Final Independent External Peer Review Report Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report (GRR)

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
National Planning Center of Expertise for Inland Navigation (PCXIN)
Baltimore District

Contract No. W912HQ-15-D-0001
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Executive Summary

PROJECT BACKGROUND AND PURPOSE

The General Reevaluation Report (GRR) will evaluate Shallow Draft Lock Replacement alternatives within the Inner Harbor in New Orleans, Louisiana. The inner harbor corridor is a combined deep and shallow draft canal extending northward from the Mississippi River to Lake Pontchartrain. The existing Inner Harbor Navigation Canal (IHNC) passes barge traffic between the Mississippi River and the Gulf Intracoastal Waterway (GIWW) at New Orleans, and is a vital link in the GIWW system. The existing lock is antiquated and well beyond its design life. The closure of the Mississippi River Gulf Outlet (MRGO) heightens the need for a modern and more reliable lock. A lock outage would clog the entire GIWW system with the only viable alternate route taking 17 days.

The plan identified in the 1997 Evaluation Report included construction of a concrete lock; replacement of the St. Claude Avenue bridge with a new, low-level double bascule bridge; construction of a temporary bridge at St. Claude Avenue that would provide continuous use of that canal crossing during construction of the new bridge; replacement of the center lift-span and raising of the towers on the Claiborne Avenue bridge by using innovative construction methods that will reduce the closure at that bridge, for both marine and ground traffic, for very short durations (1-4 weeks); provision of by-pass channels around the new lock construction site and the existing lock during its demolition, both of which would provide continuous usage of the existing lock and canal during construction; extension of the Mississippi River flood protection along the canal to the site of the new lock; and implementation of a community impact mitigation plan to offset and/or compensate for impacts the project will have on the surrounding communities, even though USACE is not relocating any residences. The GRR will reevaluate this plan as well as other alternatives identified in the 1997 Evaluation Report. New alternatives and/or lock locations will also be considered under the GRR.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The U.S. Army Corps of Engineers (USACE) is conducting an Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report and Supplemental Environmental Impact Statement (GRR/SEIS) (hereinafter: IHNC Lock Replacement GRR/SEIS IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate this IEPR. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in

USACE (2012) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the decision documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: Civil Works planning/economics, environmental, hydrology and hydraulic engineering, geotechnical engineering, and structural engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of final candidates to confirm that they had no COIs, but Battelle made the final selection of the five-person Panel.

The Panel received electronic versions of the decision documents (3,314 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2012) and OMB (2004), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference at the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process. The Panel produced individual comments in response to the charge questions.

IEPR panel members reviewed the decision documents individually. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, 13 Final Panel Comments were identified and documented. Of these, one was identified as having medium/high significance, eight had a medium significance, three had medium/low significance, and one had low significance.

Battelle received public comments from USACE on the IHNC Lock Replacement, totaling 2,285 pages of comments) and will provide them to the IEPR panel members. Battelle will complete the public comment review following the schedule in Table A-1. The public comment review for the IEPR panel members will take place after the Final IEPR Report (this document) has been submitted to USACE and will be documented in a separate Addendum to this Final IEPR Report.

Results of the Independent External Peer Review

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2012; p. D-4) in the IHNC Lock Replacement GRR/SEIS review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel's findings.

Based on the Panel's review, the GRR/SEIS summarizes a long and involved project history into an understandable, clear, and concise report. The Panel found the overall conceptual engineering approach to be sound, comprehensive, and well thought-out; the empirical use of the economic models to be well done; and the efforts to eliminate wetland impacts to be commendable. The report provides a balanced assessment of the economic, engineering, and environmental issues of the overall project; however, the Panel identified several elements of the report that should be clarified or revised.

Plan Formulation and Economics: From an economic perspective, the Panel believes that the GRR/SEIS should be updated to include more recent economic data to ensure the traffic projections are accurate and the benefits based on those projections are appropriate.

Engineering: The Panel is concerned that there is no justification given for the +5.0 foot top elevation of the cofferdam and no analysis or discussion of the risk of overtopping of the cofferdam during construction. Since cofferdam overtopping is likely to significantly impact the project schedule and cost, the report would benefit from updating Appendix B to include information on why the +5.0 foot elevation was chosen and to describe the overtopping risk. The Panel agrees that the GRR/SEIS does not discuss how the cofferdam system would be flooded in anticipation of an overtopping event to prevent damage from falling water, and encourages the Project Delivery Team to include an acknowledgment that the final cofferdam design will include sluiceways and/or flood gates. In addition, the Panel believes that several construction noise-related issues are not addressed in the GRR/SEIS (including which construction activities will be happening during nighttime hours), which could also affect project cost and schedule due to noise complaints, changes in construction sequencing, or the addition of noise abatement measures. The Panel recommends establishing a baseline noise condition, conducting construction noise analyses, evaluating noise adjustments and controls, and implementing a noise control plan to see if construction can adhere to the proposed schedule with the addition of noise-related measures.

The Panel also agrees that life safety concerns have not been developed in enough detail for such a complex project, which includes marine construction in an active shipping area and in close proximity to a large population area. The Panel also found that the need for and effectiveness of the jet grouting program is not well-defined and the sliding stability and bearing capacity of the cofferdam cells should be reevaluated in future design stages due to the potential schedule and cost impacts. The Panel noted that future pile load testing to verify the load carrying capacity of the piles, the driving characteristics, and the noise impacts of the driving process are not addressed in the GRR/SEIS, nor is any potential settlement of the lock structures supported by the pile foundation. Finally, the Panel observed that the GRR/SEIS would benefit from a general description of subsurface conditions, which would enhance the stability computations of the cofferdam system, and that the factor of safety of the cofferdam's sliding stability may need to be recomputed using the procedures described in Engineer Manual (EM) 1110-2-2503.

Environmental: The main environmental concerns are all regarding compliance with USACE guidance or National Environmental Policy Act (NEPA). The Panel believes that the GRR/SEIS does not include sufficient evaluations of climate change or relative sea level rise (RSLR), as required by two USACE guidance documents (EM 1100-2-2503 [USACE 2014a] and Engineer Technical Letter [ETL] 1100-2-1 [USACE 2014b]). The Panel suggests updating the GRR/SEIS to include a discussion of climate change impacts (including the potential for increased sedimentation) and to develop and analyze a credible range of RSLR scenarios. In addition, the Panel agrees that the community impact mitigation plan (CIMP) is out of date and that the measures it proposes may not be acceptable or adequate for target communities, particularly vulnerable populations. Possible remedies include describing the timeline for updating and implementing the CIMP in the GRR/SEIS and addressing how vulnerable populations will be able to gain

access to the benefits described in the CIMP. Finally, the Panel noted that the environmental justice analysis in the GRR/SEIS is too brief and out of date, and does not include an evaluation of whether vulnerable populations may be disproportionally affected by this project. A more detailed analysis of potential environmental justice issues would improve the GRR/SEIS and help eliminate risk to the project.

Table ES-1. Overview of 13 Final Panel Comments Identified by the IHNC Lock Replacement GRR/SEIS IEPR Panel

No.	Final Panel Comment
Significance – Medium/High	
1	
Significance – Medium	
2	The GRR/SEIS does not include sufficient evaluations of climate change impacts or relative sea level rise.
3	
4	The environmental justice analysis is too brief and is out of date.
5	
6	The GRR/SEIS does not describe how the cofferdam system would be flooded in anticipation of an overtopping event.
7	Life safety planning and analyses during all stages of construction have not been developed in enough detail.
8	
9	

Table ES-1, continued. Overview of 13 Final Panel Comments Identified by the IHNC Lock Replacement GRR/SEIS IEPR Panel

Significance – Medium/Low	
10	
11	
12	The potential settlement of the lock structures supported by the pile foundation has not been addressed.
Significance – Low	
13	

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LIST OF ACRONYMS

ADM	Agency Decision Milestone
ATR	Agency Technical Review
CIMP	Community Impact Mitigation Plan
COI	Conflict of Interest
CSLIDE	Sliding Stability of Concrete Structures
CWRB	Civil Works Review Board
DrChecks	Design Review and Checking System
EC	Engineer Circular
EM	Engineer Manual
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ETL	Engineer Technical Letter
FLAC	Fast Lagrangian Analysis of Continua
GIWW	Gulf Intracoastal Waterway
GRR	General Reevaluation Report
IEPR	Independent External Peer Review
IHNC	Inner Harbor Navigation Canal
IWR	Institute for Water Resources
LWRC	Louisiana Water Resources Council
MRGO	Mississippi River Gulf Outlet
NED	National Economic Development
NEPA	National Environmental Policy Act
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
PDT	Project Delivery Team
PSF	pounds per square foot
RSLR	Relative Sea Level Rise
SEIS	Supplemental Environmental Impact Statement
TSP	Tentatively Selected Plan
USACE	United States Army Corps of Engineers
WRDA	Water Resources Development Act

1. INTRODUCTION

The General Reevaluation Report (GRR) will evaluate Shallow Draft Lock Replacement alternatives within the Inner Harbor in New Orleans, Louisiana. The inner harbor corridor is a combined deep and shallow draft canal extending northward from the Mississippi River to Lake Pontchartrain. The existing Inner Harbor Navigation Canal (IHNC) passes barge traffic between the Mississippi River and the Gulf Intracoastal Waterway (GIWW) at New Orleans, and is a vital link in the GIWW system. The existing lock is antiquated and well beyond its design life. The closure of the Mississippi River Gulf Outlet (MRGO) heightens the need for a modern and more reliable lock. A lock outage would clog the entire GIWW system with the only viable alternate route taking 17 days.

