



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
NORTH ATLANTIC DIVISION, US ARMY CORPS OF ENGINEERS  
FORT HAMILTON MILITARY COMMUNITY  
BROOKLYN, NEW YORK 11252-6700

**DEC 11 2012**

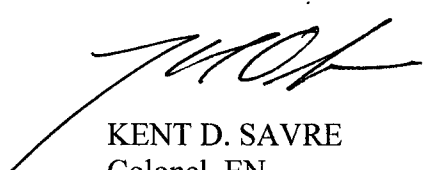
CENAD-PD-PP

MEMORANDUM FOR Commander, Norfolk District, ATTN: CENAO-WR-P

SUBJECT: Review Plan Approval for Lynnhaven River Ecosystem Restoration, Virginia Beach, VA Feasibility Study

1. The attached Review Plan for the subject study has been prepared in accordance with EC 1165-2-209, Civil Works Review Policy.
2. The Review Plan has been coordinated with the Ecosystem Planning Center of Expertise of the Mississippi Valley Division, which is the lead office to execute this plan. For further information, contact Ms. Jodi Creswell at 309-794-5448. The Review Plan does not include independent external peer review, as it was deemed not applicable by Headquarters, US Army Corps of Engineers.
3. I hereby approve this Review Plan, which 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 will require new written approval from this office.

Encl

  
KENT D. SAVRE  
Colonel, EN  
Commanding

## REVIEW PLAN

**Lynnhaven River Ecosystem Restoration, Virginia Beach, VA**  
**Feasibility Report with Integrated Environmental Assessment**

**Norfolk District**

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



**US Army Corps  
of Engineers®**

**REVIEW PLAN**

**Lynnhaven River Ecosystem Restoration, Virginia Beach, VA  
Feasibility Report with Integrated Environmental Assessment**

**TABLE OF CONTENTS**

1. PURPOSE AND REQUIREMENTS ..... 1

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION ..... 1

3. STUDY INFORMATION..... 1

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

5. AGENCY TECHNICAL REVIEW (ATR).....4

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR).....6

7. POLICY AND LEGAL COMPLIANCE REVIEW .....9

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION 10

9. MODEL CERTIFICATION AND APPROVAL..... 10

10. REVIEW SCHEDULES AND COSTS ..... 12

11. PUBLIC PARTICIPATION..... 13

12. REVIEW PLAN APPROVAL AND UPDATES ..... 14

13. REVIEW PLAN POINTS OF CONTACT ..... 14

ATTACHMENT 1: TEAM ROSTERS ..... 15

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION  
DOCUMENTS..... 16

ATTACHMENT 3: REVIEW PLAN REVISIONS..... 18

## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for Lynnhaven River Ecosystem Restoration, Virginia Beach, VA, Feasibility Report with Integrated Environmental Assessment.

### 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, 31 Mar 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) Lynnhaven River Ecosystem Restoration Project Management Plan, 22 August 2011
- (6) 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).

## 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 National Ecosystem Planning Center of Expertise (ECO-PCX).

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.** The purpose of the decision document entitled Lynnhaven River Basin Ecosystem Restoration AFB Draft Feasibility Report with Integrated Environmental Assessment (EA) and Appendices is to present the results of a feasibility study undertaken to restore the aquatic ecosystem of the Lynnhaven River Basin. The Lynnhaven River Basin Restoration study was authorized by Resolution of the Committee on Transportation and Infrastructure of the U.S. House of Representatives, Docket 2558, adopted May 6, 1998. The

feasibility phase of this project is cost shared 50/50 with the project sponsor, the City of Virginia Beach. This report provides planning, engineering, and implementation details of the recommended restoration plan and incorporates the comments provided during the Feasibility Scoping Meeting in a Project Guidance Memorandum dated 12 October 2005 to allow final design and construction to proceed following the approval of the plan, preparation of a Chief's Report, and subsequent Authorization by Congress.

