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Final External Peer Review Report for Boston Harbor Navigation Improvement

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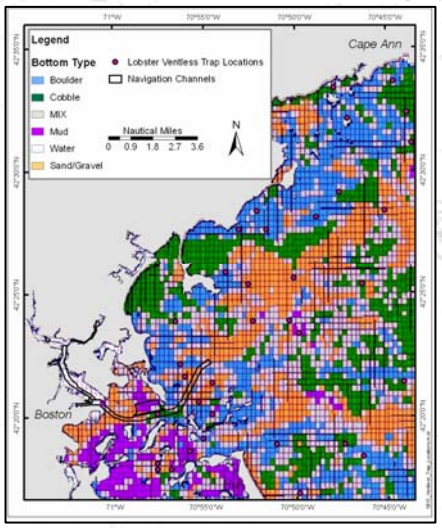

Prepared for
U.S. Army Corps of Engineers
Mobile District

Contract No. DACW33-03-D-0004
Delivery Order: CK01

June 3, 2008

FINAL

EXTERNAL PEER REVIEW REPORT

for

Boston Harbor Navigation Improvement Project,
Massachusetts, Feasibility Study

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EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE), in partnership with the Massachusetts Port Authority (Massport), has initiated a study of potential deep-draft navigation channel improvements to Boston Harbor, New England's largest port, which handles about 25 million tons of cargo annually. USACE and Massport executed an agreement to share the cost of the feasibility study on June 27, 2002. As part of this effort, USACE and Massport prepared a Draft Feasibility Report (DFR) and Draft Supplemental Environmental Impact Statement (DSEIS) of proposed channel and associated navigation feature improvements to the Port of Boston. The DSEIS has also been prepared as a Draft Environmental Impact Report (EIR) in fulfillment of State requirements.

The purpose of the Boston Harbor Navigation Improvement Project, Massachusetts, Feasibility Study is to identify, formulate, evaluate, and screen potential alternatives for channel deepening and related improvements at the Port of Boston, consistent with the goals of Massport, and in response to direction from Congress in the authorizing resolution. The study will seek to determine the navigation-related needs of the harbor, port facilities, harbor users, and the region. The study will examine the Port of Boston's current and likely future role in the maritime commerce of the nation, and identify likely levels of future navigation traffic and commerce through the port. The study will investigate a number of alternative options for accommodating increased deep-draft vessel traffic at Boston Harbor, including channel deepening, cargo diversion, and no action. The goal of Massport is to provide deeper access to their Conley Container Terminal on the Reserved Channel in South Boston at a depth at least equal to the 45 feet now available at the Conley Terminal facility's berths. Additional minor port improvements in the Mystic and Chelsea Rivers and in the Main Ship Channel above the Reserved Channel Turning Area to the Massport Marine Terminal are also under consideration. The costs of implementing the options will be measured against estimated benefits to improving commercial transportation costs, to identify whether improvements are warranted consistent with the policies of the Army. The final project design will be selected during the design phase of the project when the economic analysis can be optimized.

In order to strengthen quality control processes and help ensure that the study is supported by the best scientific and technical information, an external peer review (EPR) process has been implemented by USACE to complement the internal technical review (ITR). This final report describes the EPR process, summarizes final comments of the EPR panel, and describes the panel members and their selection. The results of this EPR report will be taken into consideration in preparation of a final Feasibility Report and SEIS/EIR.

Four panel members were selected for the EPR from nearly 20 identified candidates. The potential external reviewers were screened for potential conflicts of interest and expertise relative to predetermined technical criteria. These criteria focused on dredging and dredged material management, channel deepening/navigation, estuarine ecology/coastal processes, and habitat creation/modification. The reviewers selected were from academe or were independent consultants. Corresponding to the technical content of the DFR and DSEIS/EIR, the areas of technical expertise of the selected peer reviewers included: estuarine ecology (estuarine/coastal processes and lobster populations); economics and plan formulation; engineering (channel design and navigation); and construction engineering (dredged material placement and beneficial use).

The peer reviewers were provided an electronic version of the DFR and DSEIS/EIR on April 4, 2008, along with a charge that solicited their comments on specific sections of the documents that were to be reviewed. The peer reviewers had four weeks for the review of the documents. Nearly 300 individual comments were received from the EPR panel in response to the charge questions.

Following the individual reviews of the DFR and DSEIS/EIR by the EPR panel members, a consensus discussion was conducted to review key technical comments, discuss charge questions in which there were conflicting responses, and reach consensus on the final comments to be provided to USACE. The final comments were documented according to a five-part format that included, (1) nature of the comment, (2) basis for the comment, (3) significance of the comment (high, medium, or low), (4) cross-referencing of the comment if related to another comment, and (5) a recommendation on how to resolve the comment. Overall, 14 final EPR comments were identified and documented. Of the 14 final comments, five were identified as having high significance, two were identified as having medium significance, and seven comments were identified as having a low level of significance.

Table ES-1 summarizes the final comments by level of significance. Detailed explanations of each comment are contained in Appendix A of this report.

Table ES-1. Overview of 14 Final Comments Identified by the Boston Harbor EPR Panel

Significance – High	
#	Comment
1	Mitigation of the NSTAR cable is of concern. Mitigation will be expensive. Should mitigation not be resolved in a timely manner, the project could be authorized but not built for an undetermined length of time.
2	Incremental trucking costs between Port of New York and New Jersey – New York Harbor (PONYNJ) and Boston Harbor (BH), which are presented to constitute a major proportion of the National Economic Development (NED) benefits (shipper savings) for the project, are not analytically supported. Moreover, the actual total transportation costs savings to shippers are a function of the total transportation costs, vessel, port, landside and related inventory (transit time) costs, which are far more than land side trucking costs.
3	The assumption that the International Longshoremen Association (ILA) fee (which has a history of being reduced) will perpetuate in the next 50 years is not justified. The ILA fee is a transfer payment ("tax") and should not be included as a benefit to the nation (resource saving).
4	The risk of losing current business (i.e., two lines and three services) at Boston Harbor with or

	without the project has not been adequately considered.
5	The benefits to the cement industry are entirely speculative and pending contractual commitments, and there is no supporting documentation related to vessel costs, markets served, delivered prices, etc. in competition with other ports and existing domestic suppliers.
Significance – Medium	
6	The water quality impacts on biological resources could be significantly higher than the report implies given the likely timing of dredging and the potential quantity of fine-grained sediment.
7	Additional details are needed to clarify the measures to prevent mortalities of marine mammals and fishes with respect to the roles of marine mammal observers and the fish detection system.
Significance – Low	
8	The potential for impacts to localized air quality is not addressed sufficiently.
9	The reviewers support the use of rock rubble for lobster habitat enhancement, but the lobster life stages for which habitat is being created are not specified and neither are potential negative impacts to the original habitat with respect to Essential Fisheries Habitat (EFH) considerations.
10	Multiple beneficial uses of dredged rock should be considered to enhance the total use of this natural resource in the Boston Harbor deepening project, or a justification that additional beneficial uses (e.g., shore protection) are not economical should be included.
11	Economic benefits which will accrue to foreign flag carriers may not be fully passed on to U.S. shippers, and the report does not provide any recognition of this.
12	Further detail is needed on the frequency and impact of rerouting Logan Airport airplanes and other aviation-related restrictions on vessels in the container terminal berthing or at work in Boston Harbor.
13	The discussion of the Permanent International Association of Navigation Congresses (PIANC) design methodology for channel width is poorly written/illustrated.
14	Has sufficient consideration been given to the potential shockwave effects of blasting in the vicinity of the Ted Williams Tunnel?

Overall, the external peer reviewers find the reports to be very well written. The content, however, presents very limited to non-existent information in specific sections to support the conclusions, particularly for economic benefits. Information that is not presented sufficiently or adequately considered (e.g., total and incremental transportation costs, impacts to localized air quality, benefits of rock to the aggregate/construction industry, and the amount of fine-grained sediment to be removed), could lead the reader to a different conclusion. The EPR panel generally felt that the planning objectives and constraints are sufficiently identified and described, with the exception of the mitigation of the NSTAR cable and operational impacts on airport and harbor activities due to potential runway interference. In terms of the economic analysis, additional documentation is needed to support the impact that Boston Harbor has on the current and likely future role in the maritime commerce of the nation, particularly the risks associated with projecting that viable major marine container line services will be retained in contrast to past historical trends and the benefits of foreign flag ships relative to U.S. flag ships.

The design approach relies heavily on PIANC guidance and, where PIANC criteria cannot be satisfied (such as in radii of channel bends), design results are substantiated through simulation studies. Such is considered appropriate. The EPR panel generally thought that the methodology to describe the dredged material quantity estimates is acceptable; however, additional details are

needed to clarify the role of the marine mammal observers and the fish detection systems that are going to be employed during dredging/blasting operations. They also believed that the purpose of the habitat enhancement component of this project should be more explicitly stated, particularly with respect to the impact on commercially important species. The EPR panel supports the use of rock rubble for lobster habitat enhancement, but felt that multiple uses (e.g., shore protection, shallow hard bottom, and aggregate use) of the dredged rock may provide better overall benefit to the project. The beneficial use of the parent material for covering the Industrial Waste Site (IWS) debris field is supported, but it requires EPA/USACE agreement to include the IWS in the Massachusetts Bay Disposal Site (MBDS). For the data presented, the panel concurs that the benefit-cost ratio of the recommended 48-foot depth alternative exceeds 1.0 and yields the highest net annual benefit. Its overall environmental impact is considered small and, thus, it is considered to be the preferred alternative.

1. INTRODUCTION

1.1 Background of Report Reviewed

The U.S. Army Corps of Engineers (USACE), in partnership with the Massachusetts Port Authority (Massport), has initiated a study of potential deep-draft navigation channel improvements to Boston Harbor. This study was authorized by a resolution of the Senate Subcommittee on Public Works dated September 12, 1969. USACE and Massport executed an agreement to share the cost of the feasibility study on June 27, 2002. As part of this effort, USACE and Massport prepared a Draft Feasibility Report (DFR) and Draft Supplemental Environmental Impact Statement (DSEIS) of proposed channel and associated navigation feature improvements to the Port of Boston. The DSEIS has also been prepared as a Draft Environmental Impact Report (EIR) in fulfillment of State requirements.

Boston Harbor is located on the eastern shore of Massachusetts on Massachusetts Bay. It is New England's largest port, handling about 25 million tons of cargo annually. Massport manages the harbor's major public terminals located throughout the harbor, including the port's only container terminal, the Conley Terminal in South Boston on the Reserved Channel. The four tunnels that cross beneath the harbor a short distance up-harbor from the Reserved Channel limit channel deepening of the upper harbor to the 40 feet provided by the existing authorized Federal navigation project.

The purpose of the Boston Harbor Navigation Improvement Project, Massachusetts, Feasibility Study is to identify, formulate, evaluate, and screen potential alternatives for channel deepening and related improvements at the Port of Boston, consistent with the goals of Massport, and in response to direction from Congress in the authorizing resolution. The study will seek to determine the navigation-related needs of the harbor, port facilities, harbor users, and the region. The study will examine the Port of Boston's current and likely future role in the maritime commerce of the nation, and identify likely levels of future navigation traffic and commerce through the port. The study will investigate a number of alternative options for accommodating increased deep-draft vessel traffic at Boston Harbor, including channel deepening, cargo diversion, and no action. The goal of Massport is to provide deeper access to their Conley Container Terminal on the Reserved Channel in South Boston at a depth at least equal to the 45 feet now available at the Conley Terminal facility's berths. Additional minor port improvements in the Mystic and Chelsea Rivers and in the Main Ship Channel above the Reserved Channel Turning Area to the Massport Marine Terminal are also under consideration. The costs of implementing the options will be measured against estimated benefits to improving commercial transportation costs, to identify whether improvements are warranted consistent with the policies of the Army. The final project design will be selected during the design phase of the project when the economic analysis can be optimized.

