

# Boston Harbor, Massachusetts

## Deep Draft Navigation Improvement Feasibility Report and Supplemental Environmental Impact Statement



**USACE New England District  
in Partnership with Massport**

*NAD/SAD Meeting  
8 September 2008  
Mark L. Habel - NAE*



## CWRB Outcome



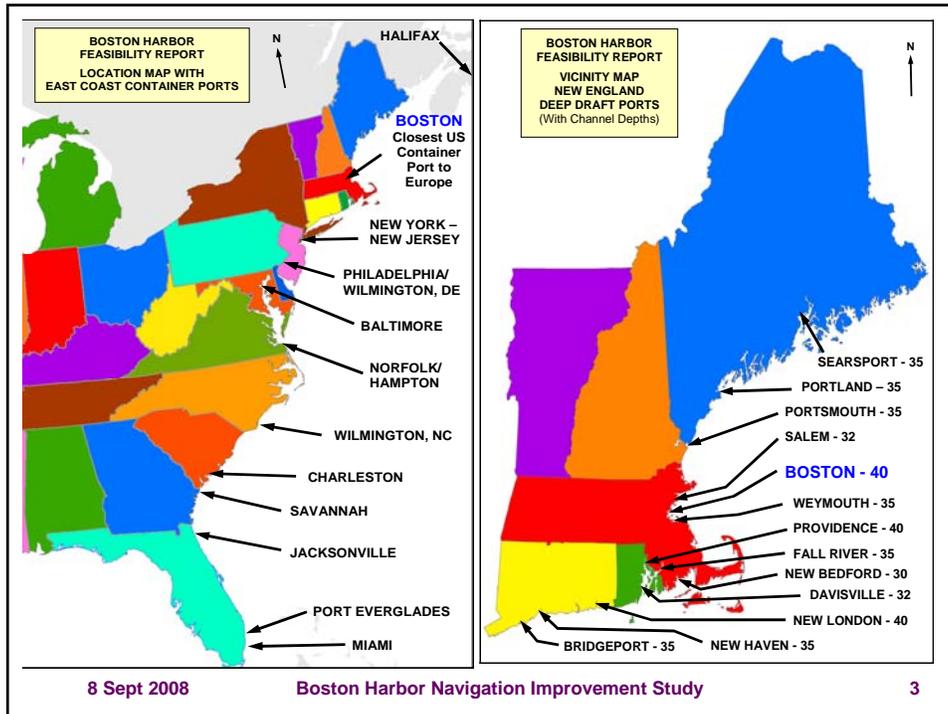
**Conley Terminal on  
Reserved Channel**

- The Civil Works Review Board met 21 August 08 and voted to have the project further examine economic analysis:
- Landside Benefits - will truck cargo really shift to the water
- Waterside Alternatives – Is a shift to smaller containerships more likely than larger ships
- Revisit vessel sailing drafts – use another port's distribution rather than the current Boston distribution
- Additional analyses will take 6 to 9 months

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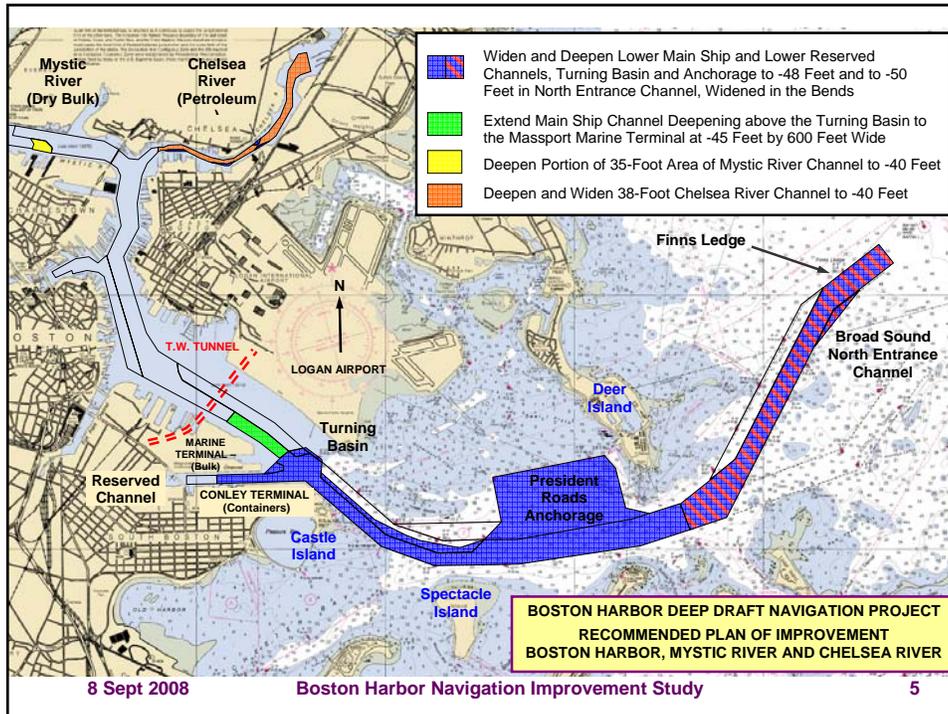
## Feasibility Recommendation 4 Improvements to Harbor