**b. Study/Project Description.** The study area is located wholly in the boundaries of the City of Virginia Beach, Virginia in Southeastern Virginia. The Lynnhaven River Basin is an approximately 64-square-mile tidal estuary in the lower Chesapeake Bay system. The study is a single-purpose project focusing on ecosystem restoration. The preliminary estimated total project cost is \$26.8 million. For this study, measures considered include the following: tidal wetland habitat creation/restoration, planting of submerged aquatic vegetation (SAV) beds in optimal locations, placement of reef habitat in optimal locations, removal of dams blocking off areas previously connected to the tidal estuarine environment, restoration of bay scallops, removal of accumulated silts in choked areas to create improved subaqueous habitat for oysters and fish, and various nonstructural measures.

**c. Factors Affecting the Scope and Level of Review.**

- The study itself has no challenging portions.
- The main risks with the project are with SAV's and bay scallops. The risk for SAV's are related to tropical or sub-tropical storms having negative impacts on the SAV's or removing newly cast seed. The risk for bay scallops are related to predation before the scallops can mature and the risk of tropical or sub-tropical storms negatively impacting their SAV habitat. The risk are discussed and addressed in the main report and in the adaptive management plan. There is also acquisition of real estate. Efforts have been made to contact property owners and only positive comments have been made but not all property owners responded.
- The project is likely to have effects within the Lynnhaven River Basin and to some extent, by proximity, the southern Chesapeake Bay by restoring the basin from its degraded state. Additionally, the Lynnhaven River Inlet is the southern most inlet of the Chesapeake Bay and as such, its restoration would contribute to meeting the goals and objectives of Chesapeake Bay Protection and Restoration Executive Order (Executive Order 13508).
- The project is not likely to involve a significant threat to human life/safety assurance. The project is composed of wetlands restoration, SAV restoration, reintroduction of bay scallops and construction of reef habitat.
- The project could have some interagency interest. The Lynnhaven River Inlet is the southern most inlet of the Chesapeake Bay and as such, its restoration would contribute to meeting the goals and objectives of Chesapeake Bay Protection and Restoration Executive Order (Executive Order 13508).
- The project is not controversial and is widely supported in the local community and by the City of Virginia Beach.

- If the project report does not contain influential scientific information or likely to be a highly influential scientific assessment. The methods used in the report have been used before and are all cited from scientific literature.
- Methods are novel or complex: The methods are not novel or complex. Artificial fish reefs have a long history of success in estuaries and near-shore coastal waters throughout the world. Such reefs typically develop a robust population of sessile benthic organisms, typically corals or molluscan shellfish, depending on temperature/salinity regimes where the reefs are placed. Wetlands have been restored in various ways by the USACE and others in the Chesapeake region for several decades. SAV restoration has recently had considerable success in nearby Eastern Shore waters, as has bay scallop restoration, which is the newest ecological restoration attempted in the local area. However, shellfish restoration has also been done throughout the world, including scallop species.
- The proposed project design will not require redundancy, resiliency, and/or robustness. There are some risks associated with the restoration of SAV's and bay scallops. The risk for SAV's are related to tropical or sub-tropical storms having negative impacts on the SAV's or removing newly cast seed. The risk for bay scallops are related to predation before the scallops can mature and the risk of tropical or sub-tropical storms negatively impacting their SAV habitat. The risk are discussed and addressed in the main report and in the adaptive management plan.
- There is one necessary construction sequence, the SAV's must be built before the bay scallops are reintroduced. The SAV's serve as the habitat for the bay scallops and the scallops will not be able to produce a self sustaining population without them. There is also a construction sequence that would serve to increase the chances of success. Constructing the wetlands and placing the reef balls first would give the SAV a higher chance of success as the reef balls and wetlands begin to realize their ecosystem benefits.

