DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
2600 ARMY PENTAGON
WASHINGTON, D.C. 20310-2600

AUG 22 2019

CECW-NAD

MEMORANDUM FOR Assistant Secretary of the Army (Civil Works)
108 Army Pentagon, Washington, D.C. 20310-0108

SUBJECT: Atlantic Coast of New York, East Rockaway Inlet to Rockaway Inlet and Jamaica Bay, Integrated Hurricane Sandy General Reevaluation Report and Environmental Impact Statement, New York City, New York – Final U.S. Army Corps of Engineers (Corps) Response to Independent External Peer Review

1. Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-217, and the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).

2. The IEPR was conducted by Analysis Planning and Management Institute and managed by the Logistics Management Institute. The IEPR panel consisted of five members with technical expertise in Civil Works planning/economics, biological resources and environmental law compliance, structural/geotechnical engineering, civil engineering/risk review, and coastal/hydrological/hydraulic engineering.

3. The final written responses to the IEPR are hereby approved. The enclosed document contains the final written responses of the Chief of Engineers to the issues raised and the recommendations contained in the IEPR report. The IEPR Report and the Corps responses have been coordinated with the vertical team and will be posted on the Internet, as required in EC 1165-2-217.

4. If you have any questions on this matter, please contact Ms. Catherine Shuman, Deputy Chief, North Atlantic Division Regional Integration Team, at (202) 761-1379.

Encl

TODD T. SEMONITE
Lieutenant General, USA
Chief of Engineers

I'
To Approve This Report To Build Critical Protective Structure For Rockaway and Jamaica Bay. Supplemental Funding Available Now To Start Planning and Design!
Sandy "Critical Hurricane Project That Needs To Be Built." USACE is Proud

East Rockaway Inlet to Rockaway Inlet and Jamaica Bay
Draft Integrated Hurricane Sandy
General Reevaluation Report and Environmental Impact Statement

US Army Corps of Engineers Response to
Independent External Peer Review
August 2019

Independent External Peer Review (IEPR) was conducted for the East Rockaway Inlet to Rockaway Inlet and Jamaica Bay General Reevaluation Report in accordance with Section 2034 of the Water Resources Development Act of 2007, the U.S. Army Corps of Engineers (USACE) peer review policy (EC 1165-2-217), and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (2004). The goal of the USACE Civil Works program is to always provide scientifically sound, sustainable water resources solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of the products USACE provides to the American people.

The IEPR was conducted by Analysis Planning and Management (APM) Institute and managed by the Logistics Management Institute (LMI). The IEPR panel consisted of five members with technical expertise in Civil Works planning/economics, biological resources and environmental law compliance, structural/geotechnical engineering, civil engineering/risk review, and coastal/hydrological/hydraulic engineering. The IEPR panel comments are documented in the LMI report titled "Independent External Peer Review of the Rockaway Inlet to Rockaway Inlet and Jamaica Bay Draft Integrated Hurricane Sandy General Reevaluation Report and Environmental Impact Statement," dated 11 January 2017.

Thirty-four IEPR final comments were developed by the panel, six of which were identified as having high significance. USACE concurred with 23 comments and did not concur with 11 comments. Of the 50 recommendations made by the IEPR panel, 40 were adopted and 10 were not adopted. The following discussions present the USACE final response to the comments.

1. **IEPR Comment (High Significance). It is unlikely that sufficient information has been provided in this Environmental Impact Statement (EIS) for it to be considered an adequate EIS under the National Environmental Policy Act (NEPA).**

   This comment includes one recommendation, which was adopted.

   1) USACE should incorporate additional information and analyses into this document and reissue the Draft HSGRR/EIS for additional public review or issue a Supplemental Draft EIS in the future.

   USACE Response: Adopted
   Actions Taken/Actions to be Taken: As a result of the Agency Decision Milestone (ADM), the storm surge barrier component to the *tentatively selected plan (TSP)* was deferred to a separate ongoing regional study looking at long term coastal storm risk regionally, including analyzing the feasibility of a constructing a number of storm surge barriers throughout the New York and New Jersey Harbor and Tributaries. Given this significant change to the recommendation, USACE released a Revised Draft General Reevaluation Report/Environmental Impact Statement (GRR/EIS) for a second comment period, which included additional impact analysis for the remaining components of the Recommended Plan. Further impact analysis associated with the proposed storm surge barrier across Jamaica Bay will be conducted, as appropriate, under the New York and New Jersey Harbor and Tributaries (NYNJHATs) Study, which is ongoing.

