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| **Feasibility Phase**DECISION DOCUMENT REVIEWPLAN |

**PRETTY LAKE WATERSHED**

**NORFOLK VIRGINIA, VIRGINIA**

**SECTION 205**

**FLOOD RISK MANAGEMENT PROJECT**

****

**U.S. Army Corps of Engineers**

**Norfolk District**

**803 Front Street**

**Norfolk, Virginia 23510-1096**

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1. **PURPOSE AND REQUIREMENTS**
	1. **Purpose.** This Review Plan defines the scope and level of peer review for the Pretty Lake Watershed, Norfolk, Virginia, and Section 205 flood risk management Detailed Project Report (DPR). This plan is an attachment to the Project Management Plan (PMP). Section 205 of the Flood Control Act of 1948, as amended, authorizes USACE to study, design and construct flood risk management projects. It is a part of the Continuing Authorities Program (CAP) which focuses on water resource related projects of relatively smaller scope, cost and complexity. Traditional USACE civil works projects are of wider scope and complexity and are specifically authorized by Congress. The Continuing Authorities Program is a delegated authority to plan, design, and construct certain types of water resource and environmental restoration projects without specific Congressional authorization. Additional Information on this program can be found in Engineering Regulation 1105-2-100, Planning Guidance Notebook, Appendix F.
	2. **Applicability.** This review plan is based on the model Programmatic Review Plan for Section 103 and 205 project decision documents, which is applicable to projects that do not require an EIS. If an EIS is required, the model Programmatic Review Plan is not applicable and a study specific review plan must be prepared by the home district, coordinated with the appropriate Planning Center of Expertise (PCX) and approved by the home Major Subordinate Command (MSC) in accordance with EC 1165-2-209.

Applicability of the model Programmatic Review Plan for a specific project is determined by the home MSC. If the MSC determines that the model plan is applicable for a specific study, the MSC Commander may approve the plan (including exclusion from IEPR if warranted) without additional coordination with a PCX or Headquarters, USACE. The initial decision as to the applicability of the model plan should be made no later than the Federal Interest Determination (FID) milestone (as defined in Appendix F of ER 1105-2-100, F-10.e.1) during the feasibility phase of the project. A review plan for the project will subsequently be developed and approved prior to execution of the Feasibility Cost Sharing Agreement (FCSA) for the study. In addition, per EC 1165-2-209, the home district and MSC should assess at the Alternatives Formulation Briefing (AFB) whether the initial decision on Type I IEPR is still valid based on new information. If the decision on Type I IEPR has changed, the District and MSC should begin coordination with the appropriate PCX immediately.

This review plan does not cover implementation products. A review plan for the design and implementation phase of the project will be developed prior to approval of the final decision document in accordance with EC 1165-2-209.

**c. References**

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010

(2) Director of Civil Works’ Policy Memorandum #1, Jan 19, 2011

(3) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2010

(4) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006

(5) ER 1105-2-100, Planning Guidance Notebook, Appendix F, Continuing Authorities Program, Amendment #2, 31 Jan 2007

(6) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007

**d. Requirements.** This programmatic 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 ensuring that planning models and analysis are compliant with Corps policy, theoretically sound, computationally accurate, transparent, described to address any limitations of the model or its use, and documented in study reports (per EC 1105-2-412).