This report describes the external peer review (EPR) process that was conducted, and summarizes comments on the DFR and DSEIS/EIR, that were received from the external peer reviewers. Detailed information on the comments is provided in Appendix A.

1.2 Purpose of External Peer Review

The purpose of EPR, in general, is to strengthen USACE's quality control processes for the development of decision documents in support of its Civil Works program. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses.

To help ensure that USACE documents are supported by the best scientific and technical information, a peer review process has been implemented by USACE that utilizes EPR to complement the ITR, as described in the Department of the Army, USACE, guidance *Peer Review of Decision Documents* (EC 1105-2-408) dated May 31, 2005, and CECW-CP Memorandum dated March 30, 2007. In this case, the EPR of the Boston Harbor Navigation Improvement Project, Massachusetts, Feasibility Study was conducted and managed using contract support from an independent 501(c)(3) organization (Battelle Memorial Institute; hereafter Battelle) to ensure independent objectivity, along with a high degree of flexibility and responsiveness, which was essential for USACE to meet deadlines.

2. METHODS

This section describes the methods followed in selecting external peer reviewers, and in planning and conducting the EPR. The EPR was conducted following procedures described in USACE's guidance cited above (Section 1.2) and in accordance with the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review*, released December 16, 2004. Supplemental guidance on evaluation for conflicts of interest used the National Academies' *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports*, dated May 12, 2003.

2.1 Planning and Schedule

Table 1 defines the schedule followed in execution of the EPR.

Table 1. Schedule

Action	Completed by Date
Notice to proceed received	January 25, 2008
Potential external peer reviewers identified and screened	February 27, 2008
EPR panel selected and contracts completed	April 4, 2008
Draft Feasibility Report, Draft Supplemental Environmental Impact Statement/Environmental Impact Report, and draft charge sent to EPR panel	April 4, 2008*
Final charge sent to EPR panel	April 11, 2008
Individual comments from the EPR panel completed	May 2, 2008
EPR panel consensus meeting	May 14, 2008

Action	Completed by Date
Final EPR comments completed	May 21, 2008
Working draft peer review report completed	May 30, 2008
EPR panel provides comments on working draft peer review report	June 2, 2008
Final peer review report submitted to USACE	June 3, 2008
USACE provides clarifying questions to Battelle	June 6, 2008
EPR Panel provides responses to clarifying questions	June 16, 2008

*Complete set of documents received from the USACE on March 28, 2008 and an additional set of revised documents on April 5, 2008

2.2 Identification and Selection of External Peer Reviewers

Battelle initially identified nearly 20 potential peer reviewers, confirmed their availability, evaluated their technical expertise, and inquired about potential conflicts of interest. Of those initially contacted, nine external peer review candidates confirmed their interest and availability, and nine candidates declined either due to the schedule and anticipated level of effort, disclosed conflicts of interest, or because they did not possess the technical expertise being sought.

Preliminary information about the nine available reviewers, including their expertise, level of previous engagement in applied evaluations, and requested rates of compensation, was evaluated by Battelle. USACE reviewed the list of candidates to determine if there were potential conflicts of interest that had not been revealed to Battelle. The reviewers were primarily from academic institutions, but consultants (company-affiliated and independent) or experts associated with industry, non-governmental organizations, and non-USACE government agencies were also considered. The credentials of the peer reviewers were evaluated according to the overall scope of the Boston Harbor Navigation Improvement Project, focusing on several technical criteria including dredging and dredged material management, channel deepening/navigation, estuarine ecology/coastal processes, and habitat creation/modification.

The following additional factors were considered:

- Participation in previous USACE technical review committees
- Other technical review panel experience.

The peer reviewers were additionally screened for the following *potential* exclusion criteria or conflicts of interest:

- Involvement in producing the Draft Feasibility Report and Supplemental Environmental Impact Statement/Environmental Impact Report and related technical and supporting appendices pertaining to the Boston Harbor Navigation Improvement Project, Massachusetts, Feasibility Study;
- Involvement in any USACE projects in the Boston Harbor area or relating to Boston Harbor Federal Navigation Dredging Projects;
- Current USACE employee;

- Other USACE affiliation [Scientist employed by the USACE (except as described in National Academy of Sciences (NAS) criteria, see EC 1105-2-408 section 9d)];[a]
- A significant portion of personal or company revenues within the last 3 years came from USACE contracts;
- Current or future financial interests in Boston Harbor contracts/awards from USACE;
- Any publicly documented statement made by the reviewer or reviewer's firm advocating for or against the subject project;
- Other possible perceived conflict of interest for consideration, e.g.,
    - Former USACE employee
    - Repeatedly served many times as USACE technical reviewer.

In selecting final peer reviewers from the list of potential peer review candidates, an effort was also made to select experts who best fit the technical criteria and exclusion criteria described above. Based on these considerations, four peer reviewers were selected from the potential list (see Section 3 for names and biographical information on the selected peer reviewers). Battelle established subcontracts with the peer reviewers indicating their willingness to participate and confirmed the absence of conflicts of interest (through a signed conflict of interest form).

2.3 Preparation of the Charge and Conduct of the Peer Review

A charge for peer review, which contained specific questions regarding the DFR and DSEIS/EIR, was developed to assist the EPR panel. The draft charge was prepared by Battelle with input from USACE and guidance provided in USACE's guidance *Peer Review of Decision Documents* (EC1105-2-408) and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review*, released December 16, 2004. A draft charge was submitted to the USACE for consideration and evaluation. The USACE edited the draft questions and recommended eliminating some questions. The charge was finalized based on the USACE's input. The charge was presented in comment response table format, and was organized according to the order of the documents to be reviewed. The charge consisted of approximately 123 specific questions on the DFR and DSEIS/EIR. The EPR panel was instructed to respond to the charge questions within the comment response form table. The final charge is shown in Appendix B of this report.

The peer reviewers were provided with electronic copies of the draft charge and DFR and DSEIS/EIR on April 4, 2008. The peer reviewers had four weeks for the review of the documents.

[a] Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE funding have sufficient independence from USACE to be appropriate peer reviewers. See the OMB memo p. 18, "….when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

2.4 Review of Verbatim Comments

Nearly 300 verbatim (i.e., individual) comments in response to the charge questions were received from the individual EPR panel members. Battelle reviewed these comments to identify overall recurring themes, potential areas of conflict, and other impressions of the report. As a result of this review, Battelle developed a preliminary list of 35 overall "strawman" comments and discussion points that emerged from the EPR panelists' verbatim comments. Each reviewer's verbatim comments were shared with the EPR panel.

2.5 External Peer Review Panel Consensus Discussion

Battelle convened a consensus discussion conference call with the EPR panel on May 14, 2008. The purpose of the consensus discussion was to allow the exchange of technical information among the panel experts, many of whom are from diverse scientific backgrounds. This information exchange ensured that the EPR report represents the consensus of the panel and avoided isolated or conflicting information and analyses. The main goal of the consensus discussion was to review the overall comments and ascertain and confirm their importance to the EPR panel, remove points having a lack of consensus, identify and add any missing issues of high-level importance to the EPR panel, and finally, reach consensus on the final comments to be provided to USACE.

The panel discussion resulted in 14 overall consensus comments. A summary explaining each consensus comment organized by level of significance, as defined by the EPR panel, was also prepared and distributed to the EPR panel by Battelle in a memorandum dated May 14, 2008. The memorandum provided a detailed approach for developing the final comments for the DFR and DSEIS/EIR.

In addition to reaching consensus on the final comments to be provided to USACE, the EPR panel discussed responses to about a half-dozen specific charge questions where there appeared to be disagreement among the reviewers. The disagreement was resolved and the comment was either incorporated into the final comments or determined to stand as is (i.e., was not important enough to include as a final comment).

2.6 Preparation of Final Comments

The EPR panel used the 14 overall consensus comments as a basis for preparing the final comments. A memorandum was distributed on May 14, 2008, to the EPR panel providing detailed instructions on developing the final comments. A summary of the directive is provided below:

- Lead Responsibility: A lead reviewer was assigned for each consensus comment. The lead was responsible for coordinating the development of the final comment and submitting it to Battelle by May 21, 2008. Lead assignments were modified by Battelle at the direction of the EPR panel. To assist each lead in the development of the final comments, Battelle distributed individual verbatim comments in the comment response

table format, a summary detailing each consensus comment (in the memorandum), an example final comment following the five-part structure (described below), and a template for the preparation of the final comments.

- Directive to the Lead: Each lead was encouraged to communicate directly with other reviewers, as needed, to contribute to a particular consensus comment. If a significant comment was identified that was not covered by one of the original 14 overall consensus comments, the appropriate lead was instructed to draft a new consensus comment. For this EPR, no additional comments were identified by the EPR panel. If a consensus comment was related to one or more other consensus comments, the lead was to cross-reference them.

- Format for Final Comments: Each final comment was presented as part of a five-part structure, including:

    1. Nature of comment (i.e., succinct summary statement of concern)
    2. Basis for comment (i.e., details regarding the concern)
    3. Significance (high, medium, low) (see description below)
    4. Final comment cross-referencing (see description below)
    5. Recommendation (see description below).

- Criteria for Significance: The following were used as criteria for assigning a significance level to each final comment:

    - High — Describes a fundamental problem with the project that could affect the recommendation or justification of the project
    - Medium — Affects the completeness or understanding of the reports/project
    - Low — Affects the technical quality of the reports, but will not affect the recommendation of the project.

- Cross Referencing Comments: Each final comment was to indicate if it was related to another final comment using cross referencing.

- Guidance for Developing the Recommendation: The recommendation was to include specific actions that the USACE should consider to resolve the comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed, etc.).

As a result of this process, 14 final comments were prepared. Battelle reviewed and edited all final comments for clarity and adherence to the requested final comment template format. The final EPR comments were assembled and are presented in Appendix A.

3. BIOGRAPHICAL INFORMATION ON EXTERNAL PEER REVIEWERS

Potential peer review candidates were identified through Battelle's EPR Database, targeted internet searches using key words (e.g., technical area, geographic region), search of websites of local universities or other compiled expert sites, and through referrals from candidates who declined. A draft list of screened (for availability, technical background, conflict) potential reviewers was prepared by Battelle and provided to USACE. The final list of peer reviewers was determined by Battelle.

An expanded list of the credentials and areas of expertise of the four reviewers selected for the EPR panel in relation to the technical evaluation criteria is presented in Table 2. Reviewer identities were unknown to the USACE authors of the DFR and DSEIS/EIR during the EPR process. More detailed biographical information regarding each candidate and his or her qualifications is presented following the table.

Table 2. EPR Panel: Technical Criteria and Areas of Expertise

Name	Affiliation	Engineer	Dredging and Dredged Material Management	Channel Deepening/ Navigation	Hydrodynamic Modeling	Transportation	Beneficial Use	Biologist/Ecologist	Estuarine/Estuaries	Habitat Creation/Modification	Lobster Populations	Economist	Plan Formulation
	Totals →	*2*	*2*	*3*	*1*	*1*	*2*	*1*	*2*	*1*	*1*	*1*	*1*
Michael Clancy	Boston University						X	X	X	X	X		
Kevin Horn	GEC, Inc.			X		X						X	X
Robert H. Mayer, Jr.	US Naval Academy	X	X	X									
Robert E. Randall	Texas A&M University	X	X	X	X		X		X				

Michael Clancy, Ph.D.
Role: This reviewer was chosen primarily for his expertise in estuarine ecology/biology, estuarine/coastal processes, and lobster populations.
Affiliation: Boston University, Boston MA

Dr. Clancy has been a faculty member in the College of General Studies at Boston University for eight years. His expertise is in marine ecology, benthic-pelagic coupling, population dynamics and developing techniques to measure human-induced impacts on ecosystems and commercially important species. He has worked on several oil spills, designed species-specific restoration plans and has over 15 years of experience in the field. He has authored numerous technical reports, journal publications, refereed conference publications and been asked to review large multi-dimensional research projects. Dr. Clancy received an M.S. in Marine Biology and Biochemistry from the University of Delaware and a Ph.D. in Biological Sciences from the University of Rhode Island.