2. **IEPR Comment (High Significance). The Draft HSGRR/EIS Executive Summary does not contain any conclusions regarding whether the proposed Tentatively Selected Plan (TSP) would cause significant environmental impacts, and, if so, whether they would be mitigated, which result in weakening the compliance of this with Council on Environmental Quality (CEQ) regulations.**

   This comment includes two recommendations, the first of which was adopted.

   1) Include an overall assessment of the information collected to date as to whether or not the project will have "significant" environmental impacts.

   USACE Response: Adopted
   Actions Taken/Actions to be Taken: An overall assessment of the information collected to date on whether or not the project will have significant environmental impacts was added to the executive summary and relevant portions of the Final HSGRR/EIS. This can be seen in the Executive Summary of the Final Report, Section 5.7.2, Table 5-13, Planning Considerations and Constraints discussions in Section 5.10, Section 5.12 (fourth bullet), Section 6.5, Section 7.5.2.1. As a result of the ADM, the storm surge barrier component of the TSP is now being further evaluated under a separate ongoing study, the NYNJHATs Study. Additionally, natural and nature-based features were added to the recommendation on the Bayside, resulting in a net gain of functional habitat resulting

from the Recommended Plan, which obviated the need for any habitat mitigation. Furthermore, coordination with the USFWS on the Biological Opinion resulted in a series of Conservation Measures and Reasonable and Prudent Measures for the project which avoid and reduce impacts to threatened and endangered species. These are discussed in Section 7.12.2.1 as well as Appendix D2.

3. **Panel Comment (High Significance). The EIS provides insufficient quantitative data and discussion of methodology to justify the assessment of impacts on ecological communities and mitigation of these impacts, described in Table 5-6 and Section 6.1, making conclusions regarding project impacts difficult to understand and confirm.**

   This comment includes one recommendation, which was adopted.

   1) Provide more quantitative data and a better description of the methodology used to analyze impacts on habitats. The following are examples of what information is needed: (1) provide a description of how habitat types were identified, (2) provide a habitat map in the EIS showing the extent of existing communities and some text describing how they were quantified, (3) include photos of each habitat so that the public can visualize them and scientists/stakeholders can verify what USACE is describing, and (4) include a detailed discussion of how impacts were quantified.

   USACE Response: Adopted
   Actions Taken/Actions to be Taken: The functional habitat assessment was performed and is discussed along with mitigation requirements in Section 6.5 of the Final EIS. A brief explanation of the method was provided.

4. **Panel Comment (High Significance). Table 7-2 and associated text on p. 163 of the Draft HSGRR/EIS inappropriately describes the acreage changes associated with the Action Alternative as benefits and is confusing because a similar table is not provided for the Proposed Action.**

   This comment includes two recommendations, the first of which was adopted and the second was not.

   1) Provide a discussion of how habitats were valued in order to support a conclusion of project benefits.
   2) Provide similar tables of habitat impacts for all scenarios.

   USACE Response 1: Adopted
   Actions Taken/Actions to be Taken: The functional habitat assessment was performed and is discussed in Section 6.5 of the Final EIS.

USACE Response 2: Not Adopted
Actions Taken/Actions to be Taken: The tables comparing habitat impacts of the perimeter and surge barrier plans still differ, but were edited to more clearly present the analysis performed to date that was used to compare the effects of the two alternatives and conclude that the storm surge barrier had less habitat impacts. The results of the functional habitat assessments that were performed on the Recommended Plan are more clearly presented in the Final EIS in order to assess the impacts of the recommendation as they pertain to choosing alignments and tie-in locations, etc. See Section 5 for edited explanation of the alternative screening and Section 6.5 for explanation of the functional habitat assessment that was performed on the Recommended Plan.

5. **Panel Comment (High Significance). There is insufficient discussion for the TSP of the environmental impacts of groin placement on other shoreline areas including areas outside of the study area.**

   This comment includes one recommendation, which was adopted.

   1) Provide an analysis of the impacts on downdrift areas from erosion potentially caused by groin placement within the study area as proposed.

   USACE Response: Adopted
   Actions Taken/Actions to be Taken: The report was revised to include a discussion of groin impacts outside the study area, particularly potential erosion downdrift of the groins. See Section 7.1.2.3, Section 7.2.2.

6. **Panel Comment (High Significance). The Draft HSGRR/EIS does not address regional traffic safety and transportation issues.**

   This comment includes two recommendations, which were adopted (though USACE did not concur with the level of significance of this comment).