* + - District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the PMP. It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The MSC/District quality management plans address the conduct and documentation of this fundamental level of review.
		- Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home district.
		- Independent External Peer Review (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 is generally for feasibility and reevaluation studies and modification reports with EISs. IEPR is managed by an outside eligible organization (OEO) that is described in Internal Revenue Code Section 501(c) (3), is exempt from Federal tax under section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project.
		- Policy and Legal Compliance Review. Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level 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. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and Headquarters, USACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration polices, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.
		- Safety Assurance Review. In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007, EC 1105-2-410 requires that all projects addressing flooding or storm damage reduction undergo a safety assurance review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare. A future circular will provide a more comprehensive Civil Works Review Policy that will address the review process for the entire life cycle of a Civil Works project. That document will address the requirements for a safety assurance review for the Pre-Construction Engineering Phase, the Construction Phase, and the Operations Phase. The decision document phase is the initial design phase; therefore, ER 1105-2-410 requires that safety assurance factors be considered in all reviews for decision document phase studies.
		- Model Certification/Approval. EC 1105-2-407 requires certification (for Corps models) or approval (for non-Corps models) of planning models used for all planning activities. The EC defines planning models 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 EC does not cover engineering models used in planning. Engineering software is being address under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering activities in support of planning studies shall proceed as in the past. 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.
1. **REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION**

The RMO is responsible for managing the overall peer review effort described in this review plan. The RMO for Section 205 decision documents is the home MSC. The MSC will coordinate and approve the review plan and manage the ATR.

If Type I IEPR will be performed, the MSC will coordinate with the IEPR effort with the appropriate PCX, which will administer the Type I IEPR. The home District will post the approved review plan on its public website. A copy of the approved review plan (and any updates) will be provided to the Flood Risk Management (FRM) PCX to keep the PCX apprised of requirements and review schedules.

1. **STUDY INFORMATION**
2. **Decision Document.** The Pretty Lake Watershed, Norfolk, Virginia decision document will be prepared in accordance with ER 1105-2-100, Appendix F. The approval level of the decision document (if policy compliant) is the home MSC. An Environmental Assessment (EA) or Environmental Impact Statement (EIS) will be prepared along with the decision document.
3. **Study Description.** The City of Norfolk is located on the southern shore of the Chesapeake Bay approximately 90 miles southeast of Richmond, Virginia. The City is bordered mostly by water with the Chesapeake Bay on the north, with Hampton Roads harbor on the west and the Elizabeth River to the south. The Cities of Chesapeake and Virginia Beach bound the City on the south and east, respectively. The Pretty Lake watershed is in the northeast portion of the City. The watershed includes 7,721 parcels within the 2,545 acres of land in the watershed. Approximately 22,650 residents of the City live within the drainage basin (as defined by the City's Planning Department).

The City of Norfolk is low-lying, nearly all portions of the City are below elevation 15 feet (NAVD88) and drainage gradients are limited. Thus, a significant percentage of the City is susceptible to flooding from high tides, nor'easters, hurricanes, and other storm events. Current flooding ranges from nuisance flooding to severe, albeit less frequent, flooding from hurricanes and major nor'easters, such as occurred in November 2009. The frequency, extent and duration of flooding have been documented to be increasing due to both natural factors and man-induced conditions. Pretty Lake is a tidal creek located in northern Norfolk, and is a westward extension of Little Creek, a tributary of the Chesapeake Bay. The topography of the Pretty Lake watershed is generally flat and below elevation 12 feet. Approximately 22 percent of the study area lies below elevation 8 feet. The southern and eastern portions of the watershed’s ground surface slopes gently to the north into Pretty Lake. The northern area of the watershed is predominantly low lying and flat with the exceptions of a few high mounds. Further, increased flood damages are anticipated as land subsidence and sea level rise amplifies the coastal flooding problems. Related to land subsidence and sea level rise, the Virginia Institute of Marine Science and the Norfolk District have completed a report, “Chesapeake Bay Land Subsidence and Sea Level Change, an Evaluation of Past and Present Trends and Future Outlook” that contains relevant information. This report classified the Norfolk area, including Pretty Lake, as increasingly prone to severe flooding due to local land subsidence and sea level rise.

The recommended alternatives of the detailed project report will aim to reduce flood risk to public, health, safety, and property in the Pretty Lake watershed associated with coastal flooding from storm events and consider land subsidence and sea level rise forecasts for a 50-year planning horizon. Each one of these alternatives would evaluate structural and non-structural measures for flood risk management. Additionally, the project would be conducted so as to strive to educate the public about ongoing residual flooding risk in the Pretty Lake watershed.