- **Main Channels Improvement:** For Containership Access to Conley Terminal
- **Main Ship Channel Deepening Extension:** For Large Dry Bulk Carrier Access to Massport Marine Terminal
- **Mystic River Channel:** Deepen for Smaller Dry Bulk Carrier Access to Massport's Medford Street Terminal
- **Chelsea River Channel:** Deepen Channel for Liquid Petroleum Carriers

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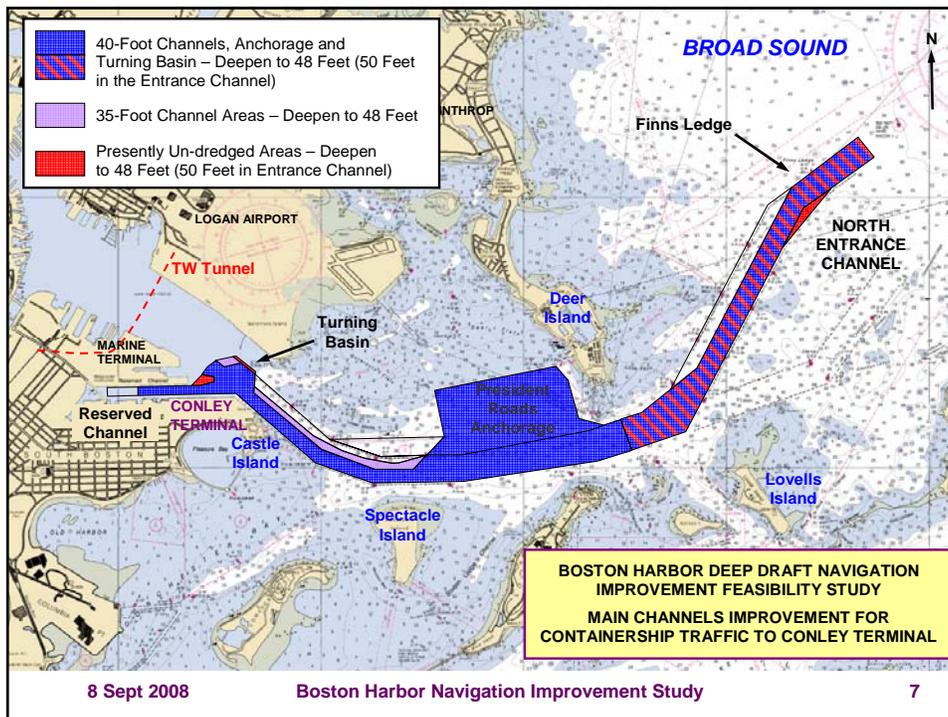
## Main Channels Improvement Deepening for Containership Access

- Project Features
  1. North Entrance Channel to 50 feet, widened at Finns Ledge Bend
  2. Main Ship Channel from Outer Confluence to Reserved Channel to 48 feet, widened to 900 feet below Castle Island and 800 feet above. Widened further in the bends.
  3. President Roads Anchorage Area to 48 feet
  4. Lower Reserved Channel along Conley Terminal to 48 feet
  5. Reserved Channel Turning Area widened to about 1600 feet and deepened to 48 feet
- Examined incremental depths of 42 to 50 feet MLLW – Optimized at 48 feet
- Entrance Channel two feet deeper than inner channels for increased sea states and vessel motion
- Conley Terminal Berths will be deepened to 3 feet deeper than the channel by Massport for tidal navigation
- Benefits from shifting truck transport to containership transport

