

Final Independent External Peer Review Report Passaic River Tidal Protection Area, New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRM) Project

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Prepared for
U.S. Army Corps of Engineers
Coastal Storm Risk Management Planning Center of Expertise
Baltimore District

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Executive Summary

PROJECT BACKGROUND AND PURPOSE

The study is the Passaic River Tidal Protection Area, New Jersey, Draft Integrated HSGRR/EA, CSRM Project. The purpose of this study is to identify and re-evaluate CSRM options within the Passaic River Tidal Area. The decision document presents planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to approval of the plan. In response to Hurricane Sandy in October 2012, this effort is part of the Public Law 113-2, the Disaster Relief Appropriation Act of 2013. The project sponsor is the New Jersey Department of Environmental Protection (NJDEP).

The 1990 authorization for the Passaic River Main Stem includes an area known as the Tidal Area Protection that provided “protection in the Lower Passaic Valley [which] included 5.5 miles of levees and 5.0 miles of floodwalls lying downstream of Interstate 280 to Newark Bay which provide 500-year protection against hurricane and tidal surges.” The CSRM measures that are examined in the reevaluation report (channel modification, levees, floodwalls, as well as tide gates) are also being reconsidered in light of changes to existing conditions and changes to environmental policy.

The District initiated a general reevaluation study to determine if the authorized plan is still economically justified, environmentally acceptable, and technically feasible. Based on the significant changes in the basin since authorization of the project, other alternatives were also considered.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. USACE is conducting an Independent External Peer Review (IEPR) of the Passaic River Tidal Protection Area, New Jersey, Draft Integrated HSGRR/EA CSRM Project (hereinafter: Passaic Tidal Project 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: plan formulation/economics, environmental law and compliance, hydrology and hydraulic engineering, and civil/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 all the final candidates to independently confirm that they had no COIs, and Battelle made the final selection of the four-person Panel from this list.

The Panel received electronic versions of the decision documents (722 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.

IEPR panel members reviewed the decision documents individually and produced individual comments in response to the charge questions. 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, 11 Final Panel Comments were identified and documented. Of these, one was identified as having medium/high significance, three had a medium significance, four had medium/low significance, and three had low significance.

Battelle received public comments from USACE on the Passaic Tidal Project (approximately 17 pages of written comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the Passaic Tidal Project review documents. After completing its review, the Panel confirmed that no issues or concerns were identified other than those already covered in the Final Panel Comments.

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 Passaic Tidal Project 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 report is generally well-written and organized. 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. The Panel identified some elements of the project where additional analysis is warranted and places where clarification of project findings and objectives need to be documented in the Passaic Tidal Project documents.

Plan Formulation/ Economics: The Panel acknowledged that the Tentatively Selected Plan (TSP) is a unique example of meeting the non-Federal sponsor's needs in a cost-effective manner. However, the Panel's most significant finding is related to the planning process used to develop the interior drainage system design. The interior drainage system is critical to the functioning of the TSP and represents a substantial portion of the total project cost. Without an understanding of how the interior drainage system was designed and what its impacts will be, the Panel cannot determine whether the TSP provides the anticipated project benefits in the most cost-effective manner and with minimum adverse impacts. The Panel recommends providing a detailed description of the planning process that led to the TSP interior drainage system design and its impacts. Additionally, the Panel believes a more detailed analysis and comparison is needed of the extent to which the alternatives (particularly the National Economic Development [NED] plan and the locally preferred plan [LPP]) address the four accounts as required by the Principles and Guidelines for Land and Water Resources Planning and the associated USACE planning guidance.

The Panel also noted there was some uncertainty about whether the TSP is proposed as a complete stand-alone LPP or as an "interim recommendation and deferring remaining elements". The Panel suggests including a comprehensive comparison of the NED plan and the LPP in the HSGRR/EA, including a detailed discussion of the significant trade-offs, residual damages and life/safety risks, potential environmental justice issues, and/or potential community impacts associated with both plans.

The Panel noted it was unclear why Segment 7 is not specifically included in the recommended Federal flood risk management project. If Segment 7 is essential to the successful functioning of the recommended LPP, it should be included in the project cost and cost-shared with the non-Federal sponsor, designed and built to USACE standards, and integrated into the project's operation and maintenance requirements. The Panel suggests modifying the HSGRR/EA to incorporate Segment 7 as an integral feature of the proposed Federal coastal storm risk management project. The Panel was also uncertain whether the economic analysis accounted for structures substantially damaged by Hurricane Sandy and planned resilience projects. Proper accounting of resilience projects and structures that have been substantially damaged by prior floods is critical to calculating flood risk management benefits.

The Panel observed that the HSGRR/EA does not discuss what analyses (or models) were performed or how it was concluded that the Harrison 2 Section was hydrologically independent from other components of the TSP. The Panel is concerned that the performance of the TSP and its benefit-cost ratio may change if Harrison 2 is not hydrologically independent. The Panel recommends updating the HSGRR/EA to explain why the Harrison 2 Section is hydrologically independent from the remaining TSP components.

Engineering: The Panel notes that the flooding and frequency relationships have not been confirmed for the TSP/LPP or outlined in the feasibility report. The main concern is how the TSP/LPP affects the other areas in the study from a flooding perspective. After reviewing the HSGRR/EA and Hydrology and Hydraulics Appendix, the Panel believes there is an increased probability of flooding in adjacent areas due to floodwaters being blocked as part of the Newark Flanking model. These concerns justify more

detailed modeling in the TSP/LPP study area and adjacent areas. The Panel suggests that in the HSGRR/EA USACE acknowledge in detail the work to be conducted in future phases to verify and validate project impacts and benefits. Additionally, the Panel suggests identifying the direct and cumulative impacts of adjacent flooding prior to implementation of the planning, engineering, and design (PED) phase.

The Panel has acknowledged that the TSP/LPP alternatives have not been fully addressed in the HSGRR/EA or its appendices in regard to geotechnical and hydrology and hydraulic analyses. Specifically, the following analyses are not focused on the TSP/LPP: subsurface explorations, wave analyses, foundation elements, gate inventory, and pumps, station, and drainage structures. Therefore, the Panel is concerned that the conclusions regarding potential impacts on are not supported by analysis on appropriate TSP/LPP project features. The Panel recommends updating the report to acknowledge that analysis is not focused on the TSP/LPP and it is not anticipated to affect the project conclusions.

The Panel notes that FEMA-accredited levee criteria were not considered, therefore future flood mitigation requirements will be the same. The Panel is concerned that by not addressing FEMA levee certification or obtaining a waiver for such certification, may be considered a deficiency in the future. The Panel suggests confirming with key stakeholders that FEMA accreditation should not be a project goal.

Environmental: The Panel noted that the Executive Summary, Draft Finding of No Significant Impact (FONSI), and Pertinent Data information at the beginning were concise and very helpful. However, the Panel is concerned that the decision to use significantly more expensive floodwalls (compared to levees) to avoid encounters with hazardous, toxic, radioactive waste (HTRW) may not fully consider the range of risks, costs, and trade-offs associated with that decision. Levees in some locations might provide other benefits in certain communities as they may be more aesthetically pleasing than a floodwall, as well as provide greenspace, walking/trail corridors, and easier access from one side to the other. The Panel suggests that these trade-offs and other considerations be addressed in the report as they potentially could affect net benefits of the NED plan.

The Panel observed that the HSGRR/EA lacks a detailed description of the environmental justice implications associated with the TSP/LPP, particularly as compared to the more comprehensive NED plan. They noted a public comment from the Ironbound Community Corporation (ICC) voiced a similar concern at the omission of portions of the study area from the LPP. The Panel suggests that the report should more carefully describe and compare the demographics, socio-economics, and land use considerations in the areas covered, and not covered, by the flood risk reduction measures in the TSP/LPP to ensure that real or perceived environmental justice concerns are adequately addressed.

Table ES-1. Overview of 11 Final Panel Comments Identified by the Passaic Tidal Project IEPR Panel

No.	Final Panel Comment
Significance – Medium/High	
1	The feasibility report lacks a description of the interior drainage system, how it was designed, or its impacts.
Significance – Medium	
2	The rationale for choosing the LPP over a relatively comprehensive NED plan is not clearly defined in the feasibility report.
3	Considering the importance of Segment 7 to the function of the modified Newark Flanking Plan, it is unclear why it is not included as a feature of the LPP for the proposed Federal CSRM project.
4	It is unclear how or whether the economic analysis accounted for structures substantially damaged by Hurricane Sandy and planned resilience projects.
Significance – Medium/Low	
5	The decision to replace the levees in the plan with floodwalls to decrease the potential scope of HTRW remediation is not adequately supported in the report.
6	The potential impacts of the TSP/LPP on socio-economic/environmental justice issues have not been sufficiently addressed in the report.
7	Flooding and frequency relationships have not been confirmed for the TSP/LPP or outlined in the feasibility report.
8	The TSP/LLP alternative has not been evaluated from an engineering perspective in the HSGRR/EA or its appendices.
Significance – Low	
9	The assumption that the Harrison 2 Section is hydrologically independent is not supported in the main report.
10	It is unclear which models were used to produce the results presented in the report.
11	FEMA-accredited levee criteria have not been considered, which may not be consistent with goals based on similar, on-going HUD-financed flood protection projects.

Table of Contents

	Page
Executive Summary	i
1. INTRODUCTION.....	1
2. PURPOSE OF THE IEPR.....	1
3. METHODS FOR CONDUCTING THE IEPR	2
4. RESULTS OF THE IEPR.....	2
4.1 Summary of Final Panel Comments.....	3
4.2 Final Panel Comments	3
5. REFERENCES.....	21
Appendix A. IEPR Process for the Passaic Tidal Project	
Appendix B. Identification and Selection of IEPR Panel Members for the Passaic Tidal Project	
Appendix C. Final Charge for the Passaic Tidal Project IEPR	
Appendix D. Conflict of Interest Form	

List of Tables

	Page
Table ES-1. Overview of 11 Final Panel Comments Identified by the Passaic Tidal Project IEPR Panel.	v

LIST OF ACRONYMS

ADM	Agency Decision Milestone
COI	Conflict of Interest
CSRM	Coastal Storm Risk Management
DrChecks	Design Review and Checking System
EA	Environmental Assessment
EC	Engineer Circular
EQ	Environmental Quality
ER	Engineer Regulation
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GRR	General Reevaluation Report
HEC-HMS	Hydrologic Engineering Center-Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center-River Analysis System
HS	Hurricane Sandy
HTRW	Hazardous, Toxic, Radioactive Waste
ICC	Ironbound Community Corporation
IEPR	Independent External Peer Review
IWR	Institute for Water Resources
LPP	Locally Preferred Plan
NACCS	North Atlantic Coast Comprehensive Study
NED	National Economic Development
NEPA	National Environmental Policy Act
NJDEP	New Jersey Department of Environmental Protection
OEO	Outside Eligible Organization
O&M	Operation and Maintenance
OMB	Office of Management and Budget
OMRR&R	Operation, Maintenance, Repair, Replacement, and Rehabilitation
OSE	Other Social Effects
PDT	Project Delivery Team
PED	Planning, Engineering, and Design

RED	Regional Economic Development
SLM	Senior Leader Meeting
TSP	Tentatively Selected Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1. INTRODUCTION

The study is the Passaic River Tidal Protection Area, New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRM) Project. The purpose of this study is to identify and re-evaluate CSRM options within the Passaic River Tidal Area. The decision document presents planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to approval of the plan. In response to Hurricane Sandy in October 2012, this effort is part of the Public Law 113-2, the Disaster Relief Appropriation Act of 2013. The project sponsor is the New Jersey Department of Environmental Protection (NJDEP).