# Factors Affecting the Scope and Level of Review. Several factors were considered to determine the appropriate scope and level of review necessary for the project. However, it should be noted that the project has just complete the draft Determination of Federal Interest and has not yet developed a scope of work for the feasibility stage. Once the scope of work is developed, this review plan will need to be updated. It has not yet been determined if this project will require an EIS or EA. It has also not yet been determined what models will be used in this project. In accordance with EC 1165-2-209 the detailed project report for this project will undergo District Quality Control, Agency Technical Review, and Independent External Peer Review Type I. The level of review at this point in time was determined based on extensive background data developed by the sponsor which suggests a high likelihood of structural flood risk management measures being recommended in the final decision document.

**d. In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The amount of in-kind services by the local sponsor are not yet determined as the project has not yet signed a feasibility cost sharing agreement (FCSA).

1. **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 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.

There will be DQC review performed on the Planning and Design Analysis Plan Formulation Report. Basic quality control tools include checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and recommendations.

1. **AGENCY TECHNICAL REVIEW (ATR)**

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.) The ATR shall ensure that the product is consistent 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 the results in a reasonably clear manner for the public and decision makers. ATR 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 lead will be from outside the home District, but within the North Atlantic Division (NAD). The leader of the ATR team will participate in milestone conferences to address review concerns.

* 1. **Products to Undergo ATR.** ATR will be performed throughout the study in accordance with the District and MSC Quality Management Plans. Certification of the ATR will be provided prior to the District Commander signing the final report. Products to undergo ATR include: the Feasibility Scoping Meeting documentation, Alternative Formulation Briefing, and the Draft and Final Reports.
	2. **Required ATR Team Expertise.**

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| **ATR Team Members/Disciplines** | **Expertise Required** |
| ATR Lead | The ATR lead should be a senior professional with extensive experience in preparing Section 205 decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may 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 flood risk management studies. Team member will be an expert in the field of plan formulation and have a thorough understanding of planning principles and procedures. The planner must have an in-depth knowledge of planning guidance such as ER-1105.  |
| Economics | The Economics reviewer should be a senior water resources planner with experience in flood risk management studies. Team member will be an expert in the field of economics and have a thorough understanding of economic analysis procedures as it relates to a least cost analysis.  |
| Environmental Resources | The Environmental Resources reviewer should be a senior environmental resource professional with experience in the field of Environmental Planning and have a thorough understanding of the National Environmental Policy Act (NEPA) as it relates to flood risk management projects. They should also be experienced in the cultural resource coordination necessary for this type of study. |
| Hydrology and Hydraulic/Coastal Engineering | The Hydrology and Hydraulic Engineering reviewer will be an expert in the field and have a thorough understanding of coastal and inland flooding issues, software models such as HEC-HMS and HEC-RAS, and both structural and non-structural techniques used in flood risk management projects.  |
| 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.  |
| Civil Engineering | The Civil Engineering reviewer should be an expert in the field and have a thorough understanding of interior drainage issues created by structural flood risk management projects. |
| Geotechnical Engineering | The Geotechnical Engineering reviewer should be an expert in the field and have a thorough understanding of the geotechnical needs of structural measures of flood risk management projects. |
| Structural Engineering | The Structural Engineering reviewer should be an expert in the field and have a thorough understanding of structural measures of flood risk management projects. |
| Electrical/ Mechanical Engineering | The Electrical/Mechanical Engineering reviewer should be an expert in the field and have a thorough understanding of pumping stations needed for interior drainage and other electrical/mechanical components associated with structural measures of flood risk management projects. |
| Construction/Operations | The Construction/Operations reviewer should be an expert in the field and have a thorough understanding of structural measures of flood risk management projects. |
| Real Estate | The Real Estate reviewer should be an expert in the field and have a thorough understanding of the real estate needs for structural or non-structural measures of flood risk management projects. |

* 1. 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:
		+ The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
		+ The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
		+ 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
		+ The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification to 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 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 1110-2-12 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 prior to the District Commander signing the final report. A sample Statement of Technical Review is included in Attachment 2.