**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 sponsor include:

The non-Federal sponsor contracted with URS Corporation for the development of a watershed model to provide both freshwater flows and nutrient and sediment loadings from the Lynnhaven River Basin. URS Corporation of Virginia Beach developed a landside watershed model for the Lynnhaven River Basin, using HSPF (Hydrological Simulation Program – FORTRAN), version 12 (URS Technical Memorandum, Hydrologic Concepts and Parameter Development, 2006). This model was calibrated by comparing its predictions to monitoring data collected at 5 sites within and/or nearby the Lynnhaven basin. The calibrated model was then used to provide multi-year datasets of its outputs of hourly non-point source nutrient loadings and hourly freshwater discharge values to the VIMS hydrodynamic and water quality model within the river to determine fate and transport of the runoff and determine possible optimal locations for proposed Best Management Practice (BMP) implementation. The results of these models will also be used to review and address the city's stormwater management plan.

**4. DISTRICT QUALITY CONTROL (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 MSC.

- a. **Documentation of DQC.** The DQC Report includes the comments received during internal review and their responses, technical review meeting notes and the Technical and Legal Review Certification.

**5. 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 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 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. The ATR team lead will be from outside the home MSC.

- a. **Products to Undergo ATR.** The products to undergo ATR include the AFB Draft Feasibility Report and Integrated Environmental Assessment, Main Report and Appendices, to include the Engineering (includes cost estimates), Economic, Environmental, and Cultural Resources Appendices as well as the Real Estate Plan.
- b. **Required ATR Team Expertise.** The ATR team will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members will roughly mirror the composition of the PDT. It is anticipated that the ATR team will consist of 9-11 members. The ATR team members will be identified by the ECO-PCX at the earliest possible date. The cost engineering expert on the team shall be coordinated with CENWW – Cost Estimating Directory of Expertise.

<b>ATR Team Members/Disciplines</b>	<b>Expertise Required</b>
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).
<b>ATR Team Members/Disciplines</b>	<b>Expertise Required</b>
Plan Formulation	The Planning reviewer should be a senior water resources planner with experience in ecosystem restoration and preparing decision documents for ecosystem restoration.
Economics-CE/ICA	The Economics reviewer should be a senior water resources economist or ecosystem restoration specialist with experience in cost effective/incremental cost analysis on ecosystem projects, familiar with the MCDA module of IWR Planning Suite software, and participating in preparing decision documents for ecosystem restoration.
Biology/NEPA	The Environmental Resources reviewer should be a senior environmental resources professional with experience in ecosystem restoration, preparing decision documents for ecosystem restoration and the production of Environmental Assessments for ecosystem restoration studies.
Model Reviewer/Biology	The Biology reviewer should be a senior biologist with experience in ecosystem restoration, ecosystem benefits research and evaluation.
Cultural Resources	The Cultural Resources reviewer should be a senior cultural resources professional with experience in ecosystem restoration and preparing decision documents for ecosystem restoration. They should also be experienced in the cultural resource coordination necessary for this type of study.
Hydrology and Hydraulic Engineering	The hydrology and hydraulic engineering reviewer will be an expert in the field and have a thorough understanding of hydrodynamic modeling and structural construction techniques such as wetland construction and sub-aquatic reef construction.
Cost Engineering	The Cost Engineering reviewer should be a senior cost engineer certified by the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District.
Real Estate	The Real Estate reviewer should be a senior real estate professional with experience in preparing Real Estate Plans involving property acquisition and potential temporary construction easements.