The plan identified in the 1997 Evaluation Report included construction of a concrete lock; replacement of the St. Claude Avenue bridge with a new, low-level double bascule bridge; construction of a temporary bridge at St. Claude Avenue that would provide continuous use of that canal crossing during construction of the new bridge; replacement of the center lift-span and raising of the towers on the Claiborne Avenue bridge by using innovative construction methods that will reduce the closure at that bridge, for both marine and ground traffic, for very short durations (1-4 weeks); provision of by-pass channels around the new lock construction site and the existing lock during its demolition, both of which would provide continuous usage of the existing lock and canal during construction; extension of the Mississippi River flood protection along the canal to the site of the new lock; and implementation of a community impact mitigation plan to offset and/or compensate for impacts the project will have on the surrounding communities, even though USACE is not relocating any residences. The GRR will reevaluate this plan as well as other alternatives identified in the 1997 Evaluation Report. New alternatives and/or lock locations will also be considered under the GRR.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report and Supplemental Environmental Impact Statement (GRR/SEIS) (hereinafter: IHNC Lock Replacement GRR/SEIS IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (USACE), Engineer Circular (EC) *Civil Works Review* (EC 1165-2-214) (USACE, 2012) and the Office of Management and Budget (OMB), *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, economic, environmental, and plan formulation analyses contained in the IHNC Lock Replacement GRR/SEIS decision documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted, including the complete schedule followed in executing the IEPR. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE in the final Work Plan according to the schedule listed in Table 1. Appendix D presents the organizational conflict of interest form that Battelle

completed and submitted to the Institute for Water Resources (IWR) prior to the award of the IHNC Lock Replacement GRR/SEIS IEPR.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2012).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the IHNC Lock Replacement GRR/SEIS was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-214). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. Table 1 presents the major milestones and deliverables of the IHNC Lock Replacement GRR/SEIS IEPR. Due dates for milestones and deliverables are based on the award/effective date listed in Table 1. Note that the actions listed under Task 6, as well as the review of public comments, occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on August 17, 2017[1]. The actual date for contract end will depend on the date that all activities for this IEPR, including Civil Works Review Board (CWRB) preparation and participation, are conducted and subsequently completed.

Table 1. Major Milestones and Deliverables of the IHNC Lock Replacement GRR/SEIS IEPR

Task	Action	Due Date
1	Award/Effective Date	3/8/2017
	Review documents available	3/15/2017
2	Battelle submits list of selected panel members	3/20/2017
	USACE confirms the panel members have no COI	3/22/2017
3	Battelle convenes kick-off meeting with USACE	3/15/2017

[1] As of the submission of this Final IEPR Report, the modification for the review of the public comments had not yet been completed. Therefore, this deliverable date is approximate.

Table 2, continued. Major Milestones and Deliverables of the IHNC Lock Replacement GRR/SEIS IEPR

Task	Action	Due Date
	Battelle convenes kick-off meeting with USACE and panel members	3/30/2017
4	Panel members complete their individual reviews	4/20/2017
	Panel members provide draft Final Panel Comments to Battelle	5/3/2017
	Battelle sends public comments to panel members for review[a]	5/16/2017
	Panel develops additional Final Panel Comment(s) with regard to the public comments, if necessary[a]	6/7/2017
5	Battelle submits Final IEPR Report to USACE	5/16/2017
	Battelle submits Addendum to Final IEPR Report to USACE[a]	6/19/2017
6[a]	Battelle convenes Comment Response Teleconference with panel members and USACE[a]	8/2/2017
	Battelle submits pdf printout of DrChecks project file to USACE[a]	8/17/2017
	Agency Decision Milestone (ADM) meeting[b]	June 2017
	CWRB Meeting (estimated date)[b]	March 2018
	Contract End/Delivery Date	3/7/2018[c]

[a] *Task 6 and public comment activities occur after the submission of this report. As of the submission of this Final IEPR Report, the review of the public comments had not yet been completed. Therefore, these milestone and deliverable dates are approximate.*

[b] *The ADM and CWRB meetings were listed in the Performance Work Statement under Task 3 but were relocated in this schedule to reflect the chronological order of activities.*

[c] *A time extension will be required to accommodate participation in the CWRB as well as project closeout activities, which includes time to close out subcontracts with panel members following the CWRB.*

Battelle identified, screened, and selected five panel members to participate in the IEPR based on their expertise in the following disciplines: Civil Works planning/economics, environmental, hydrology and hydraulic engineering, geotechnical engineering, and structural engineering. The Panel reviewed the IHNC Lock Replacement GRR/SEIS documents and produced 13 Final Panel Comments in response to 16 charge questions provided by USACE for the review. This charge included two overview questions and one public comment question added by Battelle. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-214, Appendix D), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2012; p. D-4) in the IHNC Lock Replacement GRR/SEIS review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel's findings.

Based on the Panel's review, the GRR/SEIS summarizes a long and involved project history into an understandable, clear, and concise report. The Panel found the overall conceptual engineering approach to be sound, comprehensive, and well thought-out; the empirical use of the economic models to be well done; and the efforts to eliminate wetland impacts to be commendable. The report provides a balanced assessment of the economic, engineering, and environmental issues of the overall project; however, the Panel identified several elements of the report that should be clarified or revised.

Plan Formulation and Economics: From an economic perspective, the Panel believes that the GRR/SEIS should be updated to include more recent economic data to ensure the traffic projections are accurate and the benefits based on those projections are appropriate.

Engineering: The Panel is concerned that there is no justification given for the +5.0 foot top elevation of the cofferdam and no analysis or discussion of the risk of overtopping of the cofferdam during construction. Since cofferdam overtopping is likely to significantly impact the project schedule and cost, the report would benefit from updating Appendix B to include information on why the +5.0 foot elevation was chosen and to describe the overtopping risk. The Panel agrees that the GRR/SEIS does not discuss how the cofferdam system would be flooded in anticipation of an overtopping event to prevent damage from falling water, and encourages the Project Delivery Team to include an acknowledgment that the final cofferdam design will include sluiceways and/or flood gates. In addition, the Panel believes that several construction noise-related issues are not addressed in the GRR/SEIS (including which construction activities will be happening during nighttime hours), which could also affect project cost and schedule due to noise complaints, changes in construction sequencing, or the addition of noise abatement measures. The Panel recommends establishing a baseline noise condition, conducting construction noise analyses, evaluating noise adjustments and controls, and implementing a noise control plan to see if construction can adhere to the proposed schedule with the addition of noise-related measures.

The Panel also agrees that life safety concerns have not been developed in enough detail for such a complex project, which includes marine construction in an active shipping area and in close proximity to a large population area. The Panel also found that the need for and effectiveness of the jet grouting

program is not well-defined and the sliding stability and bearing capacity of the cofferdam cells should be reevaluated in future design stages due to the potential schedule and cost impacts. The Panel noted that future pile load testing to verify the load carrying capacity of the piles, the driving characteristics, and the noise impacts of the driving process are not addressed in the GRR/SEIS, nor is any potential settlement of the lock structures supported by the pile foundation. Finally, the Panel observed that the GRR/SEIS would benefit from a general description of subsurface conditions, which would enhance the stability computations of the cofferdam system, and that the factor of safety of the cofferdam's sliding stability may need to be recomputed using the procedures described in Engineer Manual (EM) 1110-2-2503.

Environmental: The main environmental concerns are all regarding compliance with the National Environmental Policy Act (NEPA). The Panel believes that the GRR/SEIS does not include sufficient evaluations of climate change or relative sea level rise (RSLR), as required by both NEPA and two USACE guidance documents (EM 1100-2-2503 [USACE 2014a] and Engineer Technical Letter [ETL] 1100-2-1 [USACE 2014b]). The Panel suggests updating the GRR/SEIS to include a discussion of climate change impacts (including the potential for increased sedimentation) and to develop and analyze a credible range of RSLR scenarios. In addition, the Panel agrees that the community impact mitigation plan (CIMP) is out of date and that the measures it proposes may not be acceptable or adequate for target communities, particularly vulnerable populations. Possible remedies include describing the timeline for updating and implementing the CIMP in the GRR/SEIS and addressing how vulnerable populations will be able to gain access to the benefits described in the CIMP. Finally, the Panel noted that the environmental justice analysis in the GRR/SEIS is too brief and out of date, and does not include an evaluation of whether vulnerable populations may be disproportionally affected by this project. A more detailed analysis of potential environmental justice issues would improve the GRR/SEIS and help eliminate risk to the project.

4.2 Final Panel Comments

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

Final Panel Comment 1

The GRR/SEIS does not provide any justification for the +5.0 foot top elevation of the cofferdam and does not discuss the relative risk of overtopping during construction.

Basis for Comment

As described in Appendix B (p. 7) and Annex 2 (p. 2), the engineering feasibility design development uses a +5.0 foot top elevation for the cofferdam structure. The Panel presumes this elevation was developed to minimize the risk of overtopping during the construction period. However, the GRR/SEIS offers no explanation for the hydrologic basis for the +5.0 foot top elevation of the cofferdam. Overtopping of the cofferdam can cause damage to the temporary structure and the permanent work under construction within the cofferdam, which would result in additional cost and time delays to the project. It is not possible to judge the overtopping risk to the project without understanding the basis of the established +5.0 foot top elevation for the cofferdam structure. Since standard design procedures for cofferdams generally include an evaluation of risk, this evaluation should be included in the report, including a discussion of the overtopping risk at the +5.0 foot elevation.

Significance – Medium/High

The risk analysis used to determine the elevation of the cofferdam should be included in the GRR/SEIS because overtopping of the cofferdam is likely to significantly impact the project schedule and cost.

Recommendation for Resolution

1. Include in Appendix B of the GRR/SEIS a discussion of the justification and an analysis of risk for selecting the +5.0 foot cofferdam top elevation and the relative risk of overtopping at that elevation.

Final Panel Comment 2

The GRR/SEIS does not include sufficient evaluations of climate change impacts or relative sea level rise.

Basis for Comment

The GRR/SEIS does not appear to follow guidance provided in two documents issued by USACE relating to climate change and relative sea level rise (RSLR): Climate Change Adaptation Plan (USACE 2014a) and Procedures to Evaluate Sea Level Change (USACE 2014b).

An evaluation of climate change was absent from the GRR/SEIS. In particular, there was no discussion on the risks and uncertainties associated with climate change and potential increased upstream flows and resulting increased sedimentation, which could result in a lower level of protection than is actually necessary. In addition, the treatment of RSLR was based on "professional judgement" (p. 4-5) as opposed to scientific data and calculations. For example, professional judgement was used as justification to add additional freeboard to compensate for potential sea level rise; however, no data are provided to support that justification. Without following the guidance documents referenced, the conclusions appear less credible than they would be if actual quantitative information were used.

Significance – Medium

Without addressing the potential effects of climate change in the documentation, the GRR/SEIS may not comply with USACE policy documents, and the residual risk and uncertainty associated with potential increased upstream flows and increased sedimentation may be understated.

Recommendation for Resolution

1. Refer to USACE (2014a) and include the applicable discussion in the GRR/SEIS.
2. Develop a credible range of possibilities for RSLR and include quantifiable supporting documentation to strengthen the conclusions and discussion following USACE (2014b).
3. Provide documentation on the impacts of climate change and potential increased sedimentation rates resulting from higher upstream flows.

Literature Cited:

USACE (2014a). Climate Change Adaptation Plan. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

USACE (2014b). Procedures to Evaluate Sea Level Change: Impacts, Responses, and Adaptations. Engineer Technical Letter (ETL) 1100-2-1. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. June 30.

