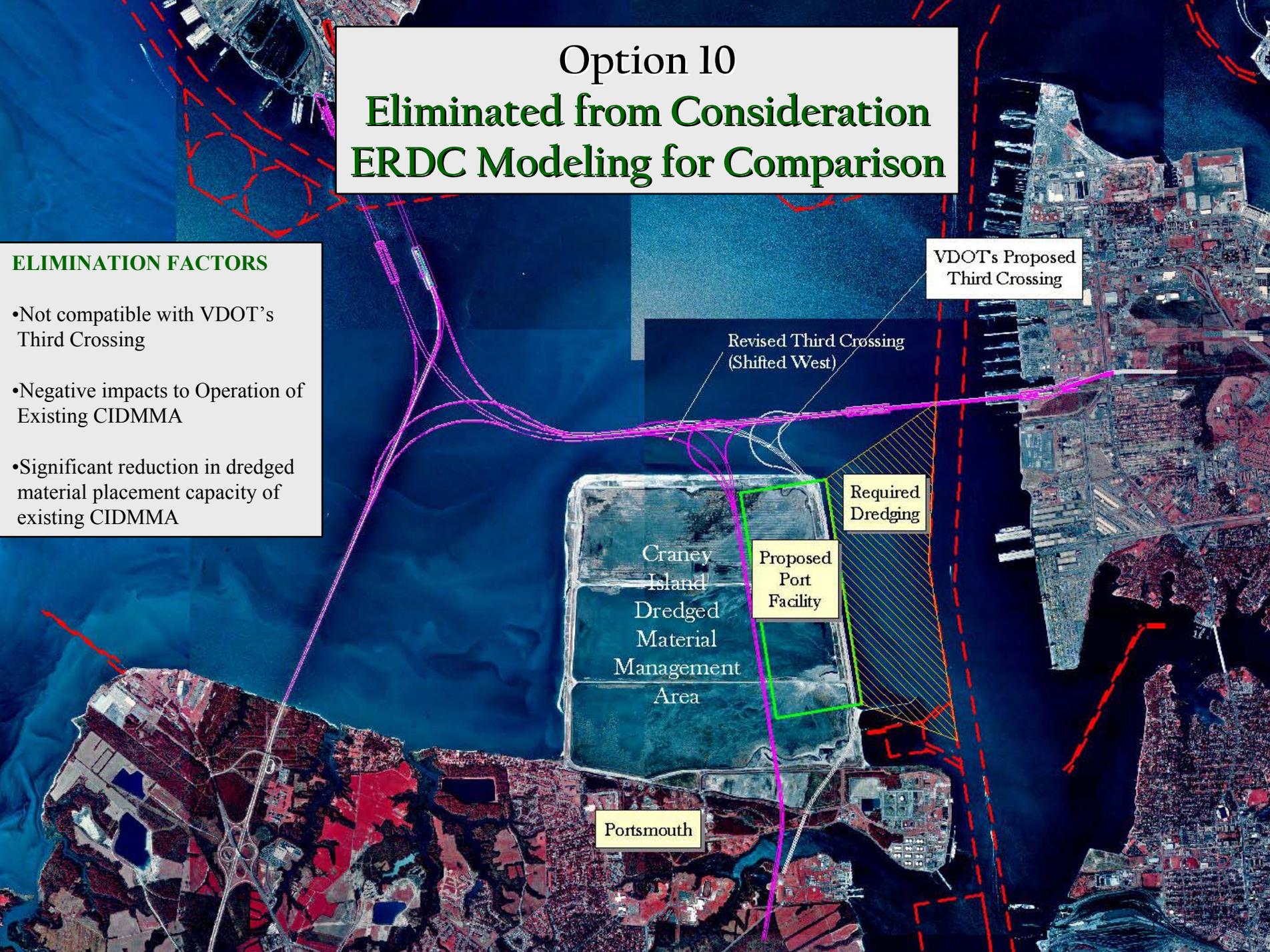
Revised Third Crossing (Shifted West)

