

# **REVIEW PLAN**

**Forge River Watershed, Suffolk County, New York  
Feasibility Report**

**New York District**

**MSC Approval Date: Pending  
Last Revision Date: None**



**US Army Corps  
of Engineers®**

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## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Forge River Watershed, Suffolk County, New York, Feasibility Report. The review procedures have been described in accordance with EC 1105-2-209, Water Resources Policies and Authorities: CIVIL WORKS REVIEW POLICY.

### b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 21 March 2011
- (3) Engineering 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) Forge River Watershed, Suffolk County, New York, Project Management Plan
- (6) New York District Quality Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). 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 levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-412).

- (1) District Quality Control/Quality Assurance (DQC). All **decision documents** (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home Major Subordinate Command (MSC).
- (2) Agency Technical Review (ATR). 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 US Army Corps of Engineers (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 a designated Risk Management Organization (RMO) and is conducted by a qualified team 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 senior USACE personnel and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.

- (3) Independent External Peer Review (IEPR). 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 1165-2-209, 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 is generally for decision documents and Type II is generally for implementation products.
- (a) 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 the underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.
- (b) 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.
- (4) Policy and Legal Compliance Review. All **decision documents** will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. 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 Chief of Engineers. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.
- (5) Cost Engineering Review and Certification. All **decision documents** shall be coordinated with the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District. The DX, or in some circumstances regional cost personnel that are pre-certified by the DX, will conduct the cost ATR. The DX will provide certification of the final total project cost.
- (6) Model Certification/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 models, for the purposes of the EC, are 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. Use of engineering models is also subject to DQC, ATR, and IEPR.

## **2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION**

The 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 National Planning Center of Expertise (ECO PCX).

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates, construction schedules and contingencies.

## **3. STUDY INFORMATION**

- a. Decision Document.** This feasibility study is designed to proceed in two phases, with Phase I applying technical assessments to develop a watershed plan, and Phase II expanding the analysis to optimize the appropriate recommendation. The Forge River Watershed, Suffolk County, New York Feasibility Study is a General Investigations funded study, and, at the conclusion of Phase II, will require Chief of Engineers approval for the document and Congressional authorization. It will likely require an Environmental Assessment be prepared along with the document.
- b. Study/Project Description.** The study is designed to proceed in two phases, with Phase I applying technical assessments to develop a watershed plan, and Phase II expanding the analysis to optimize the appropriate recommendation. Phase II of the study will identify and evaluate Ecosystem Restoration (ER) options in the Forge River Watershed, in Suffolk County, New York. The decision document will present planning, engineering and implementation details of the recommended plan to restore the watershed and to allow final design and construction to proceed subsequent to approval of the plan. A study area map is provided in Attachment 4.

The Forge River and its associated tributaries have experienced significant declines in water quality and environmental conditions. These are reflected by hypoxic and or anoxic conditions in the water column, resulting in die-offs of numerous aquatic species and creating objectionable odors and visual impacts. These impacts can be characterized as Water Quality Impacts and Habitat Degradation leading to a loss of ecosystem services.

The ecosystem within the Forge River Watershed has been impacted by a number of anthropogenic factors. This includes the discharges of duck farm effluent from a maximum of 10 duck farms which occurred from the 1940's through the 1960's, prior to the implementation of environmentally protective regulations. Current contributors to impaired water quality include point and non-point source discharges from the two remaining duck farms, residential fertilizer use, on-site septic systems, storm water runoff. The combination of high nutrient loading, elevated water temperatures, and low flushing of the upper reaches of the river have led to eutrophic conditions, excessive growth of macro-algae, and plankton blooms. All of these factors contribute to reduced oxygen levels in the river and to the eventual production of hydrogen sulfide gasses. In these situations, resident fish and benthic communities that are unable to escape the low oxygen environment can be severely impacted.

All of these factors lead to the reduction in the water quality of the Forge River which then degrades the habitat in the river and ultimately, leads to the loss of ecosystem services.

Structural and non-structural ecosystem restoration measures to be considered include, but are not limited to, increasing water circulation, dredging, capping, and marsh and wetland restoration and or creation.