The 1990 authorization for the Passaic River Main Stem includes an area known as the Tidal Area Protection that provided “protection in the Lower Passaic Valley [which] included 5.5 miles of levees and 5.0 miles of floodwalls lying downstream of Interstate 280 to Newark Bay which provide 500-year protection against hurricane and tidal surges.” The CSRM measures that are examined in the reevaluation report (channel modification, levees, floodwalls, as well as tide gates) are also being reconsidered in light of changes to existing conditions and changes to environmental policy.

The District initiated a general reevaluation study to determine if the authorized plan is still economically justified, environmentally acceptable, and technically feasible. Based on the significant changes in the basin since authorization of the project, other alternatives were also considered.

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 Passaic Tidal Project 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 Passaic Tidal Project IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted, including the 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 A-1. Appendix D presents the organizational COI form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the Passaic Tidal Project 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, 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 Passaic Tidal Project 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. The IEPR was completed in accordance with established due dates for milestones and deliverables as part of the final Work Plan; the due dates are based on the award/effective date and the receipt of review documents.

Battelle identified, screened, and selected four panel members to participate in the IEPR based on their expertise in the following disciplines: plan formulation/economics, environmental law and compliance, hydrology and hydraulic engineering, and civil/structural engineering. The Panel reviewed the Passaic Tidal Project documents and produced 11 Final Panel Comments in response to 18 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 Passaic Tidal Project 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 report is generally well-written and organized. 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. The Panel identified some elements of the project where additional analysis is warranted and places where clarification of project findings and objectives need to be documented in the Passaic Tidal Project documents.

Plan Formulation/ Economics: The Panel acknowledged that the Tentatively Selected Plan (TSP) is a unique example of meeting the non-Federal sponsor’s needs in a cost-effective manner. However, the Panel’s most significant finding is related to the planning process used to develop the interior drainage system design. The interior drainage system is critical to the functioning of the TSP and represents a substantial portion of the total project cost. Without an understanding of how the interior drainage system was designed and what its impacts will be, the Panel cannot determine whether the TSP provides the anticipated project benefits in the most cost-effective manner and with minimum adverse impacts. The Panel recommends providing a detailed description of the planning process that led to the TSP interior drainage system design and its impacts. Additionally, the Panel believes a more detailed analysis and comparison is needed of the extent to which the alternatives (particularly the National Economic Development [NED] plan and the locally preferred plan [LPP]) address the four accounts as required by the Principles and Guidelines for Land and Water Resources Planning and the associated USACE planning guidance.

The Panel also noted there was some uncertainty about whether the TSP is proposed as a complete stand-alone LPP or as an “interim recommendation and deferring remaining elements”. The Panel suggests including a comprehensive comparison of the NED plan and the LPP in the HSGRR/EA, including a detailed discussion of the significant trade-offs, residual damages and life/safety risks, potential environmental justice issues, and/or potential community impacts associated with both plans.

The Panel noted it was unclear why Segment 7 is not specifically included in the recommended Federal flood risk management project. If Segment 7 is essential to the successful functioning of the recommended LPP, it should be included in the project cost and cost-shared with the non-Federal sponsor, designed and built to USACE standards, and integrated into the project’s operation and maintenance requirements. The Panel suggests modifying the HSGRR/EA to incorporate Segment 7 as an integral feature of the proposed Federal coastal storm risk management project. The Panel was also uncertain whether the economic analysis accounted for structures substantially damaged by Hurricane Sandy and planned resilience projects. Proper accounting of resilience projects and structures that have been substantially damaged by prior floods is critical to calculating flood risk management benefits.

The Panel observed that the HSGRR/EA does not discuss what analyses (or models) were performed or how it was concluded that the Harrison 2 Section was hydrologically independent from other components of the TSP. The Panel is concerned that the performance of the TSP and its benefit-cost ratio may

change if Harrison 2 is not hydrologically independent. The Panel recommends updating the HSGRR/EA to explain why the Harrison 2 Section is hydrologically independent from the remaining TSP components.

Engineering: The Panel notes that the flooding and frequency relationships have not been confirmed for the TSP/LPP or outlined in the feasibility report. The main concern is how the TSP/LPP affects the other areas in the study from a flooding perspective. After reviewing the HSGRR/EA and Hydrology and Hydraulics Appendix, the Panel believes there is an increased probability of flooding in adjacent areas due to floodwaters being blocked as part of the Newark Flanking model. These concerns justify more detailed modeling in the TSP/LPP study area and adjacent areas. The Panel suggests that in the HSGRR/EA USACE acknowledge in detail the work to be conducted in future phases to verify and validate project impacts and benefits. Additionally, the Panel suggests identifying the direct and cumulative impacts of adjacent flooding prior to implementation of the planning, engineering, and design (PED) phase.

The Panel has acknowledged that the TSP/LPP alternatives have not been fully addressed in the HSGRR/EA or its appendices in regard to geotechnical and hydrology and hydraulic analyses. Specifically, the following analyses are not focused on the TSP/LPP: subsurface explorations, wave analyses, foundation elements, gate inventory, and pumps, station, and drainage structures. Therefore, the Panel is concerned that the conclusions regarding potential impacts on are not supported by analysis on appropriate TSP/LPP project features. The Panel recommends updating the report to acknowledge that analysis is not focused on the TSP/LPP and it is not anticipated to affect the project conclusions.

The Panel notes that FEMA-accredited levee criteria were not considered, therefore future flood mitigation requirements will be the same. The Panel is concerned that by not addressing FEMA levee certification or obtaining a waiver for such certification, may be considered a deficiency in the future. The Panel suggests confirming with key stakeholders that FEMA accreditation should not be a project goal.

Environmental: The Panel noted that the Executive Summary, Draft Finding of No Significant Impact (FONSI), and Pertinent Data information at the beginning were concise and very helpful. However, the Panel is concerned that the decision to use significantly more expensive floodwalls (compared to levees) to avoid encounters with hazardous, toxic, radioactive waste (HTRW) may not fully consider the range of risks, costs, and trade-offs associated with that decision. Levees in some locations might provide other benefits in certain communities as they may be more aesthetically pleasing than a floodwall, as well as provide greenspace, walking/trail corridors, and easier access from one side to the other. The Panel suggests that these trade-offs and other considerations be addressed in the report as they potentially could affect net benefits of the NED plan.

The Panel observed that the HSGRR/EA lacks a detailed description of the environmental justice implications associated with the TSP/LPP, particularly as compared to the more comprehensive NED plan. They noted a public comment from the Ironbound Community Corporation (ICC) voiced a similar concern at the omission of portions of the study area from the LPP. The Panel suggests that the report should more carefully describe and compare the demographics, socio-economics, and land use considerations in the areas covered, and not covered, by the flood risk reduction measures in the TSP/LPP to ensure that real or perceived environmental justice concerns are adequately addressed.

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 feasibility report lacks a description of the interior drainage system, how it was designed, or its impacts.

Basis for Comment

The interior drainage system is located in a densely developed area and must be integrated into existing infrastructure. There are likely to be multiple alternatives that should be considered and compared using the USACE six-step planning process. There are two key reasons for providing a clear description of the planning process used to develop the interior drainage system design:

- The interior drainage system is critical to the functioning of the TSP and represents a substantial portion of the total project cost. Flood damages in the study area may be caused by either tidal surge or by stormwater runoff produced by a severe rainfall event. The TSP is designed to protect against tidal surge. The interior drainage system should be designed to maintain, or reduce, the existing flood risk associated with stormwater runoff. If the interior drainage system design reduces the risk of flood damages caused by stormwater runoff, the TSP benefits could be increased.
- Pump stations are normally included in a drainage plan only when there is no alternative. Pump stations require significant construction costs and operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) costs. In order for the system to function properly, the non-Federal sponsor must be capable of meeting the complex and demanding OMRR&R requirements.

Without an understanding of how the interior drainage system was designed and what its impacts will be, the Panel cannot determine whether the TSP provides the anticipated project benefits in the most cost-effective manner and with minimum adverse impacts.

The following information would provide justification for the interior drainage system:

- A description of the existing drainage system, if any
- The alternatives that were considered for interior drainage
- How the TSP interior drainage system was selected
- The impacts on resources, such as
 - HTRW
 - Environmental justice
 - Wetlands
 - Water quality
 - Existing stormwater infrastructure (culverts, swales, drainage systems)
- The OMRR&R requirements and the non-Federal sponsor's ability and willingness to perform them.

Significance – Medium/High

Providing a description of how the TSP interior drainage system was designed will support the conclusion that the TSP provides benefits in a cost-effective manner without unacceptable adverse impacts.

Recommendation for Resolution

1. Provide a detailed description of the planning process, similar to the list above, that led to the TSP interior drainage system design and its impacts.

Final Panel Comment 2

The rationale for choosing the LPP over a relatively comprehensive NED plan is not clearly defined in the feasibility report.

Basis for Comment

The HSGRR/EA selects (p. 86) a LPP with an extremely limited scope within the study area with no prior consideration of a similar plan. The “Focused Array of Alternatives” discussion (HSGRR/EA Section 4.8, p. 80) includes only variants of the authorized plan. The move from the National Economic Development (NED) plan to the LPP occurs abruptly and seems to be based solely upon a November 18, 2016 letter from the NJDEP, the non-Federal sponsor. According to the HSGRR/EA (p. 86), the NJDEP letter (which the Panel members could not find in the project documentation) “proposed that the Newark Flanking component of the project be considered as a stand-alone flood risk management project ...” The HSGRR/EA further indicates that the NJDEP letter stated the high benefit-cost ratio and the lesser chance of encountering HTRW within the project footprint as reasons for supporting the Newark Flanking component.

In addition, the kick-off presentation for the IEPR (slide # 53) indicated some uncertainty about whether the TSP is proposed as a complete stand-alone LPP or as an “interim recommendation and deferring remaining elements” because of the non-Federal sponsor’s concerns about being able to clean up HTRW necessary for construction of a larger floodwall plan.

