DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION
FORT HAMILTON MILITARY COMMUNITY
302 GENERAL LEE AVENUE
BROOKLYN NY 11252-6700

CENAD-PD-P

SEP 1 8 2017

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, New York District, 26 Federal Plaza, New York, NY 10278-0090

SUBJECT: Request for Approval of the Hudson River Habitat Restoration, New York Ecosystem Restoration Feasibility Study Review Plan

1. Reference Memorandum, CENAN-DE, dated 13 Sept 2017, subject as above.

2. The Ecosystem Restoration Planning Center of Expertise of the Mississippi Valley Division (MVD) is the lead office to execute the referenced Review Plan. The Review Plan includes Independent External Peer Review.

3. The enclosed Review Plan is approved for execution and is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution require new written approval from the NAD Commander.

4. The point of contact is Mr. Larry Cocchieri, NAD Planning Program Manager at 347-370-4571 or Lawrence.J.Cocchieri@usace.army.mil.

Encl

LEON F. PARROTT
Colonel, EN
Deputy Commander

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278-0090

SEP 13 2017

CENAN-DE

MEMORANDUM FOR: BG (P) Graham, Commander, North Atlantic Division (CENAD-PD-X/ Mr. Lawrence Cocchieri), 301 General Lee Avenue, Fort Hamilton Community, Brooklyn, New York 11252

SUBJECT: Request for Approval of the Hudson River Habitat Restoration, New York Ecosystem Restoration Feasibility Study Review Plan

1. References

a. Engineer Circular (EC) 1165-2-214, Civil Works Review, 15 DEC 12

b. EC 1105-2-412, Planning, Assuring Quality of Planning Models, 31 MAR 11

c. Engineer Regulation (ER) 1110-2-12, Quality Management, 30 SEP 06

2. The subject draft Review Plan is enclosed for your approval in accordance with Appendix B of Reference 1 (Enclosure 1). The Review Plan complies with all applicable policies and provides an adequate approach to District Quality Control and Agency Technical Review of the plan formulation, engineering and environmental analyses, and other required planning considerations.

3. The Review Plan was prepared in coordination with CENAD Planning Division Programs Directorate and the National Ecosystem Restoration Planning Center of Expertise (ECO-PCX). Mr. Gregory Miller, ECO-PCX Operating Director, reviewed the Plan and recommends the plan for approval (Enclosure 2).

4. If you should require more information, my point of contact is Ms. Karen Baumert, Project Planner, at karen.a.baumert@usace.army.mil or 917-790-8608.

THOMAS D. ASBERY
COL, EN
Commanding

2 Encls
1. Review Plan
2. ECO-PCX Endorsement

CF:
Chief, CENAD Planning Division Programs Directorate (Mr. Vietri)
Deputy Chief, CENAD Planning Division Programs Directorate (Mr. Gruber)

DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

CEMVD-PD-L (ECO-PCX) 23 August 2017

MEMORANDUM FOR Commander, North Atlantic Division, U.S. Army Corps of Engineers
ATTN: (Joseph Vietri, CENAD-PD-P)

SUBJECT: Hudson River Habitat Restoration, New York, New York District; Ecosystem Restoration Planning Center of Expertise, Recommendation to Approve Review Plan

1. References:

a. Engineer Circular (EC) 1165-2-214, Civil Works Review, 15 December 2012.

b. EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011.

c. Engineer Regulation (ER) 1110-2-12, Quality Management, 30 September 2006.

d. Draft Review Plan, Hudson River Habitat Restoration, New York, August 2017.

2. The National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) has reviewed the subject Review Plan. The plan complies with all applicable policy and provides an adequate approach to District Quality Control (DQC) and Agency Technical Review (ATR) of the plan formulation, engineering, and environmental analyses, and other aspects of plan development.

3. A risk-informed analysis has been conducted regarding Type I Independent External Peer Review (IEPR). The total program cost will likely exceed the $200M threshold, and therefore a Type 1 IEPR is required. Based upon the District's risk assessment, a Type II IEPR is not warranted because there is little to no threat to human life or safety if a project ecosystem restoration feature fails.