The study area is located in the Town of Brookhaven on the South Shore of Long Island. (Map attached) The Forge River is approximately 4.5 miles in length. It runs north to south and is fed by the tributaries Ely Creek, Poospatuck Creek, and Second Neck Creek and empties into Moriches Bay, an estuary of the Atlantic Ocean, near Mastic, in Suffolk County, New York.

The Town of Brookhaven is the local sponsor for this single-purpose study. The estimated cost of the Feasibility Study is \$3 million, to be cost shared 50/50 between the USACE and Brookhaven. Phase I is budgeted within the Project Management Plan to cost \$1.5 million and to focus on characterizing the existing conditions within the watershed and completion of a watershed plan. Phase II is designed to carry the findings of Phase I into a feasibility phase with recommendation and design of an ecosystem restoration solution. Phase II is budgeted at \$1.5 million. Estimated costs of a recommended plan vary widely at this point in the planning process and will be more certain at the conclusion of Phase I. Given the small scale of the watershed and the alternatives available, any plan recommended at the end of Phase II will likely range from \$10 million to \$17 million.

- c. **Factors Affecting the Scope and Level of Review.** The dynamic nature of a watershed study and the technical nature of the watershed assessments that will be conducted in Phase I are the primary factors affecting the appropriate scope and level of review. The PDT, including the local sponsor, the PCX, and vertical team will assess existing conditions and model future conditions during Phase I. Upon agreement that a restoration alternative is feasible, the team will move into Phase II, to examine and optimize a recommended restoration alternative for the Forge River Watershed.

The phased approach to the feasibility study requires an additional milestone before Phase II to determine whether an IEPR is necessary for the final products of the study. This milestone will coincide with the Formulation Review/Briefing scheduled at the conclusion of Phase I. At this milestone, the local sponsor and the Corps will revise the PMP to update necessary tasks, reflect costs and dates for the final product. The Review Plan update and an IEPR determination will be undertaken at this milestone.

- The most challenging part of the study will be the evaluation of with project conditions given the dynamic nature of a watershed focus. Current conditions are influenced by demographic, historic, and hydrologic conditions. The analysis will include a three-dimensional, finite-difference, physics-based numerical code used for modeling hydrodynamics and noncohesive sediment transport. A similar model, CH3D-SED, is being used in the Currituck Sound Feasibility Study in Wilmington District. Therefore, The Forge River Watershed project can benefit from and adapt in response to lessons learned elsewhere.

This project is considered low risk overall. The potential for failure is low because the project involves straight forward concepts with numerous successful national applications. The alternatives presented in the Reconnaissance report include: 1) Increase the circulation within the Forge River by increasing the fluvial flow within the tributaries or increasing the tidal flow from Moriches Bay; 2) Mitigate the exposure of the nutrient-rich layer of fine sediment to the waterbody by capping the sediment in place; 3) Dredge sediment layer and treat; and 4) Restore marsh and terrestrial habitats to augment natural restorative processes.

- The potential for controversy regarding project implementation is low because the recommended plan will take into account the public concerns. A socio-economic analysis will be prepared and at least one public meeting will be held. The uncertainty of success of the project is low because the methods used for evaluating the project are standard and the concept of implementing proposed project features is not innovative. A detailed assessment of existing conditions is proposed to reduce risk of recommendation of a non-sustainable solution. Since many factors contribute to the impairment, and may vary over time, sustainability of the ecosystem restoration recommendation is the greatest risk in formulation.
- The project does not likely involve significant threat to human life/safety assurance since the consequences of non-performance would be insignificant in that regard. The scale of a recommended project is yet to be determined, but in comparison to ecosystem restoration efforts in the region, it is expected that no safety assurance factors beyond those described in EC 1165-2-209 will be necessary to prevent consequences of non-performance on project economics or the environmental and social well-being. The alternatives presented in the Reconnaissance report include: 1) Increase the circulation within the Forge River by increasing the fluvial flow within the tributaries or increasing the tidal flow from Moriches Bay; 2) Mitigate the exposure of the nutrient-rich layer of fine sediment to the waterbody by capping the sediment in place; 3) Dredge sediment layer and treat; and 4) Restore marsh and terrestrial habitats to augment natural restorative processes.
- The project is not likely to have significant economic, environmental, and social impacts to the nation, such as adverse impacts on scarce or unique cultural, historic or tribal resources, or adverse impacts on fish and wildlife species or their habitat, or any endangered species.
- The potential for controversy regarding project implementation is low because the recommended plan will take into account the public concerns. A socio-economic analysis will be prepared and at least one public meeting will be held. A federally recognized tribe, the Poospatuck, is located within the watershed, and is represented on the project steering committee.