Other than the NJDEP letter, the HSGRR/EA does not present a justification, including the relevant trade-offs, for the abrupt transition to a highly constrained and more localized LPP. The proposed LPP abandons the more comprehensive system-wide approach represented by the NED plan in favor of a plan that is narrowly defined and targeted to a relatively small portion of the overall study area. The LPP would only reduce flood damages in the study area by about 14 percent (p. 98), leaving exceptional residual flood damage risk, omitting flood risk reduction measures from a large portion of Newark and all of Kearney and Harrison. The HSGRR/EA does not provide any detailed explanation or analysis of the significant trade-offs, residual damages and life/safety risks, potential environmental justice issues, and/or potential community impacts associated with recommending the LPP compared to the NED plan or another alternative.

A more detailed analysis and comparison is needed of the extent to which the alternatives (particularly the NED plan and LPP) address the four accounts (National Economic Development [NED], Environmental Quality [EQ], Other Social Effects [OSE], and Regional Economic Development [RED]) as required by the Principles and Guidelines for Land and Water Resources Planning and the associated USACE planning guidance. In the HSGRR/EA, only one paragraph (p. 97) is devoted to the four accounts (for the LPP only). In addition, the report does not compare the extent to which each alternative meets the four criteria by which all water resource development plans are to be evaluated, as required by the Principles and Guidelines: completeness, effectiveness, efficiency, and acceptability. Given the initial scope of the HSGRR/EA, it is not clear in the report whether the LPP would be considered “complete,” given limited flood risk reduction across the study area, and “acceptable” to stakeholders and community members since so much of the study area was left out. Public comments on the HSGRR/EA from the Ironbound Community Corporation reinforce this concern.

Final Panel Comment 2

The life and safety hazard assumptions for the study seem appropriate, given the comprehensive focus of the authorized plan and stated opportunities, goals and objectives, and planning constraints and considerations stated in Section 4 of the HSGRR/EA. Nonetheless, the planning process described in the HSGRR/EA ultimately rejects the more comprehensive approach with the abrupt emergence of the LPP, based upon the November 2016 letter from NJDEP, without a meaningful discussion of the ramifications of that decision.

Significance – Medium

Without a comprehensive comparison of the plans that addresses the concerns identified above, it is not clear that the best overall plan has been selected.

Recommendation for Resolution

1. Include a comprehensive comparison of the NED plan and the LPP in the HSGRR/EA, including a detailed discussion of the significant trade-offs, residual damages and life/safety risks, potential environmental justice issues, and/or potential community impacts associated with both plans.
2. Clarify in the HSGRR/EA whether the TSP is proposed as a complete stand-alone LPP or as an “interim recommendation and deferring remaining elements” because of the concerns about HTRW clean-up that would be necessary for the larger floodwall plan (as indicated on slide 53 of the kick-off slide presentation of the IEPR).

Final Panel Comment 3

Considering the importance of Segment 7 to the function of the modified Newark Flanking Plan, it is unclear why it is not included as a feature of the LPP for the proposed Federal CSR project.

Basis for Comment

The HSGRR/EA states (p. 87):

However, further hydrologic analysis showed that the Newark Flanking segments cannot stand alone once the authorized project floodwalls are eliminated from the plan. Three additional areas with low elevations allow for flooding near I-95. Additionally, the updated analysis shows the Minish Park segment (Segment 7) and the Newark Flanking segment connecting, due to low topography between the two segments ... Therefore, in order for the Newark Flanking segment to function, the I-95 area and the Minish Park segment would need to be included as the "Newark Flanking Plan.

These statements indicate that the Minish Park segment (Segment 7) is essential to the successful functioning of the LPP and necessary to achieve the stated flood risk reduction benefits of the proposed Federal project.

The HSGRR/EA further states (p. 89):

As part of the Newark Passaic Riverfront Revitalization project, the City of Newark and the Trust for Public Land are redesigning and completing construction at the park. Part of the plan for the park included placing fill in the area. After reviewing the City's plans, the New York District made suggestions to increase the ground elevation to the height of the floodwall proposed in the area. The City incorporated the suggestions into their designs. By increasing the elevation of the park and meeting the proposed elevation grade, the low-lying areas were removed and the need for Segment 7 was eliminated.

It is not clear from the paragraph above whether the necessary improvements for flood risk reduction in Minish Park (Segment 7), as specified in the HSGRR/EA, have already been constructed by the City of Newark and/or Trust for Public Lands.

Regardless of whether the feature has been designed and/or constructed already, it is also not clear why Segment 7 is not specifically included in the recommended Federal flood risk management project. If Segment 7 is essential to the successful functioning of the recommended LPP, it should be included in the project cost and cost-shared with the non-Federal sponsor, designed and built to USACE standards (even if the non-Federal sponsor constructs it with USACE oversight), and integrated into the project's operation and maintenance requirements. Unless included as an integral part of the recommended Federal project, neither USACE nor the non-Federal sponsor (NJDEP) may be able to ensure that the Minish Park segment is designed, constructed, operated, and maintained over the project life to USACE standards for flood risk management purposes.

Significance – Medium

Final Panel Comment 3

Without Segment 7 in the recommended Federal project, the HSGRR/EA does not provide clear assurance that all necessary features to provide the stated level of flood risk management will be designed, built, and maintained to USACE standards.

Recommendation for Resolution

1. Clarify whether the City of Newark and Trust for Public Lands have already completed construction of the earthen structure in Minish Park that is intended to negate the need for a levee or floodwall structure. If so, confirm in the HSGRR/EA that the design of the feature was reviewed by USACE and constructed to USACE standards for a flood risk reduction measure.
2. If not already constructed by local interests, modify the HSGRR/EA to incorporate Segment 7 as an integral feature of the proposed Federal CSRM project

Final Panel Comment 4

It is unclear how or whether the economic analysis accounted for structures substantially damaged by Hurricane Sandy and planned resilience projects.

Basis for Comment

The assessment of damages to structures described in Appendix G and the HSGRR/EA was based on detailed surveys of 520 structures out of a total of 6,774 structures in the study area. The detailed survey results were extrapolated to the structures that were not surveyed.

Since 2007, the NJDEP has required that structures substantially damaged as a result of a flood be rebuilt with a first floor elevation one foot above the Base Flood Elevation. There is no mention of how or whether there was consideration given to structures that were substantially damaged during Hurricane Sandy and rebuilt above the Based Flood Elevation. Such structures should not be included in the benefits calculation for this project, even if they have not been rebuilt.

It is also unclear whether the “resilience projects” (HSGRR/EA, p. 79) that are planned in the industrial areas were accounted for in the economic analysis. The HSGRR/EA does not clearly describe the “resilience projects,” where they are planned, or how they would impact flood risk.

Significance – Medium

Proper accounting of structures that have been substantially damaged by prior floods and resilience projects is critical to calculating flood risk management benefits.

Recommendation for Resolution

1. Describe how many structures were substantially damaged during Hurricane Sandy, or other flood events since 2007, and how these structures were accounted for in the calculation of flood damages.
2. Describe any planned or existing resilience projects and how they were addressed in the calculation of flood damages.

Final Panel Comment 5

The decision to replace the levees in the plan with floodwalls to decrease the potential scope of HTRW remediation is not adequately supported in the report.

Basis for Comment

The refinements to the authorized plan (HSGRR/EA, p. 81) were made to develop new alternatives analyzed in the HSGRR/EA. One of the changes was to remove levees from further consideration and change the authorized plan to all floodwalls to reduce potential exposure to HTRW and require less real estate. Table 28 (HSGRR/EA, p. 80) indicates that slightly over 2 miles of the authorized plan would be levees. However, Section 4.6 (pp. 77 and 78) states that the levee and floodwall plan in the Passaic Tidal Area involves 5.5 miles of levee and 5 miles of floodwall. This significant difference in the HSGRR/EA's characterization of the extent of levees versus floodwalls in the authorized plan is not explained.

Regardless of whether the authorized plan would involve 2 or 5.5 miles of levee, the report does not discuss the trade-offs involved in the decision to change to an all floodwall plan. According to the HSGRR/EA (p. 78), floodwall costs per mile, using the cost estimate of the North Atlantic Coast Comprehensive Study (NACCS), would be 3.4 times more than levee costs per mile (\$28.2 million/mile versus \$8.3 million/mile). This change from levee to all floodwall potentially leads to an excessively high cost estimate for the authorized plan and to a potentially significant understatement of net benefits of the NED plan (a variation of the authorized plan), making it appear less cost-effective than it might otherwise be.

A principal reason given for the change to replace all levees in the authorized plan with floodwalls is to minimize encounters with HTRW and to decrease the amount of remediation needed. Since little is known about the actual extent of HTRW contamination along the levee/floodwall corridor for the authorized plan, the decision to use significantly more expensive floodwalls (compared to levees) to avoid HTRW encounters may not fully consider the range of risks, costs, and trade-offs associated with that decision. Floodwall construction may not significantly reduce HTRW exposure. Levees could serve to cap HTRW-contaminated surface soils, potentially addressing two issues concurrently: flood risk reduction and remediation of contaminated soils. Further, levees may not substantially increase real estate costs compared to floodwalls. Levees in some locations might provide other benefits in certain communities as they may be more aesthetically pleasing than a floodwall as well as provide greenspace, walking/trail corridors, and easier access from one side to the other. These trade-offs and other considerations are not addressed in the report and potentially could affect the appropriate scope of the NED plan and net benefits of the NED plan.

Significance – Medium/Low

The discussion in support of the decision to change the authorized plan (from which the NED plan is derived) omits key technical information and trade-off analysis vital to determining if the NED plan is accurately defined and enabling a fair comparison of the NED plan to the TSP/LPP.

Final Panel Comment 5

Recommendation for Resolution

1. Clarify the inconsistencies in the HSGRR/EA regarding the extent of levees versus floodwalls in the authorized plan (from which the NED plan was derived)
2. Incorporate a more complete discussion of the rationale for changing the levee/floodwall combination in the authorized plan to an all floodwall configuration, including the trade-offs, risks and uncertainties, and significantly greater cost per mile associated with the change.

Final Panel Comment 6

The potential impacts of the TSP/LPP on socio-economic/environmental justice issues have not been sufficiently addressed in the report.

Basis for Comment

The HSGRR/EA Section 6.6.1 states (p. 106) that “no disproportionately high and adverse impacts to minority and low-income populations would be expected ...” from the TSP, or the LPP. The LPP would only reduce flood damages in the overall study area by about 14 percent (p. 98), leaving exceptional residual flood damage risks compared to the NEP plan by omitting flood risk reduction measures from a large portion of Newark and all Kearney and Harrison. The LPP clearly does not provide flood risk reduction measures for a significant portion of the study area, but the HSGRR/EA does not sufficiently address the potential effects, real or perceived, of the LPP favoring a portion of the study area over others or potentially having disproportionate adverse impacts on communities that were excluded from risk reduction by the LPP.