   1) The existing conditions section of the EIS should describe the regional transportation network – roads, railroads, bridges, tunnels, airport access, etc. – and the degree to which it is susceptible to inundation or failure during the next major storm event. At a minimum, the description of existing roadways and traffic presented in Appendix I Section 4.14 should be moved into the EIS in the existing conditions section. Although a traffic study may not be warranted, some discussion of existing traffic conditions is warranted because of the dense network of roadways within the study area and the issue of future beach access.
   2) Provide an impact analysis that discusses how the TSP would affect public safety, such as, if sufficient time for egress during a major event is affected. Also, provide an analysis of whether traffic patterns and/or volume of traffic in the future will be affected by the TSP.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: The description of existing roadways and traffic presented in Appendix I, Section 4.14 was moved into the EIS in the existing conditions section (Section 2.16 of the Final Report). Discussion of impacts to infrastructure, including how trucks would be routed during construction, can be found in Section 7.16.2 of the EIS.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: An impact analysis of how the TSP would affect public safety, namely evacuation routes, was added (see Table 5-29 of the Final GRR/EIS). A brief analysis of any temporary impacts to traffic during construction was added to the Final EIS (see Section 7.16.2). An objective of the study is to "improve community resiliency, including infrastructure and service recovery from storm effects." Additionally, a planning constraint of the study was to not reduce community access and egress during emergencies. Evaluation of how this constraint and objective rate for the Recommended Plan can be found in Table 5-29.

7. **Panel Comment (Medium High Significance). The structure of the EIS made it difficult to follow and to reach conclusions regarding the overall significance of impacts of the Future No-Action conditions.**

This comment includes three recommendations, the last of which was adopted.

1) Combine Sections 2 and Future No-Action portions of Section 7.
2) Drop impacts assessment of alternative action and expand Section 6.1 and present as its own "Section 8."
3) Discuss mitigation separately for each alternative if both are to be carried through the impacts analysis.

USACE Response 1: Not Adopted
Actions Taken/Actions to be Taken: The Corps planning process typically lays out the existing condition and then projects forward what will happen in the future if no project is built. This is compared against the various alternatives analyzed, including the potential environmental impacts of the proposed alternatives. However, the USACE edited Section 7 for clarity (see Section 7 of the Final Report).

USACE Response 2: Not Adopted
Actions Taken/Actions to be Taken: This recommendation appears to be inconsistent with the Corps planning process and no action was taken.

USACE Response 3: Adopted
Actions Taken/Actions to be Taken: The report was edited to clarify the estimated mitigation for the impacts analyzed on the alternatives to the extent possible during the initial screening stage in the planning process and design for the storm surge barrier. The Final HSGRR/EIS includes more information on the functional habitat assessment performed and mitigation. However, the Final Report still lacks some of the detail for the

perimeter plan since the District was able to confidently screen that out prior to performing the functional habitat assessment based on cost and sheer scope of environmental impacts based on acreage. See response to comments 2 and 3 for citations of discussion of the functional habitat assessment on the Recommended Plan and analysis of the mitigation requirements were performed as well as the updates to the Recommended Plan.

8. **Panel Comment (Medium High Significance). There is inadequate documentation of methodologies, analyses, sources of information, cost estimates, and lack of literature citations in sections of the report, which affects the credibility of the report conclusions.**

   This comment includes one recommendation, which was adopted.

   1) Review the report and provide adequate supporting documentation and sources and as full as possible an explanation of the basis for decisions. The examples in the Basis for Comment are only some examples that need improvement.

   USACE Response: Adopted
   Actions Taken/Actions to be Taken: Additional detail was added throughout the report to support an enhanced discussion of impacts used for both screening and the impact analysis of the recommended plan. See Section 7 of the Final EIS. The technical appendices of the Final Report focus on the Recommended Plan, which no longer includes the storm surge barrier component of the TSP. Therefore added cost backup detail that is no longer pertinent was not added to the technical appendix, but was made available to the reviewer who concurred with the approach. The NYNJHATs study which is currently evaluating the storm surge barrier component further has already released significant cost backup data on the storm surge barrier analysis that is underway and this can be found in the Interim Report which is available at: https://www.nan.usace.army.mil/Missions/Civil-Works/Projects-in-New-York/New-York-New-Jersey-Harbor-Tributaries-Focus-Area-Feasibility-Study/

9. **Panel Comment (Medium High Significance). Several places in the EIS inappropriately describe future conditions under Existing Conditions.**

   This comment includes one recommendation, which was not adopted.

   1) All discussions of Future without project conditions should be in Section 3.

   USACE Response: Not Adopted
   Actions Taken/Actions to be Taken: The Existing Condition description can and should include discussion of degraded ecosystems, such as the lack of oyster reefs where there historically used to be some. Degraded ecosystems can also represent an opportunity, especially where natural resiliency has been lost and natural and nature-based features can be considered as measures. It would be incorrect to move descriptions of degraded ecosystems out of the existing conditions section. The Final HSGRR/EIS contains

revised language to explain that the existing condition is degraded habitat lacking historic oyster reefs and the section on sediment transport and quality was renamed for clarity. (Section 2.2.2, 2.7 and 4.5.1 of Final Report).