Final Panel Comment 3

Basis for Comment

Significance – Medium

Recommendation for Resolution

1. Add a detailed description in the GRR/SEIS of how and when the CIMP will be updated and how it will be implemented in this complex environment of multiple communities with competing interests.
2. Describe how vulnerable populations affected by the project will gain access to the benefits offered in the community mitigation plan. Specifically, address how elderly, disabled, and special needs populations may receive assistance with eligibility determination, and with applying for and accessing the benefits described in the CIMP.

Final Panel Comment 4

The environmental justice analysis is too brief and is out of date.

Basis for Comment

The environmental justice analysis in the GRR/SEIS (p. 7-4) is extremely brief when compared to the overall scale of environmental effects on the local community. In addition, the brief discussion draws on the 2009 SEIS, which is out of date. The environmental justice analysis must describe vulnerable populations, including but not limited to minority and low income populations, and determine whether there are disproportionately greater environmental effects on these populations. The analysis must also consider cumulative effects (past, present, and future actions) in concert with the proposed project.

Public comments reviewed as part of Appendix A indicate that the affected public is concerned about environmental justice issues and expressed the view that the existing documentation does not adequately address vulnerable communities and individuals.

Significance – Medium

The brief and out-of-date description of the environmental justice analysis included in the GRR/SEIS may increase the risk level of the project.

Recommendation for Resolution

1. Evaluate in greater detail the potential environmental justice issues that may be associated with the project. Include a discussion of cumulative effects on vulnerable populations.
2. Discuss how the CIMP potentially mitigates environmental justice issues.
3. Describe additional public engagement activities that have been performed since the GRR/SEIS was completed and how the comments received during those activities have or will be addressed.

Final Panel Comment 5

Despite environmental commitments that USACE would establish effective noise controls during construction, several construction noise-related issues are not addressed.

Basis for Comment

The GRR/SEIS addresses construction noise and provides some estimates of construction noise effects from the project (p. 6-10). For example, Figure 6-1 (p. 6-13) gives estimates of Day-Night noise levels from the project during construction. Noise levels for vibratory and impact pile hammers are given as 101 dB at 50 feet distance (p. 6-12). In addition, Table 1-1 in the March 2009 SEIS (GRR/SEIS Appendix F) describes environmental commitments that USACE would use to establish effective noise controls during construction. However, numerous construction noise-related issues are not addressed, such as the following:

- Activities that will be allowed (a) during daytime hours and (b) during nighttime hours, and the noise levels associated with these activities
- Whether nighttime impact and vibratory pile driving will be allowed and, if not, why the Day-Night noise metric is being used to evaluate the project
- The methods that will be used to abate noise levels, whether they have been field-tested, and their effects on equipment noise levels
- Whether the piles will be concrete or steel, and what recent information USACE has concerning hammer energies, soil resistance, noise measurements from similar impact, and vibratory pile driving of concrete and steel piles
- Whether concurrent impact pile driving will be allowed and its noise effects (with two crews installing piles for about 1000 days)
- Whether both individual equipment noise and overall noise levels will be monitored
- The local noise ordinance requirements pertaining to construction noise and how USACE intends to comply with them
- Whether USACE will honor the environmental performance commitments from the March 2009 SEIS and whether USACE can determine what is required in the noise control plan to meet those commitments.

Significance – Medium

All of the construction noise-related issues identified by the Panel may raise the risk level for project cost and schedule, potentially due to such outcomes as noise complaints from the public, changes in construction sequencing, or the late addition of noise abatement measures.

Recommendation for Resolution

1. Obtain the most current information on noise from vibratory and impact pile driving of steel and concrete piles.
2. Establish a current baseline noise condition by performing 24-hour noise measurements at several locations that are affected by the project.
3. Perform a construction noise analyses with the current construction schedule and construction activities.

4. Adjust construction activities and provide mitigation and other controls and rerun the analysis with the adjustments and controls to see if the construction can progress as planned and meet the proposed construction schedule.
5. Document the noise control plan and environmental performance commitments.

Final Panel Comment 6

The GRR/SEIS does not describe how the cofferdam system would be flooded in anticipation of an overtopping event.

Basis for Comment

Cofferdams are generally not intended to withstand extremely large flood events. Provisions need to be made to flood the cofferdam prior to overtopping and thereby prevent damage from the falling water created by an overtopping event. Such overtopping can potentially undermine the cofferdam cells.

The GRR/SEIS does not address provisions for flooding the cofferdam during a storm event. Large cellular cofferdam structures constructed in areas where overtopping could occur during a storm event should be designed and constructed with sluiceways and/or flood gates to control flood waters (EM 1110-2-2503, Section G-4 Emergency Flooding; USACE 1989).

Significance – Medium

Overtopping of an unflooded cofferdam area can cause serious damage to uncompleted construction features and potentially undermine the cofferdam cells.

Recommendation for Resolution

1. Describe in Appendix B how the cofferdam system will be flooded in advance of an overtopping event, including an acknowledgment that the final design of the cofferdam structure will require sluiceways and/or flood gates.

Literature Cited:

USACE (1989). Engineering and Design: Design of Sheet Pile Cellular Structures, Cofferdam and Retaining Structures. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

Final Panel Comment 7

Life safety planning and analyses during all stages of construction have not been developed in enough detail.

Basis for Comment

The GRR/SEIS discusses the health and safety aspects of the project alternatives, safety risks to the construction workers, and safety risks to the public (p. 6-18). It notes that worker safety is of prime importance to the contractor, and that public safety will be assured through restricted access to the project site. The project, as conceptually designed, will involve multiple construction phasing and temporary structures.

More detailed analysis and planning is needed, however, to provide for construction personnel safety (e.g., hearing conservation programs, work during nighttime hours), shipping safety (e.g., maintaining consistent marine traffic in a narrow and busy shipping corridor close to the construction), and the general safety of the public (e.g., protection of vehicular traffic, safe pedestrian passage, secured exclusion zone). Life safety analysis and planning will need to be developed concurrently as the design effort progresses; however, more detail should be provided now on the methods that will be used during this feasibility phase to assess health and safety risks pertaining to these three areas.

Significance – Medium

Given the project complexity and construction challenges, life safety planning and implementation is important to protect workers, shipping personnel, and the public; without these considerations, the risk level of the project may increase.

Recommendation for Resolution

1. Add a discussion on life safety planning as the project design is developed, and provide more details as to how the safety risks to construction workers, shipping traffic, and the public will be analyzed and mitigated during the feasibility phase.

Final Panel Comment 8

Basis for Comment

Significance – Medium

Recommendation for Resolution

1. Employ analytical techniques such as FLAC in future design stages to provide a more definitive evaluation of the interaction of the cofferdam structure and the soft cohesive foundation material.
2. Conduct a detailed evaluation of previous similar projects that used jet grouting to verify the constructability and future performance of this soil improvement technique. This evaluation would be performed as part of future design efforts.
3. Expand the discussion in the GRR/SEIS to provide a more robust justification for the applicability of jet grouting for this application.

Literature Cited:

USACE (1989). Engineering and Design: Design of Sheet Pile Cellular Structures, Cofferdam and Retaining Structures. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

Final Panel Comment 9

Basis for Comment

Significance – Medium

Recommendation for Resolution

1. Recompute the sliding stability of the cellular cofferdam structure using the procedures given in USACE (1989) and revise the computations contained in Appendix B (Annex 2, Appendix F).
2. Consider using the USACE program Sliding Stability of Concrete Structures (CSLIDE) to expedite the computations using the force equilibrium approach described in USACE (1989).

Literature Cited:

USACE (1989). Engineering and Design: Design of Sheet Pile Cellular Structures, Cofferdam and Retaining Structures. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

Final Panel Comment 10

Some of the economic data being used for traffic volume projections are not up to date, which can affect the analyses of benefits based on these projections.

Basis for Comment

Some of the economic data presented in Appendix D are not up to date, extending only to 2012 or 2013. Since the Tentatively Selected Plan (TSP) has cost/benefit ratios and National Economic Development (NED) benefits that are very close to those of other alternatives, changes in traffic volume projections and commodity marketing flows as a result of including recent years could affect the basis for the TSP. Furthermore, if available, the data for 2013-2016 could be used in a sensitivity analysis, comparing the projected flows and benefits to the actual experience in that period.

There may also be a data problem in Table 2-7 of Appendix D (p. 9). The text says that the tonnage is increasing, whereas the table data show that the tonnage is flat.

In Section 3.2.2.3 of Appendix D (p. 27), extrapolations are used to project commodity traffic volumes into the future. It is possible these extrapolations could be affected by the addition of 3 to 4 years of recent data. It is not clear whether straight line, regression, or some other techniques were used; an updated data set might affect each technique differently.

Significance – Medium/Low

The addition of more recent data on commodity traffic volumes would strengthen the basis for the TSP and NED plan.

Recommendation for Resolution

1. Update information on traffic projections with more recent data from 2013 to 2016, if available.
2. Determine if the more recent data and projections affect the economic analyses of benefits and, if so, evaluate the implications on the cost/benefit ratio and the basis for the TSP and the NED plan and update the GRR/SEIS accordingly.
3. Clarify any tonnage discrepancies in Table 2-7.
4. Clarify the technique being applied to calculate projected commodity traffic volumes.

Final Panel Comment 11

The GRR/SEIS does not address the future pile load testing needed to verify the load capacity and evaluate noise impacts and related mitigation.

Basis for Comment

The GRR/SEIS, Section 4.1, states (p. 4-1):

> "Foundation pilings would be driven within the unwatered cofferdam to support the concrete pours of the lock module. Foundation pilings would consist of 24-inch x 24-inch precast, pre-stressed concrete pilings spaced on approximately 10-foot centers with tighter spacing under lock module walls. A total of 1,386 vertical pilings would be driven to a depth of 136 feet below grade. Either a vibratory or impact hammer, or a combination of both, would be used for pile driving."

The GRR/SEIS does not indicate that future design stages will employ pile load test(s) to verify the load carrying capability of the piles, the driving characteristics of the large size precast piles, or the noise impacts associated with the driving process. Guidance for pile design (USACE 1991) indicates that pile load tests are always technically desirable.

The proposed lock structure will be supported by 1,386 precast concrete piles. The length and size of these piles is currently based on estimates of the point bearing and shear friction along the length of the pile. It is very important to verify the estimated load-bearing characteristics of the piles prior to procurement of the 1,386 piles to ensure the proper pile length and size. In addition to verifying the load-bearing characteristics, the pile load test can be used to determine the driving characteristics and most efficient driving methods prior to award of a general contract for the lock construction. The results of the pile load test will provide valuable information to potential bidders. This test pile program can also be used to evaluate noise impacts associated with the selected driving techniques and to determine appropriate mitigation.