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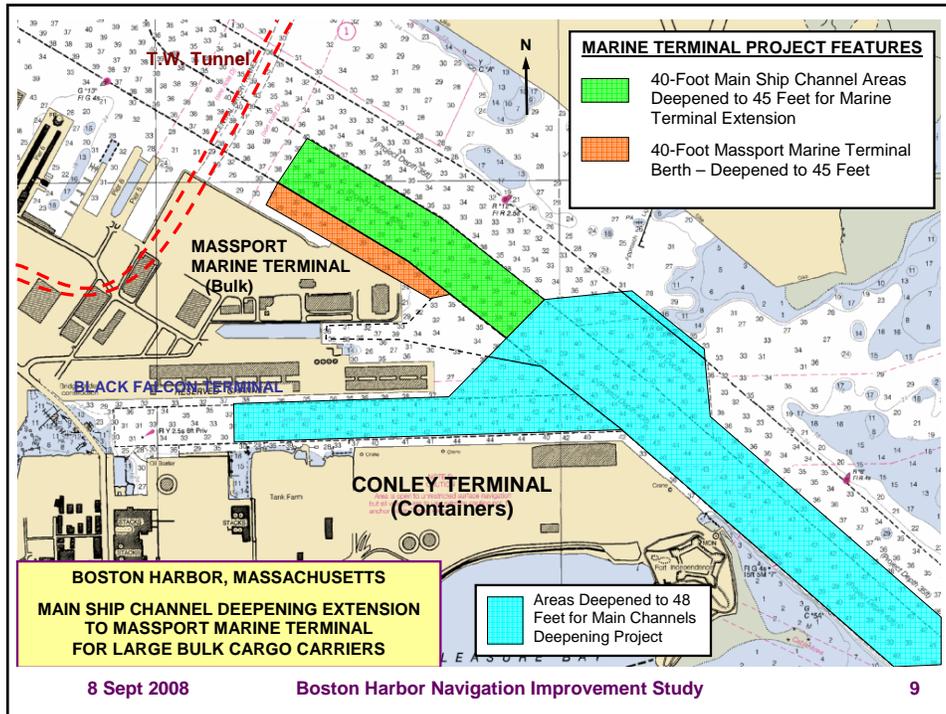
## Main Ship Channel Deepening to Massport Marine Terminal for Large Bulk Cargo Carriers

- Deepen existing 40-foot lane of the Main Ship Channel above the Reserved Channel Turning Area to the Massport Marine Terminal to 45 feet
- Until recently facility was site of highway construction staging
- Last terminal seaward of the tunnel restrictions
- Massport and developer on track to begin operations of new bulk cargo terminal in 2009 with existing 40-foot channel
- Cement imports used for economic analysis – benefits from shift to larger bulk carriers
- Depths increments of 42 to 45 feet examined

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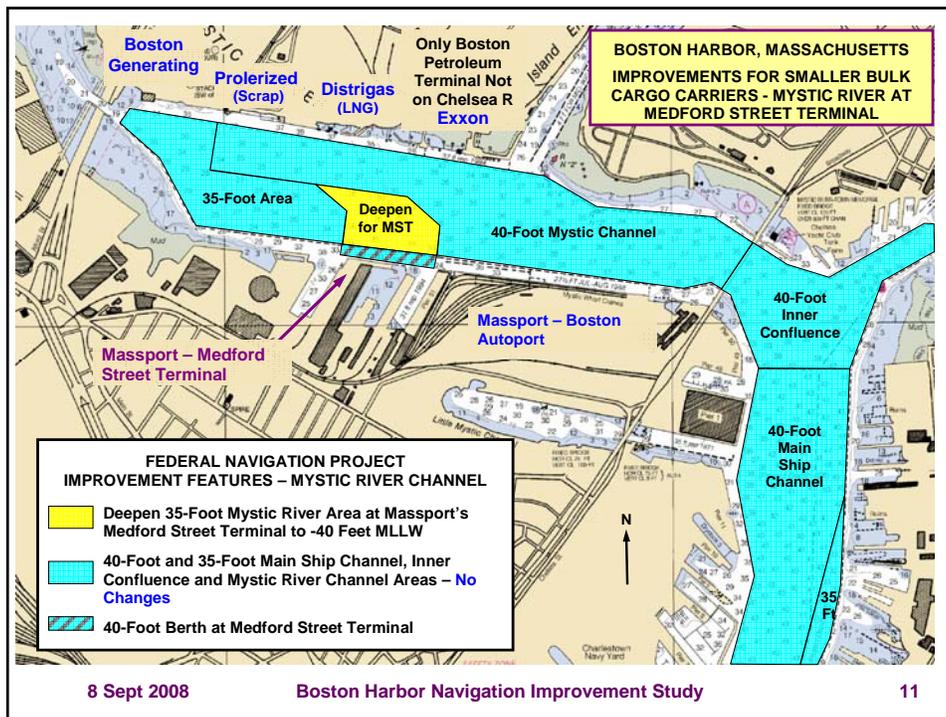
## Mystic River Channel Deepen Small Area to Access Massport's Medford Street Terminal for Small Bulk Cargo Carriers