Required Dredging

Proposed Port Facility

Craney Island Dredged Material Management Area

Portsmouth



Option 11 Eliminated

VDOT's Proposed
Third Crossing

Proposed Placement
Area

Revised Third Crossing
(Shifted West & 1200' South)

Required
Dredging

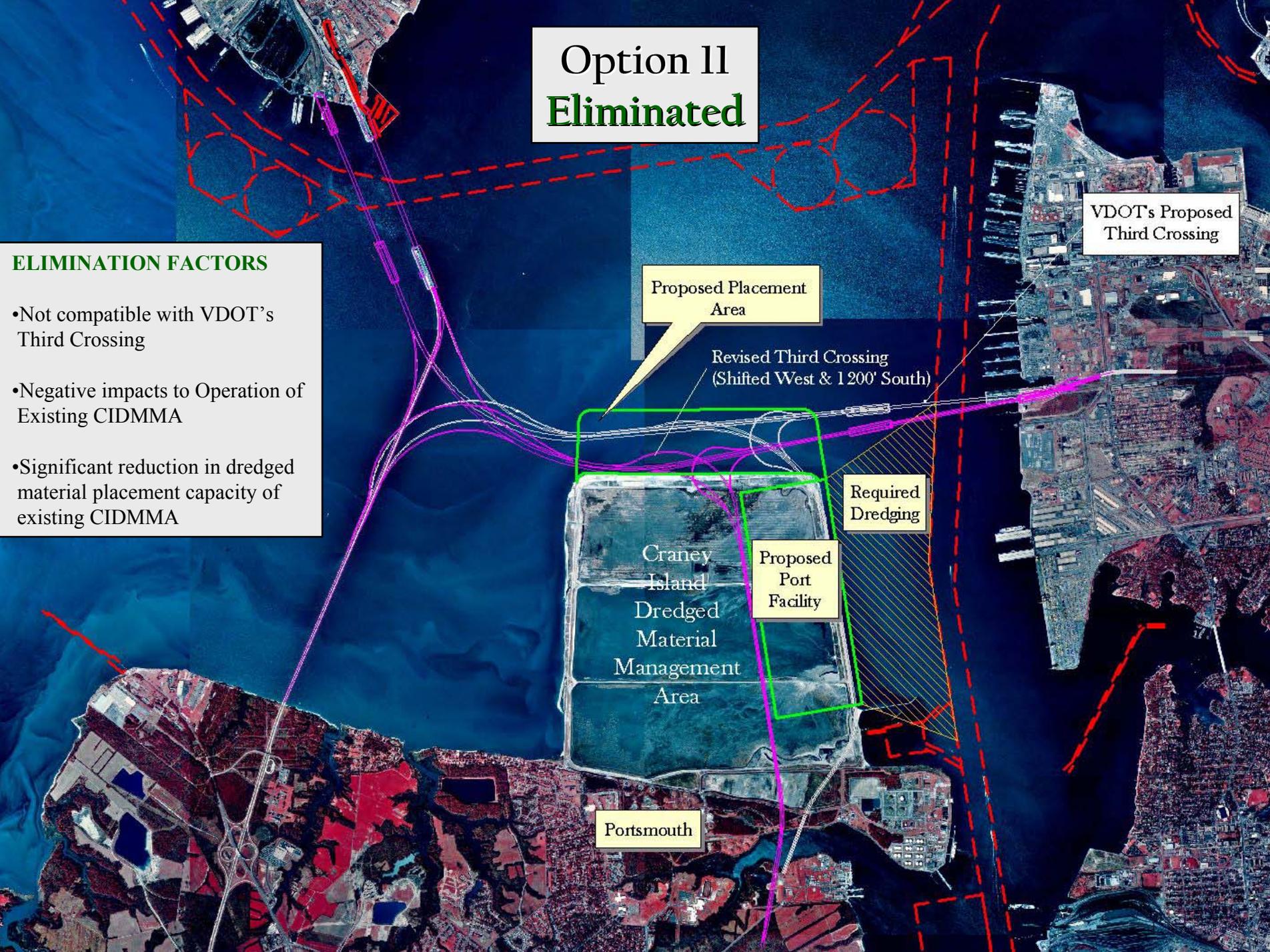
Craney
Island
Dredged
Material
Management
Area