Kevin Horn, Ph.D.
Role: This reviewer was chosen primarily for his expertise in economics and plan formulation.
Affiliation: GEC Inc., Delaplane, VA

Dr. Horn is a Senior Consultant responsible for the transportation and navigation economics practice at GEC. He is responsible for the technical support of the analysis for USACE Districts involving both deep-draft and shallow-draft navigation and related transportation networks. Dr. Horn has more than 35 years of experience in transportation and logistics economics and financial analysis, with a particular focus on freight and intermodal operations related to navigation, including shallow- and deep-draft ports and waterways. Before joining GEC, Dr. Horn was a Senior Manager with AECOM Consulting, a Research Professor with the National Ports and Waterways Institute, and Senior Intermodal Analyst with Louis Berger Group. His past experience includes port and intermodal transport capacity and investment simulation studies, benefit cost analysis of river and harbor navigation improvements, vessel fleet cost analysis and size projections, and port and marine terminal privatization. He has rail freight operations, trucking, and warehousing experience in conjunction with logistics and distribution planning. Dr. Horn is a recognized expert on National Economic Development (NED) benefits studies of river and harbor improvements, and is a co-author of the existing Deep Draft Navigation NED Benefits Manual. He has extensive experience in waterway cost analysis, including collecting and compiling shallow- and deep-draft vessel costs for the USACE.

Robert H. Mayer, Jr., Ph.D.
Role: This reviewer was chosen primarily for his expertise in channel design, navigation, and engineering.
Affiliation: United States Naval Academy, Annapolis, MD

Dr. Mayer is Professor of Ocean Engineering and Chairman of the Department of Naval Architecture and Ocean Engineering at the U.S. Naval Academy. For the past 25 years he has taught courses in ocean systems engineering design and marine-related environmental engineering with an emphasis on the effective management of ocean resources. He has delivered numerous presentations and authored various technical reports and journal publications on ocean

engineering design, a number related to the design of deep-draft navigation channels. He is also co-author of the text, Quantitative Construction Management: Uses of Linear Optimization. Dr. Mayer received his Ph.D. in civil engineering from the University of Delaware in 1983.

Robert E. Randall, Ph.D., P.E.
Role: This reviewer was chosen primarily for his expertise in dredged material placement, beneficial use, and engineering.
Affiliation: Texas A&M University, College Station, TX

Dr. Randall received a Bachelor of Mechanical Engineering degree in 1963 from Ohio State University. He served in the U.S. Navy as a submarine officer from 1963 to 1967, and received an M.S. in 1969 and a Ph.D. in 1972 in Ocean Engineering from the University of Rhode Island. From 1972 to 1975, he worked as civilian for the U.S. Navy and for a private oceanographic institution. In 1975, Dr. Randall began an academic career in the Ocean Engineering Program at Texas A&M University and is now Ford Professor of Ocean and Civil Engineering. He has served as the Director for the Center for Dredging Studies since 1994. As a member of the Western Dredging Association (WEDA), he currently serves on the WEDA Board of Directors. Dr. Randall authored the chapter "Dredging" in Port Engineering published in 2004, and the chapter "Dredging in the United States" in Dredging in Coastal Waters published in 2006. The Texas A&M Annual Dredging Engineering Short Course and the Cutter Suction Dredge Simulator Short Course are directed by Dr. Randall. Dr. Randall received the "Dredger of the Year" award at the 2006 WEDA Technical Conference. He is a registered professional engineer in the state of Texas.

4. Results – Summary of Peer Review Comments

As a result of the consensus discussion process, the EPR panel identified 14 final comments, segmented into rankings of high, medium, or low significance. In total, as shown in Table 3, five were identified as having high significance, two were identified as having medium significance, and seven comments were identified as having a low level of significance.

Table 3. Overview of 14 Final Comments Identified by the Boston Harbor EPR Panel

Significance – High	
#	Comment
1	Mitigation of the NSTAR cable is of concern. Mitigation will be expensive. Should mitigation not be resolved in a timely manner, the project could be authorized but not built for an undetermined length of time.
2	Incremental trucking costs between Port of New York and New Jersey – New York Harbor (PONYNJ) and Boston Harbor (BH), which are presented to constitute a major proportion of the National Economic Development (NED) benefits (shipper savings) for the project, are not analytically supported. Moreover, the actual total transportation costs savings to shippers are a function of the total transportation costs, vessel, port, landside and related inventory (transit time) costs, which are far more than land side trucking costs.
3	The assumption that the International Longshoremen Association (ILA) fee (which has a history of being reduced) will perpetuate in the next 50 years is not justified. The ILA fee is a transfer payment ("tax") and should not be included as a benefit to the nation (resource saving).

4	The risk of losing current business (i.e., two lines and three services) at Boston Harbor with or without the project has not been adequately considered.
5	The benefits to the cement industry are entirely speculative and pending contractual commitments, and there is no supporting documentation related to vessel costs, markets served, delivered prices, etc. in competition with other ports and existing domestic suppliers.
Significance – Medium	
6	The water quality impacts on biological resources could be significantly higher than the report implies given the likely timing of dredging and the potential quantity of fine-grained sediment.
7	Additional details are needed to clarify the measures to prevent mortalities of marine mammals and fishes with respect to the roles of marine mammal observers and the fish detection system.
Significance – Low	
8	The potential for impacts to localized air quality is not addressed sufficiently.
9	The reviewers support the use of rock rubble for lobster habitat enhancement, but the lobster life stages for which habitat is being created are not specified and neither are potential negative impacts to the original habitat with respect to Essential Fisheries Habitat (EFH) considerations.
10	Multiple beneficial uses of dredged rock should be considered to enhance the total use of this natural resource in the Boston Harbor deepening project, or a justification that additional beneficial uses (e.g., shore protection) are not economical should be included.
11	Economic benefits which will accrue to foreign flag carriers may not be fully passed on to U.S. shippers, and the report does not provide any recognition of this.
12	Further detail is needed on the frequency and impact of rerouting Logan Airport airplanes and other aviation-related restrictions on vessels in the container terminal berthing or at work in Boston Harbor.
13	The discussion of the Permanent International Association of Navigation Congresses (PIANC) design methodology for channel width is poorly written/illustrated.
14	Has sufficient consideration been given to the potential shockwave effects of blasting in the vicinity of the Ted Williams Tunnel?

Overall, the external peer reviewers find the reports to be very well written. The content, however, presents very limited to non-existent information in specific sections to support the conclusions, particularly for economic benefits. Information that is not presented sufficiently or adequately considered (e.g., total and incremental transportation costs, impacts to localized air quality, benefits of rock to the aggregate/construction industry, and the amount of fine-grained sediment to be removed), could lead the reader to a different conclusion. The EPR panel generally felt that the planning objectives and constraints are sufficiently identified and described, with the exception of the mitigation of the NSTAR cable and operational impacts on airport and harbor activities due to potential runway interference. In terms of the economic analysis, additional documentation is needed to support the impact that Boston Harbor has on the current and likely future role in the maritime commerce of the nation, particularly the risks associated with projecting that viable major marine container line services will be retained in contrast to past historical trends and the benefits of foreign flag ships relative to U.S. flag ships.

The design approach relies heavily on PIANC guidance and, where PIANC criteria cannot be satisfied (such as in radii of channel bends), design results are substantiated through simulation studies. Such is considered appropriate. The EPR panel generally thought that the methodology

to describe the dredged material quantity estimates is acceptable; however, additional details are needed to clarify the role of the marine mammal observers and the fish detection systems that are going to be employed during dredging/blasting operations. They also believed that the purpose of the habitat enhancement component of this project should be more explicitly stated, particularly with respect to the impact on commercially important species. The EPR panel supports the use of rock rubble for lobster habitat enhancement, but felt that multiple uses (e.g., shore protection, shallow hard bottom, and aggregate use) of the dredged rock may provide better overall benefit to the project. The beneficial use of the parent material for covering the IWS debris field is supported, but it requires EPA/USACE agreement to include the IWS in the MBDS. For the data presented, the panel concurs that the benefit-cost ratio of the recommended 48-foot depth alternative exceeds 1.0 and yields the highest net annual benefit. Its overall environmental impact is considered small and, thus, it is considered to be the preferred alternative.

As indicated in Table 3, the majority of the comments focus on areas viewed by the reviewers as needing improvement, additional discussion, or data that were omitted. The final EPR comments in their entirety are included in Appendix A.

APPENDIX A

FINAL COMMENTS FROM THE BOSTON HARBOR NAVIGATION IMPROVEMENT PROJECT, MASSACHUSETTS, FEASIBILITY STUDY

Comment 1:

Mitigation of the NSTAR cable is of concern. Mitigation will be expensive. Should mitigation not be resolved in a timely manner, the project could be authorized but not built for an undetermined length of time.

Basis for Comment:

The Massachusetts Water Resources Authority's (MWRA) main power supply line (115 kV) to its Deer Island Treatment Plant crosses beneath the Reserved Channel and the Main Ship Channel. Per the 1989 Department of Army Permit No. 198900530, this cable was to be located a minimum of 60 feet below Mean Low Water (MLW). However, per NSTAR letter of February 28, 2003, the installed cable depth is (approx) 53 feet below MLW in the Reserved Channel and 63 feet below MLW in the Main Ship Channel. NSTAR contends that the -53 foot "depth was approved through the permitting process…"

Dredging of the Reserved Channel below the current 40 feet MLW will likely place the cable in extremis due to cruise ship anchors, etc. Complicating matters, bedrock is reportedly located 53' (approx) below MLW. NSTAR suggests that licensing and installation of a replacement cable would have to precede local dredging, could take several years and cost in excess of $35M.

In 2003-2004, the USACE engaged in discussions with NSTAR and MWRA to resolve the matter but without success. The USACE has since referred the matter to the U.S. Attorney's office for enforcement action. Because of the expense involved, NSTAR/MWRA will likely appeal any enforcement action unless compensation is provided. Even so, timely resolution could prove difficult.

A similar concern could be expressed regarding the KeySpan natural gas siphon crossing the Chelsea River at a depth of 40.5 feet MLW. However, it is understood that KeySpan is currently developing a replacement line with an elevation greater than -80 feet MLW, a more-than-adequate depth for this improvement project.

Significance – High:

A possible 'show stopper': Dredging of the Reserved Channel and portions of the Main Channel cannot be completed until the power-line issue is resolved.

Comment Cross-referencing:

None

Recommendations for Resolution:

- Close monitoring of the U.S Attorney's office negotiations with MWRA/NSTAR is appropriate; if enforcement is delayed, the project could be significantly delayed.
- NSTAR's contention that the current cable depth was approved by permit is worth investigating; should the contention prove true, remedial costs would affect project net benefits.

Comment 2:

Incremental trucking costs between Port of New York and New Jersey – New York Harbor (PONYNJ) and Boston Harbor (BH), which are presented to constitute a major proportion of the National Economic Development (NED) benefits (shipper savings) for the project, are not analytically supported. Moreover, the actual total transportation costs savings to shippers are a function of the total transportation costs, vessel, port, landside and related inventory (transit time) costs, which are far more than land side trucking costs.

Basis for Comment:

In Tables 2.12 and 2.13 the mileage differentials between PONYNJ and BH are calculated (which are primarily for Massachusetts as the major state container hinterland of BH). Although the mileage differentials are detailed (an appendix with the supported actual distances would be helpful) there is no supporting documentation of the "trucking cost differential" other than a statement on the bottom of page C1-19. This is very unusual since it is this very "trucking cost differential" that constitutes the course of most of the NED benefits. We are told that the quote is for a 220 mile trip and the trucking cost is consistent with costs used for the Delaware River, etc., but just what is the quote and what does it represent?