Significance – Medium/Low

The inclusion of pile load testing could affect the construction procurement and bid schedule for the main lock structure. Adding a general description of the need for pile load testing during future design stages will provide a more complete report.

Recommendation for Resolution

1. Describe the need and general type of pile load test required during future design stages and provide a schedule of these tests relative to cofferdam construction and concrete lock construction.
2. Use the pile load test to evaluate noise impacts related to driving and develop appropriate mitigation.

Literature Cited:

USACE (1991). Engineering and Design: Design of Pile Foundations. Engineer Manual (EM) 1110-2-2906. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. January 15.

Final Panel Comment 12

The potential settlement of the lock structures supported by the pile foundation has not been addressed.

Basis for Comment

The lock structure and gate monoliths will be supported by piles driven 136 feet into cohesive deposits. The thickness of the concrete slab beneath the interior of the lock structure is 10 feet, while the base slab for the gate monoliths is 13 feet thick. The weight of the concrete from these slabs, in addition to the weight of adjacent lock walls, will impose loads on the piling that could result in long-term overall settlement and potentially harmful differential settlement of the sector gates.

The issue of settlement is addressed only in Appendix B (p. 6), which indicates that settlement will be estimated at future design milestones. Since settlement of the existing lock structure has not been a major concern, it is likely that it will not be a major concern for the new structure; however, the issue should be examined in the GRR/SEIS.

Significance – Medium/Low

Although the GRR/SEIS indicates that settlement calculations will be performed in a future design stage, the nature of the foundation material and the large loads imposed by the concrete lock structure could result in some amount of settlement of the pile foundation.

Recommendation for Resolution

1. Perform settlement computations during the next design phase to evaluate both overall settlement and the potential for differential settlement, which could affect the operation of the sector gates.
2. Evaluate the performance of the existing lock structure to provide a comparison with the current project. If possible, this should include measurements of settlement over time and a comparison of the foundation conditions at the existing lock structure and the new lock.

Final Panel Comment 13

The GRR/SEIS does not include a general description of subsurface conditions or profiles, which would help enhance the stability computations provided in the Geotechnical Annex.

Basis for Comment

The geotechnical evaluation described in Appendix B, Annex 2 of the GRR/SEIS, focuses on the stability of the proposed cellular cofferdam. From the description of the available subsurface exploration and testing, it is apparent there is an extensive amount of geotechnical data that was developed for previous alternative lock configurations. Annex 2, Section 5.0, refers to previous design documents that provide available data on site geology, subsurface exploration, and laboratory testing.

One of the major uncertainties associated with developing geotechnical analyses involves the selection of an appropriate subsurface model based upon available boring logs. However, the GRR/SEIS does not provide a general summary of the subsurface conditions or include the subsurface profiles needed to assess the subsurface models used to evaluate the stability of the cofferdam system.

Significance – Low

The lack of a description of the site geology and the inclusion of subsurface profiles affects the completeness of the report.

Recommendation for Resolution

1. Expand the discussion in Appendix B, Annex 2, to include a summary description of the site geology and subsurface profiles that support the analyses provided in the Annex.

5. REFERENCES

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2014a). Climate Change Adaptation Plan. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

USACE (2014b). Procedures to Evaluate Sea Level Change: Impacts, Responses, and Adaptations. Engineer Technical Letter (ETL) 1100-2-1. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. June 30.

USACE (2012). Water Resources Policies and Authorities: Civil Works Review. Engineer Circular (EC) 1165-2-214. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. December 15.

USACE (1991). Engineering and Design: Design of Pile Foundations. Engineer Manual (EM) 1110-2-2906. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. January 15.

USACE (1989). Engineering and Design: Design of Sheet Pile Cellular Structures, Cofferdam and Retaining Structures. Engineer Manual (EM) 1100-2-2503. Department of the Army. U.S. Army Corps of Engineers, Washington, DC. September 29.

APPENDIX A

IEPR Process for the IHNC Lock Replacement GRR/SEIS Project

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A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the schedule followed in executing the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS) Independent External Peer Review (hereinafter: IHNC Lock Replacement GRR/SEIS IEPR). Due dates for milestones and deliverables are based on the award/effective date listed in Table A-1. The review documents were provided by U.S. Army Corps of Engineers (USACE) on March 15, 2017. Note that the actions listed under Task 6 and activities associated with the public comment review occur after the submission of this report and are described in more detail at the end of this Appendix.

Table A-1. IHNC Lock Replacement GRR/SEIS Complete IEPR Schedule

Task	Action	Due Date
1	Award/Effective Date	3/8/2017
	Review documents available	3/15/2017
	Battelle submits draft Work Plan[a]	3/17/2017
	USACE provides comments on draft Work Plan	3/22/2017
	Battelle submits final Work Plan[a]	3/29/2017
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	3/10/2017
	USACE provides comments on COI questionnaire	3/13/2017
	Battelle submits list of selected panel members[a]	3/20/2017
	USACE confirms the panel members have no COI	3/22/2017
	Battelle completes subcontracts for panel members	3/29/2017
3	Battelle convenes kick-off meeting with USACE	3/15/2017
	Battelle sends review documents to panel members	3/30/2017
	Battelle convenes kick-off meeting with panel members	3/30/2017
	Battelle convenes kick-off meeting with USACE and panel members	3/30/2017
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	Not held
4	Panel members complete their individual reviews	4/20/2017
	Battelle provides talking points for Panel Review Teleconference to panel members	4/24/2017
	Battelle convenes Panel Review Teleconference	4/25/2017
	Battelle provides Final Panel Comment templates and instructions to panel members	4/25/2017
	Panel members provide draft Final Panel Comments to Battelle	5/3/2017
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	5/4 – 5/8/2017
	Panel finalizes Final Panel Comments	5/9/2017

Table A-1. IHNC Lock Replacement GRR/SEIS Complete IEPR Schedule (continued)

Task	Action	Due Date
	Battelle receives public comments from USACE	5/9/2017
	Battelle sends public comments to Panel[b]	5/16/2017
	Panel members complete their review of the public comments[b]	5/31/2017
	Battelle and Panel review Panel's responses to public comments[b]	6/2/2017
	Panel drafts Final Panel Comment on public comments, if necessary	6/7/2017
	Panel finalizes Final Panel Comment regarding public comments, if necessary[b]	6/9/2017
5	Battelle provides Final IEPR Report to panel members for review	5/10/2017
	Panel members provide comments on Final IEPR Report	5/12/2017
	Battelle submits Final IEPR Report to USACE[a]	5/16/2017
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	5/23/2017
	Battelle provides Addendum to Final IEPR Report to panel members for review[b]	6/13/2017
	Panel members provide comments on Addendum to Final IEPR Report[b]	6/15/2017
	Battelle submits Addendum to Final IEPR Report to USACE[a,b]	6/19/2017
	USACE Planning Center of Expertise (PCX) provides decision on Addendum to Final IEPR Report acceptance[b]	6/26/2017
6[b]	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	6/28/2017
	Battelle convenes teleconference with USACE to review the Comment Response process	6/28/2017
	Battelle convenes teleconference with Panel to review the Comment Response process	6/28/2017
	USACE provides draft Project Delivery Team (PDT) Evaluator Responses to Battelle	7/24/2017
	Battelle provides draft PDT Evaluator Responses to panel members	7/26/2017
	Panel members provide draft BackCheck Responses to Battelle	7/31/2017
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	8/1/2017
	Battelle convenes Comment Response Teleconference with panel members and USACE	8/2/2017
	USACE inputs final PDT Evaluator Responses to DrChecks	8/9/2017
	Battelle provides final PDT Evaluator Responses to panel members	8/11/2017
	Panel members provide final BackCheck Responses to Battelle	8/16/2017
	Battelle inputs the Panel's final BackCheck Responses in DrChecks	8/16/2017
	Battelle submits pdf printout of DrChecks project file[a]	8/17/2017

Table A-1. IHNC Lock Replacement GRR/SEIS Complete IEPR Schedule (continued)

Task	Action	Due Date
	Agency Decision Milestone (ADM) meeting (estimated date)[c]	June 2017
	CWRB meeting (estimated date)[c]	March 2018
	Contract End/Delivery Date	March 7, 2018[d]

[a] *Deliverable.*

[b] *Task 6 and public comment activities occur after the submission of this report. As of the submission of this Final IEPR Report, the review of the public comments had not yet been completed. Therefore, these milestone and deliverable dates are approximate.*

[c] *The ADM and CWRB meetings were listed in the Performance Work Statement under Task 3 but were relocated in this schedule to reflect the chronological order of activities.*

[d] *A time extension will be required to accommodate participation in the CWRB as well as project closeout activities, which includes time to close out subcontracts with panel members following the CWRB.*

At the beginning of the Period of Performance for the IHNC Lock Replacement GRR/SEIS IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., terminology to use, access to DrChecks, etc.). Any revisions to the schedule were submitted as part of the final Work Plan. The final charge consisted of 16 charge questions provided by USACE, two overview questions and one public comment question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and after their subcontracts were finalized, all the members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received an electronic version of the final charge, as well as the review documents and reference/supplemental materials listed in Table A-2 below.

Table A-2. Documents to Be Reviewed and Provided as Reference/Supplemental Information

Review Documents	No. of Review Pages
Appendix E**	214
Appendix F**	929
Exhibit 1: Order and Reasons**	27
Exhibit 2: IHNC-PONO Recommendations**	3
Risk Register**	1
Total Number of Supporting Documents	**1,174**

**USACE will submit public comments to Battelle upon their availability according to the schedule in Table A-1, who will in turn submit the comments to the IEPR Panel for review. A separate Addendum to the Final Report will be submitted with the Panel's findings on the public comments.*
***Supporting documentation only. These documents are not for Panel review and should be used as information sources only. They are not included in the total review document page count.*

In addition to the materials provided in Table A-2, the panel members were provided the following USACE guidance documents.

- USACE guidance, *Civil Works Review* (EC 1165-2-214), December 15, 2012
- Office of Management and Budget, *Final Information Quality Bulletin for Peer Review,* December 16, 2004.

About halfway through the review, the Panel provided Battelle one question regarding the project. USACE answered the question via email. Based on a review of the information provided in the email, the Panel confirmed with Battelle that a mid-review teleconference was not necessary with USACE.

In addition, throughout the review period, USACE provided documents at the request of panel members. These documents were provided to Battelle and then sent to the Panel as additional information only and were not part of the official review. A list of these additional documents requested by the Panel is provided below.