Proposed
Port
Facility

Portsmouth

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA



Option 12 Eliminated

ELIMINATION FACTORS

- Not compatible with VDOT's Third Crossing
- Negative impacts to Operation of Existing CIDMMA
- Significant reduction in dredged material placement capacity of existing CIDMMA

Revised Third Crossing
(Shifted West & 1200' South)

VDOT's Proposed
Third Crossing

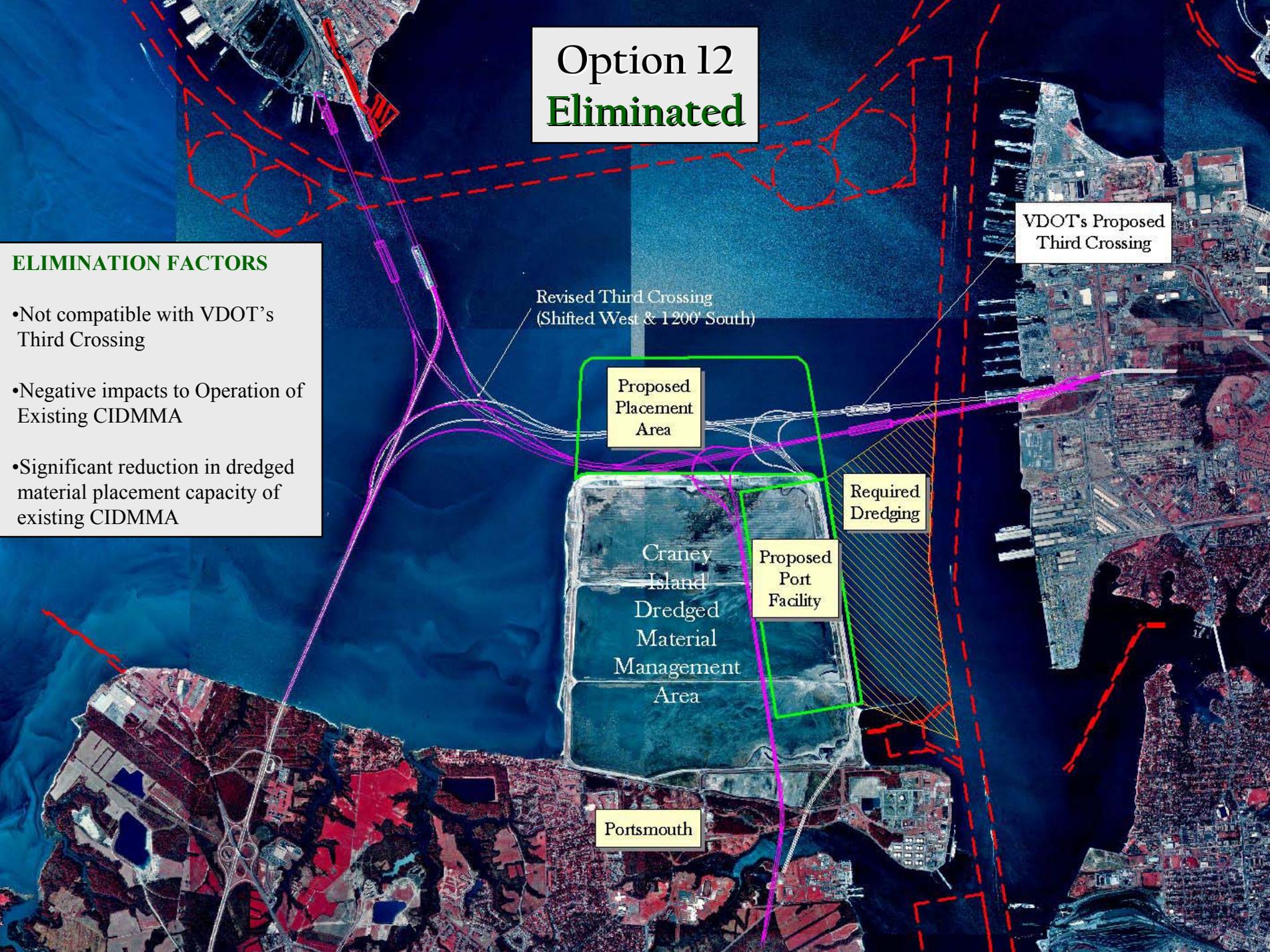
Proposed