- Deepening Small 35-Foot Area of Federal Channel to 40 Feet to Remove Restriction between 40-Foot Channel and 40-Foot Berth
- Massport Deepened Berth to 40 Feet in 1998
- Massport Developing former Sugar Terminal to Support Dry Bulk and Break Bulk Cargo. Benefits from shift to larger bulk carriers.
- Depths of 37 to 40 Feet Examined (40 Recommended)

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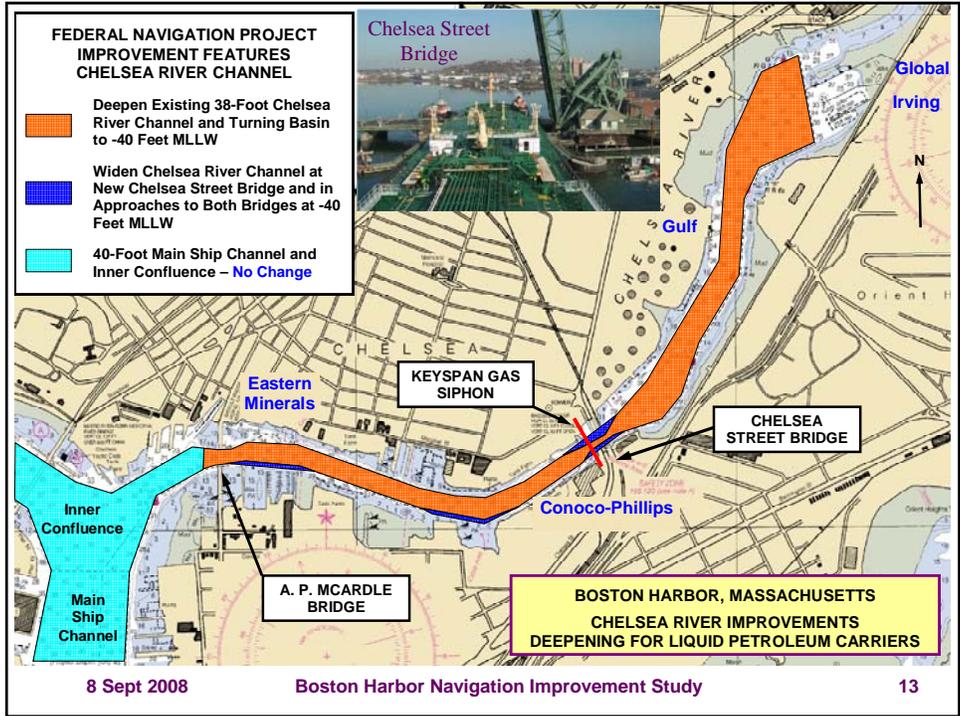
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## Chelsea River Channel Deepen for Liquid Petroleum Cargo

- Without Project Condition Requires:
  - Removal of Keyspan Gas Siphon – Planned as Part of Inner Harbor Maintenance 2008-2009. Replacement Line Completed August 2008 – Old Line to be Removed by Nov 08.
  - Replacement of Chelsea Street Bridge by USCG, State & City
    - Solicitation has been Issued for Work to be Completed in Two Years (2008-2010)
- Examined 39 and 40-Foot Depths – 40 Feet Recommended
- 5 Beneficiaries – 4 Petroleum and 1 Mineral Terminal
- Eastern Minerals and Conoco between Bridges
- 3 Petroleum Terminals at Head of Channel
- All Tankers Must use Turning Basin at Head of Channel

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**BOSTON HARBOR IMPROVEMENT PROJECT  
DREDGING QUANTITY ESTIMATES (1000s of CY)**