4. The study will use multiple planning models. This includes IWR-Planning Suite, version 2.0.9, to evaluate restoration alternatives and identify cost effective and best buy plans. The Evaluation of Planned Wetlands (EPW) model will provide information on design elements and functional capacity and a method for calculating planned wetlands sizes. Habitat Suitability Indices will provide inputs to be used with cost estimates for the CE/ICA analyses in IWR- Planning Suite. EPW is approved for use in the Northeastern Coastal Zone, Northern Piedmont and Atlantic Coastal Pine Barrens Level III Ecoregions. IWR-Planning Suite is certified for national use and the Habitat Suitability Indices are approved for use in appropriate geographic ranges.

5. Upon approval by the MSC Commander, please provide the approved Review Plan, the MSC Commander's approval memorandum, and the link to the District posting of the plan on the internet. When substantive revisions are made to the plan, due to changes in the study scope or policy, a revised Review Plan should be provided to the ECO-PCX for review. Non-substantive changes do not require further ECO-PCX review.

REVIEW PLAN

Hudson River Habitat Restoration, New York
Feasibility Report

New York District

MSC Approval Date: *Pending*
Last Revision Date: September 2017

US Army Corps
of Engineers ®

REVIEW PLAN

Hudson River Habitat Restoration, New York
Feasibility Report

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This plan defines the scope and level of peer review for the Hudson River Habitat Restoration, New York, Ecosystem Restoration Feasibility Report.

b. **References**

(1) Engineer Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
(3) Engineer Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
(4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
(5) Project Management Plan for study, February 2017
(6) New York District Quality Management Plan

c. **Requirements.** This plan was developed under EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products. It provides a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these reviews, decision documents are subject to cost engineering review and certification (per EC 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION COORDINATION

The Review Management Organization (RMO) is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Ecosystem Restoration PCX at Mississippi Valley Division (MVD). The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

a. **Decision Document.** This study is for the Hudson River Habitat Restoration, New York, Ecosystem Restoration Feasibility Report. The purpose of the Feasibility Report is to document project evaluations and facilitate acceptance of the study conclusions and recommendations by the sponsor, public, state, and local agencies, and the Federal government. The study will recommend implementation of ecosystem restoration opportunities at multiple sites within the Hudson River and tributaries between the Tappan Zee Bridge and the Federal Dam in Troy, NY, and include a construction authority in response to the study authority. Following headquarters approval, the next step is Congressional authorization for implementation. The Feasibility Report will be integrated with an Environmental Assessment.

b. **Study/Project Description.** The study area includes 125 miles of the Hudson River associated with the existing Federal channel from the upstream limits at the Federal lock and dam at Troy,

NY, to the downstream boundary for this investigation at the Tappan Zee Bridge (see Figure 1). The larger Hudson River watershed covers nearly 13,400 square miles. Tidal influences can be observed throughout the 125 miles of the study area, and saltwater can be detected as far upstream as Poughkeepsie. The watershed is characterized by eroding shorelines, degraded fish and wildlife habitat, impediments to fish passage, poor sediment and water quality, and flooding.