**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 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.** *This section describes the risk informed decision on whether IEPR (Type I, Type II, both or neither) will or will not be conducted for the decision document and, if appropriate, follow-on project implementation. The decision is based on the criteria in EC 1165-2-209 and the discussion in Section 3 – Factors Affecting the Scope and Level of Review. An exclusion to Type I IEPR is being requested, the basis for this request is described below. The exclusion request has been forwarded. This risk informed decision explicitly considers the following:*
- The decision document does not meet the mandatory triggers for Type I IEPR described in Paragraph 11.d.(1) and Appendix D of EC 1165-2-209; and if it doesn't, then also:
    - The consequences of non-performance would not have any adverse impacts. The main risks for non-performance are SAV's and bay scallops. If the SAV's are not successful, bay scallops cannot be reintroduced, however, the risk of this are low. Additionally, The risks associated with reef habitat are very low. It is unlikely that the reefs would not be colonized by oysters and fish species.
    - The project is not likely to involve a significant threat to human life/safety assurance. The project is composed of wetlands restoration, SAV restoration, reintroduction of bay scallops and construction of reef habitat.; and

- The decision document meets the possible exclusions described in Paragraph 11.d.(3) and Appendix D of EC 1165-2-209.
  - (i) It is not controversial and widely supported locally; and
  - (ii) Has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources. There are no impacts.
  - (iii) Has no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures. There is no mitigation; and
  - (iv) Has, before implementation of mitigation measures, no more than a negligible adverse impact on a species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or the critical habitat of such species designated under such Act. There is no mitigation;
- To date there has been no request from any Federal or state agency to conduct an IEPR.
- The proposed project does not meet the criteria for conducting Type II IEPR described in Paragraph 2 of Appendix D of EC 1165-2-209, including:
  - There is no threat to life safety.;
  - The methods are not novel or complex. Artificial fish reefs have a long history of success in estuaries and near-shore coastal waters throughout the world. Such reefs typically develop a robust population of sessile benthic organisms, typically corals or molluscan shellfish, depending on temperature/salinity regimes where the reefs are placed. Wetlands have been restored in various ways by the USACE and others in the Chesapeake region for several decades. SAV restoration has recently had considerable success in nearby Eastern Shore waters, as has bay scallop restoration, which is the newest ecological restoration attempted in the local area. However, shellfish restoration has also been done throughout the world, including scallop species.
  - The proposed project design will not require redundancy, resiliency, and/or robustness. There are some risks associated with the restoration of SAV's and bay scallops. The risk for SAV's are related to tropical or sub-tropical storms having negative impacts on the SAV's or removing newly cast seed. The risk for bay scallops are related to predation before the scallops can mature and the risk of tropical or sub-tropical storms negatively impacting their SAV habitat. The risk are discussed and addressed in the main report and in the adaptive management plan.
  - There is one necessary construction sequence, the SAV's must be built before the bay scallops are reintroduced. The SAV's serve as the habitat for the bay scallops and the scallops will not be able to produce a self sustaining population without them. There is also a construction sequence that would serve to increase the chances of success. Constructing the wetlands and placing the reef balls first would give the SAV a higher chance of success as the reef balls and wetlands begin to realize their ecosystem benefits.

In addition to the criteria above the following was taken into consideration in making the decision to request an exclusion to conduct an IEPR:

(1) Project Magnitude. The magnitude of this project is determined as low. The cost of the project will likely not exceed \$30 million. It is assumed that the amount of benefits accrued by the project will be worth the cost because the project impacts a large area. The recommended plan will be selected using a cost effectiveness and incremental cost analysis. The project is not considered complex and involves restoration of aquatic habitat through the implementation of standard concepts. The project will have positive long term and cumulative effects. It is anticipated that the report will not present influential scientific information or influential scientific assessments, thus only an ATR is anticipated to be required. It is anticipated that the report will not present influential scientific information or influential scientific assessments, thus only an ATR is anticipated to be required.

(2) Project Risk. This project is considered low risk overall. The potential for failure is low because restoration of wetland habitat, SAV and bottom habitat are straight forward concepts with numerous successful national applications. 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 construction of restoration opportunities is not innovative. The ecosystem has not reached an irreversible state so it is likely that a restoration effort of the magnitude proposed will be successful.

(3) Vertical Team Consensus. Mr. Larry Cocchieri of North Atlantic Division representing the vertical team concurred (phone con on 10 April 2008) that the subject matter covered in the decision document is NOT novel, controversial, or precedent-setting, and the project will not have significant interagency interest or significant economic, environmental or social effects, and that therefore ATR without EIPR was appropriate.