- The uncertainty of success of the project is low because the methods used for evaluating the project are standard and the concept of implementing proposed project features is not innovative.

**d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR, if applicable. The in-kind products and analyses to be provided by the non-Federal sponsor include: a preliminary assessment of existing conditions, Watershed survey and mapping, and data collection.

#### **4. DISTRICT QUALITY CONTROL (DQC)**

**a. Documentation of DQC.** District Quality Control (DQC) review will be performed by staff in the home district that are not involved in the study. Additional QC will be performed by the Project Delivery Team (PDT) during the course of completing the Feasibility Study. The detailed checks of computations and methodology will be performed at the District level, and the processes for this level of review are well established. A Quality Control Plan (QCP) is included in the PMP for the subject study and addresses DQC by the MSC/District. All in-kind submittals and submittals from team members will be provided to the ATR lead at each review. DQC is required for this study.

**b. Products to Undergo DQC.** A Quality Control Plan (QCP) is included in the PMP for the subject study and addresses DQC by the MSC/District. All in-kind submittals and submittals from team members will be provided to the ATR lead at each review.

**c. Required DQC Expertise.** The review team will reflect the traditional disciplines of the PDT, and the specific expertise necessary is hydrology & hydraulics. The review team member will be an expert in the field of urban hydrology & hydraulics, have a thorough understanding of the dynamics of the both open channel flow systems, enclosed systems, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, and non-structural measures especially as related to multipurpose alternatives including aquatic ecosystem restoration. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS).

#### **5. AGENCY TECHNICAL REVIEW (ATR)**

**a. Products to Undergo ATR.** ATR will be performed for the Feasibility Scoping Meeting (FSM) documentation in Phase I, and the Alternative Formulation Briefing (AFB) documentation, Draft Report (including NEPA and supporting documentation), and Final Report (including NEPA and supporting documentation) during Phase II. Additional ATR will be conducted on key technical and interim products which result from the three-dimensional, finite-difference, physics-based numerical code used for modeling hydrodynamics and noncohesive sediment transport.

**b. Required ATR Team Expertise.**

ATR Team Members/ Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience in watershed planning, and have experience in plan formulation for multipurpose projects, specifically integrating measures for ecosystem restoration, recreation, a watershed approach, and planning in a collaborative environment.
Economics	Team member will have extensive ecosystem restoration experience, be an expert in the formulation of NER benefits, and thorough understanding of IWR Planning Suite. Team member will be familiar with implications of the proposed draft Principles and Standards.
Environmental Resources	Team member will have extensive ecosystem restoration experience, be an expert in NEPA/Watershed analyses, and an understanding of IWR planning suite, and the appropriate habitat assessment models. Experience requirements may be expanded as Phase I evolves and identifies alternatives for optimization within Phase II.
Cultural Resources	Team member will have extensive experience in cultural resource coordination and procedures for coordination with federally recognized tribes.
Hydrology	Team member will be an expert in the field of urban hydrology, have a thorough understanding of the dynamics of the both open channel flow systems, enclosed systems, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, application of levees and flood walls in an urban environment with space constraints, non-structural measures especially as related to multipurpose alternatives including aquatic ecosystem restoration, non-structural solutions involving flood warning systems, and non-structural alternatives related to flood proofing. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS). A joint evaluator for Hydrology and Hydraulics may be appropriate.
Hydraulic Engineering	Team member will be an expert in the field of urban hydraulics, have a thorough understanding of the dynamics of the both open channel flow systems, enclosed systems, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, application of levees and flood walls in an urban environment with space constraints, non-structural measures especially as related to multipurpose alternatives including aquatic ecosystem restoration, non-structural solutions involving flood warning systems, and non-structural alternatives related to flood proofing. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS). A certified flood plain manager is recommended but not required. ). A joint evaluator for Hydrology and Hydraulics may be appropriate.