The Environmental Justice Summary in the HSGRR/EA (Section 6.6.1, p.106) states that the No Action Alternative “would potentially have a **major indirect adverse impact on the community** (emphasis added) within Project Area ...” The report does not provide any analysis of the demographics and socio-economic characteristics related to residential, commercial, industrial, and health/safety services (police, fire, medical), land uses, and activities in the significant portions of the study area left without any flood risk reduction measures under the LPP. Nor does the HSGRR/EA describe the residual and unaddressed adverse impacts on the low income and minority communities in these areas that would remain without flood risk reduction measures.

One of the public comments voiced environmental justice concern at the omission of portions of the study area from the LPP. In a letter dated November 15, 2017, the Ironbound Community Corporation (ICC), representing the ethnically diverse Newark neighborhood of Ironbound (a portion of which would be excluded from the LPP), stated:

While the study does show that the flooding from storm surge will be mitigated in portions of the community, the entire northeastern end of Ironbound will remain susceptible to flooding. The study claims that this area is industrial; in doing so, the study ignores or actually fails to understand that hundreds of households have also occupied the area for decades, and in some cases, more than a century. This part of Ironbound is commonly referred to as “The Island,” a mix of public housing, working class homes, businesses and industry that provide jobs for local people, and parks. The public housing in this area includes hundreds of African-American and Latino families. More must be done to mitigate flooding for this particularly vulnerable part of Ironbound. Ignoring or disregarding this largely low-income and people of color community may constitute an environmental injustice.

This public comment reinforces the Panel’s concern that a more comprehensive analysis is warranted.

Significance – Medium/Low

The HSGRR/EA lacks a detailed description of the environmental justice implications associated with the TSP/LPP, particularly as compared to the more comprehensive NED plan.

Final Panel Comment 6

Recommendation for Resolution

1. The report should more carefully describe and compare the demographics, socio-economics, and land use considerations in the areas covered, and not covered, by the flood risk reduction measures in the LPP to ensure that real or perceived environmental justice concerns are adequately addressed in the documentation.
2. The referenced public comment asserts that the report mischaracterizes, or over-generalizes, land use (residential versus industrial) in an area not protected by the LPP. The HSGRR/EA should provide a more detailed description of such communities within the overall study area.

Final Panel Comment 7

Flooding and frequency relationships have not been confirmed for the TSP/LPP or outlined in the feasibility report.

Basis for Comment

The HSGRR/EA shows the Hurricane Sandy surge boundary (Figure 16), the Newark area without the TSP/LPP (Figure 19), and Newark with the TSP/LPP (Figure 20). It is clear the NACCS model, which focuses on coastal surge conditions, was used. However, it is unclear how the flooding and frequency relationships were developed for the focused array of alternatives, specifically the +14 feet, +16 feet, and +18 feet NAVD scenarios.

The HSGRR/EA shows flood frequency elevations in Tables 4 and 5, but it appears these are graphics produced by the Federal Emergency Management Agency (FEMA) prior to Hurricane Sandy. Figure 15 in the Hydrology and Hydraulics Report (Appendix F) shows a lack of correlation between rainfall and surge, though it is clearly a storm surge problem. The main concern is how the TSP/LPP affects the other areas in the study from a flooding perspective. The HSGRR/EA should present details on the volume and elevation of floodwaters that are flanked (or blocked) by the TSP/LPP that will result in the flooding of other parts of the basin.

It is also unclear whether the velocities in the Passaic River have the potential to increase, causing more scour in the channel, around bridges, and in contaminated areas. The HSGRR/EA does not present an analysis to determine if the impacts are minimal or negligible. These details are important because the risks, impacts, and uncertainties should be documented in the HSGRR/EA.

Significance – Medium/Low

The relationship between flooding and frequency within the TSP/LPP and how it may affect flooding in adjacent areas (Kearny, Harrison, and Minish) is not clear therefore project risks and impacts is unknown.

Recommendation for Resolution

1. Include an analysis of flooding and frequency within the TSP/LPP, but also for adjacent planning reaches in the study areas.
2. Include with and without TSP/LPP conditions for Kearny, Harrison, and Minish for water surface elevations and velocities.
3. Address the scour potential of contaminated areas from the TSP/LPP.

Final Panel Comment 8

The TSP/LLP alternative has not been evaluated from an engineering perspective in the HSGRR/EA or its appendices.

Basis for Comment

The TSP/LLP alternative has not been evaluated in the engineering appendices, therefore the Panel is uncertain about the implications of this omission on the implementation of the selected alternative. The following provides details on the analyses that the Panel believes are lacking in the various appendices.

1. Geotechnical Report: The geotechnical report does not address the TSP/LLP. Specifically, subsurface explorations do not appear to have been performed at structure locations: Segments 1 through 6. Therefore, it is not clear whether the performed analyses (including foundation recommendations) reflect the subsurface conditions present at those locations.
2. Draft Engineering and Design: Hydrology and Hydraulics (Section 6) and Geotechnical Analysis (Section 7) do not appear to apply to the TSP/LLP. Wave analyses do not appear to have been performed reflective of the TSP/LLP. Section 7.0 acknowledges that the geotechnical report does not represent the TSP/LLP sites, but notes that the available data, conclusions, and recommendations have been “conservatively” assumed for the TSP/LLP. No basis is provided for supporting this assumption. However, the report indicates that additional investigations will be performed before the final report is completed.
3. Floodwall Design Criteria (represented as 30% design): The Floodwall Design Criteria, specifically the foundation elements, do not address the TSP/LLP. Water levels appear to bracket the condition of TSP/LLP, except Elevation 12 top of wall segments.
4. Draft Closure Gates (represented as 30% design): The gate inventory and type appear not to represent the TSP/LLP segments as presented on Drawings C-101 through C-107 and described in the Engineering Report.
5. Drawings: Sheets C-101 through C-107 reflect the plan details for the TSP/LLP. The sheets that follow, showing wall details, gate details, pumps, station and drainage structures, do not appear to be applicable to the TSP/LLP. No details are provided for TSP/LLP tide gates.

Significance – Medium/Low

The engineering documentation does not evaluate the TSP/LLP alternative; therefore, the basis for cost and constructability is not presented, affecting the technical quality of the documentation.

Recommendation for Resolution

1. Acknowledge in each of the supporting project documentation identified above that the TSP/LLP is not addressed (similar to the statement addressing geotechnical report).
2. Confirm that the lack of available analyses for TSP/LLP is not anticipated to affect conclusions.

Final Panel Comment 9

The assumption that the Harrison 2 Section is hydrologically independent is not supported in the main report.

Basis for Comment

The HSGRR/EA does not discuss what analyses (or models) were performed or how it was concluded that the Harrison 2 Section was hydrologically independent from other components of the TSP/LPP. As a result, it is not clear whether the Harrison 2 Section should be included in the TSP/LPP.

The assumption that the Harrison 2 Section is hydrologically independent is important because it potentially affects both the benefits, costs, and performance of the TSP/LPP. Since the equivalent annual benefits are less than the costs for the Harrison 2 Section, the TSP/LPP benefit-cost ratio would be reduced if the Harrison 2 Section was included in the TSP/LPP.

Significance – Low

The performance of the TSP/LPP and its benefit-cost ratio may change if Harrison 2 is not hydrologically independent.

Recommendation for Resolution

1. Explain why the Harrison 2 Section is hydrologically independent from the remaining TSP/LPP components.

Final Panel Comment 10

It is unclear which models were used to produce the results presented in the report.

Basis for Comment

The HSGRR/EA does not clearly outline which models were used in the project analysis. Based on comments and answers from the PDT during the mid-review teleconference, the only modeling identified was the NACCS modeling system, which simulated the larger region affected by Hurricane Sandy. As to the use of other models, the HSGRR/EA is unclear. The Panel has three main concerns regarding the modeling presented in the HSGRR/EA.

1. USACE states the Hydrologic Engineering Center-River Analysis System (HEC-RAS) model can be used for flooding impacts and scour velocity evaluations. In the Hydrology and Hydraulics Report (Appendix F), the HEC-Hydrologic Modeling System (HEC-HMS) model was applied for interior drainage and produced Tables 22-43. It is unclear if there was a linkage from the NACCS to the HEC-HMS and HEC-RAS models that could be useful for the river flow routing. USACE has stated further modeling would be developed during the PED phase to refine the TSP/LPP. Therefore, it is confusing to understand which model produced the flood predictions for the TSP/LPP.
2. It is important to document the models and their usefulness to the reader, yet, for example, there are no calibration or validation plots in the HSGRR/EA nor the Hydrology and Hydraulics Report. The HSGRR/EA (p. 101) describes flooding with and without the project (TSP/LPP). This is important to present if the results were directly from the NACCS model. If so, USACE should describe where the calibration of the model has been documented and if it is a USACE-approved planning model.
3. In the HSGRR/EA and the Hydrology and Hydraulics Report, there are various figures showing flood elevations (some of which are simulated with NACCS). It is unclear if the following (HSGRR/EA, pg. 101) was simulated.

During storms that exceed the design criteria of the pump stations, some ponding of stormwater in the interior portions of Newark would occur, resulting in localized residual flooding. This is expected to be an infrequent occurrence; however, any residual flooding is expected to be far less than any associated storm surge when compared to the No Action Alternative. In cases of excessive rainfall without an accompanying storm surge, the residual flooding may result in minor to moderate impact to the communities within the drainage areas.

Significance – Low

It is not clear what model produced the flooding analysis for the TSP/LPP or what additional modeling will be done in the future therefore, the impact the implementation of the TSP/LPP cannot be determined.

Final Panel Comment 10

Recommendation for Resolution

1. Explain the future phases of modeling during PED that inform the public of additional studies of the TSP/LPP during design. This would also help develop the future scopes and budgets required to support the design and could be added to Section 4.7 under “Key Uncertainties.”
2. Include a full calibration and validation for the flood stages from the NACCS model in the HSGRR/EA; the current NACCS references are from 2015.

Final Panel Comment 11

FEMA-accredited levee criteria have not been considered, which may not be consistent with goals based on similar, on-going HUD-financed flood protection projects.

Basis for Comment

FEMA levee accreditation can reduce flood insurance costs as well as building code flood mitigation requirements applicable to new construction, substantial improvement, and substantial damage projects. The Department of Housing and Urban Development (HUD) considers FEMA accreditation to be a fundamental design goal and benefit of these projects, which are similar in nature and purpose to the TSP. FEMA accreditation is an important goal for large (municipal) scale perimeter flood protection projects like the one proposed. Without FEMA accreditation (or remapping for a non-accredited levee), by regulation, future flood mitigation requirements will be the same (for property owners) as if the project hadn't been constructed.