10. Panel Comment (Medium High Significance). The EIS inadequately addresses the baseline recreation conditions and the project impacts and benefits on recreation within the study area.

This comment includes two recommendations, which were adopted.

1) Add an Existing Conditions section to the EIS that describes recreation activities and facilities.
2) Provide an adequate analysis of impacts to recreation.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: The Report was revised to add the various forms of recreation to the Existing Conditions to better capture the current recreation opportunities and uses. This can be found in Section 2.14 Recreation of the Final Report.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: The report was updated to include an impacts to recreation section in the Final HSGRR/EIS (Section 7.14).

11. Panel Comment (Medium High Significance). It is not clear how the TSP would perform if a large storm such as Hurricane Sandy were to occur in the project area.

This comment includes one recommendation, which was adopted, though the USACE did not concur with the premise of the comment.

1) Conduct an analysis of the performance of the TSP with a Sandy-like Hurricane and estimate the damages. Compare the results with the actual damages of Hurricane Sandy to determine the cost-benefit ratio with the TSP. Determine if the 100-year design storm is still cost effective.

USACE Response: Adopted
Actions Taken/Actions to be Taken: Comparing the impacts of Hurricane Sandy to the modeled impacts does not affect the choice of the recommended plan, but calibrates the model. The Sandy event was a calibration event and the model was demonstrated to be valid. Comparing the damages estimated by the model to the damages of Hurricane Sandy would not influence the selection of the TSP. However, the Economic Appendix discussion of residual risk will be added to the Main Report, to better illustrate the likely impacts of a Hurricane Sandy sized event on the TSP. This can be seen in Section 6.8.1 Residual Risks of the Final Report.

12. Panel Comment (Medium Significance). Retreat or elevating structures in the flood zone have not been considered adequately in the report to justify why these alternatives were eliminated from further consideration.

This comment includes one recommendation, which was adopted.

1) Provide an adequate analysis of the alternative of retreat or elevating structures in the project flood zone. Consider the case of retreat or elevating for the entire flood zone as well as when used in conjunction with other structural alternatives in selected areas. Describe the methodology, data and sources, and findings of the analyses in the report. The information could be presented in the appendix on plan formulation and summarized in the body of the report.

USACE Response: Adopted
Actions Taken/Actions to be Taken: The Non-structural plan was evaluated and screened out in early phases of study due to the density of the development in the study area. The GRR was amended to provide a summary of the initial cost screening steps taken and interpreted to confirm that a wholly non-structural solution is infeasible as a complete, economically justified, and environmentally acceptable plan. For areas where a structural solution is infeasible, retreat, floodproofing or elevation is generally considered in the optimization phase. Since report lengths are targeted at 100 pages, the initial screening was documented in a technical MFR, and the findings only were repeated in the report. In response to Agency Technical Review comments on the Draft Report, the Plan Formulation Appendix was incorporated into the main report and is no longer included as a separate appendix in the Final Report. Sections 5, in particular Sections 5.5 and 5.17 of the Final Report, discuss the non-structural screening.

13. Panel Comment (Medium Significance). Mitigating residual risk as described in Appendix A-2 H of the Draft HSGRR/EIS considers only structural means to protect shoreline property under low-frequency surge events and does not evaluate nonstructural alternatives such as flood proofing or acquisition.

This comment includes one recommendation, which was adopted.

1) Conduct a preliminary evaluation to determine the feasibility of flood proofing or acquisition as an alternative to reduce residual risk. In future stages of project development determine a cost-benefit ratio for each of the 26 areas subjected to residual risk and consider nonstructural alternatives on a reach-by-reach basis.

USACE Response: Adopted
Actions Taken/Actions to be Taken: The residual risk features were further evaluated in the final report. The evaluation included natural and nature based features, retreat or elevation or floodproofing, and structural solutions where feasible. This can be seen in Section 6.8.1 Residual Risks of the Final Report.

14. Panel Comment (Medium Significance). The projected sea level rise (SLR) for the project area is based on historical SLR data of 3.99 mm/year (0.013 ft/year) for Sandy Hook, NJ, which includes land subsidence. The report does not discuss how land subsidence in the project area compares to subsidence in Sandy Hook to validate using the Sandy Hook relative SLR value for the project area.

This comment includes one recommendation, which was adopted.

1) Provide a better justification for using the relative SLR value at Sandy Hook at the project area. As appropriate, include in the discussion other relevant elements, such as tidal constituents, which affect the applicability of SLR values at Sandy Hook to the project area.