Geotechnical Engineering	Team member will be an expert in geotechnical engineering, have a thorough understanding of soils and dredging. Team member will have an understanding of computer modeling techniques to be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS).
Real Estate	Team member will have a thorough understanding of Real Estate applications and appropriate mechanisms for identifying, accessing and securing appropriate interests in the necessary properties.
Hazardous, Toxic and Radioactive Waste (HTRW)	Team member will be an expert in characterizing and isolating Hazardous, Toxic and Radioactive Waste (HTRW), and appropriate management of special wastes.
Cost Engineering	Cost Engineering ATR will be completed by, or under the direction of the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District. Regional cost personnel that are pre-certified by the DX, may conduct the cost ATR. The DX will provide certification of the final total project cost.

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 been 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 in order 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 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 will be 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 verbatim copy of each reviewer's comments (either 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 (IEPR)**

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 1165-2-209, 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 (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.
  - **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.** 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. IEPR can also be used where the

information is based on novel methods, presents complex interpretation challenges, contains precedent-setting methods or models, or presents conclusions that are like to change the prevailing practices. The degree of independence required for technical review increases as the project magnitude and project risk increase. For this project, we cannot determine until the end of Phase I whether we expect to conduct an IEPR using outside sources, and we will seek a deferred decision on IEPR until the conclusion of Phase I of the study. At that point, the PDT and the local sponsor will have identified alternative plans for addressing the water resources problems within the Forge River and will proceed into Phase II to formulate the concept fully. This milestone will coincide with the Formulation Review/Briefing scheduled at the conclusion of Phase I. At this milestone, the local sponsor and the Corps will revise the PMP to update necessary tasks and establish costs and dates for the final product. The Review Plan update and an IEPR determination will be undertaken at this milestone.

This feasibility study is designed to proceed in two phases, with Phase I applying technical assessments to develop a watershed plan, and Phase II expanding the analysis to optimize the appropriate recommendation. The Review Plan will be revised at the conclusion of Phase I to confirm whether an alternative to be explored in Phase II of the Feasibility study meets the mandatory triggers for Type I IEPR described in Paragraph 11.d.(1) and Appendix D of EC 1165-2-209; or other consequences which warrant an independent review, or to confirm that the project is complete, and no IEPR is necessary and no subsequent products will produced.

- a. **Products to Undergo Type I IEPR.** This feasibility study is designed to proceed in two phases, with Phase I applying technical assessments to develop a watershed plan, and Phase II expanding the analysis to optimize the alternative recommended. If Phase I concludes that an alternative to be explored in Phase II of the Feasibility study is likely to meet any of the mandatory triggers for Type I IEPR described in Paragraph 11.d.(1) and Appendix D of EC 1165-2-209; or other consequences which warrant an independent review, we will revise the Review Plan to address the need for an IEPR and expand upon the specific qualities of the study that require review. This RP revision will be initiated as a specific milestone at the end of Phase I, to coincide with the Formulation Review Briefing/Conference milestone.

Should the determination be made at this milestone at the conclusion of Phase I that an IEPR is advisable, the likely products from Phase I that will require review will be the three-dimensional, finite-difference, physics-based numerical code used for modeling hydrodynamics and noncohesive sediment transport that will be done with the CH3D-SED model and the model results and the watershed study documenting existing conditions, the future without project conditions, and the recommendations based on the model's results will undergo IEPR during Phase II.

- b. **Required Type I IEPR Panel Expertise.** Since the study is designed to proceed in two phases, with Phase I applying technical assessments to develop a watershed plan, and Phase II expanding the analysis to optimize the alternative recommended, it is premature to assess whether an IEPR is required at this point in the feasibility study. For planning purposes, however, we will articulate the likely disciplines needed should Phase I conclude with a recommended alternative to be explored in Phase II which makes Type I IEPR advisable, or meets the mandatory triggers described in Paragraph 11.d.(1) and Appendix D of EC 1165-2-209; or other consequences which warrant an independent review.