FEMA accreditation has been a key consideration on similar flood protection projects in New York, New Jersey, and Connecticut. Specifically, the Rebuild by Design projects in New York City, New Jersey and Connecticut funded by Post-Sandy Public Assistance funding and managed through HUD required the following (79 FR 62182 [2014]):

The grantee must certify in its Action Plan Amendment that it, or the local authority assuming ownership of a levee, will take action to ensure the levee is certified and meets FEMA standards at 44 CRF 65.10 and is subsequently accredited by FEMA, which allows for floodmaps to be re-drawn accordingly, HUD, Third Allocation, 79 Fed. Reg. 62182-01, Oct. 16, 2014. HUD can also waive this requirement if the grantee is unable to get certification once the flood control structure is complete.

The implications of FEMA accreditation (or lack of) are not discussed or considered in the documentation, including benefit-cost analyses. The implications of remapping for a non-accredited levee are also not discussed or considered in the HSGRR/EA.

Significance – Low

The lack of FEMA accreditation may be perceived, now or in the future, as a project deficiency.

Recommendation for Resolution

1. Confirm with key stakeholders that FEMA accreditation should not be a project goal.

Literature Cited:

Third Allocation, Waivers, and Alternative Requirements for Grantees Receiving Community Development Block Grant (CDBG) Disaster Recovery Funds in Response to Hurricane Sandy. 79 FR 62182 (2014). Available online at: <https://www.federalregister.gov/documents/2014/10/16/2014-24662/third-allocation-waivers-and-alternative-requirements-for-grantees-receiving-community-development>

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.

Third Allocation, Waivers, and Alternative Requirements for Grantees Receiving Community Development Block Grant (CDBG) Disaster Recovery Funds in Response to Hurricane Sandy. 79 FR 62182 (2014). Available online at: <https://www.federalregister.gov/documents/2014/10/16/2014-24662/third-allocation-waivers-and-alternative-requirements-for-grantees-receiving-community-development>

USACE (2012). Water Resources Policies and Authorities: Civil Works Review. Engineer Circular (EC)

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APPENDIX A

IEPR Process for the Passaic Tidal Project

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

Table A-1 presents the major milestones and deliverables of the Passaic Tidal Project 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 the U.S. Army Corps of Engineers (USACE) on January 30, 2018. Note that the actions listed under Task 6 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 June 1, 2018. The actual date for contract end will depend on the date that all activities for this IEPR are conducted and subsequently completed.

Table A-1. Major Milestones and Deliverables of the Passaic Tidal Project IPER

Task		Due Date
1	Award/Effective Date	1/12/2018
	Review documents available	1/30/2018
	Public comments available	2/1/2018
	Battelle submits draft Work Plan ^a	2/12/2018
	USACE provides comments on draft Work Plan	2/20/2018
	Battelle submits final Work Plan ^a	2/22/2018
2	Battelle submits list of selected panel members ^a	2/2/2018
	USACE confirms the panel members have no COI	2/21/2018
3	Battelle convenes kick-off meeting with USACE	2/8/2018
	Battelle convenes kick-off meeting with panel members	2/28/2018
	Battelle convenes kick-off meeting with USACE and panel members	3/1/2018
4	Panel members complete their individual reviews	3/19/2018
	Battelle sends public comments to panel members for review	3/27/2018
	Panel members provide draft Final Panel Comments to Battelle	3/29/2018
	Panel confirms no additional Final Panel Comment is necessary with regard to the public comments	4/2/2018
	Panel finalizes Final Panel Comments	4/4/2018
5	Battelle submits Final IEPR Report to USACE ^a	4/10/2018
6 ^b	Battelle convenes Comment Response Teleconference with panel members and USACE	5/16/2018
	Battelle submits pdf printout of DrChecks project file ^a	6/1/2018
	Agency Decision Milestone (ADM) meeting ^c	5/15/2018
	Post-ADM Senior Leader Meeting (SLM) (estimated date) ^c	3/1/2019
	Contract End/Delivery Date	

^a Deliverable.

^b Task 6 occurs after the submission of this report.

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

At the beginning of the Period of Performance for the Passaic Tidal Project 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 18 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.

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

Review Documents	Page Count
Draft Integrated Feasibility Report & Environmental Assessment	146
Appendix A: Federal Consistency Assessment	23
Appendix B1: Clean Water Act Section 404(b)(1)	11
Appendix B2: Clean Air Act Conformity, record of Non-Applicability	6
Appendix C: Essential Fish Habitat Assessment	14
Appendix D: Pertinent Correspondence, Consultation, and Coordination	80
Appendix E: Draft Programmatic Agreement	27
Appendix F: Draft Hydrology and Hydraulics	80
Appendix G: Draft Economic	47
Appendix H: Draft Cost Engineering	21
Appendix I: Draft Real Estate Plan	28
Appendix J: Draft Engineering and Design	44
Appendix J-1: Geotechnical Report	75
Appendix J-2: Floodwall Design Criteria	66
Appendix J-3: Draft Closure Gates	15
Appendix J-4: Schedule	1
Appendix J-5: Drawings	21
Public Comments	17
Total Number of Review Pages	722

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.
- Foundations of SMART Planning
- SMART Planning Bulletin (PB 2013-03)
- SMART – Planning Overview
- Planning Modernization Fact Sheet.
- USACE Climate Change Adaptation Plan (June 2014)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs.

Near the end of the review, a teleconference was held with USACE, Battelle, and the Panel so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted 15 panel member questions to USACE. USACE was able to provide responses to all the questions during the teleconference or written responses to all the questions prior to the end of the review.

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 Passaic Tidal Project 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 members 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:** There is a fundamental issue within study documents or data that will influence the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
 2. **Medium/High:** There is a fundamental issue within study documents or data that has a strong probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
 3. **Medium:** There is a fundamental issue within study documents or data that has a low probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
 4. **Medium/Low:** There is missing, incomplete, or inconsistent technical or scientific information that affects the clarity, understanding, or completeness of the study documents, and there is uncertainty whether the missing information will affect the selection of, justification of, or ability to implement the recommended plan.

5. Low: There is a minor technical or scientific discrepancy or inconsistency that affects the clarity, understanding, or completeness of the study documents but does not influence the selection of, justification of, or ability to implement the recommended plan.

- 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, 11 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 Conduct of the Public Comment Review

Following the schedule in Table A-1, Battelle received a PDF file containing 17 pages of public comments on the Passaic Tidal Project documents from USACE. Battelle then sent the public comments to the panel members in addition to the following charge question:

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

The Panel produced individual comments in response to the charge question. Each panel member's individual comments for the public comment review were shared with the full Panel. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. Upon review, Battelle determined, and the Panel confirmed, that no issues or concerns were identified other than those already covered in the Final Panel Comments. However, the Panel noted that some of the issues raised in the public comments were similar to concerns raised in the IEPR Final Panel Comments, particularly concerning the Ironbound district and whether the full area is covered by the Newark Flanking Plan.

A.6 Final IEPR Report

After concluding the review and formulation 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.7 Comment Response Process

As part of Task 6, Battelle will enter the 11 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.

APPENDIX B

Identification and Selection of IEPR Panel Members for the Passaic Tidal Project

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B.1 Panel Identification

The candidates for the Passaic River Tidal Protection Area, New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRSM) Project (hereinafter: Passaic Tidal Project IEPR) Panel were evaluated based on their technical expertise in the following key areas: plan formulation/economics, environmental law and compliance, hydrology and hydraulic engineering, or civil/structural engineering. These areas correspond to the technical content of the review documents and overall scope of the Passaic Tidal project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle’s Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected four experts for the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

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 Questionnaire for the IEPR of the Passaic Tidal Project

- | | |
|--|--|
| 1. Previous and/or current involvement by you or your firm in the Passaic Tidal, New Jersey, Tidal Protection Area, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRSM) Project (hereinafter: Passaic Tidal Project), Passaic River Mainstem, New Jersey Flood Risk Management Project (hereinafter: Passaic Mainstem), and/or related projects. | |
| 2. Previous and/or current involvement by you or your firm in coastal storm risk management studies or work related to the Passaic Tidal project. | |
| 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 any projects in the Passaic Tidal, Passaic Mainstem, and/or related projects. | |

Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the Passaic Tidal Project

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 the Passaic Tidal CSRM, Passaic Mainstem, and/or related projects.	
6. Previous and/or current employment or affiliation with the non-Federal sponsor or any of the following cooperating Federal, state, county, local, and regional agencies, environmental organizations, and interested groups (<i>for pay or pro bono</i>):	
<ul style="list-style-type: none"> • New Jersey Department of Environmental Protection • City of Harrison • City of Newark • City of Kearny • The County of Essex, New Jersey • The Trust for Public Land • Passaic River Institute • Passaic River Coalition • The Passaic River Basin Flood Advisory Commission • NY/NJ Baykeeper • Sierra Club, New Jersey Chapter • Hackensack Riverkeeper • Ironbound Community Corporation 	
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to the Passaic River.	
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 New York District.	
9. Previous or current involvement with the development or testing of models (such as Hydrologic Engineering Center-Flood Damage Reduction Analysis (HEC-FDA)) that will be used for, or in support of the Passaic Tidal project.	
10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the New York 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 New York District. Please explain.	
11. Any previous employment by USACE as a direct employee, notably if employment was with the New York District. If yes, provide title/description, dates	

Panel Conflict of Interest (COI) Screening Questionnaire for the IEPR of the Passaic Tidal Project	
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 New York 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 coastal storm risk management or impacts on New Jersey coastal areas and include the client/agency and duration of review (approximate dates).	
14. Pending, current, or future financial interests in Passaic Tidal project-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. Significant portion of your personal or office's revenues within the last three years came from New Jersey Department of Environmental Protection contracts.	
17. Any publicly documented statement (including, for example, advocating for or discouraging against) related to the Passaic Tidal project.	
18. Participation in relevant prior and/or current Federal studies relevant to this project and/or the Passaic River.	
19. Previous and/or current participation in prior non-Federal studies relevant to this project and/or the Passaic River.	
20. Has your research or analysis been evaluated as part of the Passaic Tidal project?	
21. 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. The term "firm" in a screening question referred to any joint venture in which a firm was involved. It applied to whether that firm serves as a prime or as a subcontractor to a prime. Candidates were asked to clarify the relationship in the screening questions.