Table 2.15 shows the trucking cost (differential) as $374.25. Does this reflect the higher distances of 143.0 miles from Table 2.13? If so then are we looking at a round trip or one way "cost" even though Table 2.15 says "One-Way Loaded"?

All trucking costs have a fixed cost component related to time such as loading and unloading, including delays related thereto, and a variable cost component related to distance associated with driving that will reflect fuel consumption and related vehicle variable expenses. Trips to or from NY and BH have a weighted average incremental distance of 143.0 miles for which an average driving speed of 50 miles per hour would be about three (incremental) driving hours. Drayage truck costs would be about $60 per hour underway, including fuel, which would be $180 to $200 for three extra hours of (incremental) driving distance for NY compared to BH. Somehow Table 2.15 shows $374.25 with no supporting documentation, samples, etc.

If the incremental distance between NY and BH is 143 miles and three hours is the incremental driving time, based on average underway speed of 50 miles per hour, this suggests a truck average total hourly operating cost of about $125 ($374.25/3 = $124.75) which is about double drayage truck average total hourly costs.

Moreover, the basis for NED benefits is the <u>change in total transportation costs</u> not just local landside trucking costs. The benefits framework (page C-6) does not address the total origin to destination costs but instead only uses trucking costs (with an element of "port cost" that will be discussed subsequently). This is a big issue to assume that the <u>only</u> difference in the total cost of container cargo to the BH hinterland whether via NY or BH is landside trucking.

Basis for Comment: (Continued)

It is assumed implicitly or explicitly (but not stated) that vessel and related port costs to call BH are the same as to call NY per unit of cargo discharged or conversely that calling BH in addition to NY (which is the common practice for the two carriers who do both). It is not shown that BH calls do not add vessel costs to the overall itinerary that would supplant some of the landside savings from a BH call. In the absence of higher costs levied to BH shippers for a boutique direct call service by two lines and three services the total savings from landside trucking savings may be less.

It should be shown and documented that the container lines that call BH have the same costs as calls to NY as part of their voyage itinerary; therefore the lines calling BH (in addition to NY) do not take some of the shipper surplus (land transportation cost savings) into consideration by charging a premium for a direct call at BH, indicative of higher costs from a second call (BH) in addition to NY. No where is this pivotal assumption discussed. Before deregulation of the steamship lines it was a common practice to equalize rates for competing ports. But it is no longer the prevailing norm under service and volume contracts between the lines and shippers and is not shown as such in the report. Given the volumes at NY compared to BH it is quite possible that the lines calling BH are charging more than for service to NY. One would expect that lines that add a port call to BH would consider appropriating some of the shipper trucking cost savings into their rate base consistent with the extra vessel and port expenses of an additional call (BH) to a traditional call at PONYNJ.

Continued growth of containerized cargo being constrained by the 40 foot channel should consider the trends of the past decades when BH had the same depth as NY (40 feet) and there has been a long history of stagnation of containerized cargo at BH compared to growth at NY (at the expense of BH). Obviously, channel depth and higher land costs are not the only reasons why container lines have clustered services and cargo at NY and have left BH. Shippers too found the number of lines and services (schedules) far greater at NY rather than BH (once a week service frequency) suggesting that the higher value more time sensitive freight went through NY rather than BH. No shipper inventory (cargo) cost analysis is presented in the report to reflect the cost savings of greater sailing frequencies through NY compared to BH even for the current cargo mix.

Significance – High:

Nearly 80 percent of the NED benefits are from "trucking cost differentials" that are not supported and may not represent the total cost (savings) to shippers using NY and BH, and thus do not constitute an accurate basis of the "total transportation cost savings," which should reflect NED benefits.

Comment Cross-referencing:

Also see the following comments regarding calculation of NED benefits and shipping savings/costs: Comment 3 regarding the International Longshoremen Association fee under the New York Harbor collective bargaining agreement; Comment 4 regarding consideration of risk of losing lines/services at Boston Harbor; and Comment 11 regarding economic benefits which will accrue to foreign flag carriers and thus may not be fully passed on to U.S. shippers.

Recommendations for Resolution:

To resolve these concerns, the report would need to be expanded to include:

- There should be an analytical truck cost model that documents the average total truck costs by major components (labor, fuel, capital, etc.) for both waiting and driving circumstances, and then computes the incremental driving costs related to the incremental driving distances between NY and BH (143 miles).
- There should be documentation of the total transportation costs (vessel, port and landside) through NY and BH so all related components can be included rather than just landside trucking costs. Because of significant volume differences average total costs of each component, vessel, port and landside, may be distinctly different and tradeoffs between the transportation cost components for NY and BH may exist
- Shipper inventory costs for weekly services through BH should be compared with more frequent services through NY for the same trading lanes (services) to reflect the fact that there are more lines and services calling NY than BH.

Comment 3:

The assumption that the International Longshoremen Association (ILA) fee (which has a history of being reduced) will perpetuate in the next 50 years is not justified. The ILA fee is a transfer payment ("tax") and should not be included as a benefit to the nation (resource saving).

Basis for Comment:

The assumption that the International Longshoremen Association (ILA) collective bargaining negotiated fee for payments to sustain the Guaranteed Annual Income (GAI) royalty fund based on an assessment (which has a history of being reduced) upon all loaded containers "originated or terminated" at New York Harbor (NYH) hinterland will be perpetuated in kind entirely over the project life (fifty years) is not justified. Moreover, the ILA fee levied on the shipping lines' loaded containers at NYH is a transfer payment ("tax") and does not reflect resource consumption and consequently should not be included as part of the NED benefits along with lower transportation costs. The fee structure, based on the geographic distances reflecting port competitiveness, is a testament to this "tax" assessment devoid of related resource consumption.

The ILA assessment of $110 for each loaded box handled within 260 miles of the port (NYH) and $20 for each loaded box handled greater than 260 miles from port (NYH) is not a resource cost related to the value of services produced. It is a tax (transfer) from steamship lines to labor pool that has no relation to the value of the labor services (resources) performed (but rather a relationship to labor services NOT performed through underemployed and a "guarantee" of full employment).

Historically, the ILA GAI assessment was to account for the vast pool of redundant labor at NYH which arose from containerization. Historically, the fee was at one time much higher, about $350 per box in nominal terms with an exception for boxes that did not originate or terminate by land at NYH. Under these circumstances container barging between NY and BH was more popular because it avoided the NYH ILA GAI and BH had little or no GAI.

To describe the "assessment" which is for the (underemployed) labor pool as a "handling fee" in Table 2.15 is erroneous. The GAI fee structure was subsequently revamped at NYH from being applied to all loaded containers regardless of port competition to charge a higher fee for relatively local traffic (more non-competitive from the standpoint of diversion to other ports) and to charge a much lower fee for relatively longer distance cargo (more competitive to other ports such as Norfolk for Midwest cargo). While the ILA cargo assessment tax is a pecuniary (financial) "cost" to shipping lines, it does not represent resources consumed. Shipping lines barging boxes between NYH and BH or providing direct call services at BH will save the assessment (tax) but it does not reflect resource consumption and should not be part of NED benefit total transportation costs analogous to other port charges for resources consumed such as dockage, wharfage, etc.).

Significance – High:

The ILA container assessment fee that is particular to the New York Harbor collective bargaining agreement constitutes about twenty percent of the NED benefits of shifting containers from NY to BH; this is not regarded to be an NED-based (resource cost) savings that is passed on to "shippers," and as such should not constitute part of the NED benefits to the nation.

Comment Cross-referencing:

See Comment 11 regarding economic benefits which will accrue to foreign flag carriers and thus may not be fully passed on to U.S. shippers, and Comment 2 pertaining to the absence of analysis of total transportation costs for liner container services to and from NY and BH (in lieu of only trucking cost differentials); a shared hinterland might show that lines that call BH directly and avoid the GAI at NYH might charge a premium for that call relative to NY by not passing the GAI "savings" on to BH shippers (if the lines equalize rates at NY and BH, and at NY the rate includes the GAI and at BH excludes the NY GAI, essentially there is no savings for shippers but the vessel operators have different costs).

Recommendations for Resolution:

To resolve these concerns, the report would need to be expanded to include:

- The analysis needs to demonstrate the resource cost basis for the value added services of GAI that can be apportioned to individual boxes and for the resource cost distinctions between one geographic grouping of local (less regional port competitive) NYH boxes (up to 260 miles which pays $110) and a second geographic grouping of regional (more regional port competitive) NYH boxes (beyond 260 miles which pays $20). How are "resource costs" reflected by GAI assessments indicative of the competitive hinterland distance conditions? In other words how does a box terminated in Hoboken, NJ "cost" $110 assessment and a box terminated in Columbus, Ohio "cost" $20? How are the resources consumed differently?
- The analysis needs to demonstrate that the GAI component that may be related to resource costs will persist for the next fifty years given that the purpose of the assessment is to fund a Guaranteed Annual Income for longshoremen for the next fifty years. What will the supply and demand for GAI eligible longshore labor be in NYH over the future that would require a GAI assessment compared to the number of loaded boxes expected to be handled through NYH? Might not the GAI assessment drop to $50 in the future compared to $110 now (or $20) depending on distance and a much larger nominal and real amount in the past?
- The analysis needs to address that if there are GAI resource costs and boxes are shifted from NYH to BH, the fixed costs of GAI at NY that are resource related would not be allocated to fewer boxes, effectively raising the assessment for other containers while containers shifted to BH avoid the assessment (tax). In principle the number of shifted BH boxes is small, but if it is resource costs that are being allocated on a total NYH box basis this has "cost" implications for the other containers not shifted to BH.

Comment 4:

The risk of losing current business (i.e., two lines and three services) at Boston Harbor with or without the project has not been adequately considered.

Basis for Comment:

With-project conditions should look at the longer term trends of loss of services and lines with implications for COSCO and or MSC shipping lines because this phenomenon has been the reoccurring pattern at BH, even when it has the same channel depth as NY. The with-project conditions assume that the "shift" from NY to BH will continue over 50 years when in fact over the last thirty years the prevailing "shift" of lines, services and cargo, has been in the opposite direction from BH to NY. To assume that the longer term shift of container lines, services and cargo, away from BH to NY will be permanently and irrevocably reversed by two lines and three services (for a relatively brief reported period of time) that are now calling BH is quite a break with the clear past trends of small and declining or stagnant containerized cargo through BH.

The containership benefits (page C-2) are stated to "have a high degree of certainty". Readers need to know the commitments of the two lines, MSC and COSCO, to continue to call BH. Unless the lines have very long term leases (contracts) with substantial minimum cargo volumes (which would appear doubtful using public port facilities as the only two major lines and services regularly calling there) these lines could cease calling BH and there would be little or no (benefiting) container commerce there, unless other lines decided to call there as replacements. Indeed this was the dire situation of BH about seven years ago when there was one major line and one service left (MSC) and they were in discussions to leave BH. This would have left BH, purportedly a major container port, without any major container lines calling with direct (non-feeder vessels or barges) services from other major ports.

The limited economic hinterland, described on page C-3 as the six New England states but primarily Massachusetts in terms of container volume, has been a long standing competitive problem at BH to attract container lines and direct call services. There is a very limited volume and geographic scope of the hinterland from BH compared to the economies of scale at other ports, notably NY. The limited BH container hinterland (both geographically and volume) is well served by other ports, primarily NY. Consequently, BH three decades ago had about the same or more containerized cargo than they reported now! The BH throughput of containers for its hinterland simply has not grown in scope or size (volume), although the report uses a recent and relatively short time frame to depict "growth" as a "shift" in cargo from NY. The reality is that over the past three decades the shift has been container lines, services and cargo from BH to NY as the prevailing norm.