Should the determination be made at the conclusion of Phase I that an IEPR is advisable, the likely disciplines necessary to review the three-dimensional, finite-difference, physics-based numerical code used for modeling hydrodynamics and noncohesive sediment transport, and the watershed study documenting existing conditions, the future without project conditions, and the recommendations based on the model's results are listed below.

IEPR Panel Members/Disciplines	Expertise Required
Environmental	Reviewer is required. Reviewer will have extensive ecosystem restoration experience, be an expert in NEPA/Watershed analyses, and an understanding of IWR planning suite, and the appropriate habitat assessment models. Experience requirements may be expanded as Phase I evolves and identifies alternatives for optimization within Phase II.
Hydrology and Hydraulic Engineering	Reviewer will be an expert in the field of urban hydrology and hydraulics, have a thorough understanding of the dynamics of the both open channel flow systems, enclosed systems, application of detention / retention basins, effects of best management practices and low impact development on hydrology, approaches that can benefit water quality, application of levees and flood walls in an urban environment with space constraints, non-structural measures especially as related to multipurpose alternatives including aquatic ecosystem restoration, non-structural solutions involving flood warning systems, and non-structural alternatives related to flood proofing. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS). A joint evaluator for Hydrology and Hydraulics may be appropriate.
Geotechnical Engineering	Reviewer will be an expert in geotechnical engineering, have a thorough understanding of soils and dredging. Team member will have an understanding of computer modeling techniques to be used for this project (HEC-HMS, CH3D-SED, HEC-RAS, UNET, and TABS).

**c. Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, 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 4.d 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 verbatim copy of each reviewer's comments (either 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 following the close of the public comment period for the draft decision document. USACE shall consider all

recommendations contained in the Review Report 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, including through electronic means on the internet.

**2. MODEL CERTIFICATION AND APPROVAL**

**a. Planning Models.** The computational models to be employed in the Forge River Watershed Feasibility Study have been developed by or for USACE. However, the District will coordinate the use and certification of these models with the appropriate PCX. In addition, the PDT will determine the most appropriate habitat evaluation method to evaluate aquatic ecosystem impacts of the alternatives and to develop a mitigation plan if one is required. To assess the integrity and functions of the study area's ecosystem, a functional assessment method, such as species-based, Habitat Evaluation Procedures (HEP) will be utilized to characterize the with and without project habitat conditions. Specific HEP models that are to be used will be identified later in the planning process when more information about the impacted areas and the proposed alternatives are identified. The appropriate, approved HSI Model(s) will likely be used for functional assessment.

Any model certifications and approvals for all identified planning models will be coordinated through the appropriate PCX as needed. Project schedules and resources will be adjusted to address this process for certification and PCX coordination.

The following planning models are anticipated to be used in the development of the decision document:

<b>Model Name and Version</b>	<b>Brief Description of the Model and How It Will Be Applied in the Study</b>	<b>Certification / Approval Status</b>
HEP	A functional assement methodology such as species-based HEP will be used to characterize the with and without project habitat conditions for representative species. Specific HEP models to be used will be identified later in the planning process when more information about the specific alternative recommended is available. The appropriate, approved HSI Model(s) will likely be used for functional assessment.	Certified
IWR Plan, Version 3.3	IWR-PLAN combines solutions to planning problems and calculates the additive effects of each combination, assists with plan comparison by conducting cost effectiveness and incremental cost analyses, and identifies the plans that are the best financial investments and displaying the effects of each on a range of decision variables.	Certified

**b. Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document:

<b>Model Name and Version</b>	<b>Brief Description of the Model and How It Will Be Applied in the Study</b>
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 will be used for steady and unsteady flow analysis to evaluate the future without- and with-project conditions.
HEC-HMS 3.4	By applying this model the PDT is able to: <ul style="list-style-type: none"> <li>➤ Define the watersheds’ physical features</li> <li>➤ Describe the metrological conditions</li> <li>➤ Estimate parameters</li> <li>➤ Analyze simulations</li> <li>➤ Obtain GIS connectivity</li> </ul>
CH3D-SED	A three-dimensional, finite-difference, physics-based numerical code used for modeling hydrodynamics and noncohesive sediment transport. The program will be used to describe the existing conditions and the with project conditions in the Forge River.
MCACES (MII)	This will support the development of the construction cost estimate.