- IHNC Lock Replacement GRR/SEIS Project, Design Documentation Report No. 3: Lock Foundation Report. May 2002.
- USACE Noise and Vibration Monitoring in the Adjacent Neighborhood of the Inner Harbor Navigation Canal Lock Replacement. Pile Load Test and Pile Installation Study. July 26, 2000.
    - Appendix A: Pile Driving Records
    - Appendix B: December 1999 Vibration and Acoustical Monitoring Reports
    - Appendix B: January 2000 Vibration and Acoustical Monitoring Reports
    - Appendix C: Seismite Data.

A.2 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response form provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments into a preliminary list of overall comments and discussion points. Each panel member's individual comments were shared with the full Panel.

A.3 IEPR Panel Teleconference

Battelle facilitated a teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member should serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle distributed a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the IHNC Lock Replacement GRR/SEIS IEPR:

- Lead Responsibility: For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed a summary email detailing each draft final comment statement, an example Final Panel Comment following the

four-part structure described below, and templates for the preparation of each Final Panel Comment.

- Directive to the Lead: Each lead was encouraged to communicate directly with the other panel member as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.

- Format for Final Panel Comments: Each Final Panel Comment was presented as part of a four-part structure:

  1. Comment Statement (succinct summary statement of concern)
  2. Basis for Comment (details regarding the concern)
  3. Significance (high, medium/high, medium, medium/low, and low; see description below)
  4. Recommendation(s) for Resolution (see description below).

- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:

  1. **High:** Describes a fundamental issue with the project that affects the current recommendation or justification of the project, and which will affect its future success, if the project moves forward without the issue being addressed. Comments rated as high indicate that the Panel determined that the current methods, models, and/or analyses contain a "showstopper" issue.

  2. **Medium/High:** Describes a potential fundamental issue with the project, which has not been evaluated at a level appropriate to this stage in the SMART Planning process. Comments rated as medium/high indicate that the Panel analyzed or assessed the methods, models, and/or analyses available at this stage in the SMART Planning process and has determined that if the issue is not addressed, it could lead to a "showstopper" issue.

  3. **Medium:** Describes an issue with the project, which does not align with the currently assessed level of risk assigned at this stage in the SMART Planning process. Comments rated as medium indicate that, based on the information provided, the Panel identified an issue that would raise the risk level if the issue is not appropriately addressed.

  4. **Medium/Low:** Affects the completeness of the report at this time in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium/low indicate that the Panel does not currently have sufficient information to analyze or assess the methods, models, or analyses.

  5. **Low:** Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Comments rated as low indicate that the Panel identified information that was mislabeled or incorrect or that certain data or report section(s) were not clearly described or presented.

- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel 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).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, 13 Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The full text of the Final Panel Comments is presented in Section 4.2 of the main report.

A.5 Final IEPR Report

After concluding the review and preparation of the Final Panel Comments, Battelle prepared a Final IEPR Report (this document) on the overall IEPR process and the IEPR panel members' findings. Each panel member and Battelle technical and editorial reviewers reviewed the IEPR report prior to submission to USACE for acceptance.

A.6 Conduct of the Public Comment Review

Battelle will complete the public comment review following the schedule in Table A-1. The public comment review for the IEPR panel members will take place after the Final IEPR Report (this document) has been submitted to USACE and will be documented in a separate Addendum to this Final IEPR Report.

A.7 Comment Response Process

As part of Task 6, Battelle will enter the 13 Final Panel Comments developed by the Panel into USACE's Design Review and Checking System (DrChecks), a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

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APPENDIX B

Identification and Selection of IEPR Panel Members for the IHNC Lock Replacement GRR/SEIS Project

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B.1 Panel Identification

The candidates for the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS) (hereinafter: IHNC Lock Replacement GRR/SEIS IEPR) Panel were evaluated based on their technical expertise in the following key areas: Civil Works planning/economics, environmental, hydrology and hydraulic engineering, geotechnical engineering, and structural engineering. These areas correspond to the technical content of the review documents and overall scope of the IHNC Lock Replacement GRR/SEIS project.

For each Louisiana Water Resources Council (LWRC), as defined in the Water Resources Development Act [WRDA] 2007, Section 7009) IEPR, Battelle chose panel members from its list of LWRC Primary Panel members or, in the event that a Primary Panel member did not have the expertise or could not meet schedule requirements, from the LWRC Backup Pool. Battelle endeavored to select only LWRC Primary Panel or Backup Pool members for the IHNC Lock Replacement GRR/SEIS IEPR.

Of the five expertise descriptions in the IHNC Lock Replacement GRR/SEIS IEPR PWS, four of them (Civil Works planning/economics, environmental, and hydrology and hydraulic engineering) are technical areas of expertise previously identified for the LWRC Primary Panel. Battelle consulted with the appropriate LWRC Primary Panel members for these expertise areas to evaluate their expertise and schedule commitments against the requirements of the PWS. The LWRC Primary Panel Civil Works planning member served as the Civil Works planning/economics panel member for this IEPR and the LWRC Primary Panel environmental member served as the environmental panel member for this IEPR. The LWRC Primary Panel hydrology and hydraulic engineering panel member did not meet the requirements for the hydrology and hydraulics engineering position on the Panel. Battelle identified a member of the LWRC Backup Pool with the required expertise in hydrology and hydraulic engineering. The final expertise areas described in the IHNC Lock Replacement GRR/SEIS IEPR PWS (structural engineering and geotechnical engineering) are not expertise areas on the LWRC Primary Panel. Battelle identified one member of the LWRC Primary Panel who, as a civil/construction engineering expert, fulfilled the structural engineering requirements. Finally, a member of the LWRC Backup Pool had the required expertise in geotechnical engineering.

Candidates were screened for the following potential exclusion criteria or conflicts of interest (COIs). These COI questions were intended to serve as a means of disclosure in order to better characterize a candidate's employment history and background. Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. Guidance in OMB (2004, p. 18) states,

> "…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."

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the IHNC Lock Replacement GRR/SEIS
1. Previous and/or current involvement by you or your firm on the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report (GRR) and related projects.
2. Previous and/or current involvement by you or your firm in navigation (lock replacement) projects in coastal Louisiana or Mississippi.
3. Previous and/or current involvement by you or your firm in the conceptual or actual design, construction, or operation and maintenance (O&M) of the IHNC Lock Replacement GRR Orleans Parish, Louisiana or related projects.
4. Current employment by the U.S. Army Corps of Engineers (USACE).
5. Previous and/or current involvement with paid or unpaid expert testimony related to IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR.
6. Previous and/or current employment or affiliation with members of the cooperating agencies or local sponsors OR the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups *(for pay or pro bono):* N/A for this IEPR as "there is no non-Federal sponsor requirement" for this project.
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to projects in coastal Louisiana or Mississippi.
8. Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Mississippi Valley Division – New Orleans District.
9. Previous or current involvement with the development or testing of models that will be used for, or in support of the IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR project. These models include the Gulf Navigation Investment Model (GULFNIM), the Wetland Value Assessment (WVA), the Waterways Analysis Model (WAM), and the HEC-RAS 4.0 (River Analysis System).
10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the Mississippi Valley Division – New Orleans District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the Mississippi Valley Division – New Orleans District. Please explain.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the IHNC Lock Replacement GRR/SEIS
11. Any previous employment by USACE as a direct employee, notably if employment was with the Mississippi Valley Division – New Orleans District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
12. Any previous employment by USACE as a contractor (either as an individual or through your firm) within the last 10 years, notably if those projects/contracts are with the Mississippi Valley Division – New Orleans District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
13. Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning navigation in coastal Louisiana or Mississippi, and include the client/agency and duration of review (approximate dates).
14. Pending, current, or future financial interests in IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR related contracts/awards from USACE.
15. Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
16. Any publicly documented statement (including, for example, advocating for or discouraging against) related to IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR.
17. Participation in relevant prior and/or current Federal studies relevant to this project and/or IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR, including the 1997 IHNC Lock Evaluation and the 2009 Supplemental Environmental Impact Statement (SEIS) IHNC Lock Replacement GRR Project Orleans Parish, Louisiana.
18. Previous and/or current participation in prior non-Federal studies relevant to this project and/or IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR.
19. Has your research or analysis been evaluated as part of the IHNC Lock Replacement GRR Orleans Parish, Louisiana, GRR?
20. Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. For each Louisiana Water Resources Council (LWRC, as defined in the Water Resources Development Act [WRDA] 2007, Section 7009) IEPR, Battelle selected panel members from its list of LWRC Primary Panel members or, in the event that a Primary Panel member did not have the expertise or could not meet schedule requirements, from the LWRC Backup Pool. Battelle endeavored to select only LWRC Primary Panel or Backup Pool members for the IHNC GRR IEPR.

Table B-1 provides information on each panel member's LWRC membership, affiliation, location, education, and overall years of experience. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

Table B-1. IHNC Lock Replacement GRR/SEIS IEPR Panel: Summary of Panel Members

Name	LWRC Membership	Affiliation	Location	Education	P.E.	Exp. (yrs)
Civil Works Planning/Economics						
Kenneth Casavant	Primary Panel	Independent consultant	Pullman, WA	Ph.D., Agricultural Economics	No	47
Environmental						
Kay Crouch	Primary Panel	Crouch Environmental Services, Inc.	Houston, TX	M.S., Biology and Aquatic Ecology	No	38
Hydrology and Hydraulic Engineering						
Kenneth Avery	Backup Pool	Bergmann Associates, Inc.	Rochester, NY	M.S., Water Resources Engineering	Yes	40
Geotechnical Engineering						
Douglas Spaulding	Backup Pool	Spaulding Consultants, Inc.	Golden Valley, MN	M.S., Civil Engineering	Yes	40+
Structural Engineering						
Ralph Ellis	Primary Panel	Independent consultant	Gainesville, FL	Ph.D., Civil Engineering	Yes	40+

Table B-2 presents an overview of the credentials of the final five members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information regarding each panel member and his or her area of technical expertise is given in Section B.3.