USACE Response: Adopted
Actions Taken/Actions to be Taken: Two gages are available near the Project site, the Battery, and Sandy Hook. Sandy Hook and the project area are more similar as they are located in the Coastal Plain geologic formation, whereas the Battery is not. Sandy Hook also has slightly higher sea level rise values than the Battery, and was chosen as the most appropriate available gage. The report will be amended to note the similarities of the project area and the area surrounding the Sandy Hook gage. See Section 4.4 of Appendix A1 of the Final Report.

15. Panel Comment (Medium Significance). The report does not justify why other coastal processes models and integrated hydrodynamic models were not used for project analysis.

This comment includes two recommendations, the first of which was adopted.

1) Describe how the USACE selected the hydrodynamic and coastal process models were used in the project, and justify why these are the appropriate models to use.
2) Discuss the CSHORE model and 2-D and 3-D model suites and justify why they were not used for this project analysis.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: The USACE amended the technical information to explain why specific models were used. This explanation can be found in Section 5.6.2.1 Perimeter Plan (plan D) and Surge Barrier Plan (Plan C) of the Final report as well as section 5.14 Wave Height Analysis for HFFRRFs. Information on the JEM model can be found on page 274 and 276 of Appendix G.

USACE Response 2: Not Adopted
Actions Taken/Actions to be Taken: Technical team has confidence in the models selected, and would prefer to defend their use rather than explain inapplicability of other models.

16. Panel Comment (Medium Significance). The Panel could not determine if the storm on 21 October 2012 in the project region was considered as an antecedent event when calibrating the models used for the project analysis.

This comment includes one recommendation, which was adopted.

1) State in the report if and how antecedent storms were used to calibrate the models for this project. If antecedent storms were not used, provide justification in the report for excluding them.

USACE Response: Adopted
Actions Taken/Actions to be Taken: The USACE added additional detail regarding the date of the post-storm LIDAR data survey. See page 62 of Appendix A1A Engineering Modeling Appendix.

17. Panel Comment (Medium Significance). The Draft HSGRR/EIS does not describe how the proposed mitigation approaches are adaptable to the uncertainty in future climate conditions.

This comment includes one recommendation, which was partially adopted.

1) Include in the report a discussion of how the project mitigation measures are adaptable to uncertain future climate conditions and how the adaptability protects the planned project investment for coastal storm risk mitigation.

USACE Response: Partially Adopted/Not Adopted
Actions Taken/Actions to be Taken: The Team has evaluated and summarized the adaptability of the coastal storm risk management features recommended in the plan and has added more discussion of this to the report; however, increase in frequency and intensity is not the position of USACE for Coastal studies. The report was revised to create a specific section to detail the sea level change (SLC) findings, see Section 6.6.2 of the Final Report.

18. Panel Comment (Medium Significance). The same level of information in the tables in Appendix E for Jamaica Bay is not provided in the tables for the project oceanfront reach.

This comment includes two recommendations, which were adopted.

1) If possible, provide the same level of information for the oceanfront reaches as is provided for Jamaica Bay.
2) If the same level of detail cannot be provided, include an explanation in the report as to why the level of detail available is different and justify how the level of detail used in the report for the oceanfront reach is adequate for the decisions that the USACE is making at this stage in the project development.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: Where appropriate, Section 5 was edited to provide the same level of information for screening of both the Atlantic and the Bayside reaches.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: Reach by reach problem identification and applicability of measures was added (Tables 5-1 was added for Shorefront in the Final Report). A distinction should be made, however, that the features considered and retained for the Atlantic Shoreline are more consistent in application and design than those evaluated and carried forward for the Jamaica Bay communities. The USACE participated in a multi-agency collaboration to ensure that all suggested CSRM measures were screened before identifying the final recommendation (Figure 5-3 of main report and Table 5-2 summarize this collaborative screening). Therefore, greater detail of the broader scale of alternatives is necessary for the Jamaica Bay sub study area than for the measures for the Atlantic Shoreline reach. The Atlantic Shoreline reach is largely evaluated and screened based upon life cycle costs and impacts, which is explained in Section 5.

19. Panel Comment (Medium Significance). Socioeconomic considerations are not addressed adequately in the EIS.

This comment includes one recommendation, which was adopted.

1) Provide a more adequate discussion and analysis of socioeconomic considerations in the EIS. Include other aspects of socioeconomics beyond environmental justice. Much of the necessary discussion is provided in Section 4.18 of the original EIS presented in Appendix I and should be moved into the Existing Conditions section of this Draft HSGRR/EIS. In addition, the Future Action and No-Action analyses should address the impacts of the project on these issues.