**b. Products to Undergo Type I IEPR Not-Applicable**

**c. Required Type I IEPR Panel Expertise. Not-Applicable**

**d. Documentation of Type I IEPR. Not-Applicable**

## **7. 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 home MSC Commander. 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.

## 8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

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

## 9. 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 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 (if required).

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 (if required).

- a. **Planning Models.** 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>
<u>Environmental Benefits Model (Secondary Production and Total Suspended Solids)</u>	The model consists of an Excel spreadsheet, with numbers for secondary production (animal biomass produced per unit area of each restoration option), and TSS (Total Suspended Solids) reduction. For the secondary production and TSS reduction, the numbers are broken down into monthly increments for an acre of each restoration option – wetlands, SAV beds, scallops, and	<u>Approval for Single Use on this project is currently being coordinated</u>

	fish (oyster) reefs for the VIMS model only. The spreadsheet on page 81 of the main report and embedded within the “Lynnhaven Ecosystem Restoration, Benefits Model Information” is the model to be certified for local use. Reefs are built at two different heights, depending on the water depth, and this does affect the surface area of the reefs which is taken into account in the benefits calculations.	
Wildlife Habitat Value of New England Salt Marshes model	The model was developed by the U.S. Environmental Protection Agency. The purpose of the model is to quantify habitat values of coastal salt marshes based on marsh characteristics and the presence of habitat types that contribute to use by terrestrial species. The scores produced by the model can be used to make planning and management decisions, such as “(1) prioritizing marshes for protection and restoration, (2) identify ecologically important marshes that could potentially harbor high biodiversity, and (3) monitor changes in habitat value over time, for example during the course of salt marsh restoration” (McKinney et al. 2009a).	<u>Approval for Single Use on this project is currently being coordinated</u>
<u>Benthic Index of Biotic Integrity (BIBI) on the Lynnhaven River Watershet</u>	The BIBI assessment was developed by Dr. Dan Dauer, Professor of Marine Science, Old Dominion University. The purpose of the BIBI is to assist in obtaining a measure of NER benefits using similar metrics between restoration activities. In the present study it is used primarily to describe increases in species diversity as a result of restoration activities. BIBI is an ecosystem response that measures increases in species diversity as habitat quality changes. It is a rating system from 1-5, with the highest ratings typical of high quality, complex habitat such as reefs. Species composition can be altered positively by restoration activities and this difference can be measured via monitoring post construction. The present study assigns expected ratings to different restoration activities in order to compare them to each other and to pre-restoration conditions.	<u>Approval for Single Use on this project is currently being coordinated</u>
<u>IWR-Planning Suite (version 1.0.11.0)</u>		<u>Certified</u>
<u>Multi-Criteria Decision Module of the IWR-Planning Suite (version 2.0.7.0)</u>	The purpose of the model for the Lynnhaven River Ecosystem Restoration Study is to combine several basic ecological benefit parameters provided in various amounts by all the proposed restoration activities into one single output which gives a more complete representation of the system as a whole as compared to any of the benefit parameters on an individual basis.	<u>Approval for Single Use on this project is currently being coordinated</u>