Continued growth of containerized cargo being constrained by the 40 foot channel should explicitly consider the past thirty years when BH had the same depth as NY (40 feet) and there has been a long history of decline and stagnation of containerized cargo at BH compared to growth at NY (at the expense of BH). Obviously, channel depth and higher land transportation (incremental trucking distances and related variable costs) costs are not the only reasons why container lines have clustered services and cargo at NY and have left BH, with one notable exception in 2001 (MSC Europe/Med service had also considered leaving BH but did not). Shippers too found the number of lines (index for competition) and frequency of services (multiple sailing schedules and shorter origin destination transit times due to greater service frequency compared to weekly service calls at BH) far greater at NY than BH, suggesting that the higher value and more time sensitive freight went through NY rather than BH.

Basis for Comment: (Continued)

The benefits are based on two container lines and three services. Any one of these lines or services could be redeployed from BH subject to the unknown terms of the occupancy of the Massport Conley Marine Terminal. By contrast, container ports that are candidates for major deepening typically have considerably more lines and services, and demonstrate a much longer period of stability/growth in commerce. Moreover, at other ports many of the customers (lines) have long term leases and substantial minimum cargo volumes committed. There is no indication that these commitments apply to BH with few (two) major carriers and services calling at a public terminal that has an abundance of excess capacity.

Significance – High:

The report provides a very short time series of historical container volume trends at BH; these short-term trends do not reveal the very long-term issues that have been reflected in the loss of lines and cargo at BH, which may well continue to occur, resulting in the loss of one or both of the benefiting lines and their services at BH.

Comment Cross-referencing:

Also see Comment 2 wherein total transportation costs (vessel, port, and landside), including shipper inventory costs from less frequent services (weekly at BH), are not computed; merely land side trucking costs (and ILA GAI assessment) are used to derive the "shift" of cargo and resulting benefits to shippers.

Recommendations for Resolution:

To resolve these concerns, the report would need to be expanded to include:

- Indicate the contractual commitments and time frames of the two major container lines calling BH.
- Compute benefits for the loss of one or both benefiting container lines and services.
- Show history of major container lines calling and ceasing to call BH, e.g., Maersk and related container volumes for a minimum of ten years.
- Indicate why container lines have a demonstrated history of leaving BH when it had a 40 foot channel depth (same as NY) and chose to call NY and either absorb the trucking cost differential and ILA GAI assessment (unless the barge was used) or pass the trucking costs to shippers unable to receive container service directly at BH.
- Indicate the lines' prevailing commercial practices during the last decade to service BH through NY by issuing a Boston bill of lading (meaning the line will pay to deliver the cargo to BH or its hinterland) or a NY bill of lading (meaning the "shipper" pays the trucking cost to BH hinterland).

Comment 5:

The benefits to the cement industry are entirely speculative and pending contractual commitments, and there is no supporting documentation related to vessel costs, markets served, delivered prices, etc. in competition with other ports and existing domestic suppliers.

Basis for Comment:

Introduction (page C2-1) indicates that the benefits are conjectural since there are no benefiting cargoes currently moving through the Massport and Medford Terminals. "Strong commitments from a development group and likely future tenants at the site," should not be confused with the current absence of benefits for existing cargoes or contractual commitments and associated investments for future cargoes. Since development of both terminals is not contingent upon deepening, the deepening analysis should be regarded as conjectural in the absence of cargo movements and commitments.

Moreover, there are concerns about the unspecified nature of the assumptions made for the characteristics of the cement trade that affect economic benefits. Massport Marine Terminal page C2-2 indicates that this is expected to become a "regional import terminal for cement" which will subsequently be distributed throughout the northeastern U.S. by barge or trucked to local (nearby Boston) markets. Cement is seldom handled twice in import markets (first unloaded from a ship and then reloaded to another vessel). Cement is commonly trucked to local markets within a 100 mile radius of the receiving port. So any developments of a "regional import terminal" that serves the northeastern U.S. in competition with other existing domestic mills, other ports, and distribution outlets would need to be examined closely to determine the market hinterland in which imported cement via BH would be price competitive (delivered cost basis) and displace domestic sources. What are the destinations and alternative U.S. sources of supply and resulting total delivered costs? This is an issue on which no data is provided, yet there is projected a substantial volume of imported cement, upwards of one million tons!

Commerce Forecast and Future Demand for Cement uses population for the northeast region to grow cement consumption, when it would appear that the more local market (Massachusetts) would be more applicable, unless service to New England markets in competition with existing suppliers can be shown.

"It is expected that most of the increase in demand in the future will need to be met by imported cement" was true for some markets back in 2006 where there had been booming construction, such as in Florida in the face of sustained cement shortages. There is no evidence that such shortages have affected BH market or the northeast U.S. or that they will persist.

The World Bulk Carrier Fleet should note that cement carriers are typically smaller vessels ranging in size from 35,000 to 40,000 dwt for flexibility in serving smaller foreign ports and terminals. While new bulk carriers may average 66,000 dwt this is substantially larger than the typical new cement carriers of about 40,000 dwt. There is not a clear trend toward larger cement vessels in the range of 60,000 dwt except for some wider beam vessels but not deeper drafts. If this is so, this should be shown for CEMENT bulk ships (particularly self-unloading with are dedicated to the trade).

Basis for Comment: (Continued)

Commerce Forecast suggests that Massport would double cement volumes currently moving into BH either through displacement of existing waterborne commerce and/or serving a larger northeast hinterland. According to the report, the cement is expected to come from the "far east" and would be characterized by very long distances by vessel that would result in substantial savings for larger vessels. To the contrary, most imported cement comes from the nearest market relative to world prices and currency exchange rates. Far East cement, usually from China, has supplied the U.S. West Coast but not the U.S. East Coast. U.S. East Coast imported cement is usually from South America, Mexico, Caribbean or Europe (Spain, Turkey, etc.). Importing cement from the Far East to the U.S. East Coast has not worked for major existing cement terminals in Florida so why should it work for BH?

Calculation of Benefits has scant details on the benefits other than a one-way time of 20 days which would suggest a voyage distance of about 6240 nautical miles and six days for in-port unloading. The vessel voyage distances are high compared to typical U.S. East Coast cement sources (surely not Far East as mentioned earlier) and the length of the distance proportionately increases the vessel voyage costs allowing more savings to be claimed by using larger more efficient vessels. Six days in port to unload (!) adds to the expense as this suggests that very low unloading rates will be achieved, which again adds to the cost of the cement vessel. Unlike container vessels, cement vessels will incur tidal delay but the report assumes light loading to access the harbor at intermediary depths.

Significance – High:

The cement benefits are based on a substantial volume of new cargo for a very large domestic hinterland that would move very long distances in much larger vessels and incur substantial savings – about $2.00 per ton for an annual volume of 1.0 million tons – without any documentation of sources, vessel voyage costs, or the domestic hinterland served (including the delivered price in competition with other ports and domestic suppliers).

Comment Cross-referencing:

None

Recommendations for Resolution:

To resolve these concerns, the report would need to be expanded to include:

- What are the foreign sources of cement used for vessel voyage costs and the domestic destinations and the total delivered prices for both BH and other ports or domestic suppliers? Data on the volumes, markets, and displacement of existing domestic suppliers or other ports is needed to support this facility.
- Supply data and documentation on the total costs of cement imports that would show how the additional handling costs at BH would be absorbed into competitive margins of existing suppliers of these markets, particularly for the "new" non-local markets which involve substantial distances by truck and or by vessel/truck via other ports and resulting double handling.

Recommendations for Resolution: (Continued)

- Provide details on the calculation of benefits in terms of total expected vessel voyage and related port costs, etc. Currently there are scant details on the benefits other than one-way travel time of 20 days!
- Indicate why cement vessels would not incur tidal delays as is common in bulk trades.
- Substantiate the size of the cement vessels and provide a basis for the assumption that larger vessels (50,000 to 60,000 dwt) will be used for cement, particularly if self-unloading vessels are to be engaged.
- The sensitivity analysis of using foreign flag vessels (Fleet Forecast Medford Street Terminal) and longer distances have no documentation or supporting details. Nothing is shown that would support the text that "the impact on the benefits of the long travel time offsets the significantly lower hourly total operating costs of foreign flag ships relative to U.S. flag ships."

Comment 6:

The water quality impacts on biological resources could be significantly higher than the report implies given the likely timing of dredging and the potential quantity of fine-grained sediment.

Basis for Comment:

It is well known that organisms, particularly small poikilotherms and invertebrates, have a decreased ability to withstand environmental stressors when those same organisms are already stressed. Winter-related activities and blasting can provide two sources of stress that are in addition to the presence of fine-grained sediments. The dose response curves for larvae and small juveniles of fish (e.g., winter flounder) will be very steep and any small increase in stress will result in a significant increase in mortality. In a specific example of this phenomenon, from the North Cape oil spill in southern Rhode Island, it is generally agreed that the timing of the spill (mid-January 1996) contributed to the overall lobster and invertebrate mortality of the event. The spill ultimately killed approximately 9.0 million lobsters and numerous other invertebrates of varying sizes. The spill was caused by a number of unrelated events but a series of strong storms caused the #2 heating oil to be emulsified and driven into the sediments where the organisms resided. Due to the timing of the event and particularly the low water temperature, mobile organisms such as lobsters were unable to avoid the oil and move out of their shelters (Cobb et al., 1998).

It is not my contention that the fine-grained sediment being moved during this project will approximate #2 home heating oil. However, it seems reasonable to assume that dredging and blasting will be conducted during winter and the timing of this will render small vertebrates (e.g., larvae and juveniles) and benthic invertebrates less able to handle stress.

In addition, the DFR and DSEIS/EIR clearly state that there will not be any/much fine-grained sediment removed in the dredging project and that this material will be moved to Confined Aquatic Disposal (CAD) cells. However even these statements have some potential difficulties associated with them. It seems likely, for instance, that the sediments will be removed via a dredge that will suspend some of these sediments. If removal occurs on an outgoing tide and biological resources are within the vicinity, these stressed organisms (due to cold water or proximity to blasting) may be exposed to a significantly higher toxicant load than they can withstand. Again, this scenario seems likely. Finally Appendix J, Geophysical Investigations, indicates that there are several areas where the benthos consisted of "organic-rich, gaseous sediments in the near surface" (pg J-28), and also that, "Areas where gaseous, organic material present in the shallow subsurface inhibit penetration of the seismic signal were also identified during this process" (pg J-22). The DFR and DSEIS/EIR do not reconcile these statements and the qualitative results presented in Appendix J with the points that are stated later in this comment.

Significance – Medium:

During times or in regions of high stress (e.g. winter or in proximity to blasting) the benthic and epibenthic organisms, particularly those classified as biological resources, will be highly susceptible to additional stress from fine-grained sediments being suspended into the water column.

Comment Cross-referencing:

None

Recommendations for Resolution:

To resolve these concerns, the DFR and DSEIS/EIR should clearly articulated the following items:

- Provide the total estimated quantity of fine-grained sediment to be removed.
- Estimate the geographic extent of the fine-grained sediment to be removed and the distance between dredging these sediments and the nearest significant concentration of biological resources.
- Provide a qualitative chemical description of the fine-grained sediments focusing particularly on which compound (e.g., polycyclic aromatic hydrocarbons and/or heavy metals) they contain.

Comment 7:

Additional details are needed to clarify the measures to prevent mortalities of marine mammals and fishes with respect to the roles of marine mammal observers and the fish detection system.