Placement
Area

Required
Dredging

Craney
Island
Dredged
Material
Management
Area

Proposed
Port
Facility

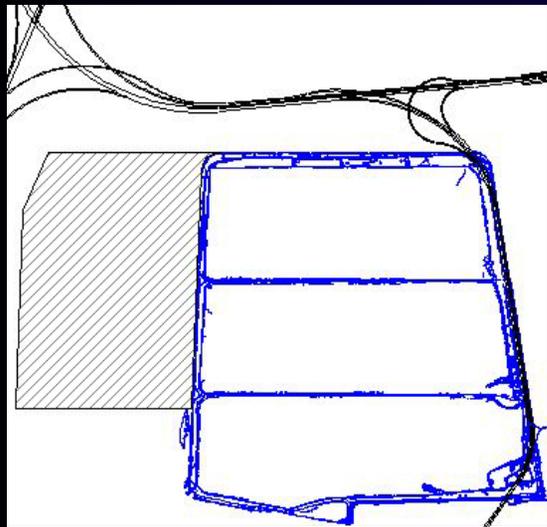
Portsmouth



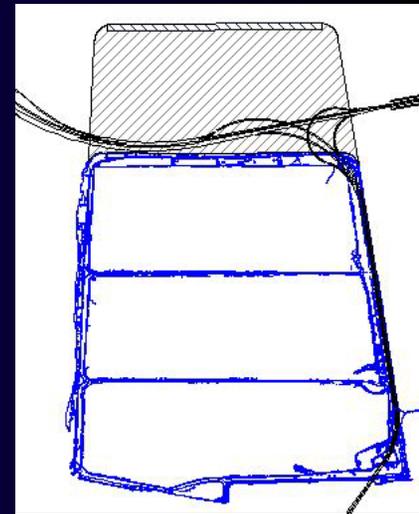
History of Coordination

◆ January 2001

- Footprints selected for VIMS modeling
- Footprints selected for ERDC modeling

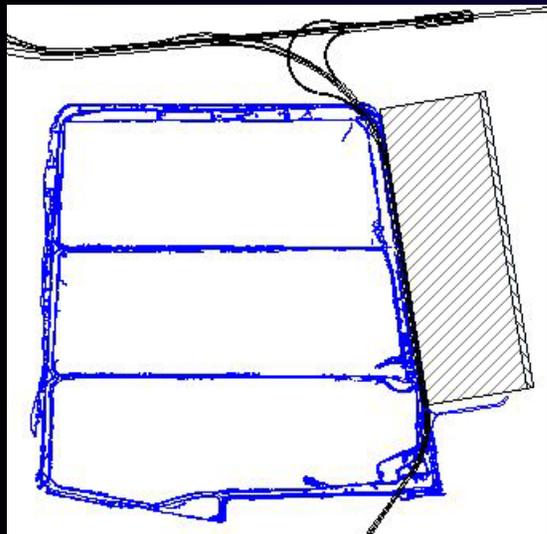


Modified Option 5



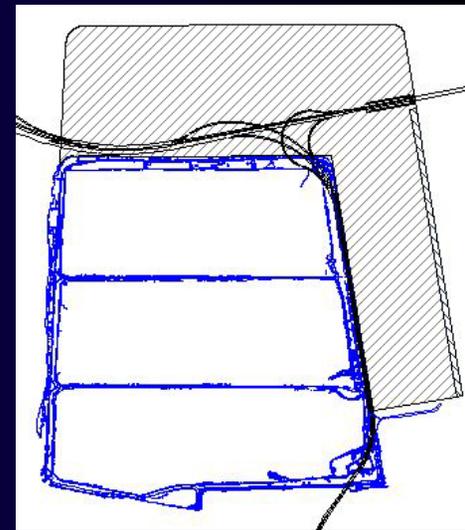
Option 6

Option 7