1. **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. For Section 103 and 205 decision documents prepared under the model Programmatic Review Plan, Type I IEPR may or may not be required.
* 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.

For Section 103 and 205 decision documents prepared under the model Programmatic Review Plan, Type II IEPR may or may not be anticipated to be required in the design and implementation phase. The decision on whether Type II IEPR is required will be verified and documented in the review plan prepared for the design and implementation phase of the project.

* 1. **Decision on IEPR**. It is the policy of USACE that Section 205 project decision documents should undergo Type I IEPR unless ALL of the following criteria are met:

Federal action is not justified by life safety or failure of the project would not pose a significant threat to human life;

Life safety consequences and risk of non-performance of a project are not greater than under existing conditions;

There is no request by the Governor of an affected state for a peer review by independent experts;

The project does not require an EIS;

The project/study is not likely to involve significant public dispute as to the size, nature, or effects of the project;

The project/study is not likely to involve significant public dispute as to the economic or environmental cost or benefit of the project;

The information in the decision document or anticipated project design is not likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices;

The project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule; and

* There are no other circumstances where the Chief of Engineers or Director of Civil Works determines Type I IEPR is warranted.

Further, if Type I IEPR will not be performed:

Risks of non-performance and residual flooding must be fully disclosed in the decision document and in a public forum prior to final approval of the decision document;

The non-Federal sponsor must develop a Floodplain Management Plan, including a risk management plan and flood response plan (and evacuation plan if appropriate for the conditions), during the feasibility phase; and

* The non-Federal sponsor must explicitly acknowledge the risks and responsibilities in writing in a letter or other document (such as the Floodplain Management Plan) submitted to the Corps of Engineers along with the final decision document.

The decision on whether the above criteria are met (and a Type I IEPR exclusion is appropriate) is the responsibility of the MSC Commander. Additional factors the MSC Commander might consider include in deciding if an exclusion is appropriate include, but are not limited to: Hydrograph / period of flooding, warning time, depth of flooding, velocity of flooding, nature of area protected, and population protected.

Based on the information and analysis provided in the preceding paragraphs of this review plan, the project covered under this plan will apply for an exclusion from IEPR. If any of the criteria outlined in paragraph 1(b) are not met, the model National Programmatic Review Plan is not applicable and a study specific review plan must be prepared by the home district, and approved by the home MSC in accordance with EC 1165-2-209.

**b. Products to Undergo Type I IEPR**. Not applicable.

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

1. **Documentation of Type I IEPR.** Not Applicable.
2. **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.

1. **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. For decision documents prepared under the National Programmatic Review Plan Model, Regional cost personnel that are pre-certified by the DX will conduct the cost engineering ATR. The DX will provide the Cost Engineering DX certification. The RMO will coordinate with the Cost Engineering DX on the selection of the cost engineering ATR team member.

1. **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).

* 1. **Planning Models.** The following planning models are anticipated to be used:

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| **Model Name and Version\*** | **Brief Description of the Model and How It Will Be Applied in the Study** | **Approval Status** |
| Example: HEC-FDA 1.2.4 (Flood Damage Analysis) | The Hydrologic Engineering Center’s Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans along the Wild River near River City to aid in the selection of a recommended plan to manage flood risk. | Certified |

\*Other models may be added upon the development of the Scope of Work to be included in the FCSA, and the review plan will be updated at that time.

* 1. **Engineering Models.** The following engineering models are anticipated to be used.

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| **Model Name and Version\*** | **Brief Description of the Model and How It Will Be Applied in the Study** | **Approval Status** |
|  |  |  |

\*Models will be added upon the development of the Scope of Work to be included in the FCSA, and the review plan will be updated at that time.