**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>	<b>Approval Status</b>
Development of Hydrodynamic and Water Quality Models for the Lynnhaven River System	VIMS has performed a successful development of an integrated numerical modeling framework for the Lynnhaven River. This framework combines a high-resolution 3D hydrodynamic model (UNTRIM) that provides the required transport for a water quality model (CE-QUAL-ICM) that, in turn, provides intra-tidal predictions of 23 water quality state variables.	<u>Model has been validated but not approved.</u>
Landside watershed model for the Lynnhaven River Basin, using HSPF (Hydrological Simulation Program – FORTRAN)	The non-Federal sponsor contracted with URS Corporation for the development of a watershed model to provide both freshwater flows and nutrient and sediment loadings from the Lynnhaven River Basin. URS Corporation of Virginia Beach developed a landside watershed model for the Lynnhaven River Basin, using HSPF (Hydrological Simulation Program – FORTRAN), version 12 (URS Technical Memorandum, Hydrologic Concepts and Parameter Development, 2006). This model was calibrated by comparing its predictions to monitoring data collected at 5 sites within and/or nearby the Lynnhaven basin. The calibrated model was then used to provide multi-year datasets of its outputs of hourly non-point source nutrient loadings and hourly freshwater discharge values to the VIMS hydrodynamic and water quality model within the river to determine fate and transport of the runoff and determine possible optimal locations for proposed Best Management Practice (BMP) implementation. The results of these models will also be used to review and address the city’s stormwater management plan.	<u>Model has been validated but not approved.</u>

**10. REVIEW SCHEDULES AND COSTS**

**ATR Schedule and Cost. Timing and Schedule**

(1) Throughout the development of this document, the team will hold team meetings to ensure planning quality. Senior staff and subject matter experts from the PDT District and members of the vertical team (DST, Planning CoP, RIT as needed) will attend the meetings, as required, and provide comments on the product to date.

(2) The ATR will begin once a recommended team has been selected, the preliminary design is complete, and the environmental assessment has been performed.

(3) The PDT will hold a “page-turn” session to review the draft report to ensure consistency across the disciplines and resolve any issues prior to the start of ATR. Writer/editor services will be performed on the draft prior to ATR as well.

(4) The ATR process for this project will follow the timeline below.

<b>Task</b>	<b>Date</b>
Certified	March 2012
Alternative Formulation Briefing (AFB)	April 2012
Public Review of Draft Report	December 2012
Final Report	September 2013

#### Funding

(1) The PDT district shall provide labor funding by cross charge labor codes. Funding for travel will be provided through government travel orders. The Technical Team Lead will work with the ATR manager to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for this review is \$50,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

(2) The ATR team leader shall provide organization codes for each team members and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes.

(3) Reviewers shall monitor individual labor code balances and alert the ATR team leader to any possible funding shortages.

**a. Type I IEPR Schedule and Cost.** *Not Applicable*

**b. Model Certification/Approval Schedule and Cost.** The model certification and approval schedule is being coordinated with the Eco-PCX

#### 11. PUBLIC PARTICIPATION

**a.** Public review of the draft report will occur after issuance of the AFB policy guidance memo and concurrence by 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. Should significant public comments result in revision of the decision document, the review team will be asked to re-review the report.



- b. Public review of the draft report will begin approximately one month after the completion of the ATR process and policy guidance memo. The period will last 30 days as required.
- c. The public review of necessary State or Federal permits will also take place during this period.
- d. A formal State and Agency review will occur concurrently with the public review. However, intensive coordination with these agencies have occurred concurrent with the planning process. A Steering Committee has been established involving representatives of the state and Federal resource agencies and stakeholder groups that meets bi-monthly to discuss progress of the study to date, potential measures and alternatives for restoration, and any related issues and concerns.
- e. Upon completion of the review period, comments will be consolidated in a matrix 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 document.

## **12. 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.

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

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

- Jennifer Armstrong, Project Manager, Norfolk District (757) 201-7704
- DST manager for this project is Joe Forcina, CENAD-PD-CID-S at 718-765-7084.
- Sue Ferguson, NAD Account Manager, Eco PCX Nashville District 615-736-7192

## ATTACHMENT 1: TEAM ROSTERS

The project delivery team (PDT) is comprised of those individuals directly involved in the development of the decision document. Contact information and disciplines are listed below.