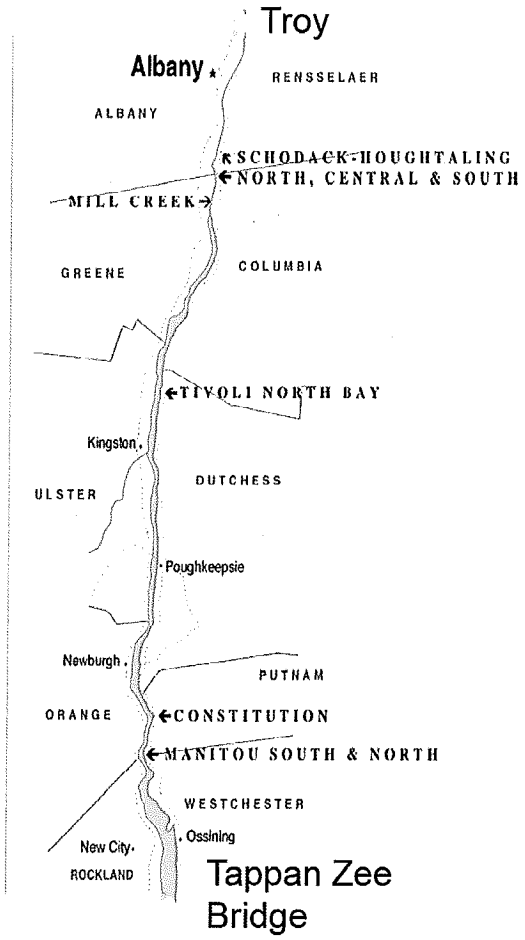

Figure 1: Hudson River Habitat Restoration Study Area

The Reconnaissance Report was completed in 1995 and the Feasibility Cost Share Agreement with New York State Department of Environmental Conservation (NYSDEC) and NYS Department of State (NYSDOS) was signed in 1996. Study investigations in the Hudson River began in 1998 and primarily focused on four specific locations. As the study progressed, these four sites became unavailable as a result of implementation by others or designation as critical habitat for listed species. Subsequently, progress was suspended due to lack of consensus on path forward/ approach, leading to rescissions and reprogramming of federal funding through 2005. The former NYSDEC Commissioner Joseph Martens requested the USACE reinitiate the study in 2012. The Rescoping Charette was held in March 2014 to obtain concurrence on the path forward and the study approach. NAN initially received funds in April 2016 and developed a Project Management Plan by working closely with the non-federal sponsors. Per the Study Authorization, this Study's overall ecosystem restoration objective is to restore degraded aquatic, riparian, and wetland

ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. More specifically, the goals are to:

1. Restore a mosaic of interconnected, large river habitats, which together host a diversity of native taxa.
   1.1. Increase the extent and quality of subtidal, shallow water habitats (e.g., submerged aquatic vegetation, side channels).
   1.2. Increase the extent and quality of intertidal habitats (e.g., freshwater tidal marshes, mud/sand flats).
   1.3. Promote neighboring shoreline, riparian, and upland habitats contributing to aquatic ecosystem integrity.
   1.4. Promote a balanced mosaic of habitat types.

2. Restore lost ecological connectivity within the Hudson River and to other regional ecosystems
   2.1. Increase the connectivity of spawning, foraging, and resting habitats for migratory fish (e.g., shad, herring, eel, sturgeon)
   2.2. Increase the connectivity of stopover, nesting, and foraging habitat for migratory and resident birds from freshwater ecosystems to the ocean.
   2.3. Promote actions improving the transport regime of water, sediment, and nutrients to the estuary.

c. Factors Affecting the Scope and Level of Review.

This will not be a highly controversial study, as the resource agencies and members of the public all support ecosystem restoration in the Hudson River. There is no influential scientific information presented in this study, as the study is essentially a larger scale ecosystem restoration study than other similar work in NAN.

- The risks of this project occur mostly in the implementation phase, where risk of not receiving Federal and non-Federal funds would drive the costs of the project higher and delay the implementation and receipt of benefits to the environment. The risks of the project not performing as designed would result in those environmental restoration improvements not being realized and the Hudson River would retain the existing poor aquatic habitat quality and water quality.
- There are no significant threats to human life or safety as the alternatives mainly involve restoration of fresh and salt marsh grasses, shorelines, and earth moving. The purpose of the project does not involve storm damage reduction or flood risk management and there is no expectation from any stakeholder that the implementation of this project would provide any storm damage protection.
- There has not been a request by the Governor of an affected state for a peer review by independent experts.
- There has not been any significant public dispute as to the size, nature, effects, or the projected economic or environmental benefits of the project, only the timing, with our non-Federal partners and stakeholders interested in accelerating implementation of the project.
- The alternatives identified in this ecosystem restoration study would be designed in such a way as they would be self-sustaining. The redundancy, resiliency and/or robustness discussion does not apply to this ecosystem restoration study, as the purpose of this study is to bring natural restoration to the Hudson River.

d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsors, NYSDEC and NYSDOS, include constribution of benthic and ArcGIS mapping, baseline ecological assessments and conditions and site screening information as part of their work-in-kind credit to the study.