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. Table B-1 provides information on each panel member's 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. Passaic Tidal Project IEPR Panel: Summary of Panel Members

Name	Affiliation	Location	Education	P.E.	Exp. (yrs)
Plan Formulation / Economics					
Lewis Hornung	DR Reed & Associates, Inc.	Jupiter, FL	B.S., Civil Engineering	N/A	40
Environmental Law and Compliance					
Dennis Barnett	Tetra Tech	Atlanta, GA	M.S., Water Resources Planning	Yes	43
Hydrology and Hydraulic (H&H) Engineering					
Steven Davie	GHD	Atlanta, GA	M.E., Civil Engineering	Yes	23
Civil / Structural Engineering					
Daniel Stapleton	GZA	Norwood, MA	M.S., Ocean and Civil Engineering	Yes	35

Table B-2 presents an overview of the credentials of the final four members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information on the panel members and their areas of technical expertise is given in Section B.3.

Table B-2. Passaic Tidal Project IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Hornung	Barnett	Davie	Stapleton
Plan Formulator / Economics				
Minimum of 15 years of demonstrated experience in economics	X			
Minimum M.S. degree or higher in economics	W ¹			
Familiar with USACE plan formulation processes, procedures, and standards as they relate to urban CSRM studies, especially in highly developed areas	X			
Minimum of five years of experience dealing directly with the USACE six-step planning process and policies governed by ER 1105-2-100, Planning Guidance Notebook, and SMART planning risk-informed assessment	X			
Familiar with USACE application of risk and uncertainty analyses in storm damage reduction studies	X			
Familiar with standard USACE Engineering Center (HEC-FDA) economic modeling computer software, including flood damage analysis	X			
Environmental Law and Compliance				
Minimum of 15 years of experience directly related to water resources environmental evaluation		X		
Minimum M.S. degree or higher in a related field		X		
At least 10 years of demonstrated experience in evaluating and conducting National Environmental Policy Act (NEPA) impact assessments, including cumulative effects analyses for complex, multi-objective public works projects with competing trade-offs		X		
Familiar with environmental concerns and constraints within urban settings, including Hazardous, Toxic, and Radioactive Waste (HTRW) familiarity		X		
Familiar and have experience with United States Fish and Wildlife Service Habitat Evaluation Procedure (USWFS, 1980), Endangered Species Act, Clean Water Act, and essential fish habitat		X		
Hydrology and Hydraulic (H&H) Engineering				
Minimum of 15 years of experience in H&H engineering			X	
Expert in the field of urban hydrology and hydraulics with a thorough understanding of open-channel systems and tidally influenced riverine systems			X	
Familiar with USACE application of risk and uncertainty analyses in storm risk management studies			X	
Familiar with standard USACE H&H computer model, HEC-FDA.			X	
Understanding of Safety Assurance Review (SAR) in accordance with ER 1110-2-1150			X	

Table B-2. Passaic Tidal Project IEPR Panel: Technical Criteria and Areas of Expertise (continued).

Technical Criterion	Hornung	Barnett	Davie	Stapleton
Registered Professional Engineer			X	
Civil / Structural Engineering				
Minimum of 10 years of experience in structural engineering from academia, a public agency whose mission includes CSRM, or an Architect/Engineer or consulting firm				X
Thorough understanding of structural measures to include, but not be limited to, levees, floodwalls, retaining walls, channel improvements, and tide gates in urban setting				X
Demonstrated experience in performing geotechnical evaluation and geo-civil design for all phases of CSRM projects				X
Understanding of Safety Assurance Review (SAR) in accordance with ER 1110-2-1150				X
Registered Professional Engineer				X

W¹ - The PWS states that the Plan Formulator/Economics panel member should have a “Minimum MS degree or higher in economics”. Mr. Lewis Hornung earned a B.S. in civil engineering and has 40 years of experience directly related to plan formulation and economics as they relate to coastal storm risk management. While Mr. Hornung does not have a Master’s degree in economics, Battelle is confident that his years of experience make him a highly suitable expert for these panel positions.

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	Lewis Hornung
Role	Plan Formulation/Economics
Affiliation	DR Reed & Associates, Inc.

Mr. Hornung is a planning expert with DR Reed & Associates in Jupiter, Florida, specializing in the planning, economics, design phase, and operation of water resources and public works projects. He earned his B.S. in civil engineering from the University of Houston in 1977. His 40-year career includes 19 years with USACE, seven years with the South Florida Water Management District, and the remainder with private architectural/engineering consulting firms. He has played lead roles on many planning projects, including studies for coastal planning, flood damage reduction, ecosystem restoration, and water supply. He has taken part in previous IEPR panels for Battelle as an economist/Civil Works planning expert, including the recent CSRМ study in the northeastern part of the U.S. for the Raritan Bay and Sandy Hook Bay Highlands, New Jersey, Feasibility Study and the flood risk management project for the Middle Rio Grande Flood Protection Project, Bernalillo to Belen, New Mexico, General Reevaluation Report and Supplemental Environmental Impact Statement.

Mr. Hornung has direct experience in USACE plan formulation processes, procedures, and standards. His career at USACE included more than 12 years in the Galveston and Jacksonville Districts. He is familiar with USACE plan formulation processes, procedures, and standards as they relate to hurricane and urban CSRМ studies in highly developed areas. Following Hurricane Katrina, he spent two years in New Orleans supporting USACE recovery efforts as a member of the team for the Louisiana Area Coastal Protection and Restoration Study. This study developed a regional plan for providing protection against coastal flooding using a combination of wetland restoration and traditional structural and non-structural measures. He also managed two studies addressing coastal protection and wetland restoration as part of the Louisiana Coastal Area Project. In addition, for the C-4 Miami Canal Flood Control Study, he developed a methodology for identifying incremental measures for maintaining flood protection against flooding associated with sea level rise over the next 100 years in this urbanized area. The methodology involved the use of USACE's Hydrologic Engineering Center River Analysis System (HEC-RAS) and HEC-Flood Damage Reduction Analysis (HEC-FDA) models, sea level rise projections, and storm surge modeling to identify incremental steps to cost effectively maintain flood protection for metropolitan Miami over time as sea levels rise.

Mr. Hornung has applied the USACE six-step planning process, governed by Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook, for reconnaissance studies, feasibility studies, limited reevaluation reports, general reevaluation reports, major rehabilitation reports, and continuing authority studies. Relevant studies include the C-111 General Reevaluation Report (GRR) (SAJ), the C-51 West GRR (SAJ), the Lake Okeechobee Watershed Feasibility Study (SAJ), Herbert Hoover Dike Major Rehabilitation Report (SAJ), and the Alexandria to the Gulf of Mexico Flood Control Feasibility Study, New Orleans District (MVN).

Mr. Hornung managed four contracts between 2011 and 2017 supporting USACE Headquarters in the development of strategies and procedures for implementing SMART Planning. Additionally, he has applied SMART Planning principles in many feasibility studies since 2011.

Mr. Hornung has more than 10 years of experience conducting traditional National Economic Development (NED) plan benefits associated with flood risk management projects, all of which required the evaluation of NED benefits. His extensive experience conducting NED and Regional Economic Development (RED) evaluations reflects his capability in evaluating traditional NED plan benefits associated with hurricane and CSRM projects. Relevant studies include the Comprehensive Everglades Restoration Plan Feasibility Study, Alexandria to the Gulf of Mexico Feasibility Study, C-51 West General Reevaluation Study, Herbert Hoover Dike Major Rehabilitation, and C-111 General Reevaluation Study. In addition, he served on the IEPR Panel to evaluate the NED analysis that was performed using HEC-RAS for the West Sacramento Flood Risk Management GRR by the Sacramento District.

Mr. Hornung has more than five years of experience working with HEC-FDA for many USACE studies, including storm damage reduction studies. For example, the Northwest El Paso Flood Risk Management Feasibility Study involved application of FLO-2D and HEC-RAS for Hydrology and Hydraulics simulations and use of HEC-FDA to calculate flood damages. Mr. Hornung has participated in many studies that required calculation of flood risk management benefits, several of which have involved the use of HEC-FDA. His involvement in the Alexandria to the Gulf of Mexico Feasibility Study for the New Orleans District illustrates his experience with HEC-FDA. As an employee of HDR Engineering, he served as study manager and utilized HEC-RAS to simulate the complex system of primary and secondary flood control canals in the town of Alexandria and downstream areas, and then applied an innovative application for automating data input to HEC-FDA. HEC-FDA was used to calculate flood damages for the without- and with-project alternatives. The application was so successful that he later managed a contract with HEC to modify the application for broader use.

Name	Dennis Barnett, P.E.
Role	Environmental Law and Compliance
Affiliation	Tetra Tech, Inc.

Mr. Barnett is a civil engineer with 43 years of experience in water resource and environmental planning. Prior to joining Tetra Tech in 2009, he had a 34-year career with USACE as a water resource and environmental planner covering both the South Atlantic Division and the Mobile District. Mr. Barnett has extensive experience applying planning principles and procedures to address water resource problems and opportunities, including plan formulation, public involvement, trade-off analysis, and environmental impact assessment. He is a recognized expert in developing and coordinating environmental assessments and impact statements in accordance with the National Environmental Policy Act (NEPA). His experience includes addressing substantive and procedural requirements of relevant environmental laws and regulations and working collaboratively with local, state, and Federal agencies, environmental organizations, and other interest groups on complex and controversial water resource projects. He was responsible for successful implementation of NEPA for USACE activities in the South Atlantic region as well as compliance with applicable environmental laws, regulations, policies, and executive orders. He is knowledgeable of USACE regulations and policies governing the presence of hazardous, toxic, and/or radioactive wastes (HTRW) on Civil Works projects and has effectively applied that knowledge to ensure

compliance with HTRW requirements for Civil Works projects in the successful completion of numerous planning and post-authorization reports, or in the review of these reports.

As a senior USACE environmental planner for 25 years, Mr. Barnett performed, or provided oversight for, planning and environmental activities in support of large- and small-scale water resource projects across the southeastern United States, Puerto Rico, and Virgin Islands. He facilitated the resolution of complex and controversial planning and environmental issues necessary to the successful completion of numerous large and small water resource studies and projects addressing deep- and shallow-draft navigation channel improvements, coastal storm damage reduction, flood risk management, and ecosystem restoration. He participated in the development and evolution of policies and procedures for Civil Works reviews, including agency technical reviews and independent external peer reviews, and facilitated the implementation of those reviews in the USACE South Atlantic region.

Following his career with USACE, Mr. Barnett has continued to be involved with USACE Civil Works projects as a consultant with Tetra Tech, including such activities as lead planner for a watershed study for the Detroit District; a principal author of a major Environmental Impact Statement for a controversial update of the master water control manual for several reservoirs in the Mobile District; and team leader for completion of cultural resource, wetlands, and endangered species surveys and the assessment of potential impacts on these resources in support of the engineering and design for two significant environmental mitigation features for the Savannah Harbor Expansion Project. In a recent project to develop a stream restoration and trail plan in the highly urbanized downtown Louisville, Kentucky, area, Mr. Barnett completed an inventory of potential HTRW sites within the stream corridor and identified specific areas for detailed analysis in subsequent phases of the project. He has worked with various habitat-based models and procedures to evaluate and select cost-effective ecosystem restoration plans and has led coordination, consultation, and compliance activities to meet the requirements of Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, and Magnuson-Steven Fisheries Conservation and Management Act (essential fish habitat) for numerous Civil Works projects, both during his USACE career and as a consultant.