Basis for Comment:

Throughout the DFR and DSEIS/EIR there is recognition that the dredging operations may have a significant impact on sensitive animals and life stages in the area. However there is not enough detail provided to judge the proposed measures to prevent ship strikes of marine mammals and the fish detection systems, both of which will be used to limit or prevent mortality events. In the first case, ships striking marine mammals, this is extremely important because of the potential for impacting small and sensitive populations such as the Atlantic Right Whales. Several instances in the DFR and DSEIS/EIR there is mention of a time frame "From February 1 through May 31 of any year, an approved marine mammal observer will be present aboard disposal vessels transiting between dredge site and the Massachusetts Bay Disposal Site (MBDS) during daylight hours" (for instance see pg 4-27 DSEIS/EIR). However nowhere in the report is there a description of what the observers' duties and responsibilities will be. For instance if an observer detects a Right Whale in the path of a disposal vessel, will he/she inform the captain that the vessel must either change course or stop it's forward motion? It is never made clear the role of these "approved marine mammal observers" and the impact, if any, they will have on preventing marine mammal mortalities. Finally why have "approved observers" on board during a part of the year and not the months of June to October?

In the second group of organisms, finfish species, there are also missing details related to the "fish detection system" that is going to be employed during dredging/blasting operations. For instance the DSEIS/EIR states on page ES-7 that "Four fish mortality events were observed during the ledge pinnacle removal project in the late fall of 2007" but little additional detail is provided anywhere. The only thing that is clear is that four fish mortality events occurred during the 2007 operations. Additional detail would help the reader understand the scope of the mortality events in terms of species involved and total area impacted. The documents never mention improvements (if any) to the fish detection system that could be proposed and the reader is unable to understand what would be involved in improving this system due to a lack of detail. For instance if the systems work but they are limited spatially, simply adding vessels to detect and deter fish adjacent to the operations would be a simple solution. Also, there is no mention of total numbers nor the species involved in the mortality events. If 1 million juvenile winter flounder were killed during 2007 operations then that is far more significant to users of Boston Harbor than if a few small commercially unimportant fish were killed.

Significance – Medium:

As the DFR and DSEIS/EIR have presented there is not sufficient detail to judge the efficacy of the marine mammal avoidance system and the fish detection system to understand total possible losses due to the operations.

Comment Cross-referencing:

None

Recommendations for Resolution:

- Describe in greater detail the total responsibilities of "approved marine mammal observers" with emphasis on how they can prevent ship strikes from occurring.
- Justify using "approved marine mammal observers" for only a small portion of the year, even though marine mammals and reptiles (e.g. sea turtles) will be in the Gulf of Maine and potentially the area of operations.
- The 2007 fish mortality events should be described in greater detail. Greater detail will allow the reader to judge the importance of each of these four events for themselves. At least provide an estimate of total number of fish killed and a list of species observed for the reader.
- The fish detection system must be more completely described. Particular emphasis should be placed on the total number of systems to be deployed (e.g. # vessels), the approximate proximity and any other related information.

Comment 8:

The potential for impacts to localized air quality is not addressed sufficiently.

Basis for Comment:

There are several instances when local and regional air quality is addressed and the reports, both the DFR and DSEIS/EIR, correctly state that fewer trucks on the roads in New England will improve regional air quality. In fact there are several instances when total miles not driven by trucks were quantified for the reader. However, there is very little recognition that fewer trucks in greater New England will mean more trucks in the Boston area. On page 4-1 it is stated "With the proposed project, there would be a slight increase in truck traffic and associated air emissions from the proposed project with the Boston metropolitan area. However, the overall regional air quality in New England would improve," and while these statements are correct, they do not sufficiently present the negative impact to air quality in the Boston metropolitan area. In addition there is a demographic description of the Suffolk County but that does not provide enough detail to judge potential impact to air quality. Table 3-16 (pg. 3-101) compares demographic data between Massachusetts and Suffolk County in general but there is never a description of the total number of people that live close enough to the harbor to be impacted by decreased air quality. The end result of this analysis is that the reader is left wondering how many people will be impacted by a reduced air quality due to the indirect impacts of the dredging operations and of the Boston Harbor operations.

Significance – Low:

The DFR and DSEIS/EIR did not address or quantify indirect changes in air quality due to local Boston trucking operations.

Comment Cross-referencing:

None

Recommendations for Resolution:

- The indirect emissions should explicitly include factors that will negatively impact air quality in the greater Boston area. Allow the readers to judge a "slight increase" in truck traffic by providing as much information about the numbers of trucks, their size, time a truck may spend in the Boston Harbor operational area and any other relevant information as is possible.
- Provide better demographic data to compare the total number of people living, working and transiting the area of Boston Harbor. Additional data, if those data are not available, could include distances to the nearest community (and their demographic makeup) in each direction (North, South, and West).

Comment 9:

The reviewers support the use of rock rubble for lobster habitat enhancement, but the lobster life stages for which habitat is being created are not specified and neither are potential negative impacts to the original habitat with respect to Essential Fisheries Habitat (EFH) considerations.

Basis for Comment:

It is clear that the Boston Harbor dredging project will produce a significant amount of cobble and boulder, so-called shelter providing habitat, for many organisms and we wholeheartedly endorse this use. However it is never made clear what species-specific biological criteria is being used to decide on where to place the rock/rubble mix. On page 2-21 of the DSEIS/EIR, five criteria are described and include "biological productivity of the area, bottom type, capacity to accept the material, other existing uses, and navigable distance to the sites from the project area" but there is never a mention of which species this project hopes to enhance. The DSEIS/EIR and Appendix U describe habitat utilization patterns of the American lobster and that as individuals grow they exploit a greater diversity of habitat types and depths. These same documents (DSEIS/EIR and Appendix U) describe the newly settled lobsters (EBP stages and small juveniles) as habitat and depth restricted stages: these stages are found most often in shelter providing habitat and in shallow water (less than 10m). From the description of the most suitable enhancement sites (Massachusetts Bay and Broad Sound, Figure 2-3, page 2-22 DSEIS/EIR) they are very deep and thus will not provide much habitat to the most sensitive lobster stages, particularly the EBP and small juveniles.

In addition, the two most suitable enhancement sites (Massachusetts Bay and Broad Sound) have 22 and 20 documented species of finfish respectively, but the potential negative impact to these species is not discussed. These species, such as with flounder, monkfish and others, are demersal and prefer relatively featureless habitat. Therefore it is safe to assume that these populations will be negatively impacted by the proposed habitat enhancement activities.

Significance – Low:

There should be more explicit detail provided about individual species to be enhanced and not just communities or ecosystem measures.

Comment Cross-referencing:

Also see comment 10, multiple uses of rock rubble.

Recommendations for Resolution:

- The purpose of the habitat enhancement component of this project should be more explicitly stated. If the goal is to enhance new settled (EBP) and juvenile lobster habitat then using the Broad Sound and Massachusetts Bay enhancement sites is not optimal. Perhaps the decision criteria should be adjusted to include impacts to specific species.
- The potential negative impact of the enhancement sites to benthic epifauna (crabs and fish) is never mentioned. Describe the quantitative impact (if any) to these impacted populations.

Comment 10:

Multiple beneficial uses of dredged rock should be considered to enhance the total use of this natural resource in the Boston Harbor deepening project, or a justification that additional beneficial uses (e.g., shore protection) are not economical should be included.

Basis for Comment:

The Boston Harbor Deepening project is expected to produce up to 14.8 million cubic yards of parent material (stiff clay and glacial till) and up to 1.4 million cubic yards of blasted or excavated rock depending on the final depth of the dredged channel. Both the parent material and rock have been approved for open water disposal at the Massachusetts Bay Disposal Site (MBDS). Two beneficial uses have been identified in the DSEIS/EIR. One beneficial use is to use the parent material to cover the debris field known as the Industrial Waste Site that is next to the MBDS. The second beneficial use is to use the rock to create hard bottom habitat in selected areas to create habitat diversity for fish and lobster.

On page 2-19 of the DSEIS/EIR, a beneficial use of using rock for shore protection in the Boston Harbor area is discussed. This beneficial use was not further evaluated due to the unknown suitability of the rock and permits that would need to be obtained. Another possible beneficial use is to use the rock as aggregate material. This possibility was not further evaluated due to legalities of a private contractor receiving the rock from a Federal project, permit issues, and available shore facilities for offloading the rock.

It is suggested that sufficient time is available to consider the economic benefits of using the rock for shore protection, aggregate use, and creation of hard bottom habitat. These alternatives could be compared to determine the optimum economic beneficial use of the rock and perhaps develop multiple uses for the rock that would serve more diverse needs in the area.

In Appendix S of the DSEIS/EIR on page S-35, the volume capacity of the identified hard bottom sites is discussed. The discussion shows there is sufficient capacity at either the Broad Sound site or the Massachusetts Bay site to beneficially use all the expected rock from the deepening project. The use of the Nantasket Roads site might also be considered for the development of a multiple beneficial use of the rock. Additionally, Comment 9 discusses the value of creating hard bottom habitat in shallower waters to benefit earlier life stages of lobster.

Since there are multiple beneficial use opportunities for the rock, it is suggested that a ranking be established based upon economic benefit to use the rock for multiple uses that would benefit the Boston Harbor area in more diverse ways. There is more capacity for beneficially using the rock than the amount of rock expected to be produced from the deepening project, and consequently it is suggested that no rock be placed in the MBDS.

Significance – Low:

The significance of this comment is low because there is capacity to beneficially use all the rock from the Boston Harbor deepening project for hard bottom habitat, but it is felt that other multiple uses (e.g. shore protection, shallow hard bottom , and aggregate use) of the rock may have a better overall benefit to the project.

Comment Cross-referencing:

Also see Comment 9, which addresses the need for shallow water hard bottom habitat.

Recommendations for Resolution:

The Boston Harbor Deepening Project sponsors are encouraged to find ways to overcome obstacles preventing the beneficial use of all the rock from the deepening project. Additional beneficial uses could include additional hard bottom areas in areas such as:

- Nantasket Roads Area or not yet defined shallower areas (see Comment 9),
- Find ways to use the rock in Boston Harbor Area where shore line protection improvements are needed,
- Provide the rock as aggregate material to the aggregate industry.

The deepening project should not waste a valuable resource by placing the rock in the MBDS deepwater disposal site.

Comment 11:

Economic benefits which will accrue to foreign flag carriers may not be fully passed on to U.S. shippers, and the report does not provide any recognition of this.

Basis for Comment:

The NED savings are based on landside trucking cost savings (refer to comment 2) and also avoidance of the ILA GAI assessment (refer to comment 3). Assuming for the sake of argument that the ILA GAI assessment is a resource cost that is saved from container lines direct calling at BH there is no support that this "saving" would be passed on to U.S. shippers (importers and exporters) rather than retained by the foreign owned lines, MSC and COSCO, that provide the benefiting services for with-project conditions.

It is widely recognized that the liner shipping industry is oligopolistic in market structure (few firms that directly influence each other by prices, services, etc.). The high entry barriers, largely capital, and concentration of market share among a few large firms is not the standard paradigm for a competitive industry. It is recognized that the USACE assumes a competitive shipping industry model under which cost savings are passed to customers. This is likely to prevail in competitive ocean shipping sectors such as bulk cargo but is not the norm for liner services.

Significance – Low:

The report makes no allowance for the fact that an oligopolistic market structure (two firms and three services) calling BH may not share the assumed resource cost savings of the NYH ILA GAI assessment with U.S. shippers.

Comment Cross-referencing:

Also see: Comment 2 regarding the absence of total transportation costs, and Comment 3 on avoidance of the NYH ILA GAI assessment.

Recommendations for Resolution:

To resolve these concerns, the report would need to be expanded to include:

- Provide documentation that shows that the NYH ILA GAI assessment avoided by direct calls at BH (MSC and COSCO) is passed to U.S. shippers in lower rates than for similar services by these lines at NYH.

Comment 12:

Further detail is needed on the frequency and impact of rerouting Logan Airport airplanes and other aviation-related restrictions on vessels in the container terminal berthing or at work in Boston Harbor.