### 3. REVIEW SCHEDULES AND COSTS

**a. ATR Schedule and Cost.** The ATR process for this document will follow the timeline below. Actual dates will be scheduled once the period draws closer. The FSM review will begin in the 1<sup>st</sup> Quarter of FY 2013. Review of the AFB will begin in the 1<sup>st</sup> Quarter of FY 2014. The certification of the AFB, Draft Feasibility Report and Final Feasibility Report will follow the completion of each review.

<b>Task/Milestone</b>	<b>Date</b>
PHASE I	
ATR of FSM	February 2012
Revision of RP and IEPR Determination	February 2012
PHASE II	
ATR of draft AFB documentation begins	October 2013
ATR Certification of AFB	January 2014
Draft Feasibility Report Complete	September 2014
ATR of Draft Report Complete	November 2014
ATR Certification/Completion of Draft Report	December 2014
Public Review of Draft Report	July 2015
Final Report – Completed by District	May 2016
ATR Certification/Completion of Final Report	September 2016

The estimated cost for the ATR effort will likely be revisited as Phase I concludes. The PMP includes \$75,000 as the budget for the ATR, which is anticipated to cover ATR at three points in time.

- b. Type I IEPR Schedule and Cost.** Should the determination be made at the conclusion of Phase I that an IEPR is warranted, the IEPR process for this document will follow the timeline below. Actual dates will be scheduled once the period draws closer. The FSM review will begin in the 1<sup>st</sup> Quarter of FY 2013. Review of the AFB will begin in the 1<sup>st</sup> Quarter of FY 2014. The certification of the AFB, Draft Feasibility Report and Final Feasibility Report will follow the completion of each review.

<b>Task/Milestone</b>	<b>Date</b>
Revision of RP and IEPR Determination	February 2012
Initiate IEPR of Draft Report	December 2014
Complete IEPR of Draft Report	June 2015

- c. Model Certification/Approval Schedule and Cost.** Any model certifications and approvals for all identified planning models will be coordinated through the appropriate PCX as needed. It is most likely that the Habitat modeling will use approved Habitat Suitability Indices, and no certification will be required. Schedules and resources will be adjusted to address this process for certification and PCX coordination if it becomes necessary at the end of Phase I.

<b>Task/Milestone</b>	<b>Date</b>
Certification of Planning Model	May 2013

#### **4. PUBLIC PARTICIPATION**

Public review of the draft report will occur after completion of the ATR and IEPR and concurrence by NAD and HQUSACE that the document is ready for public release. As such, public comments other than those provided at any public meetings held during the planning process will not be available to the review team. However, the PDT may hold an “information session” with the public to describe the recommendations and findings and to gather public opinion information, which will then be available to the IEPR Panel.

Public review of the draft report will begin approximately one (1) month after the completion of the ATR process and policy guidance memo. The period will last 30 days as required. Public review comments will be forwarded to the ATR Team Leads upon completion of the public review comment period.

A formal State and Agency review will occur concurrently with the public review. However, it is anticipated that intensive coordination with these agencies will have occurred concurrently with the planning process.

Upon completion of the review period, comments will be consolidated and addressed if needed. A comment resolution meeting will take place if needed to decide upon the best resolution of comments. A summary of the comments and resolutions will be included in the final document.

The project is not likely to have significant interagency interest beyond representation on the project steering committee.

## **5. 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 (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review 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 changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC. It is anticipated that the Review Plan will be revised at the conclusion of Phase I to determine whether an IEPR is warranted. The specific milestone for this determination is the Formulation Review Briefing/Conference milestone.