Table B-2. IHNC Lock Replacement GRR/SEIS IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Casavant	Crouch	Avery	Spaulding	Ellis
Civil Works Planning/Economics					
Minimum of 15 years demonstrated experience as a senior water resources planner on navigation (lock replacement) projects in a coastal inland waterway system					
Familiar with USACE plan formulation processes, procedures, and standards	X				
Familiar with evaluation of alternative plans for navigation/lock replacement projects	X				
	X				
Minimum of 15 years of demonstrated experience or combined equivalent of education and experience in economics	X				
M.S. degree or higher in economics	X				
	X				
	X				
Environmental					
Minimum M.S. degree or higher in an appropriate field of study		X			
		X			
		X			
Active participation in related professional societies		X			

Technical Criterion	Casavant	Crouch	Avery	Spaulding	Ellis
Hydrology and Hydraulic (H&H) Engineering					
Registered professional engineer with an M.S. degree in civil engineering or H&H engineering			X		
			X		
			X		
Familiar with USACE applications of risk and uncertainty analysis in navigation transportation projects			X		
Active participation in related professional societies			X		
Geotechnical Engineering					
Minimum of 20 years of demonstrated engineering experience or combined equivalent of education and experience in soils engineering or related field					
Registered professional engineer with an M.S. or higher degree				X	
Several years of direct experience with regard to locks and dams as either a designer or construction project engineer				X	
Skillful with the USACE risk-informed approach to navigation transportation and flood risk reduction projects				X	
Capable of addressing the USACE Safety Assurance Review (SAR) for this project				X	
Active participation in related professional societies				X	
Structural Engineering					
Minimum of 10 years of demonstrated civil engineering experience or combined equivalent of education and experience in assessing navigation (lock replacement)					X
Registered professional engineer with an M.S. or higher degree					X
					X
Capable of addressing the USACE SAR for this project					X
Active participation in related professional societies					X

B.3 Panel Member Qualifications

Detailed biographical information on each panel members' credentials and qualifications and areas of technical expertise are summarized in the following paragraphs.

Name	*Role*	*Affiliation*
Dr. Ken Casavant	Civil Works Planning/Economics	Independent consultant

Dr. Casavant is a professor and economist at the School of Economic Sciences at Washington State University, Director of the Freight Policy Transportation Institute (FPTI), and adjunct professor at North Dakota State's Upper Great Plains Transportation Institute. He earned his Ph.D. in agricultural economics from Washington State University in 1971. Dr. Casavant has nearly 50 years of experience as an economist, with expertise in transportation economics and planning, particularly the evaluation and comparison of alternative plans for numerous navigation studies. He has served as an economic consultant detailing the tradeoffs necessary on several public works projects, most recently on studies of the deep draft national and international maritime industry. In this capacity, he has become a recognized expert in applied economics related to transportation economics, with specific experience with financing transportation infrastructure and national and international logistics and transportation requirements. For example, he has aided in the design of a physical distribution system for limestone in Portugal, the wheat transportation system in Mali and Bolivia, among other domestic and international assignments.

Dr. Casavant is familiar with USACE plan formulation processes, procedures, and standards. He has more than 15 years of experience in plan formulation, evaluation and comparison of alternative plans for numerous navigation studies (lock replacement), ecosystem restoration projects, and feasibility studies, including his technical reviews of the Lower Columbia River Channel Deepening Project, the Upper Mississippi and Illinois Navigation Study, the Barataria Basin Barrier Shoreline (BBBS) Restoration Study, and the Mississippi River Gulf Outlet Ecosystem Restoration Plan. The Mississippi-Illinois system project was a navigation lock system replacement project, including coastal inland waterway system needs.

Dr. Casavant has worked with USACE methodologies for cost effectiveness/incremental cost analysis (CE/ICA) and has a detailed knowledge of USACE standards and procedures including the IWR Planning Suite. As an economist or a combined Civil Works planner/economist for USACE IEPRs, he has studied and evaluated alternative plans for navigation lock replacement projects as well as navigation/dredging projects, such as the Savannah Harbor Expansion Project GRR. Over the last 10 years, he has worked on 13 USACE projects where he has had to apply USACE standards and procedures, including the IWR Planning Suite methodologies, with a focus on effective and efficient ecological and natural sustained output per dollar of relevant expenditure for alternative project formulations. He has applied the USACE six-step planning process, which is governed by ER 1105-2-100, Planning Guidance Notebook, during his work as a technical reviewer and peer reviewer on more than 20 projects, such as the Port of Iberia Channel Deepening Project in 2006 for USACE, the External Independent Economic Opinion on Identifying and Measuring NED Benefits: Navigation Shipping USACE, 2007, and the Morganza to the Gulf IEPR study, a hurricane protection and storm damage risk project.

Dr. Casavant has experience identifying, reviewing, and evaluating impacts on environmental resources from structural flood risk and impacts related to hurricane and coastal storm damage risk reduction projects. From risk assessment in Monte Carlo evaluations to traditional risk models in the IWR Planning Suite, he has broad and applied experience working with risk-informed approaches to decision making. The six most recent projects he has contributed to had critical components concerning the impacts of environmental resources from flood risk and coastal storm damage. He has also been a plan formulator expert on LWRC IEPRs; several of the projects under review had a specific objective to evaluate the damage reduction and the risk associated with achieving benefits from flood risk management and one project focused specifically on the impact on shorelines.

Dr. Casavant has published more than 70 journal articles and has contributed to hundreds of written documents including chapters in books, books, abstracts, proceedings, professional materials, conference papers, and research bulletins, circulars, and reports. He is a member of numerous professional associations, such as the Transportation Research Board - National Research Council, the International Agricultural Economics Association, and the Logistics and Physical Distribution Association.

Name	***Role***	***Affiliation***
Kay Crouch	Environmental	Crouch Environmental Services, Inc.

Ms. Crouch is board chair of Crouch Environmental Services, Inc., a company specializing in National Environmental Policy Act (NEPA) analysis, environmental site assessment, permitting, and mitigation for projects with high public and interagency interests. She earned her M.S. in biology/ecology in 1978 from Steven F. Austin State University, and has received additional academic training in the NEPA process from the Duke University Nicholas School of Environmental and Earth Sciences (2004-05). Ms. Crouch has more than 35 years of nationwide experience in conducting environmental site assessments and NEPA impact assessments for complex multi-objective public works projects with competing trade-offs. She has performed numerous environmental evaluations throughout the coastal ecosystems of Louisiana and Texas in support of Federal Energy Regulatory Commission (FERC) filings and NEPA documentation. For the first 10 years of her consulting career, Ms. Crouch worked predominately in Louisiana performing NEPA analyses for oil and gas pipelines crossing the Louisiana Coastal Zone and has prepared over 100 NEPA documents since 1978.

Ms. Crouch has experience working with NEPA impact assessment in marsh and urban areas and related ecosystem species and habitats. She has done extensive work in the coastal marsh habitats that span the Gulf Coast. She has experience in high and low tidal marsh restoration and evaluation, as well as inland wetlands. Additionally, she has worked on projects in Louisiana involving evaluation of chenieres and inland swamps. In the mid-1990s, Crouch Environmental Services Inc. designed and constructed the Baytown Nature Center, Texas, a large coastal marsh creation project for which the company received the 1998 Award of Excellence from the National Association of Landscape Architects.

Ms. Crouch is familiar with USACE calculations of environmental benefits and routinely performs cumulative effects analyses on high visibility public works projects as part of her extensive NEPA practice. This type of modeling has been required on every flood damage reduction and ecosystem

restoration project she has worked on relating to USACE, including the Clear Creek Flood Damage Reduction Project and the Addicks and Barker Dams and Reservoirs system in Harris County, Texas. Other NEPA projects have consisted of flood damage reduction projects, dams, ports, parks, offshore activities, linear transportation corridors, and power plants and other types of projects involving Federal funding.

Ms. Crouch has 38 years of experience with endangered species. She has completed several projects that involve compliance with the Endangered Species Act, specifically with the listed species found in Southern Louisiana, including state-listed species, through her work in the Louisiana coastal zone. The evaluation of the presence or absence of listed species is required for almost every project she is involved in. These include USACE 404 permit applications requiring field investigations for listed species in numerous states; she also has completed the Section 7 consultation process for several species.

She also has demonstrated experience with cultural resource surveys. Almost every project Ms. Crouch works on requires an investigation and evaluation of cultural resource issues. She is intimately familiar with the record search step as well as field survey techniques for cultural resources. Her experience is supervisory, and relates to USACE 404 permits and NEPA documentation. She also has experience with Section 106 for the analysis of historical issues. She has demonstrated knowledge of conducting biological assessments, including wetlands delineation, compilation of Biological Assessments for Section 404 permitting, and NEPA documentation. She has dealt with numerous types of habitats in numerous locations nationwide.

Ms. Crouch is familiar with USACE calculation and application of environmental impacts and benefits. She routinely performs cumulative effects analyses on high-visibility public works projects as part of her extensive NEPA practice. She is well versed in various modeling types and in the performance of incremental cost analysis for mitigation evaluation for dam repair and restoration. She has experience reviewing the application of Wetland Value Assessment (WVA) methodology and has calculated the environmental losses and benefits of USACE projects using the hydrogeomorphic approach (HGM), habitat evaluation procedures (HEP), and WVA, as well as other models. Most recently, she performed WVA analysis for the Addicks and Barker Dams environmental assessment in Harris County, Texas, for the Galveston District. Additionally, she has experience serving as an environmental expert in previous IEPRs of USACE LWRC projects. Ms. Crouch is a member of the Society of Wetland Scientists.

Name	***Role***	***Affiliation***
Kenneth Avery, P.E, CFM, D. WRE	Hydrology and Hydraulic Engineering	Bergmann Associates, Inc.

Mr. Avery is a senior hydrologic and hydraulic engineer with Bergmann Associates, Inc. in Rochester, NY. He earned his M.S. in water resources engineering from Clarkson University in 1977 and is a registered professional engineer in Michigan, New York, Florida, and Montana. Mr. Avery has 40 years of experience in water resources, environmental, and civil engineering, including projects focused on navigation structures in coastal inland waterway systems. His H&H engineering experience spans state transportation agencies to the Federal government. Mr. Avery served on IEPRs for the Navigation and Ecosystem Sustainability Program (NESP) Project P2 Lock & Dam 22 Fish Passage

Improvement Project; Protection of the Harvey-Algiers Canal; and Louisiana Coastal Area Convey Atchafalaya River Water to Northern Terrebonne Marshes and Multipurpose Operation of Houma Navigation Lock, Integrated Feasibility Study and Environmental Impact Statement.

Mr. Avery has direct H&H design or construction management experience centered on lock and dam design and construction along a coastal inland waterway system. For example, he served as a senior hydraulic engineer on the New Inglis Lock project for the Florida Department of Environmental Protection, the Charleroi Locks and Dam project for the USACE Pittsburgh District, and the Lagrange Lock Alignment project for the USACE Rock Island District. For the New Inglis Lock project, he developed the lower pool frequency vs. elevation relationship using published reports and record data for use by contractors to assess construction risk. For the Charleroi Locks and Dam project, he determined hydraulic forces acting on the side and end walls of the river chamber and land chamber outlet structure. For the Lagrange Lock Alignment project, he provided recommendations concerning the hydraulic engineering methodologies, physical modeling, and numerical modeling that should be performed to establish 1D and 2D velocities, depths, sediment transport, and lock culvert filling and emptying systems.