USACE Response: Adopted
Actions Taken/Actions to be Taken: Discussion on socioeconomics beyond environmental justice concerns were moved from Appendix I to the Existing Conditions section of the main report and the impacts to those socioeconomic factors like income, employment, and life safety (esp. for vulnerable communities) were analyzed and presented in the Final Report. This can be located in Sections 2.19 and 7.19 on Socioeconomics and Environmental Justice.

20. Panel Comment (Medium Significance). The Draft HSGRR/EIS contains no analysis of potential noise impacts to adjacent communities resulting from construction activities.

This comment includes one recommendation, which was adopted.

1) Provide an analysis of existing and Future Action noise conditions. Much of this text is included in Appendix I under Sections 4.20 and 4.21 and should be moved into the main document.

USACE Response: Adopted
Actions Taken/Actions to be Taken Noise discussion will be pulled from Appendix I of the Draft Report into the main report and expanded upon, where necessary, to support the conclusion of no significant impact. See page 208 in Section 7.12.2, page 213 in Section 7.14.2, and page 227 in Section 7.20.2 of the Final Report.

21. Panel Comment (Medium Significance). The estimated costs are too low in the MCACES Second Generation (MII) cost estimate for planning, engineering, and design (PED) and for construction management.

This comment includes two recommendations, which were adopted.

1) Revise the PED and construction management costs in Appendix C to reflect industry norms and to be commensurate with the project complexity.
2) Revise the main report and associated cost-benefit calculations to reflect correct PED and construction management costs.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: Cost estimate undergoes significant refinement as it moves from comparative screening level to detailed estimate following the Cost and Schedule Risk Assessment (CSRA) and the feasibility level design refinement, both of which are conducted between the Draft and Final (Section 4 of Appendix C, the Cost Appendix in the Final Report).

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: Cost estimate undergoes significant refinement as it moves from comparative screening level to detailed estimate following CSRA and feasibility level design.

22. Panel Comment (Medium Significance). Estimated pump station costs to manage interior drainage appear low for the project alternatives.

This comment includes three recommendations, which were adopted.

1) Review cost assumptions regarding interior drainage pump stations used in the Draft HSGRR/EIS. Research actual USACE pump station costs for the CERP and for the New Orleans Flood Control Project.
2) Revise cost estimates as required based upon realistic pump station estimates.
3) Check to see if revised costs result in any changes in the TSP selection.

USACE Response 1: Adopted

Actions Taken/Actions to be Taken: The USACE reviewed the interior drainage cost assumptions and referenced the application of the USACE guidance on the subject. See Appendix A2A Interior Drainage of the Final Report.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: The USACE reviewed the interior drainage cost assumptions and referenced the application of the USACE guidance on the subject. See Appendix A2A Interior Drainage of the Final Report.

USACE Response 3: Adopted
Actions Taken/Actions to be Taken: The interior drainage costs did influence screening of the HFFRRFs, as discussed in above cited sections.

23. Panel Comment (Medium Significance). The estimated costs appear to be underestimated for the structures required to protect against residual risk because the report does not provide estimated costs for interior drainage structures associated with the 26 segments of flood barrier.

This comment includes one recommendation, which was not adopted.

1) Adjust the cost for the risk reduction features to include an allocation for interior drainage features. At this stage of the project development, this cost could be obtained by using the cost of interior drainage features for other USACE local flood control projects as adjusted for the length of the barrier.

USACE Response: Not Adopted
Actions Taken/Actions to be Taken: The cost estimate included interior drainage. The report was revised to make that more apparent. The report emphasized defending the comparisons and deferred many of the details to the technical documents. The specific details about interior drainage were added to the main report and Appendix A2E. See above cited sections. The interior drainage analysis that was performed for the HFFRRFs did in fact include costs to address back flow at existing outfalls, as well as pump stations. The interior drainage analysis did recommend pump capacity as part of the interior drainage recommendation for the Bayside. See Appendix A2E Interior Drainage.

24. Panel Comment (Medium Significance). There is limited discussion of the potential for cost-growth risk of the project in the main report and in Appendix C.

This comment includes two recommendations, the first of which was adopted.

1) Revise the main report and relevant appendices to expand discussions of cost-growth risk and ways to minimize these risks.
2) Consider undertaking pilot projects or “test construction sections” to refine final design and reduce cost uncertainty, especially for the proposed storm surge barrier or for larger floodgates.

USACE Response 1: Adopted
Taken/Actions to be Taken: The Cost estimate was refined between Draft and Final report development. An Abbreviated Risk Analysis was conducted prior to the draft report and a Cost and Schedule Risk Assessment (CSRA) was conducted between Draft and Final, as is USACE procedure. The CSRA addresses potential cost growth and details from the CSRA. The revised cost estimate describes the cost and schedule risks, and incorporates feature specific contingencies that reflect those risks. This can be located in section 6.8 Risk and Uncertainty of the Final Report and Section 4 of the Cost Appendix C.