	CY Ordinary Material	CY Rock	Acres of Subtidal Impact
Main Channels Improvement to 48 Feet for Conley Terminal. Entrance Channel to 50 Feet	11,096	953	1,097
Extend Deepening of MSC to Marine Terminal at 45 Feet	246	78	41
Deepen Portion of 35-Foot Mystic Channel to 40 Feet	67	0	9
Deepen 38-Foot Chelsea River Channel to 40 Feet	342	1	78
<b>TOTAL PROJECT</b>	<b>11,752</b>	<b>1,032</b>	<b>1,225</b>

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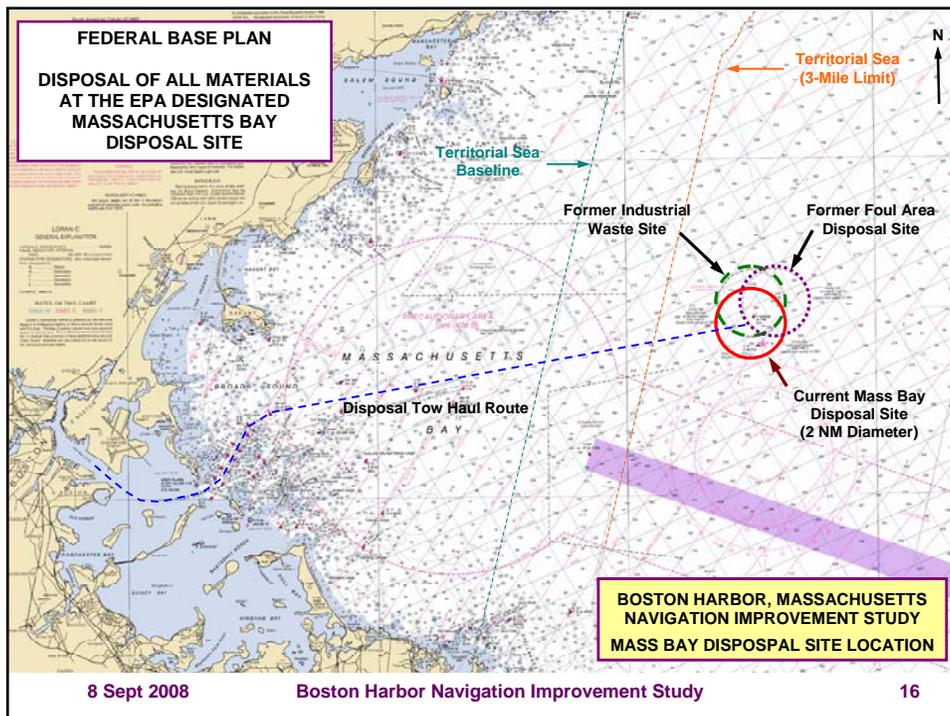
# Disposal of Dredged Material

- All Improvement Materials Tested and Determined Suitable for Unconfined Ocean Disposal by US EPA
- Massachusetts Bay Disposal Site Located about 20 Miles East of Harbor outside Territorial Sea
- Site used Since at Least the 1940s
- Site Designated for Permanent use by EPA in 1992
- Site in 300± Foot Deep Basin
- Site has Indefinite Future Capacity
- Corps and EPA Monitor Site Regularly

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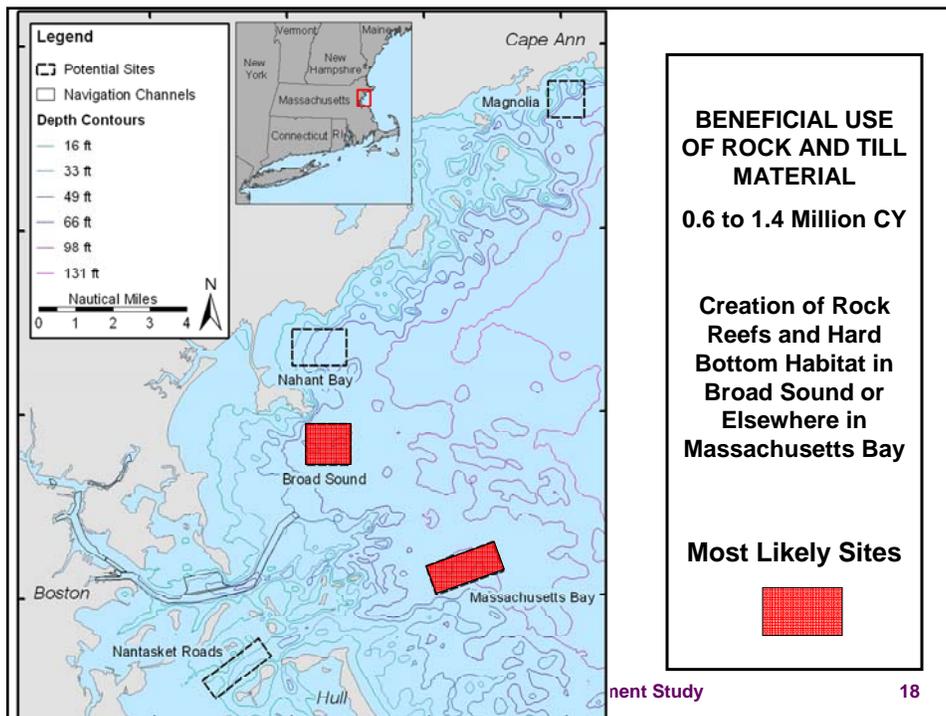
## ALTERNATIVE DREDGED MATERIAL MANAGEMENT OPTIONS – BENEFICIAL USE