Basis for Comment:

As reported (DFR pgs. 73-74), certain Logan Airport flight envelopes pass over portions of the Roads anchorage, Conley Terminal, the Main Channel, and other waterfront facilities. Anticipated project improvements will likely result both in vessels of greater air draft and facilities of greater heights. Federal Aviation Administration (FAA) review and approval will be required on all associated air draft issues within the runway approaches.

Also, two turning basin layouts were considered – referred to as the NW and NE alignments. The recommended NW alternative puts the basin directly in line with Logan's Runway 4R approach. Faster turning times and times to berth are used as justification, which may be appropriate but this discussion is anecdotal. No quantifiable data are provided, particularly with regard to airport operations.

At present, when large air-draft ships are turning in the basin, use of Runway 4R is typically suspended for several minutes and/or flights are shifted to another of the airports runways. With-project harbor activities will increase the frequency of these interruptions.

An assumption is made, but not supported, that the FAA will reroute planes to accommodate the Boston Harbor port improvements. Documentation is needed to provide confidence that the FAA will indeed reroute the planes. And, if so, the impact on other airport activities – in terms of delays and air safety – should be assessed.

Restrictions on ship and crane heights – due to potential runway interference – are not sufficiently addressed. The potential impact on Boston Harbor operations due to such restrictions and/or the operational impacts for those instances when the FAA chooses not to reroute planes from Runway 4R needs be assessed as well.

Significance – Low:

MASSPORT does not consider this issue a significant concern because flight operations are typically shifted to other runways during vessel turning or construction. However, without additional data, this conclusion is anecdotal and needs be substantiated.

Comment Cross-referencing:

None

Recommendations for Resolution:

For the with-project conditions, recommend the following questions be addressed:

- How often will Logan Airport flights be impacted and what will be their delay?
- What will be the impact – in terms of delay – of other flights affected by the rerouting?
- Are there air safety implications associated with rerouting 4R flights to other runways?
- What are the likely height restrictions on construction vessels and vessels at berth, and how might these restrictions affect port operations?

Comment 13:

The discussion of the Permanent International Association of Navigation Congresses (PIANC) design methodology for channel width is poorly written/illustrated.

Basis for Comment:

PIANC design guidance for determining channel width is discussed in Appendix D-1, pgs. D1-6 through D1-9. However, beginning on pg D1-7, the example is ill-conceived and beset with inconsistencies. To begin, the vessel's speed is reported as 6 kts, which would classify as 'slow', yet many of the parameter corrections are applied as though the speed was moderate. Winds are reported as though 'typically from the East' @ 10.7 mph, yet the DFR suggests that the prevailing winds for Boston Harbor are northwesterlies averaging 13 mph. Perhaps the example was meant to address 'onshore cross winds'. In either case, the suggested storm wave height (vice H_s) in the example is being driven by 51 mph winds. The 'Aids to Navigation' condition calls for a correction of 20%, not 10%. Finally, the summary width on pg D1-9 is based on a vessel with moderate maneuverability, not poor maneuvering as initially suggested (pg D1-7).

A proper example would define the design ship and all 'design' conditions up front, and then follow with implementation of the procedure. (By 'design' conditions, one would not specify an average wind speed, for example, but rather a max wind speed at which transit might be attempted.) Such an approach would likely eliminate many of the example's inconsistencies and result in a more positive understanding of the design procedure. That said, the design discussion beginning on pg D1-12 is clearer with regards to some design conditions (e.g., design ship and design wind speed), but unclear with regards to others (H_s and mid-channel speed). It is unclear what assumptions were made and whether they were appropriate for the project-recommended width calculations shown in Table D1-8 (pgs. D1-14 through D1-16).

Of lesser concern, it should be noted that Table D1-7 is poorly formatted and has at least two-typos (E vice ENE in column 1, and a coefficient of 18.396 seems more appropriate than 18.654 in Note 3.) Also, DFR pg. 141 reads "Figure 9-1 of EM 1110-2-1613 (2006) calls for a turning basin radius of 1.2-1.5 vessel length." The reference should be to 'turning basin <u>diameter</u>' (not radius); an apparent misstatement b/c Fig 28 portrays the appropriate diameter.

Significance – Low:

The various inconsistencies of the PIANC design example are a source of uneasiness in accepting the actual design results. While the results presented in Table D1-8 may be correct, one cannot be sure without specifying and/or justifying all the design data.

Comment Cross-referencing:

None

Recommendations for Resolution:

- The PIANC illustration beginning at the bottom of pg D1-6 should be reworked with consistent inputs/assumptions.
- The design conditions leading to the suggested channel widths of Table D1-8 should be both specified and justified.

Comment 14:

Has sufficient consideration been given to the potential shockwave effects of blasting in the vicinity of the Ted Williams Tunnel?

Basis for Comment:

As best one can tell from the available drawings (e.g., DFR Figure 34), Plan D – Main Ship Channel Deepening to MASSPORT Marine Terminal (MMT) – calls for dredging to at least minus 45' MLW within 1000' of the Ted Williams Tunnel (TWT). It is reported (DFR pg 162) that this effort will involve the greatest percentage of rock (argillite) and hard materials relative to the area's total dredge quantity.

Using a conservative assumption, removal of all ledge material in this area will require drilling and blasting. The proposed blasting plan would involve over-drilling of charge holes to 4' or 5' below the allowable overdepth or as deep as 53'-54' below MLW, i.e., 45' + 4' allowable rock overdepth + 4' or 5' over-drilling. This places the potential drill/blast holes well below the top of the TWT's rock cover layer which is generally at -45 feet MLW.

Significance – Low:

Given the 1000' separation between the TWT and the required dredging area and the likely possibility of ledge removal without blasting, this concern is seemingly of low risk. However, should blasting be required and result in shockwave damage to the tunnel, the consequences could be huge.

Comment Cross-referencing:

None

Recommendations for Resolution:

- As reported (see DFR, pg. 166), a detailed program of subsurface investigation should be conducted in this area during the design phase of the project to determine the extent of ledge to be removed and whether blasting will be required
- Should blasting be required in the northern reaches of the MMT channel deepening extension, blasting charges should be applied incrementally while monitoring and assessing their shockwave effects (in the vicinity of the TWT) before full-scale blasting is undertaken.

APPENDIX B

FINAL CHARGE TO THE EXTERNAL PEER REVIEWERS

Boston Harbor Navigation Improvement Project,
Massachusetts, Feasibility Study:

Draft Feasibility Report and Supplemental Environmental Impact Statement and Massachusetts Draft Environmental Impact Report (Draft SEIS-EIR)

Final Charge Questions

DRAFT FEASIBILITY REPORT

EXECUTIVE SUMMARY

No questions

INTRODUCTION

No questions

PROBLEM IDENTIFICATION

Existing Conditions

Geographic and Institutional Setting

Comment on the characterization of the meteorology and tidal conditions of Boston Harbor. Is it complete and at an appropriate level of detail to support the environmental impact analysis?

Environmental Setting and Natural Resources

Does the text accurately summarize the information and analyses on the project's physical and ecological setting and impacts on air quality presented in the SEIS/EIR?

Is the qualitative explanation of noise impacts satisfactory?

Comment on the characterization of the water quality of Boston Harbor. Is it complete and at an appropriate level of detail to support the environmental impact analysis?

Comment on the characterization of the project area sediment characteristics and quality. Is it complete and at an appropriate level of detail to support the environmental impact analysis?

Is the information and data presented on submerged aquatic vegetation (SAV) in Boston Harbor sufficient to determine potential impacts on SAVs associated with dredging?

Do the data presented provide sufficient detail to accurately describe the benthic community and potential impacts associated with the project?

Are the types and species of fish included in this section (i.e., winter flounder, anadromous fishes, and lobster) fully representative of those that are of particular concern with regard to this project? If not, what is missing?

Comment on whether the description of marine mammal species that could potentially be visitors to Boston Harbor and, therefore, potentially be affected by project operations, is complete.

Comment on the whether the description of threatened and endangered species that could potentially be visitors to Boston Harbor and, therefore, potentially be affected by project operations, is complete.

Cultural Resources
Does the summary of cultural resources provide sufficient detail to determine the potential for finding underwater archaeological resources including shipwrecks in the dredging areas?

Existing Navigation Conditions
Is the description of the existing navigation conditions clear and complete?

Existing Commerce
Comment on the completeness of the description of existing commerce in Boston and the impact of the harbor.

Economic Profile
Does the economic profile provide sufficient detail to understand cargo transportation within Boston Harbor? If not, what is missing?

Without Project Condition (Future Conditions)

Are the future conditions that are expected to exist in the absence of the proposed project logical and adequately described and documented?

Are the changes between without and with project conditions adequately described?

Problems and Opportunities

Address the extent to which significant problems and opportunities have been adequately identified and described.

Comment on how well the problems and opportunities are assessed in terms of economic, environmental, and other project considerations. Is the projection of these problems and opportunities clearly defined to coincide with the life (50 years; 2014-2064) of this proposed project?

PLAN FORMULATION

Discuss whether all reasonable nonstructural and structural management measures to address the problem were identified and adequately considered.

Are risks and uncertainties of benefits, costs, and impacts adequately addressed and described?

Comment on the completeness of the no-action, non-structural and structural plans.

Comment on whether you are in agreement with how the alternatives for detailed screening were derived.

EVALUATION OF ALTERNATIVES

Address the extent to which the alternatives considered are comprehensive and appropriate to address the identified problems and opportunities.

Was an incremental approach incorporated?

Navigation Improvement Alternatives

Comment on the completeness of the description of navigation improvement alternatives.

Engineering Investigations

Is the summary provided in this section consistent with the various engineering investigations conducted for the proposed project and detailed in the eight referenced technical appendices? Are the relevant findings presented?

Please comment on the basic investigative techniques, samplings, and interpretive methodologies used in the engineering analysis. Are there alternative methods that should have been performed?

Is the proposed subsurface exploration program for the design phase adequate to address expected materials to be encountered during construction? Are the assumptions used in the feasibility phase estimates reasonable (e.g., all hard material will require blasting and removal)?

Is the Permanent International Association of Navigation (PIANC) approach acceptable and adequate for the proposed project?

Quantity Estimates

Is the methodology for calculating dredged material quantity estimates appropriate and reasonable?

Dredged Material Disposal Alternatives

Comment on whether you agree with the proposed beneficial use opportunities.

Has sufficient information been presented to support the identification of the most suitable sites for creating hard bottom habitat?

Do you agree with the proposed approach to demonstrated capping at the Industrial Waste Site (IWS)? If not, explain why.

Other Improvements Investigated

Is the description of other improvements complete? If not, what is missing?

Project Implementation Costs

Address the extent to which significant project implementation costs have been adequately identified and described. Are there any assumptions that raise concerns about the uncertainties that could have a substantial impact on the project costs?

Annual costs

No questions

ECONOMIC BENEFITS ANALYSIS

Address the extent to which the methods for performing cost-benefit analysis, including use of discount rates, is adequately described and justified.

Address the extent to which the offsetting loss of commerce at the Port of New York and New Jersey are adequately evaluated and discussed in assessing the total benefits.

Address whether the uncertainty in benefits is identified and adequately addressed.

Are all costs, direct and indirect, recognized and discussed?

ASSOCIATED MAINTENANCE DREDGING

Do you agree with the plan for maintaining existing federal navigation features during the project?

ENVIRONMENTAL IMPACTS ANALYSIS

Resource Investigations

Address the extent to which the use of opinions and documents in lieu of extensive, but costly, sampling is adequate to evaluate the resources that could be impacted by the project.

Disposal Site Investigations and Beneficial Use

Comment on whether you agree or disagree that the project will provide habitat enhancement?