USACE Response 2: Not Adopted
Actions Taken/Actions to be Taken: USACE looks to experiences from similar projects across the country for lessons learned. Test sections are not generally undertaken, but Value Engineering explores alternate means to achieve the goal of the proposed feature at lower cost.

25. Panel Comment (Medium Significance). It is not clear how the proposed groins will be constructed in the field given their deep invert elevations.

This comment includes two recommendations, the second of which was adopted.

1) Include a more thorough discussion of groin construction in the Engineering Appendices.
2) Review cost estimate to ensure all costs have been captured regarding groin construction.

USACE Response 1: Not Adopted
Taken/Actions to be Taken: A description of the assumptions used for cost estimating purposes is provided in Appendix C: Rockaway Beach Cost Appendix (a sub-appendix to Appendix A1: Shorefront Engineering & Design Appendix). Cost narratives and backup data/assumptions were either consolidated into the Cost Engineering Appendix or referred to more clearly.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: Costs are refined following the identification of a TSP. The conceptual costs allow for comparison of performance and cost effectiveness, and are refined between draft and final report. This refinement includes comparisons of scales of features, a Cost and Schedule Risk assessment and a Value Engineering analysis to refine cost estimates on more specific construction methods and contingencies. This is located in Appendix C: Rockaway Beach Cost Appendix (a sub-appendix to Appendix A1: Shorefront Engineering & Design Appendix). The cost estimate was reviewed and certified by the Walla Walla District Cost Center of Expertise.

26. Panel Comment (Medium Significance). The measure design elevations for various hydraulic reaches for the project alternatives vary from 14 feet NAVD88 to 18 feet NAVD88, which is too large a variation in the system.

This comment includes two recommendations, which were adopted.

1) Review the proposed design top elevations presented in Table 2, Appendix A2, and shown in the civil design sheets. Based upon some engineering judgment AND the allowable overwash rate, revise the design top elevations to be more consistent across the project area. Elevation differences should be minimized to a maximum of 2 feet if possible.
2) Ensure that resulting final elevations do not result in vastly different levels of protection for the various hydraulic reaches.

USACE Response 1: Adopted
Taken/Actions to be Taken: Design for the optimization phase, completed after the draft report identifies the TSP, compares varied scales of features to assess which scale maximizes net benefits. This exercise is undertaken to maximize the cost effectiveness and risk management. The team revisited the recommended heights along the line of protection during the optimization phase as part of the scaling, and during that phase will rectify crest elevation differentials along the line of protection and at transitions between subreaches. Life-cycle cost optimization for beachfill, groins, and overall shorefront design on the Atlantic Shorefront Planning Reach is discussed in Sections 5.6.1.1, 5.6.1.2, and 5.6.1.3 respectively of the Final Report.

As a result of the ADM, the storm surge barrier component for the TSP was moved to the NYNJHATs Study for further evaluation. The high frequency flooding risk reduction features which are recommended for the Bayside in the Final Report were not optimized because they are designed to address frequent flooding and to potentially complement the future storm surge barrier. If you were to optimize them, you would end up with the Perimeter Plan, which this study already determined to be economically justified but less cost effective than the Storm Surge Barrier Plan. For more information on this rationale, see Sections 5.9, 5.10, and 5.11 of the Final Report.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: See above response.

27. Panel Comment (Medium Significance). An offshore or detached breakwater does not appear to have been considered as part of the project plan.

This comment includes one recommendation, which was adopted.

1) The report should discuss the applicability of a breakwater structure and its pros and cons in comparison with other measures and alternatives.

USACE Response: Adopted
Actions Taken/Actions to be Taken: Offshore breakwaters were examined in the July 2000 East Rockaway Beach Queens, NY Final Limited Reevaluation Report. They were found to provide the same level of protection at a higher cost than the beachfill with groins alternative. Detached breakwaters were screened out early in the formulation

process of the HSGRR based on previous analysis, what has been done in the area in the past and on what has proved to work in the region. A full evaluation of the applicability of detached breakwaters was not repeated in the HSGRR since the earlier project evaluation was considered applicable. Section 5 of the report was revised to cite the screening process for breakwaters and which compared the performance and cost of beachfill with groins and breakwaters. This is located in section 5.5.1 Atlantic Ocean Shorefront Planning Reach in the Final Report.

28. Panel Comment (Medium Low Significance). The construction methodology described in the report for the storm barrier gate system employed standard "in the dry" construction procedures and did not evaluate alternative "in the wet" methodologies that have been utilized for other USACE projects.

This comment includes one recommendation, which was adopted.