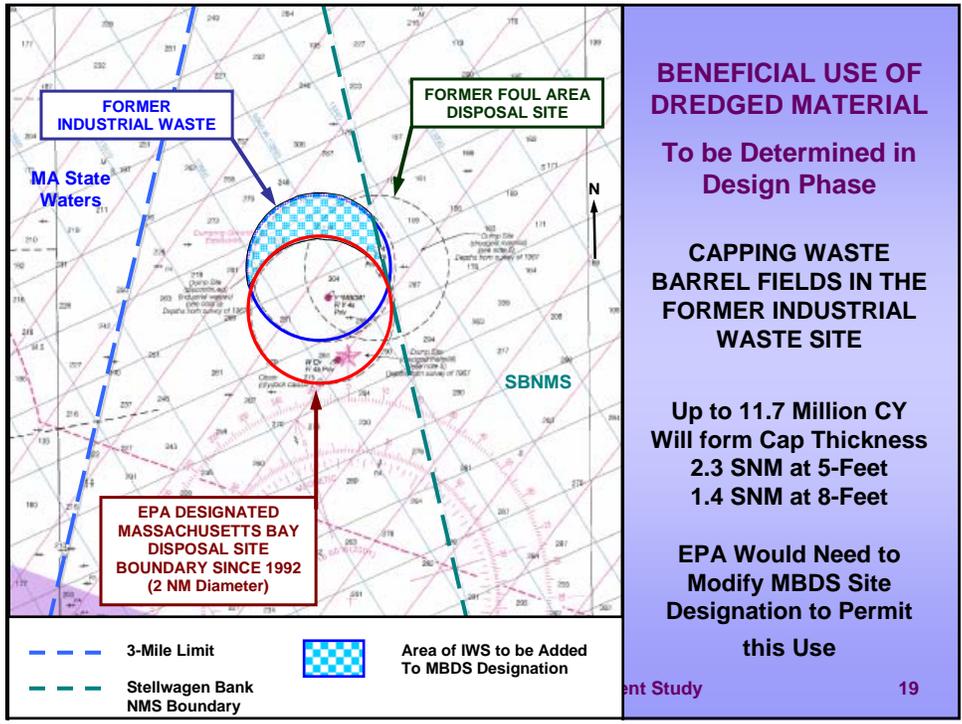
- During Design Phase additional disposal alternatives, all beneficial use options, will be investigated and incorporated into the project if found feasible and acceptable.
- Beneficial Use Potential for Rock and Till
  - Rock Reef and Hard Bottom Habitat in Mass Bay
  - Upland Commercial Use – Transfer at Dredge
  - State may Process Ashore for Use in Shore Protection Work
- Beneficial Use Potential for Clay and Unconsolidated Mat'l
  - One-Time Opportunity for Using Dredged Material as Clean Cap for Old Industrial Waste Site in Mass Bay
  - US EPA Monitored Former Ocean Waste Site Contains Barrel Fields of Chemical and Radiological Waste from 1930s to 1970s

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**BOSTON HARBOR IMPROVEMENT PROJECT COSTS**  
 (\$1000s – January 2008 Price Levels)