4. DISTRICT QUALITY CONTROL

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan. The New York District shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the MSC. Documentation of completed DQC should be provided to the MSC, PCX and ATR Team leader prior to initiating ATR.

a. **Documentation of DQC.** District Quality Control will be documented through the use of a Quality Control Report, which is managed in Dr Checks and signed by the members performing the DQC as well as the Division Chiefs of the responsible major technical offices. This report will include all comments from Dr Checks.

b. **Products to Undergo DQC.** DQC will be conducted on the draft and final Integrated Feasibility Report and Environmental Assessment and technical work that was done in support of anlaysis and formulation. The technical work will be in appendices to the feasibility report.

c. **Required DQC Expertise.** The DQC review team will consist of Section Chiefs and subject matter experts or regional technical specialists in the fields of Plan Formulation, Economics, environmental compliance, Engineering Design and Analysis and Real Estate.

5. AGENCY TECHNICAL REVIEW

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team of certified reviewers from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of certified senior USACE personnel and may be supplemented by outside experts. The ATR team lead will be from outside the home MSC.

a. **Products to Undergo ATR.** The draft and final Feasibility Reports (including National Environmental Policy Act (NEPA) and supporting documentation) will undergo ATR.

b. Required ATR Team Expertise.

ATR Team Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience preparing Civil Works decision documents and conducting ATR. The lead should have the necessary skills and experience to lead a virtual team through the ATR process. The lead may serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	This reviewer should be a senior water resources planner with experience in the plan formulation process. The reviewer should be familiar with evaluating alternative plans for urban ecosystem restoration projects.
Economics	The economics reviewer should be able to evaluate the appropriateness of cost effectiveness and incremental cost analysis (CE/ICA), using IWR-Planning Suite, as applied to dollar costs and ecosystem restoration benefits. The reviewer should also have experience with National Ecosystem Restoration analysis procedures.
Environmental Resources	The Environmental Resources Reviewer should have particular knowledge of ecosystem restoration, including the methods used to evaluate benefits, and should also be familiar with all NEPA requirements. The reviewer should have experience in wetland ecology of urban regions, preferably experience in the densely populated mid-Atlantic or Northeast.
Cultural Resources	The Cultural Resources reviewer will be familiar with Section 106 requirements, and Corps of Engineers practices and ERs.
Hydrology	The Hydrology reviewer will have a thorough understanding of hydrologic transport models, including point source and surface area run-off inputs, for the analysis of sediment and pollutant movements within the river system.
Civil Engineering	The civil engineering reviewer should have experience with engineering analysis and design of wetland restoration or related projects in urban areas.Add the expertise required.
Cost Engineering	Team member will be familiar with cost estimating for similar projects using Mii. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination is also required through the Walla Walla District DX for cost engineering.
Real Estate	The real estate reviewer will be familiar with the Corps of Engineers ER on Real Estate.Add the expertise required.
Hazardous, Toxic and Radioactive Waste (HTRW)	This reviewer will be familiar with HTRW investigations and Corps of Engineers practices and ERs.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process.

Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1165-2-214, ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports are considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a copy of each reviewer's comments (with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW

Independent External Peer Review (IEPR) may be required for decision documents under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain

criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. **Decision on IEPR.** Type I IEPR will be conducted on the draft integrated feasibility report and environmental assessment. The total program cost will likely exceed the $200M threshold, and therefore Type I IEPR is required. Type II IEPR is not warranted, as this is an ecosystem restoration study and little to no threat to human life or safety is at risk if the project fails. The consequences of non-performance on project economics would mean that the region and nation do not realize the National Ecosystem Restoration benefits that this project would provide.

b. **Products to Undergo Type I IEPR.** The draft feasibility report and environmental assessment will undergo Type I IEPR.

c. **Required Type I IEPR Panel Expertise.** Panel members will have the following expertise.