Environmental Coordination and Compliance

NA

Identification of Environmental Mitigation Requirements

Are the mitigatory measures described in this section sufficient to decrease the likelihood that project operations will have negative impacts to marine mammals, finfish, shellfish, important habitat, fishing and shellfishing activities, and air quality?

Other Social Effects

Address the extent to which significant social effects have been adequately identified and described.

Draft SEIS/EIR Coordination

NA

RECOMMENDED PLAN OF IMPROVEMENT

Address whether you agree that (1) the benefits of the proposed approach exceed costs, and (2) the proposed approach provides the highest net benefit of all alternatives investigated.

RECOMMENDATION

Address the extent to which the recommendation is consistent with the findings of the economic analysis.

Comment on the consistency of the recommendations with the evaluation of alternatives and environmental impact analysis.

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/ DRAFT ENVIRONMENTAL IMPACT REPORT

EXECUTIVE SUMMARY

No questions

1.0 INTRODUCTION

No questions

2.0 ALTERNATIVES

Address whether the proposed project is adequately explained and justified.

Was an incremental analysis performed?

Comment on the adequacy of the justification that the proposed alternative meets the stated criteria of maximizing net benefits with a justifiable environmental impact.

3.0 AFFECTED ENVIRONMENT

Comment on the approach used in the analysis of the physical environment. Is the characterization of the physical environment complete and sufficiently justified by the data presented?

Are the biological resource sections presenting data and information on submerged aquatic vegetation, benthic invertebrates, shellfish, lobster, fish, marine & coastal birds, and marine mammals and reptiles complete and accurate? What additional data or information should be included?

Is information on the threatened and endangered species and species of special concern presented in the SEIS/EIR complete and accurate? What other information, if any, should be included?

Do the historical and archaeological resources appear to be accurately described? To the best of your knowledge, what, if anything, is missing?

Has the air quality analysis been accurately described? Have the applicable air quality standards and attainment status for the area been accurately listed?

Are the requirements of the General Conformity Rule adequately described? Do the existing air quality data presented accurately represent the regional air quality?

Please address whether the relationship between the harbor usage and amenities and the socioeconomic environment is adequately described.

Does Section 3.8 accurately describe the existing harbor infrastructure? Have all the components of the harbor infrastructure that may be affected by the proposed project been adequately discussed?

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 No Action Alternative

Are the potential impacts associated with the no action alternative adequately described? Why or why not?

4.2 General Impacts of Dredging in Boston Harbor

Is description of the physical impacts that would result from dredging in Boston Harbor complete? If not, what other potential impacts may occur?

Do you agree with the discussion of potential contaminant impacts that would result from dredging Boston Harbor? Are there other contaminant issues that should be considered?

Do you agree with the described potential impacts to dissolved oxygen levels? Why or why not?

Comment on the completeness of the description of the potential impacts to benthic organisms, fisheries, lobsters, birds, and mammals as a result of dredging in Boston Harbor? What other impacts, if any, do you believe would occur to these biological resources?

Comment on the potential impacts to invertebrates, fish, and marine mammals from underwater blasting.

In your opinion, are the impacts from CAD cells similar to those for dredging and disposal operations, and are they likely to be temporary and not significant? Why or why not?

4.3 Benefits and Impacts at the Potential Habitat Enhancement Sites

Comment on the potential benefits and impacts associated with using rock material to create or enhance reefs in the area.

4.4 Disposal Impacts at the Massachusetts Bay Disposal Site (MBDS)

Comment on the completeness of the description of the chemical, physical and biological impacts associated with disposal at the MBDS.

4.5 Disposal Impacts at the Industrial Waste Site

Are the impacts associated with disposal at the industrial waste site adequately addressed? What additional information should be included?

4.6 Threatened and Endangered Species and Species of Special Concern

Is the assessment that sea turtles are unlikely to be seriously impacted by dredging activities well documented?

Comment on the proposed measures taken to protect threatened, endangered, and special concern species from dredging-related activities.

4.7 Historical and Archaeological Resources

Comment on the adequacy of the sensing surveys, borings, and other investigations associated with each improvement plan to protect submerged cultural and archaeological resources.

4.8 Air Quality

Are the direct and indirect air emissions associated with each alternative accurately quantified? Have the effects of the Emission Reduction Options been accurately quantified? Were the alternatives and options used in the General Conformity analysis adequately discussed?

4.9 Socioeconomic Impacts

Address completeness of the discussion on socioeconomic, harbor infrastructure, cumulative, and secondary impacts.

4.10 Harbor Infrastructure

Comment on the adequacy and conclusions of the review regarding the potential to damage existing Boston Harbor infrastructure during construction.

4.11 Cumulative Impacts

Have all practical and reasonable potential cumulative impacts of past, present, and anticipated future projects been evaluated?

4.12 Secondary Impacts

Is the discussion of secondary impacts complete? If not, what is missing? Please comment on the adequacy of the analysis of the impacts on ground transportation.

4.13 Mitigation

Are the planned mitigation actions and methods appropriate to the project? Are they reasonable and sufficient for their intended purpose?

5.0 AGENCY COORDINATION AND COMPLIANCE

Are the impacts on the Essential Fish Habitat accurately described?

Have all applicable Coastal Zone Management policies been identified?

Have all applicable Federal Statutes, Executive Orders, and Executive Memoranda been identified?

6.0 PUBLIC INVOLVEMENT

Is the outreach program sufficient to solicit comments and concerns from the general public, state and Federal resource agencies, and any other interested party?

DRAFT CLEAN WATER ACT SECTION 404(B)(1) EVALUATION

Discuss whether you agree or disagree that the proposed plan meets the requirements and guidelines of the Section 404(b)(1) concerning discharge of dredged or fill material into the waters of the United States.

SUPPLEMENTAL TECHNICAL APPENDICES

APPENDIX A. Public Involvement and Pertinent Correspondence

Based on the documentation in Appendix A, do you agree that the various interested parties, agencies, and public have been given adequate opportunity to provide comment on the proposed project?

APPENDIX B. Project Authorization and Work History

NA

APPENDIX C. Economic Assessment and Related Documents

Address whether the economic benefits and costs of the project alternatives are adequately identified, explained, and justified.

Address whether the economic study area is appropriate; and whether the offsetting loss of commerce at the Port of New York and New Jersey (noted on page C15, C1-2, and elsewhere) are adequately evaluated and discussed in assessing the total benefits.

APPENDIX D-1. Engineering Design

Are the channel widths adequate for the design vessel?

Are the turns properly designed?

Has the channel impact on adjacent shorelines been evaluated?

APPENDIX D-2. Project Cost Estimates

Address whether the method of calculating costs is adequately described.

Address whether the costs of the project alternatives are adequately identified, explained, and justified.

APPENDIX E. Real Estate Plan

Does the plan adequately address all real estate interests and requirements?

Is the temporary easement value reasonable?

APPENDIX F. Hydrodynamic Field Data Collection Report for Hydrodynamic Model

Were the field studies conducted to obtain hydrodynamic data to validate the numerical model sufficient for the purpose?

Comment on the representativeness of the field measurement program in terms of seasonal and storm-related events. Could any extreme events not captured in the field program result in non-trivial differences in the hydrodynamic model results and in the ship simulator results.

APPENDIX G. Hydrodynamic Model Report

Comment on the applicability, accuracy, and completeness of the hydrodynamic model with regard to predictions of any significant changes in harbor currents.

In your opinion, were the simplifying assumptions reasonable, in particular, the decision not to model rare, strong wind events?

Was the model validation appropriate and sufficient? In particular, were field data used for model forcing functions sufficiently independent from those data used for model validation?

APPENDIX H. Ship Simulation Study – ERDC

Address whether the reasons for the proposed project are adequately explained and justified.

APPENDIX I. Geology and Geotechnical Investigations

Was the description of material to be dredged sufficient to support proposed project and future design phase investigation? What are the strengths and weaknesses of the presentation made of what to expect at deeper depths? To what extent are the factors that influence the interpretation data defined? Please note any factors that are not described that are critical to or limit the interpretation of data.

Please comment on the basic investigative techniques, samplings, and interpretive methodologies used in the geotechnical analysis. Were the methods, spacing and ground coverage adequate? Please comment on the assumptions used to design and implement the investigations (e.g., -55 feet mean lower low water was considered the maximum depth of interest for the studies). Are there any additional criteria that should have been considered?

Do the figures and maps generated by the studies present a clear picture of the areas that are well-defined as well as areas that are not?

The report acknowledges data gaps and makes recommendations for further investigation in the design phase. Have the quantitative or qualitative confidence levels been adequately defined and will the additional investigation proposed meet the required confidence levels? How do the data gaps impact the proposed project?

APPENDIX J. Geophysical and Remote Sensing Investigations

Please comment on the basic investigative techniques, samplings, and interpretive methodologies used in the geophysical analysis. Was the software used in data interpretation appropriate?

The report identifies and describes areas of adequate data coverage and low to no data coverage. Is the identification and description of areas of different levels of confidence

justifiable and appropriate? Is the explanation for incomplete subsurface seismic data coverage well understood and acceptable?

APPENDIX K. Sediment Sampling and Testing

NA

APPENDIX L. Dredged Material Disposal Suitability Determinations

Is the statement that sufficient information was obtained to properly evaluate suitability of the project material for open water disposal at the Massachusetts Bay Disposal Site (MBDS) justified in terms of the regulatory-required evaluation and testing?

APPENDIX M. Cultural Resource Investigations and Coordination

Comment on whether the potential for finding underwater archaeological resources including shipwrecks in recommended studies in the Mystic River and Chelsea River dredging areas is appropriately addressed in the cost benefit analysis for the proposed project and alternatives.

APPENDIX N. Lobster Resource Survey Report – Battelle

Is the evaluation of lobster data used in the report adequate to address potential impacts to this resource from the proposed project conditions? Why or why not?

Do the data support the conclusions? Why or why not?

APPENDIX O. Air Quality Analysis – CDM Report

Does the Appendix provide sufficient detail to document the emission calculation methodologies used to estimate direct and indirect emissions for the project alternatives?

Were the methodologies used to estimate direct and indirect emissions appropriate?

Do you agree with the methodology used for the comparison of emissions to the State Implementation Plan and the General Conformity de minimis thresholds?

APPENDIX P. Massachusetts Regulatory Review Documents

Does the stated response and referenced section of the SEIS/EIR adequately address each comment?

APPENDIX Q. Bottom Sediment Types Memorandum – Ocean Surveys, Inc.

Do the data presented sufficiently characterize the harbor bottom for purposes of project design and impact assessment?

APPENDIX R. US EPA Technical Memo on Capping of the IWS

NA

APPENDIX S. Beneficial Use Investigations – Battelle – Hard Bottom Habitat Report

Were the criteria and overall methods used to rank the five potential enhancement sites adequate? Why or why not?

Should other criteria should be considered? Are other site ranking methods more suitable?

Do you agree with the final site rankings? Why or why not?

APPENDIX T. Essential Fisheries Habitat (EFH) Evaluation

Is the EFH assessment adequate? Why or why not?

APPENDIX U. Benthic Data

Do you agree with the potential impacts to the benthic resources for the various harbor areas as stated in this report? Why or why not?

APPENDIX V. Shellfish Life History Information

Are the data presented for the shellfish resources for Boston Harbor complete? Should additional information be included?

APPENDIX W. Coastal and Marine Birds in Boston Harbor and Massachusetts Bay

Are the groups and species of birds described in Appendix W fully inclusive of the avian life that could possibly be encountered in the project area?

Are the characteristics of the avian species in Table W-1 accurate to the best of your knowledge?

APPENDIX X. Marine Mammals in Boston Harbor and Massachusetts Bay

Are the marine mammals described in Appendix X fully inclusive of the species that could possibly be encountered in the project area?

Are the characteristics of the marine mammals described in Appendix X accurate to the best of your knowledge?