	MAIN CHANNELS	MSC EXTENSION	MYSTIC RIVER	CHELSEA RIVER	TOTAL COST
Terminal	Conley	Marine Terminal	Medford Street	4 Petroleum 1 Minerals	
Federal GNF Share	\$153,204	\$11,449	\$1,743	\$7,568	\$173,967
Massport GNF Share	118,354	6,139	933	4,046	129,472
LERR	125	17	4	19	165
LSF - Berths	494	1,248	0	2,055	3,797
Buoys	211	27	0	52	290
<b>Total Cost</b>	<b>\$272,391</b>	<b>\$18,880</b>	<b>\$2,680</b>	<b>\$13,740</b>	<b>\$307,691</b>
Percent of Total Project	89%	6%	1%	4%	100%

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## Economic Justification Main Channels Improvement

### FOOT-BY-FOOT DEPTH OPTIMIZATION FIRST COSTS, ANNUAL COSTS AND BENEFIT-COST ANALYSIS (In \$1,000s at 4-7/8% Rate)

	42 Feet	43 Feet	44 Feet	45 Feet	46 Feet	47 Feet	48 Feet	49 Feet	50 Feet
First Cost	\$82,791	\$112,542	\$140,847	\$166,646	\$188,855	\$218,494	\$248,499	\$286,543	\$326,790
Investment Cost	\$85,386	\$116,546	\$148,295	\$172,657	\$199,669	\$231,488	\$264,376	\$310,647	\$362,584
Annual Cost	\$4,788	\$6,465	\$8,163	\$9,475	\$10,930	\$12,648	\$14,420	\$16,921	\$19,724
BENEFITS AND BENEFIT-COST ANALYSIS – BASE ECONOMIC CASE									
Annual Benefit	\$5,540	\$8,317	\$11,079	\$14,223	\$17,366	\$20,501	\$23,635	\$23,635	\$23,635
BCR	1.16	1.29	1.36	1.50	1.59	1.62	1.64	1.40	1.20
Net Benefit	\$752	\$1,852	\$2,916	\$4,748	\$6,436	\$7,853	\$9,215	\$6,714	\$3,911

Analysis Optimizes at 48 Feet 

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## Economic Justification Channels to Bulk Cargo Terminals

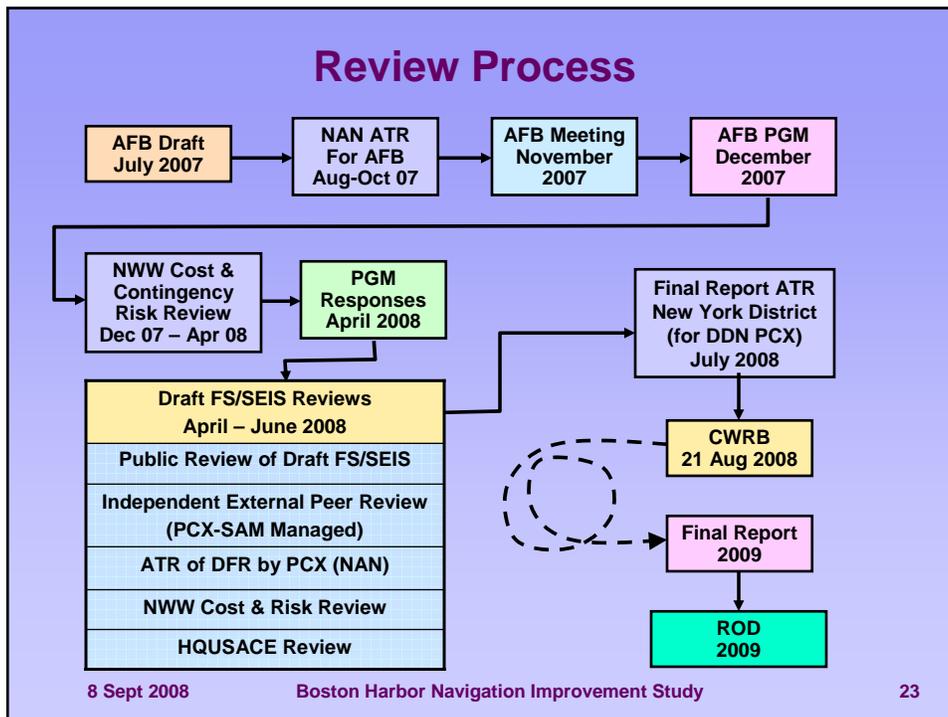
### FIRST COST, ANNUAL COST AND BENEFIT-COST ANALYSIS BULK CARGO TERMINAL SEGMENTS