He is familiar with standard USACE H&H computer models and has experience working with numerical modeling applications for flood risk reduction projects. For the Fargo-Moorhead Flood Damage Reduction Project for the USACE St. Paul District, he worked with a team of hydraulic modelers responsible for developing two-dimensional numerical and physical hydraulic models of alternative configurations for channel realignments and aqueduct designs to carry the Maple River over the Red River diversion channel. For the Devils Lake City Embankments project for the USACE St. Paul District, he led the HEC-RAS hydraulic modeling of the interior drainage areas that included: conveyance channels; ponding areas; and pumping stations and piping systems to achieve a 1% annual chance flood elevation on the protected side of the embankment that is at or below FEMAs Special Flood Hazard Area.

Mr. Avery is familiar with USACE applications of risk and uncertainty analysis in navigation transportation projects. As part of several lock and dam rehabilitation projects, he developed a method for determining the seasonally adjusted hydrologic risk of flooding during cofferdam construction for the Utica Harbor Dam, Lock & Dam E-26. As consultant manager for the New York State Canal Corporation's (NYSCC) Dam Safety Program that includes 80 dams, Mr. Avery led a Dam Risk Prioritization study for 13 high- and intermediate-hazard dams in the portfolio using FEMA's *Risk Prioritization Tool for Dams*. The risk prioritization process involves identifying potential failure modes, then compiling the overall risk onto Risk Plots of annual probability vs. life loss potential and comparing the results to ANCOLD tolerability limits. For construction of improvements to dams in NYSCC's portfolio, Mr. Avery participates on Potential Failure Mode Analysis (PFMA) teams that evaluate risk of failure during construction of improvements.

In the field of water resources, his experience encompasses planning, engineering, and design. His principal disciplines of concentration are surface water hydrology, open and closed channel hydraulics, revetment, bridge and channel scour, and sediment transport. Mr. Avery has used steady and unsteady flow hydraulic models such as the HEC and NWS software, ADH, LOCKFILL, and DYNLET. His design experience covers hydraulic structures, dams, sewers, highway and bridge hydraulics, penstocks, natural channels, and riprap revetment. Mr. Avery's relevant experience includes being the project manager and lead hydrologist for the Chase-Hibbard Dam Fish Ladder and Portage Study in Elmira, NY. The fish ladder project involved hydrologic analysis of discharges to determine operational hydraulic requirements for the fish ladder during the migration season, high flow conditions, and low

flow conditions; determination of target fish species; review of a previous denil fish ladder design; cost estimating; and conceptual design.

As a channel design expert, Mr. Avery served as project manager for the engineering and design of a 2000-foot-long section of Minisceongo Creek. The creek had experienced severe channel erosion, including failure of gabion sections, slope failures, and collapse of drainage outfall pipes. Mr. Avery developed a repair strategy, prepared plans, specifications, permits and cost estimates to repair the primary damage area. He has conducted physical hydraulic modeling (including for Control Structure 46 for the Monroe County Department of Engineering in Rochester, New York) and has done extensive work with dams, locks, spillways, and outlet works.

Mr. Avery is a member of the American Society of Civil Engineers, the Society of American Military Engineers, the American Water Resource Association, the New York State Floodplain and Stormwater Managers Association. He is a diplomate of the American Association of Water Resources Engineers and is a Certified Floodplain Manager (CFM).

Name	*Role*	*Affiliation*
Douglas Spaulding, P.E.	Geotechnical Engineering	Spaulding Consultants, Inc.

Mr. Spaulding is a Principal and geotechnical engineer with Spaulding Consultants, LLC, responsible for dam, levee, and floodwall design and inspection. He earned his M.S. in geotechnical engineering from Purdue University, and is a registered professional engineer in Wisconsin, Minnesota, and Michigan. He has almost 50 years of experience in the design, evaluation, and inspection of water-retaining structures. During his long career, he has provided geotechnical design and evaluation services for flood control levees, embankments, and hydroelectric projects in a 23-state area, including Louisiana. His experience includes 10 years with USACE, where he served as Chief of the Levee and Channel Design Section for the St. Paul District. In that capacity, he managed the development of the Pembina levee project in North Dakota and provided geotechnical design services for over $200 million worth of local flood protection projects in Minnesota and North Dakota. The Pembina project and the Mankato and Winona flood control projects in Minnesota all included extensive sections of floodwall (both I-wall and T-wall configurations). In addition, for the Winona project, Mr. Spaulding supervised the evaluation of underseepage. He is also the former Program Manager for the National Dam Safety Program in Wisconsin and Minnesota. He has experience with lock structures in Minnesota and Michigan and served on the design team for the rehabilitation of Lock and Dams No.1 and No.2 on the Mississippi River and managed the design of several hydroelectric projects at navigation dams on the Mississippi and Red Rivers.

Mr. Spaulding's geotechnical background includes evaluating the stability of levee sections founded on soft clay foundations. His experience also encompasses geotechnical design of cellular sheet pile structures, sheet pile tieback walls, conventional gravity walls, and pump stations founded on sand and soft clay deposits. He has provided design services for embankments using preload fills to strengthen underlying foundation deposits. He recently served as a consultant to evaluate the instability caused by a sanitary landfill founded on over 100 feet of soft lacustrine clay. All of the local flood control projects for which Mr. Spaulding has provided design services have involved at least several gatewells to accommodate gravity drainage.

As part of his experience, he applied USACE risk-informed approaches to the evaluation of safety issues at USACE navigation, flood control, and hydroelectric projects. Mr. Spaulding also provided dam safety training for USACE operations personnel at navigation and flood control projects from 1988 to 2010. Over the last 10 years, Mr. Spaulding has participated in more than 75 PFMA evaluations of USACE flood control dams and hydroelectric projects. As a facilitator of PFMA evaluations authorized by FERC, Mr. Spaulding has directed more than 50 evaluations for embankment dams, concrete gravity structures, and arch dam structures.

Mr. Spaulding has served on IEPR review panels dealing with local flood protection projects, dam remediation, dam replacement, and seepage control system upgrades. This experience has provided extensive background in USACE's Safety Assurance Review (SAR) requirements. Mr. Spaulding has provided peer review services on two reaches of hurricane protection projects in the New Orleans area. In 2008, he peer-reviewed the geotechnical design of the New Orleans Group 1 to Group 3 pump stations. In 2010, Mr. Spaulding also served on the IEPR team reviewing the Olmsted Lock and Dam structure on the Ohio River. In 2014 he served on the IEPR evaluation team for the Pine Creek dam remediation in Oklahoma, assessing proposed methods to control internal embankment seepage around an existing conduit that had created large internal voids in the 50-year-old dam. In addition, Mr. Spaulding currently serves on two FERC-appointed Boards of Consultants reviewing the design of two major hydroelectric projects and was appointed to the Department of Energy (DOE) Peer Review panel to evaluate ongoing DOE-sponsored research related to dams and hydroelectric generation. Mr. Spaulding is a lifetime member of the American Society of Civil Engineers. He also is a member of the Minnesota Geotechnical Society, the National Hydropower Association, and the Construction Panel for the Minneapolis section of the American Arbitration Association.

Name	*Role*	*Affiliation*
Ralph Ellis, Ph.D., P.E.	Structural Engineering	Independent consultant

Dr. Ellis, an independent consultant, earned a Ph.D. in civil engineering from the University of Florida in 1989, and is a licensed professional engineer in Florida. In 2016 he retired as Professor Emeritus in the Department of Civil Engineering at the University of Florida where he specialized in the areas of civil and construction engineering. Dr. Ellis has more than 40 years of experience on large-scale civil engineering projects, particularly the design and construction of levees, pumping stations, piping, and other structures related to water control; construction of temporary and permanent sheet pile walls; and dewatering operations. Many of the projects involved lock structures, including lock gates and gate bays, lock chambers, lock guidewalls, as well as reinforced concrete structures, steel gates, floodwalls, retaining walls, cofferdams, gate well structures, utility penetrations and relocations, interior drainage systems and structures, and the application of stoplog, sandbag, and other nonstructural measures.

Dr. Ellis has construction engineering and management experience on large-scale regional and international civil engineering projects. Prior to joining the University of Florida, he was president of the Hammer Corporation construction firm and Director of Projects for the FMI Hammer Joint Venture with responsibility for engineering and delivery of all construction projects, among them, numerous projects for USACE, U.S. Navy, and the Panama Canal Company. Many of these projects were located in South Florida and Central America and involved the construction of large-scale earthworks, some

directly associated with flood control projects that required large-scale control structures. Projects for the Panama Canal Company included modifications and repairs to the canal navigational lock structures and other related marine structures.

Dr. Ellis was responsible for the design of permanent and temporary structures within the construction scope of work for these large-scale projects. At the University of Florida, he taught senior design classes that involved the design of sheet pile walls, cofferdams, and other marine-related structures. Dr. Ellis has extensive experience with the use of soft soils and erosion control, including engineering design considerations and constructability issues. Dr. Ellis is familiar with the erosion control aspects of large- scale Civil Works projects and with engineering related to protection walls. Dr. Ellis has experience and familiarity with levee construction and design and developed and taught earthwork levee construction methods and related design concepts, and environmental protection planning to students since 1989. He has maintained current knowledge of professional practice and HSDRRS design criteria requirements. Dr. Ellis also teaches design quality management and is current with design quality control practices. Additionally, he has participated in several Louisiana coastal storm damage reduction and ecosystem restoration project IEPRs in the area of cost engineering and construction management.

In addition, Dr. Ellis is capable of addressing USACE Safety Assurance Review (SAR) as applied to this IEPR. He has served as panel member for Type I and Type II IEPRs on other USACE projects where those projects posed a significant threat to human life and public safety and the review charge included elements of SAR review.

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APPENDIX C

Final Charge for the IHNC Lock Replacement GRR/SEIS IEPR

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Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report (GRR)

This is the final Charge to the Panel for the IHNC Lock Replacement GRR/SEIS IEPR. This final Charge was submitted to USACE as part of the final Work Plan, originally submitted on March 29, 2017.