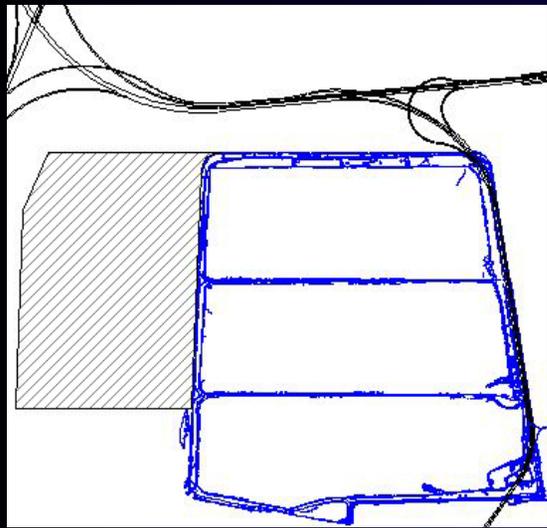


VIMS Modeling

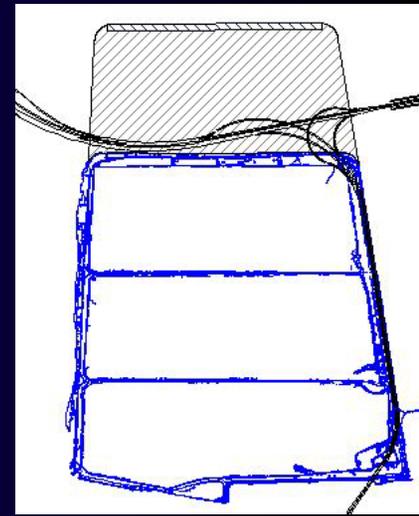
Modified Option 9



ERDC Modeling

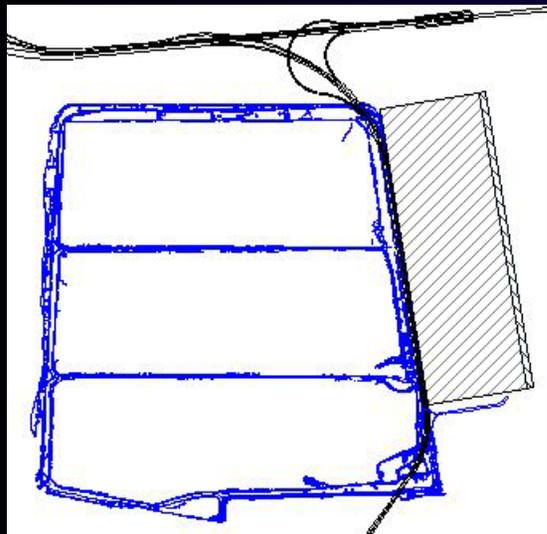


Modified Option 5

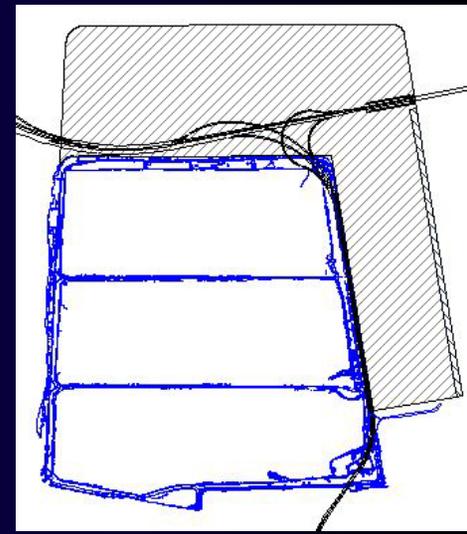


Option 6

Option 7



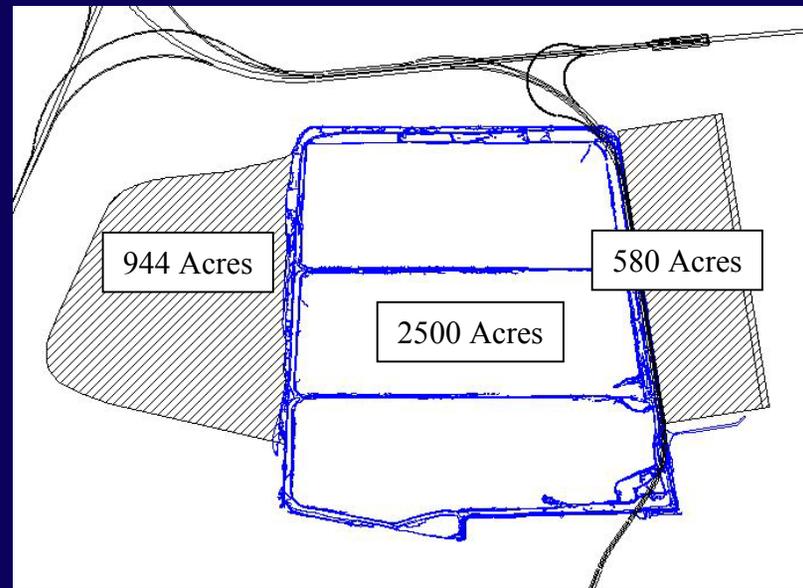
Modified Option 9



VIMS

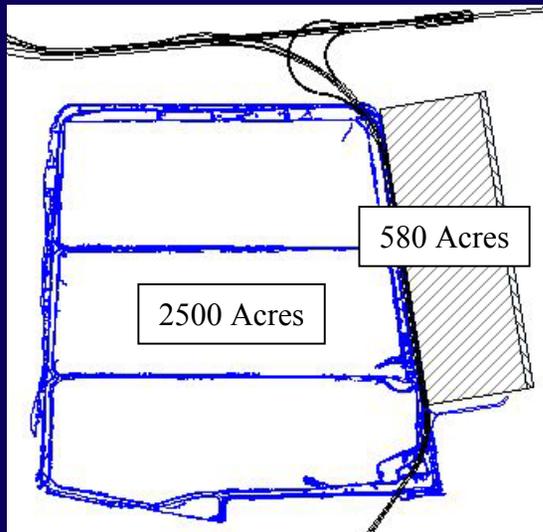
Historical Modeling

(Selected by Stakeholders)



West Placement Area
& East Port Facility

East Port Facility



Where Do We Go From Here?

- ◆ Receive Single Variable Results from Hydrodynamic Modeling ✓
- ◆ Review Input from Stakeholders
- ◆ Receive Results from ERDC Studies~ Mid-June
- ◆ Receive Results from Navigation Studies ~ June
- ◆ Alternatives Review Committee Meeting -
 - Mid – Late June
 - Select 2 footprint options for Multi-Variable Hydrodynamic modeling (VIMS)
- ◆ Final Analysis

Hydrodynamic Modeling

Dr. John Boone

VIMS