Name	Steven Davie, P.E., D. CE
Role	Hydrology and Hydraulic (H&H) Engineering
Affiliation	GHD

Mr. Davie is a civil engineer with more than 23 years of experience working on river, tidal, and coastal-related projects involving hydrodynamic modeling, coastal engineering, mitigation, engineering design, feasibility studies, EIS development, and data collection. He received an M.E. in civil engineering, with an emphasis on coastal engineering, from the University of Florida in 1997. He is a registered professional engineer in Georgia and has specialized in coastal/riverine hydraulics with over 40 applications to estuaries, ports, and navigation channels. Mr. Davie has managed multi-disciplined projects drawing on his leadership and mentorship capabilities. He has managed and served as a technical leader on several large projects such as the Savannah Harbor Expansion Project, Post 45 Charleston Harbor Deepening, Panama Canal Third Set of Locks, Port Qasim in Pakistan, Choctaw Point Terminal in Alabama, and the Calcasieu Ship Channel in Louisiana.

As an expert in the field of urban H&H, Mr. Davie has worked on numerous H&H projects in locations such as the City of Atlanta (Chattahoochee River); the City of Memphis (Lick Creek); and the

Tittabawassee, Mobile, Kalamazoo, and Fox Rivers. Most recently, Mr. Davie is leading the Hurricane Irma Recovery Support for the St. Marys River waterfront project. He was the lead coastal engineer to support a construction and engineering team to rebuild the waterfront for the City of St. Marys in southeast Georgia.

Mr. Davie has a thorough understanding of open-channel systems and tidally influenced riverine systems. He was lead hydraulic engineer on the 2011 Hurricane Plan for the Inner Harbor Navigation Channel (IHNC), Lake Borgne Surge Barrier design-build project. The purpose of the hydraulic study was to determine the operations scenario for the Bayou Bienvenue Lift Gate during the 2011 hurricane season. The hydraulic calculations assisted the team on the velocities expected through the gate and scour protection for the structure and adjacent wetlands.

Additionally, in 2014 on the Savannah Harbor Expansion Project, Mr. Davie was Principal-in-Charge for the design of two mitigation projects to offset the effects of deepening the navigation channel. First, the flow diversion project in the upper estuary was developed to divert freshwater from the Savannah River to the sensitive parts of the middle estuary, on the Middle and Little Back Rivers. Second, the New Savannah Bluff Lock and Dam Fish Passage was developed to allow sturgeon and other fish to pass around the lock and dam to upstream spawning grounds near Augusta, Georgia.

Mr. Davie has a thorough understanding of the HEC-RAS model. His master’s thesis was titled “Determination of Roughness Coefficients in Heavily Vegetated Flood Plains and their use in the HEC-RAS model.” Working with Dr. Bent A. Christensen at the University of Florida, Mr. Davie analyzed several flood events in Florida, on the Mississippi River, and on the Red River for HEC-RAS results and the validity of the Manning equation in heavily vegetated floodplains.

Mr. Davie was selected as a Diplomate in Coastal Engineering (D.CE) in 2014 from the Academy of Coastal, Ocean, Port and Navigation Engineers. He is a member of the Coasts, Oceans, Ports, and Rivers Institute (COPRI), the American Society of Civil Engineers (ASCE), the Society of American Military Engineers, the American Association of Port Authorities, the Waterways Infrastructure Subcommittee (ASCE/COPRI) in 2015-17, and the ASCE Ports & Harbors Technical Committee.

Name	Daniel Stapleton, P.E.
Role	Civil / Structural Engineering
Affiliation	GZA

Mr. Stapleton is a civil engineer with more than 35 years of experience in civil and coastal engineering, including coastal resilience, coastal processes, shoreline protection, and coastal flood protection using hard-structure, hybrid, and natural and nature-based systems. He is expert in the application of USACE risk-informed decision making for site evaluation, vulnerability assessment, and design.

Mr. Stapleton earned an M.S. in ocean and civil engineering from the University of Rhode Island in 1987 and has professional degrees in geology, civil engineering, and geotechnical engineering. He is a registered professional engineer in Massachusetts, Connecticut, and Florida. Currently, he is a Senior Principal and Senior Vice President at GZA, where he leads GZA’s Water and Natural Hazard Mitigation and Resilience services.

Mr. Stapleton's expertise encompasses (1) characterization of coastal hazards (tides, wind, storm surge, waves, and precipitation) under current and future climate conditions; (2) integration of numerical hydrodynamic, wave, and sediment transport modeling with the design of coastal and shoreline protection systems (ranging from natural and nature-based systems to hard structures); (3) the application of risk analysis (including the application of probability and statistics to coastal projects) and risk-informed decision making; (4) coastal vulnerability assessment; and (5) coastal resilience planning. Mr. Stapleton is very familiar with the development of the USACE North Atlantic Coast Comprehensive Study and the USACE Coastal Hazards System.

Mr. Stapleton's project experience ranges from critical infrastructure projects to municipal resilience planning to project design and construction. He was responsible for leading GZA's team in re-evaluating the external flood hazard for about 40 percent of the U.S. nuclear power fleet in response to a Nuclear Regulatory Commission post-Fukushima mandate to evaluate "beyond design basis" flood risk. These studies included multiple coastal sites (Gulf of Mexico, Mid-Atlantic, and Northeast) and represented some of the most robust analyses of very low-probability flood risk performed in the United States. Mr. Stapleton has completed coastal flood vulnerability assessment and resiliency planning and design for multiple non-nuclear power plants and substations in New Jersey, New York, and Connecticut. He has completed coastal resilience planning studies for Stratford, Westport, Old Saybrook, and New Haven, Connecticut, funded under Housing and Urban Development Community Development Block Grants. These resilience projects included flood vulnerability assessment, loss estimation and development of resilience and climate adaptation strategies, policies and procedures, and physical projects.

Mr. Stapleton has completed engineering analysis, conceptual and final design, and permitting for shoreline protection and coastal flood protection in both natural and urban environments. As an example, the proposed Long Wharf Flood Protection Project, New Haven, Connecticut, uses an integrated approach to coastal flood protection that includes a living shoreline, beach nourishment, coastal revetment, and a flood protection seawall. Mr. Stapleton has been responsible for metocean data analysis, numerical modeling, and environmental load assessment for design of transportation and marine infrastructure, including bridges, ferry terminal, and port piers. For the last 35 years, Mr. Stapleton has also been the lead civil and geotechnical engineer for hundreds of projects ranging in design fees from \$50,000 to \$10 million.

Mr. Stapleton is a part-time member of the ASCE Infrastructure Resilience Division-Civil Infrastructure and Lifeline Systems National Committee; a former member the Nuclear Energy Institute's Fukushima Flooding Task Force; and a member of ASCE. He is a nationally recognized speaker on climate change and natural hazard risk mitigation.

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APPENDIX C

Final Charge for the Passaic Tidal Project IEPR

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Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the Passaic River Tidal Protection Area, New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRM) Project

This is the final Charge to the Panel for the Passaic Tidal Project IEPR. This final Charge was submitted to USACE as part of the final Work Plan, originally submitted on February 22, 2018.

BACKGROUND

The study is the Passaic River Tidal Protection Area (see Figures 1 and 2 below), New Jersey, Draft Integrated HSGRR/EA, CSRM Project. The purpose of this study is to identify and re-evaluate CSRM options within the Passaic River Tidal Area. The decision document presents planning, engineering, and implementation details of the recommended plan to allow final design and construction to proceed subsequent to approval of the plan. In response to Hurricane Sandy in October 2012, this effort is part of the Public Law 113-2, the Disaster Relief Appropriation Act of 2013. The project sponsor is the New Jersey Department of Environmental Protection (NJDEP).

The 1990 authorization for the Passaic River Main Stem includes an area known as the Tidal Area Protection and provided "protection in the Lower Passaic Valley [which] included 5.5 miles of levees and 5.0 miles of floodwalls lying downstream of Interstate 280 to Newark Bay which provide 500-year protection against hurricane and tidal surges." The Coastal Storm Risk Management measures that are examined in the reevaluation report (channel modification, levees, floodwalls, as well as tide gates) are also being reconsidered in light of changes to existing conditions and changes to environmental policy.

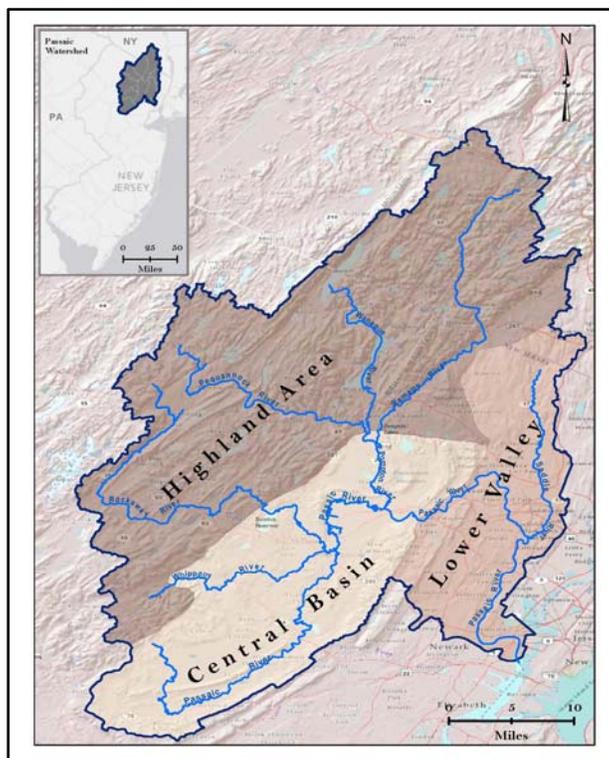


Figure 1: Passaic River Basin Study Area

The District initiated a general reevaluation study to determine if the authorized plan is still economically justified, environmentally acceptable, and technically feasible. Based on the significant changes in the basin since authorization of the project, other alternatives were also considered. The Passaic River Basin, Tidal Protection Area, New Jersey, HSGRR/EA CSRM Project has been developed to reflect the U.S. Army Corps of Engineers (USACE) modernized planning initiative, in which project studies use a risk-informed assessment, generally with only enough detail developed for each alternative to allow relative comparison, to determine the appropriate information to identify a Tentatively Selected Plan (TSP). Although this new process has altered the milestones and evaluation procedures in a feasibility study, the manner in which alternatives are developed from problems, opportunities, measures, and constraints remains the same.