## **6. REVIEW PLAN POINTS OF CONTACT**

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

- Caroline McCabe, Planner, New York District, (917) 790 8316
- Sue Ferguson, NAD representative of ECO PCX, (615) 736-7192

**ATTACHMENT 1: TEAM ROSTERS**

**PROJECT DELIVERY TEAM**

Name	Discipline	Phone (917) 790	Email
Ronald Pinzon	Project Management	x-8627	Ronald.R.Pinzon@usace.army.mil
Stephen Couch	Section Chief, Plan Formulation	x-8707	Stephen.J.Couch@usace.army.mil
Caroline McCabe	Plan Formulation	x-8624	Caroline.M.McCabe@usace.army.mil
Johnny Chan	Economics	x-8706	<a href="mailto:Johnny.C.Chan@usace.army.mil">Johnny.C.Chan@usace.army.mil</a>
Peter Weppler	Section Chief, Environmental Analysis	x-8703	Peter.W.Weppler@usace.army.mil
Peter Weppler	Biology/NEPA	x-8703	Peter.W.Weppler@usace.army.mil
Heather Morgan	Cultural Resources	x-8612	Heather.M.Morgan@usace.army.mil
Elena Manno	Lead Project Engineer	x-8247	Elena.Manno@usace.army.mil
John Chew	Cost Engineering	x-8255	John.Y.Chew@usace.army.mil
David Andersen	Real Estate	x-8450	David.C.Andersen@usace.army.mil
Andre Chauncey	Hydrology	x-8352	Andre.T.Chauncey@usace.army.mil
Ray Schembri	Lead H&H	x-8266	Raymond.L.Schembri@usace.army.mil
John Cimmino	Geotechnical	x-8379	Gennaro.J.Cimmino@usace.army.mil

**AGENCY TECHNICAL REVIEW TEAM**

Name	Discipline	Possible Review District**
TBD	ATR Manager/Plan Formulation	Rock Island
TBD	Civil Design	Baltimore
TBD	Biology/NEPA	New England
TBD	Hydrology/Hydraulics	Baltimore
TBD	Economics	Baltimore
TBD	Cost-Engineering*	New England
TBD	Real Estate	Philadelphia
TBD	Cultural Resources	St. Louis
TBD	Geotechnical Engineering	New England
TBD	HTRW Specialist	Baltimore

\* The cost engineering team member nomination will be coordinated with the NWW Cost Estimating Center of Expertise as required. NWW will determine if the cost estimate will need to be reviewed by PCX staff. \*\*All resumes will be reviewed and approved by the PCX prior to initiating any ATR.

**VERTICAL TEAM**

Name	Agency	Email
Thomas Hodson	Chief, Plan Formulation	Thomas.J.Hodson@usace.army.mil
Leonard Houston	Chief, Environmental Branch	Leonard.Houston@usace.army.mil
Peter Blum	North Atlantic Division	Peter.R.Blum@usace.army.mil
Wes Coleman	Office of Water Policy Review	Wesley.E.ColemanJr@usace.army.mil
Cathy Shuman	Regional Integration Team	Catherine.M.Shuman@usace.army.mil

**ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS**

**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the Feasibility Study for Forge River Watershed Study, Suffolk County, New York. The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-209. 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 the comments have been closed in DrChecks<sup>sm</sup>.

*SIGNATURE*

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Name  
ATR Team Leader  
Office Symbol/Company

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Project Manager  
Office Symbol

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location

\_\_\_\_\_  
Date

*SIGNATURE*

---

Name  
Review Management Office Representative  
Office Symbol

\_\_\_\_\_  
Date

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

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

*SIGNATURE*

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Name  
Chief, Engineering Division  
Office Symbol

\_\_\_\_\_  
Date

*SIGNATURE*

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Name  
Chief, Planning Division  
Office Symbol

\_\_\_\_\_  
Date

<sup>1</sup> Only needed if some portion of the ATR was contracted

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>

ATTACHMENT 4: STUDY AREA MAP



**Forge River Watershed  
Study Area Overview Map**

1 inch equals 2,000 feet  
0 500 1,000 2,000 3,000 4,000  
Feet



**ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS**

<b>Term</b>	<b>Definition</b>	<b>Term</b>	<b>Definition</b>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
ITR	Independent Technical Review	RTS	Regional Technical Specialist
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act