BACKGROUND

The decision document GRR will evaluate Shallow Draft Lock Replacement alternatives within the Inner Harbor in New Orleans, Louisiana. The inner harbor corridor is a combined deep and shallow draft canal extending northward from the Mississippi River to Lake Pontchartrain. The existing IHNC passes barge traffic between the Mississippi River and the Gulf Intracoastal Waterway (GIWW) at New Orleans, and is a vital link in the GIWW system. The existing lock is antiquated and well beyond its design life. The closure of the Mississippi River Gulf Outlet (MRGO) heightens the need for a modern and more reliable lock. A lock outage would clog the entire GIWW system with the only viable alternate route taking 17 days.

The plan identified in the 1997 Evaluation Report included construction of a concrete lock; replacement of the St. Claude Avenue bridge with a new, low-level double bascule bridge; construction of a temporary bridge at St. Claude Avenue that would provide continuous use of that canal crossing during construction of the new bridge; replacement of the center lift-span and raising of the towers on the Claiborne Avenue bridge by using innovative construction methods that will reduce the closure at that bridge, for both marine and ground traffic, for very short durations (1-4 weeks); provision of by-pass channels around the new lock construction site and the existing lock during its demolition, both of which would provide continuous usage of the existing lock and canal during construction; extension of the Mississippi River flood protection along the canal to the site of the new lock; and implementation of a community impact mitigation plan to offset and/or compensate for impacts the project will have on the surrounding communities, even though we are not relocating any residences. The GRR will reevaluate this plan as well as other alternatives identified in the 1997 Evaluation report. New alternatives and/or lock locations will also be considered under the GRR.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana (LA), General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS) (hereinafter: IHNC Lock Replacement GRR/SEIS IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Civil Works Review* (Engineer Circular [EC] 1165-2-214, dated December 15, 2012), and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004). Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The purpose of the IEPR is to assess the "adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (EC 1165-2-214; p. D-4) for the decision documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) who meet the technical criteria and areas of expertise required for and relevant to the project.

The Panel will be "charged" with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-214, Appendix D, review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review.

Documents for Review

The following is a list of documents, supporting information, and reference materials that will be provided for the review.

Review Documents	No. of Review Pages
Appendix E**	214
Appendix F**	929
Exhibit 1: Order and Reasons**	27
Exhibit 2: IHNC-PONO Recommendations**	3
Risk Register**	1
Total Number of Supporting Documents	**1,174**

**USACE will submit public comments to Battelle upon their availability according to the schedule in Table A-1, who will in turn submit the comments to the IEPR Panel for review. A separate Addendum to the Final Report will be submitted with the Panel's findings on the public comments.*

***Supporting documentation only. These documents are not for Panel review and should be used as information sources only. They are not included in the total review document page count.*

Documents for Reference

- USACE guidance *Civil Works Review,* (EC 1165-2-214, December 15, 2012)
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004)
- Foundations of SMART Planning
- SMART Planning Bulletin (PB 2013-03)
- SMART – Planning Overview
- Planning Modernization Fact Sheet.

SCHEDULE

This schedule is based on the receipt of the final review documents. Note that dates presented in the schedule below also could change due to panel member and USACE availability.

Task	Action	Due Date
Conduct Peer Review	Subcontractors complete mandatory Operations Security (OPSEC) training	4/28/2017
	Battelle sends review documents to panel members	3/30/2017
	Battelle convenes kick-off meeting with panel members	3/30/2017
	Battelle convenes kick-off meeting with USACE and panel members	3/30/2017
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	4/10/2017
	Panel members complete their review of the documents	4/20/2017
Prepare Final Panel Comments and Final IEPR Report	Battelle provides talking points to panel members for Panel Review Teleconference	4/24/2017
	Battelle convenes Panel Review Teleconference	4/25/2017
	Battelle provides Final Panel Comment templates and instructions to panel members	4/25/2017
	Panel members provide draft Final Panel Comments to Battelle	5/3/2017
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	5/04/2017 - 5/08/2017
	Panel finalizes Final Panel Comments	5/9/2017
	Battelle receives public comments from USACE	5/9/2017
	Battelle sends public comments to Panel	5/16/2017
	Panel members complete their review of the public comments	5/31/2017
	Battelle and Panel review Panel's responses to public comments	6/2/2017
	Panel drafts Final Panel Comment on public comments, if necessary	6/7/2017
	Panel finalizes Final Panel Comment regarding public comments, if necessary	6/9/2017
	Battelle provides Final IEPR Report to panel members for review	5/10/2017
	Panel members provide comments on Final IEPR Report	5/12/2017
	Battelle submits Final IEPR Report to USACE*	5/16/2017

Task	Action	Due Date
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	5/23/2017
	Battelle provides Addendum to Final IEPR Report to panel members for review[b]	6/13/2017
	Panel members provide comments on Addendum to Final IEPR Report[b]	6/15/2017
	Battelle submits Addendum to Final IEPR Report to USACE[a,b]	6/19/2017
	USACE Planning Center of Expertise (PCX) provides decision on Addendum to Final IEPR Report acceptance[b]	6/26/2017
	Battelle provides Addendum to Final IEPR Report to panel members for review[b]	6/13/2017
	Panel members provide comments on Addendum to Final IEPR Report[b]	6/15/2017
	Battelle convenes teleconference with Panel to review Comment Response process	6/28/2017
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	7/17/2017
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	7/21/2017
	USACE PCX provides draft PDT Evaluator Responses to Battelle	7/24/2017
	Battelle provides draft PDT Evaluator Responses to panel members	7/26/2017
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	8/1/2017
	Battelle convenes Comment Response Teleconference with panel members and USACE	8/2/2017
	USACE inputs final PDT Evaluator Responses to DrChecks	8/9/2017
	Battelle provides final PDT Evaluator Responses to panel members	8/11/2017
	Panel members provide final BackCheck Responses to Battelle	8/16/2017
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	8/16/2017
	Battelle submits pdf printout of DrChecks project file*	8/17/2017
Agency Decision Milestone (ADM) Meeting	Panel prepares and/or reviews slides for ADM	TBD
	Battelle participates in the Agency Decision Milestone (ADM) Meeting	June 2017
Civil Works Review Board (CWRB)	Panel prepares and/or reviews slides for CWRB	TBD

** Deliverables*

******* A time extension will be required to accommodate participation in the CWRB as well as project closeout activities, which includes time to close out subcontracts with panel members following the CWRB.*

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the decision documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the decision documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-214; Appendix D).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.

2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.

3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.

4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.

5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.

6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.

7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).

2. Please contact the Battelle Project Manager (Project Manager; wisneskic@battelle.org) or Program Manager (Rachel Sell; sellr@battelle.org) for requests or additional information.

3. In case of media contact, notify the Battelle Program Manager, Rachel Sell (sellr@battelle.org) immediately.

4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report, but will remain anonymous.

Please submit your comments in electronic form to the Project Manager, wisneskic@battelle.org no later than 10 pm ET by the date listed in the schedule above.

Independent External Peer Review of the Inner Harbor Navigation Canal (IHNC) Lock Replacement Orleans Parish, Louisiana (LA), General Reevaluation Report (GRR)

Charge Questions and Relevant Sections as Supplied by USACE

Broad Evaluation Charge Questions

1. Is the need for and intent of the decision document clearly stated?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical information?

Given the need for and intent of the decision document, assess the adequacy and acceptability of the following:

3. Project evaluation data used in the study analyses,
4. Economic, environmental, and engineering assumptions that underlie the study analyses,
5. Economic, environmental, and engineering methodologies, analyses, and projections,
6. Models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives,
7. Methods for integrating risk and uncertainty,
8. Formulation of alternative plans and the range of alternative plans considered,
9. Quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans, and
10. Overall assessment of significant environmental impacts and any biological analyses.

Further,

11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable, and
12. Assess the considered and tentatively selected alternatives from the perspective of systems, including systemic aspects being considered from a temporal perspective, including the potential effects of climate change.

For the tentatively selected plan, assess whether:

13. The models used to assess life safety hazards are appropriate,
14. The assumptions made for the life safety hazards are appropriate,
15. The quality and quantity of the surveys, investigations, and engineering are sufficient for a concept design considering the life safety hazards and to support the models and assumptions made for determining the hazards, and
16. The analysis adequately address the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.

Battelle Summary Charge Questions to the Panel Members[1]

Summary Questions

17. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.

18. Please provide positive feedback on the project and/or review documents.

Public Comment Questions

19. Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?

[1] Questions 17 through 19 are Battelle supplied questions and should not be construed or considered part of the list of USACE-supplied questions. These questions were delineated in a separate appendix in the final Work Plan submitted to USACE.

APPENDIX D

Conflict of Interest Form

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Conflicts of Interest Questionnaire

Independent External Peer Review

Inner Harbor Navigation Canal Lock Replacement Orleans Parish, Louisiana, General Reevaluation Report

The purpose of this document is to help the U.S. Army Corps of Engineers identify potential organizational conflicts of interest on a task order basis as early in the acquisition process as possible. Complete the questionnaire with background information and fully disclose relevant potential conflicts of interest. Substantial details are not necessary; USACE will examine additional information if appropriate. Affirmative answers will not disqualify your firm from this or future procurements.

NAME OF FIRM: **Battelle Memorial Institute**
REPRESENTATIVE'S NAME: **Courtney M. Brooks**
TELEPHONE: **614-424-5623**
ADDRESS: **505 King Avenue, Columbus, OH 43201**
EMAIL ADDRESS: **brooksc1@battelle.org**

I. INDEPENDENCE FROM WORK PRODUCT. Has your firm been involved in any aspect of the preparation of the subject study report and associated analyses (field studies, report writing, supporting research etc.) **No** Yes (if yes, briefly describe):

II. INTEREST IN STUDY AREA OR OUTCOME. Does your firm have any interests or holdings in the study area, or any stake in the outcome or recommendations of the study, or any affiliation with the local sponsor? **No** Yes (if yes, briefly describe):

III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? No **Yes** (if no, briefly describe the difficulty in identifying outside reviewers):

IV. AFFILIATION WITH PARTIES THAT MAY BE INVOLVED WITH PROJECT IMPLEMENTATION. Do you anticipate that your firm will have any association with parties that may be involved with or benefit from future activities associated with this study, such as project construction? **No** Yes (if yes, briefly describe):

V. ADDITIONAL INFORMATION. Report relevant aspects of your firm's background or present circumstances not addressed above that might reasonably be construed by others as affecting your firm's judgment. Please include any information that may reasonably: impair your firm's objectivity; skew the competition in favor of your firm; or allow your firm unequal access to nonpublic information.
No additional information to report.

Courtney M. Brooks

Courtney M. Brooks — February 28, 2017

BATTELLE

It can be done