1) The report should contain a section that describes alternatives, such as the "in the wet" construction technique, that can possibly lower project costs in future stages of project development.

USACE Response: Adopted
Actions Taken/Actions to be Taken: The storm surge barrier is no longer part of the Recommended Plan and will be further evaluated in the NYNJHAT study. This comment has been referred to the NYNJHAT study team.

29. Panel Comment (Medium Low Significance). The TSP includes costly Combi-wall sections to form a barrier connecting the gate sections across the Rockaway Inlet and did not identify or consider alternatives for the wall section.

This comment includes one recommendation, which was adopted.

1) The TSP includes costly Combi-wall sections to form a barrier connecting the gate sections across the Rockaway Inlet and did not identify or consider alternatives for the wall section.

USACE Response: Adopted
Actions Taken/Actions to be Taken: The storm surge barrier is no longer part of the Recommended Plan and will be further evaluated in the NYNJHAT study. This comment has been referred to the NYNJHAT study team.

30. Panel Comment (Medium Low Significance). The required factors of safety stated under the design criteria contained in Appendix A2-F do not conform to the USACE requirements for stability of gravity structures as stated in Engineering Manual (EM) 1110-2-2100.

This comment includes one recommendation, which was adopted.

1) Review the computer-generated structural computations to determine what factors of safety were utilized for the preliminary design of the stability of gravity structures. If the factors of safe-ty do not correspond to those contained in EM-110-2-2100, review the structural design and piling support for the structures to determine if there would be a significant increase in estimated costs if the appropriate factors of safety conforming to the requirements of EM-1110-2-2100 were utilized.

USACE Response: Adopted
Actions Taken/Actions to be Taken: This comment pertains to the storm surge barrier which is no longer part of the Recommended Plan. The NYNJHATs study team which is currently evaluating this component for future recommendation has generated new design criteria.

31. Panel Comment (Low Significance). The three-foot bottom width for the core trench utilized below the proposed levee section is too narrow to obtain adequate material compaction.

This comment includes one recommendation, which was not adopted.

1) The width of the bottom of the impervious core trench should be increased to a minimum of 8 feet, and the earthwork quantities should be increased to reflect this change.

USACE Response: Not Adopted
Actions Taken/Actions to be Taken: The 3-ft wide section is at the bottom of the trench, with 1:1 side slopes. For a 12" lift, which would be typical for compaction, the width of the trench will be 5'. Vibratory roller compactors are available at 35" widths. Other equipment such as vibratory plate compactors are also available that would allow compaction to be achieved. No changes were made based on this comment, however, the design team was alerted of the concern and the USACE reexamine the design to ensure adequate material compaction.

32. Panel Comment (Low Significance). Converting units from knots to ft/s on page 18 of the Draft HSGRR/EIS is incorrect. This raises the issue that other conversion factors used in the study may be incorrect.

This comment includes two recommendations, which were adopted.

1) Use the correct factor for converting knots to ft/s. Check to determine how significantly using the correct conversion factor changes the outcome of the analysis.
2) Check the report to make sure that all conversion factors used for project analyses are correct.

USACE Response 1: Adopted

Actions Taken/Actions to be Taken: Correction was made to HSGRR/EIS page 18 and USACE performed quality reviews of the Final Report. Corrected conversion factor can be found in Section 2.3.2. Tidal Currents of the Final Report.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: USACE performed quality reviews of the Final Report.

33. Panel Comment (Low Significance). The Draft HSGRR/EIS and relevant engineering appendices include a number of important inconsistencies regarding estimated cofferdam top elevations.

This comment includes three recommendations, which were adopted.

1) Review engineering appendices to ensure that there are no inconsistencies with estimated cofferdam top elevations.
2) If errors or omissions are discovered, revise civil drawing sheets as necessary.
3) Revise cost estimates as required as well.

USACE Response 1: Adopted
Actions Taken/Actions to be Taken: USACE will ensure that there are no inconsistencies with estimated cofferdam top elevations through a series of quality control reviews at each stage of the project, per USACE regulation.

USACE Response 2: Adopted
Actions Taken/Actions to be Taken: Errors discovered during reviews will be tracked and corrected.

USACE Response 3: Adopted
Actions Taken/Actions to be Taken: Cost estimates are revised as required based on changes to the design of a recommendation and/or project.

34. Panel Comment (Low Significance). The report needs to be edited to correct errors and improve readability and understanding.

This comment includes one recommendation, which was adopted.

1) USACE should conduct an additional round of senior editorial review to improve clarity and readability to help readers to understand the analyses and findings.

USACE Response: Adopted
Actions Taken/Actions to be Taken: Edits were made throughout the report to address this comment. No applicable page numbers.