IEPR Panel Member Disciplines	Expertise Required
Economics	A degree in economics or a related field and should be able to evaluate the appropriateness of cost effectiveness and incremental cost analysis (CE/ICA), as applied to dollar costs and ecosystem restoration benefits, and preferably familiar with the Corps of Engineers tool for CE/ICA called IWR-Planning Suite. Panel member should also have experience with National Ecosystem Restoration analysis procedures.

Environmental	At minimum a Masters Degree in ecology or biology. Panelist should have particular knowledge of ecosystem restoration including the methods used to evaluate benefits, and should also be familiar with all NEPA requirements. Panel Member should have experience in wetland ecology of urban regions, preferably experience in the densely populated mid- Atlantic or Northeast.
Civil Engineering	A Civil Engineering degree and experience in performing cost engineering/construction management for all phases of ecosystem restoration projects. Team member should be familiar with similar projects across US and related Cost Engineering. Experience in contracting procedures, total cost growth analysis and related cost risk analysis is desired. Panel member should be familiar with construction industry and practices used in wetland restoration.
Civil Works Planning	A degree in planning or a related field and experience in the plan formulation process. Panelist should be familiar with evaluation of alternative plans for ecosystem restoration projects. Familiarity with USACE standards and procedures is required.

d. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 5.c above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and
- Include a copy of each reviewer's comments (with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The final Review Report will be submitted by the OEO no later than 60 days after the public comment period closes. USACE shall consider all recommendations and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, on the internet and other means.

2. POLICY AND LEGAL COMPLIANCE REVIEW

Decision documents will be reviewed throughout the study process for their compliance with law and policy. Appendix H, ER 1105-2-100 provides guidance for policy and legal compliance reviews. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the MSC Commander. DQC and ATR augment and complement the policy reviews by addressing compliance with pertinent Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

3. COST ENGINEERING REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering Directory of Expertise (DX), at the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR teamand in the development of the review charge(s). The DX will provide the Cost Engineering certification. The RMO is responsible for coordination with the Cost Engineering DX.

4. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning modelsare defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

a. Planning Models. The following models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval Status
IWR-PLAN, version 2.0.9	Used to evaluate restoration alternatives and identify cost effective best buy plans.	Certified
Environmental Benefits model: Evaluation of Planned Wetlands and Habitat Suitability Index Models	EPW is a rapid assessment procedure that documents and highlights differences between a wetland assessment and a planned wetland based on their capacity to provide six functions: shoreline bank erosion control, sediment stabilization, water quality, wildlife, fish (tidal, non-tidal stream/river and non-tidal posnd/lake) and uniqueness/heritage. The difference between wetlands are expressed in terms of individual elements. Functional Capacity Indices, and Functional Capcity Units. The results provide information on individual design elements and measures of functional capacity which are a necessity under current regulatory	EPW approved for regional use, 30 June 2016. The model is approved for use in the Northeastern Coastal Zone, Northern Piedmont and Atlantic

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval Status
	programs that require tangible goals and a method for calculating planned wetlands size. Habitat Suitability Index (HSI) analysis for representative fish species would provide ecosystem benefits related to shoreline/ streambank restoration (e.g., stabilization or softening), fish passage (dam removal, fish ladders). Models are intended for use in impact assessment and habitat management. The models were developed from a review and synthesis of existing information and are scaled to produce a HSI between 0 (unsuitable habitat) and 1 (optimally suitable habitat). The HSI model for spawning adults, eggs, and larvae is composed of two life requisite components: cover and water quality. The juvenile river herring HSI model has food and water quality life requisite components. No cover requirement for juveniles was indicated in the literature. These environmental benefits models will provide the input used, in addition to cost estimates, for the CE/ICA analyses using the IWR- Plan.	Coastal Pine Barrens Level III Ecoregions. Approved nationwide/ regional use

b. Engineering Models. These engineering models may be used to develop the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
HEC-RAS 4.0 (River Analysis System)	The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program may be used for steady flow analysis to evaluate the future without- and with-project conditions along the Hudson River and its tributaries.	Approved

5. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. The Draft Feasibility Report is planned for concurrent public, ATR IEPR, and policy review in March 2018. The ATR cost is estimated at $70,000; and the Final Feasibility Report review will occur in FY19 at a cost of $50,000.

b. Type I IEPR Schedule and Cost. The Draft Feasibility Report will be made available for IEPR with concurrent ATR, public, and policy review in March 2018. The IEPR Review is expected to cost up to $200,000.

c. Model Certification/Approval Schedule and Cost. All models are certified or approved.

6. PUBLIC PARTICIPATION

The public and stakeholders have particpated and provided input to the Feasibility Study at numerous meetings including Hudson River Estuary Management Advisory Committee Meetings, Harbor Estuary Program (HEP) Restoration Work Group Meetings, HEP and Hudson River Estuary Program meetings/conferences, Target Ecoystem Characteristics meetings. In addition, a group of more than 30 organizations formed a coalition known as the "Partners Restoring the Hudson" who are involved in the preparation of the regional comprehensive restoration plan and will be involved and comment on the work products as the feasibility report is being developed.

The Draft Feasibility Report will be made available for review and comment concurrently with ATR, IEPR and policy review. Public comments will be provided to the IEPR panel for review and consideration and responses to IEPR comments and response to public comments will be made available on the NAN website. The IEPR report will be posted on the HQUSACE website.

7. REVIEW PLAN APPROVAL AND UPDATES

The North Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (district, MSC, RMO, and HQUSACE) as to the appropriate scope and level of review for the decision document. The Review Plan may change as the study progresses. The home district is responsible for keeping the plan up to date. Minor changes to the Review Plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as scope and/or level of review changes) should be re-approved by the MSC Commander following the process used for initial approval. The latest version of the plan and the Commanders' approval memorandum will be posted on the District's webpage. The latest Review Plan will also be provided to the RMO and MSC.

8. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this plan can be directed to the following points of contact:

- Chief, Watershed Section, New York District, (917) 790-8727
- Project Manager, New York District, (917) 790-8306
- Planning Program Manager, North Atlantic Division, (347) 370-4571
- Regional Technical Specialist, Nashville District, (615) 736-7666

ATTACHMENT 2: TEMPLATE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location>*. The ATR was conducted as defined in the project Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and closed in DrChecks[sm].

SIGNATURE _____ Date _____
Name
ATR Team Leader
Office Symbol/ Company

SIGNATURE _____ Date _____
Name
Project Manager
Office Symbol

SIGNATURE _____ Date _____
Name
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ Date _____
Name
Review Management Office Representative
Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are: *Describe the major technical concerns and resolution.*

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE _____ Date _____
Name
Chief, Engineering Division, *Office Symbol*

SIGNATURE _____ Date _____
Name
Chief, Planning Division, *Office Symbol*

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND DEFINITIONS

Acronym	Definition	Acronym	Definition
ATR	Agency Technical Review	O&M	Operation and Maintenance
DPR	Detailed Project Report	OEO	Outside Eligible Organization
DQC	District Quality Control/Quality Assurance	OSE	Other Social Effects
DX	Directory of Expertise	PCX	Planning Center of Expertise
EA	Environmental Assessment	PDT	Project Delivery Team
EC	Engineer Circular	QMP	Quality Management Plan
ER	Ecosystem Restoration	QA	Quality Assurance
ER	Engineer Regulation	QC	Quality Control
Home District/ MSC	The District or MSC responsible for preparing the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
MSC	Major Subordinate Command	SAR	Safety Assurance Review
NER	National Ecosystem Restoration	USACE	U.S. Army Corps of Engineers
NEPA	National Environmental Policy Act		