First	Last	Discipline	Phone	Email
Jennifer	Armstrong	Project Manager	(757) 201-7704	<a href="mailto:Jennifer.R.Armstrong@usace.army.mil">Jennifer.R.Armstrong@usace.army.mil</a>
Janet	Cote	Biology/NEPA, Plan Formulation, Technical Team Lead (TTL)	(757) 201-7837	<a href="mailto:Janet.Cote@usace.army.mil">Janet.Cote@usace.army.mil</a>
Dave	Schulte	Biology/NEPA	(757) 201-7007	<a href="mailto:David.M.Schulte@usace.army.mil">David.M.Schulte@usace.army.mil</a>
Mark	Hudgins	Hydraulics/hydrology	(757) 201-7107	<a href="mailto:Mark.H.Hudgins@usace.army.mil">Mark.H.Hudgins@usace.army.mil</a>
Jen	Spencer	Economics, Plan Formulation	(757) 201-7102	<a href="mailto:Jennifer.A.Spencer@usace.army.mil">Jennifer.A.Spencer@usace.army.mil</a>
Mike	Hall	Cost engineering	(757) 201-7691	<a href="mailto:Michael.K.Hall@usace.army.mil">Michael.K.Hall@usace.army.mil</a>
David	Parson	Real Estate/lands	(757) 201-7736	<a href="mailto:David.B.Parson@usace.army.mil">David.B.Parson@usace.army.mil</a>
Helene	Haluska	Cultural resources	(757) 201-7008	<a href="mailto:Helene.W.Haluska@usace.army.mil">Helene.W.Haluska@usace.army.mil</a>
Marc	Gutterman	GeoEnvironmental	(757) 201-7669	<a href="mailto:Marc.D.Gutterman@usace.army.mil">Marc.D.Gutterman@usace.army.mil</a>
Karin	Dridge	GIS	(757) 201-3860	<a href="mailto:Karin.M.Dridge@usace.army.mil">Karin.M.Dridge@usace.army.mil</a>

The Agency Technical Review Team is comprised of those individuals directly involved in the review of the decision document. Contact information and disciplines are listed below.

Role	Name	District	Phone	Email	Labor
ATR Lead	Camie Knollenberg	MVR	309-794-5487	<a href="mailto:Camie.A.Knollenberg@usace.army.mil">Camie.A.Knollenberg@usace.army.mil</a>	2000
Plan Formulation	Camie Knollenberg	MVR	309-794-5487	<a href="mailto:Camie.A.Knollenberg@usace.army.mil">Camie.A.Knollenberg@usace.army.mil</a>	7500
Economics -CE/ICA	Scott Miner	SPK	916-557-6695	<a href="mailto:Scott.P.Miner@usace.army.mil">Scott.P.Miner@usace.army.mil</a>	5000
Biology/NEPA	Tomma Barnes	SAW	910-251-4728	<a href="mailto:Tomma.K.Barnes@usace.army.mil">Tomma.K.Barnes@usace.army.mil</a>	7500
H&H	Lynn Bocamazo	NAN	917-790-8396	<a href="mailto:Lynn.M.Bocamazo@usace.army.mil">Lynn.M.Bocamazo@usace.army.mil</a>	5000
Cultural Resources	Brad Perkl	MVP	651-290-5370	<a href="mailto:Bradley.E.Perkl@usace.army.mil">Bradley.E.Perkl@usace.army.mil</a>	5000
Model Review	Andy Casper	ERDC	601-634-4681	<a href="mailto:Andrew.F.Casper@usace.army.mil">Andrew.F.Casper@usace.army.mil</a>	8000
Real Estate	Heather Sachs	NAB	410-962-4648	<a href="mailto:Heather.Sachs@usace.army.mil">Heather.Sachs@usace.army.mil</a>	5000
Cost Engineering	Jim Neubauer	NWW	509-527-7332	<a href="mailto:James.G.Neubauer@usace.army.mil">James.G.Neubauer@usace.army.mil</a>	5000

**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 <type of product> for <project name and location>. 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

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

Name

Chief, Engineering Division

Office Symbol

Date

SIGNATURE

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>