4-7/8% Rate (\$1000s)	Main Ship Channel Extension to Massport Marine Terminal	Mystic River Channel Deepening	Chelsea River Channel Deepening
Recommended Depth	45 Feet	40 Feet	40 Feet
First Cost GNF (January 2008)	\$15,705	\$2,495	\$10,872
Cost with IDC	\$15,802	\$2,495	\$10,962
Annual Cost of GNF and NF Berths	\$927	\$145	\$857
Annual Benefits (December 2007)	\$1,970	\$230	\$2,536
Benefit Cost Ratio	2.13	1.59	2.96
Net Benefits	\$1,043	\$85	\$1,679

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## Principal Additional Economic Analyses

- Examine landside trucking of cargo – type, value, origin/destination – to determine why cargo is shipped by truck to New England and whether any of it is not available for shift to water transport.
- Examine use of smaller containerships as alternative to trucking or larger containerships.
- Examine sailing draft distribution of other US ports and extrapolate to Boston. Existing Boston distribution is close to maximum draft.

## Project Schedule

Draft Feasibility Report to Agencies, State and Public	4/11/08	✓
Public Hearing for Draft SEIS	5/20/08	✓
Comment Period Closed	6/2/08	✓
Civil Works Review Board	Held 8/21/08	?
Chief's Report to Congress	On Hold	
Authorization	Unknown – 2009?	
Construction	2011 to 2014?	

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## RECAP

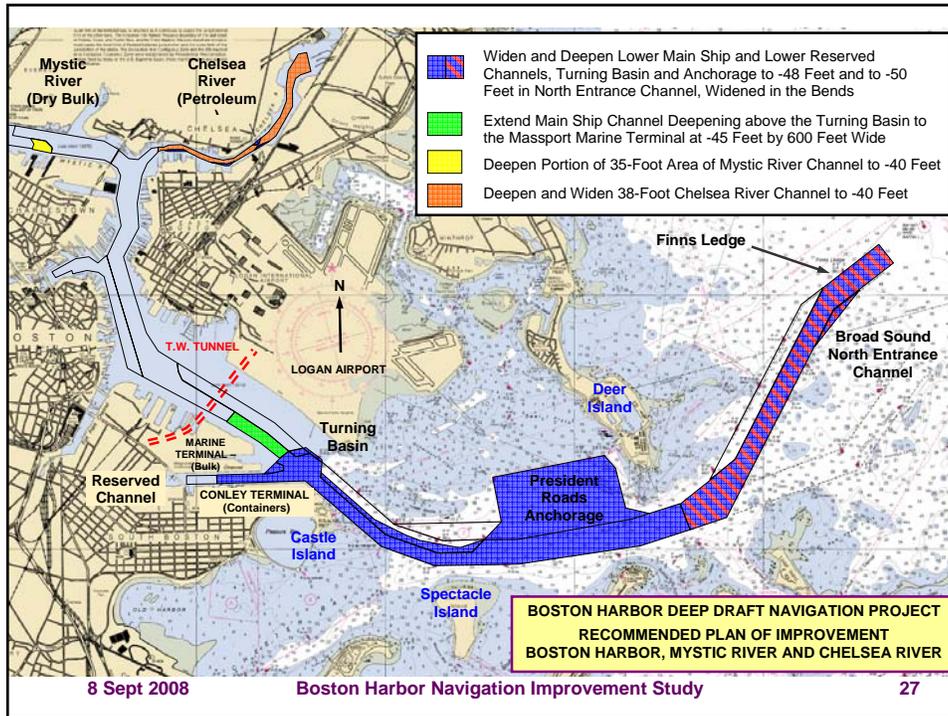
### Recommendation – 4 Improvements

- **Main Channels Improvement:** For Containership Access to Conley Terminal – 48 Foot System with 50 Feet in the Entrance Channel
- **Main Ship Channel Deepening Extension:** For Dry Bulk Carrier Access to Massport Marine Terminal – at 45 Feet
- **Mystic River Channel:** Deepen Section of 35-Foot Lane for Dry Bulk Carrier Access to Massport's Medford Street Terminal – at 40 Feet
- **Chelsea River Channel:** Deepen to 40 Feet with Minor Widening in the Bridge Approaches and Bend between the Bridges for Liquid Petroleum Carriers
- **All Disposal at the Massachusetts Bay Disposal Site**

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# Boston Harbor, Massachusetts

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**THE END  
QUESTIONS?**

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