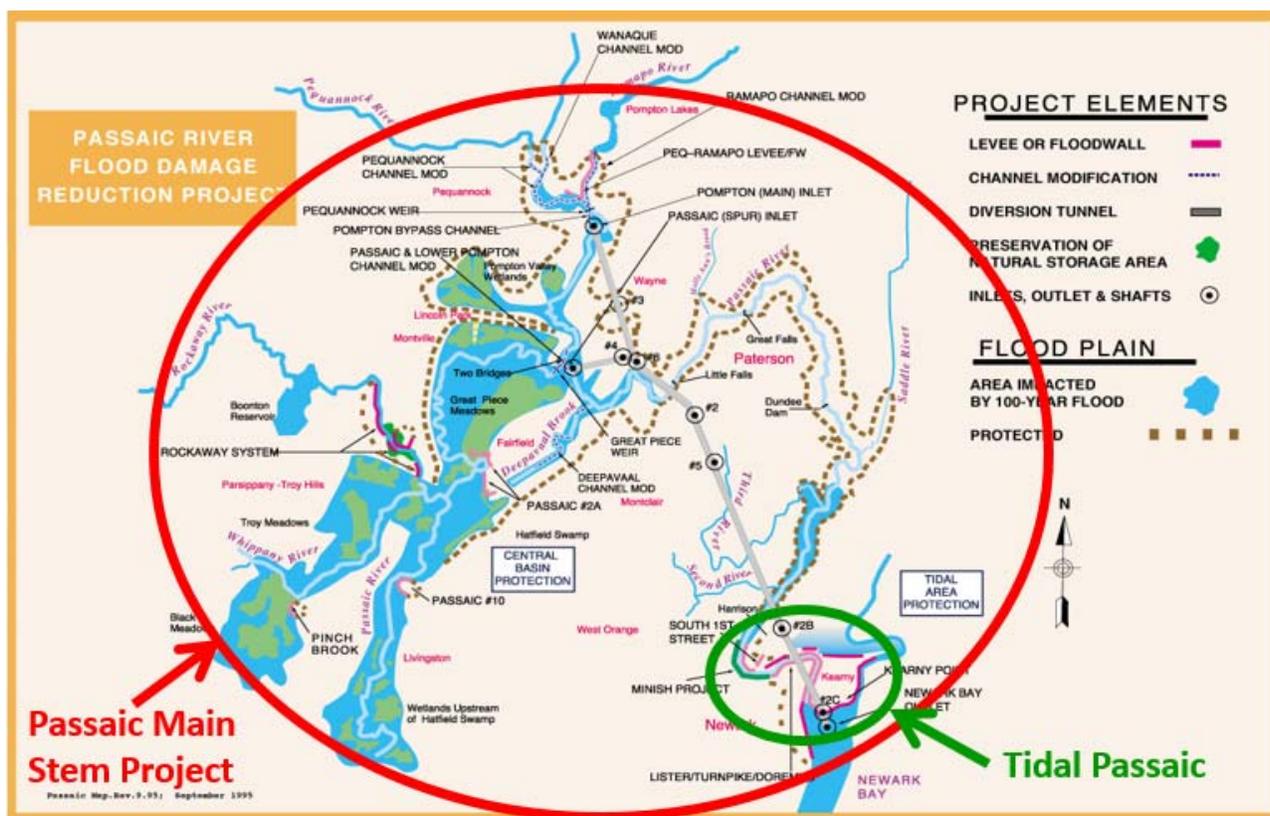


Figure 2: Location of the Passaic Mainstem River Basin New York and New Jersey

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Passaic River Tidal Protection Area, New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Assessment (HSGRR/EA), Coastal Storm Risk Management (CSRM) Project (hereinafter: Passaic Tidal Project 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. The review assignments per panel member may vary slightly according to discipline.

Review Documents	Page Count
Draft Integrated Feasibility Report & Environmental Assessment	146
Appendix A: Federal Consistency Assessment	23
Appendix B1: Clean Water Act Section 404(b)(1)	11
Appendix B2: Clean Air Act Conformity, record of Non-Applicability	6
Appendix C: Essential Fish Habitat Assessment	14
Appendix D: Pertinent Correspondence, Consultation, and Coordination	80
Appendix E: Draft Programmatic Agreement	27
Appendix F: Draft Hydrology and Hydraulics	80
Appendix G: Draft Economic	47
Appendix H: Draft Cost Engineering	21
Appendix I: Draft Real Estate Plan	28
Appendix J: Draft Engineering and Design	44
Appendix J-1: Geotechnical Report	75
Appendix J-2: Floodwall Design Criteria	66
Appendix J-3: Draft Closure Gates	15
Appendix J-4: Schedule	1
Appendix J-5: Drawings	21

Review Documents	Page Count
Public Comments	17
Total Number of Review Pages	722

* Page count for public comments is approximate. USACE will submit public comments to Battelle, who will in turn submit the comments to the IEPR Panel.

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.
- USACE Climate Change Adaptation Plan (June 2014)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs

SCHEDULE & DELIVERABLES

This schedule is based on the receipt date of the final review documents. This schedule may also change due to circumstances out of Battelle’s control such as changes to USACE’s project schedule and unforeseen changes to panel member and USACE availability. As part of each task, the panel member will prepare deliverables by the dates indicated in the table (or as directed by Battelle). All deliverables will be submitted in an electronic format compatible with MS Word (Office 2003).

Task	Action	Due Date Working Days
Attend Meetings and Begin Peer Review	Battelle convenes kick-off meeting with USACE	2/8/2018
	Battelle sends review documents to panel members	2/27/2018
	Battelle convenes kick-off meeting with panel members	2/28/2018
	Battelle convenes kick-off meeting with USACE and panel members	3/1/2018
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	3/7/2018
	Battelle participates in the ADM Meeting	5/15/2018
	Battelle participates in the SLM	3/1/2019
Prepare Final Panel Comments	Panel members complete their review of the documents	3/16/2018
	Battelle provides talking points to panel members for Panel Review Teleconference	3/19/2018
	Battelle convenes Panel Review Teleconference	3/19/2018
	Battelle provides Final Panel Comment templates and instructions to panel members	3/20/2018
	Panel members provide draft Final Panel Comments to Battelle	3/23/2018
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	3/24/2018 - 4/01/2018
	Panel finalizes Final Panel Comments	4/2/2018
Review Public Comments	Battelle receives public comments from USACE	2/1/2018
	Battelle sends public comments to Panel**	3/19/2018
	Panel members complete their review of the public comments	3/23/2018
	Battelle and Panel review Panel's responses to the public comment charge question	3/26/2018
	Panel drafts Final Panel Comment on public comments, if necessary	3/27/2018
	Panel finalizes Final Panel Comment regarding public comments, if necessary	3/29/2018
Review Final IEPR Report	Battelle provides Final IEPR Report to panel members for review	4/4/2018
	Panel members provide comments on Final IEPR Report	4/6/2018
	Battelle submits Final IEPR Report to USACE*	4/10/2018
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	4/17/2018
Comment/Response Process	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	4/18/2018
	Battelle convenes teleconference with USACE to review Comment Response process	4/18/2018
	Battelle convenes teleconference with Panel to review Comment Response process	4/18/2018
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	5/2/2018
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	5/8/2018
	USACE PCX provides draft PDT Evaluator Responses to Battelle	5/9/2018

Task	Action	Due Date Working Days
Comment/Response Process	Battelle provides draft PDT Evaluator Responses to panel members	5/10/2018
	Panel members provide draft BackCheck Responses to Battelle	5/14/2018
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	5/15/2018
	Battelle convenes Comment Response Teleconference with panel members and USACE	5/16/2018
	USACE inputs final PDT Evaluator Responses to DrChecks	5/23/2018
	Battelle provides final PDT Evaluator Responses to panel members	5/24/2018
	Panel members provide final BackCheck Responses to Battelle	5/30/2018
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	5/31/2018
	Battelle submits pdf printout of DrChecks project file*	6/1/2018
	Contract End/Delivery Date	5/31/2019

* Deliverables

** Battelle will provide public comments to the Panel after they have completed their individual reviews of the project documents to ensure that the public comment review does not bias the Panel's review of the project documents.

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; tenzarj@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, Lynn McLeod (mcleod@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, tenzarj@battelle.org no later than 10 pm ET by the date listed in the schedule above.

**Independent External Peer Review of the Passaic River Tidal Protection Area,
New Jersey, Draft Integrated Hurricane Sandy General Reevaluation Report
and Environmental Assessment (HSGRR/EA), Coastal Storm Risk
Management (CSRМ) Project**

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
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.
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
16. The analysis adequately addresses the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.
17. From a public safety perspective, the proposed alternative is reasonably appropriate or are there other alternatives that should be considered?

Specific Technical and Scientific Charge Questions

18. Assess the considered and tentatively selected alternatives for their effectiveness to preserve and protect (or enhance) the historic features of the Ste. Genevieve National Historic Landmark District and National Register Historic District. Assess their effectiveness to preserve and protect other nationally significant structures within the study area but not included in these districts from flood events.

Battelle Summary Charge Questions to the Panel Members¹

Summary Questions

19. 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.
20. Please provide positive feedback on the project and/or review documents.

Public Comment Questions

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

¹ Questions 19 through 21 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.

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APPENDIX D

Conflict of Interest Form

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Conflicts of Interest Questionnaire
Independent External Peer Review
Passaic River

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 Corporate Operations**

REPRESENTATIVE'S NAME: **Emily Forshey**

TELEPHONE: **614-424-5899**

ADDRESS: **505 King Avenue, Columbus, Ohio 43201**

EMAIL ADDRESS: **forshey@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):

The Battelle Norwell (formerly Duxbury) location has conducted work within the project area of this IEPR. Battelle staff, through a subcontract to Louis Berger, have assisted EPA Region 2 and USACE Kansas City District with assessing the risks associated with contamination in the Passaic River and designing the cleanup. This work is conducted under Non-Disclosure Agreements with specific Battelle staff and all other staff have no knowledge of the project. At this time, Battelle's review of the documents has not immediately indicated that data generated by Battelle was directly used in the report. If awarded, Battelle will continue to monitor for any possible conflicts of interest and report any findings that could be perceived as a conflict of interest.

Battelle IEPR project management and assisting staff in Norwell and other locations have no knowledge of the work conducted. The proposed project manager for this proposal has no conflict of interest and no knowledge of the work in this area.

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):

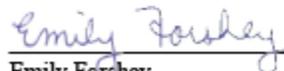
III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? No Yes (if no, briefly describe the difficulty in identifying outside reviewers):

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.



Emily Forshey

December 22, 2017

Date

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BATTELLE

It can be done