1. **REVIEW SCHEDULES AND COSTS**
	1. **ATR Schedule and Cost.** ATR will be completed prior to submission of documentation to the vertical team for a decision. ATR cost for the PDR is expected to be approximately $50,000.
	2. **IEPR Schedule and Cost.** Will be developed with the development for the Scope of Work for the FCSA.
	3. **Model Certification/Approval Schedule and Cost.** For decision documents prepared under the model National Programmatic Review Plan, use of existing certified or approved planning models is encouraged. Where uncertified or unapproved model are used, approval of the model for use will be accomplished through the ATR process. The ATR team will apply the principles of EC 1105-2-407 during the ATR to ensure the model is theoretically and computationally sound, consistent with USACE policies, and adequately documented. If specific uncertified models are identified for repetitive use within a specific district or region, the MSC(s) and home District(s) will identify a unified approach to seek certification of these models.
2. **PUBLIC PARTICIPATION**

State and Federal agencies may be invited to participate in the study covered by this review plan as partner agencies or as technical members of the PDT, as appropriate. Agencies with regulatory review responsibilities will be contacted for coordination as required by applicable laws and procedures. The ATR team will be provided copies of any public and agency comments.

The non-Federal sponsor will be given the opportunity to review the decision document and provide comments. Once the Detailed Project Report is approved by the home MSC and is considered final, it will available for distribution to the public.

1. **REVIEW PLAN APPROVAL AND UPDATES**

The Home MSC 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.

NOTE: It is critical that the Review Plan is kept up to date and the latest version (complete with the team rosters) be provided to the MSC. An informational copy of the latest plan should also be provided to the appropriate PCX. Appropriate PCXs are: Section 103: PCX-CSDR; Section 205: FRM-PCX. In particular, the schedule for ATR must be kept updated so that the RMO can provide timely delivery of these services. The PDT should contact the RMO about 8 weeks in advance of any scheduled peer review or model review effort to coordinate the effort. DELETE THIS TEXT BOX BEFORE FINALIZING THE REVIEW PLAN.

1. **REVIEW PLAN POINTS OF CONTACT**

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

* + - U.S. Army Corps of Engineers, Norfolk District

ATTN: Pretty Lake Watershed, CAP 205, Holly Carpenter, CENAO-WR-PF

803 Front Street

Norfolk, VA 23510-1096

* U.S. Army Corps of Engineers, North Atlantic Division

ATTN: Supervisory Civil Engineer, CENAD-PD-P

302 General Lee Ave

Brooklyn, NY 11252

**ATTACHMENT 1: TEAM ROSTERS**

|  |  |  |
| --- | --- | --- |
| Name | Discipline | Organization |
| Katy Battista  | GIS  | WR-OG |
| Andrew Bazzle  | Economics  | WR-PR |
| Holly Carpenter  | Planning Technical Team Leader, Plan Formulation, Flood Plain Management | WR-PF |
| Garland Cooper  | Contracting  | CT |
| Alicia Farrow  | Engineering Technical Team Leader, Hydrology, Hydraulics  | EC-EH |
| John Haynes  | Cultural Resources  | WR-PE |
| Patrick Healy  | Counsel  | OC |
| Reynaldo Hernandez  | City of Norfolk Civil Engineer  | CITY  |
| Rob Huntoon  | Geotechnical Engineering  | EC-EG |
| George Janek  | Regulatory Permits  | WR-R |
| John Keifer  | City of Norfolk Public Works Director  | CITY  |
| Alice Kelly  | City of Norfolk, Assistant Director of Public Works  | CITY  |
| Tom Lochen  | CAP Coordinator  | WR-PR |
| Wayne Miller  | Structural Engineering  | EC-ES |
| Dave Parson  | Real Estate  | RE-A |
| Jerry Rogers  | Public Affairs  | PA |
| Joel Scussel  | Construction  | WR-OT |
| Nan Sothcott  | Program Analyst  | WR-O |
| Doug Stamper  | Project Management  | WR-OD |
| Robert Sweitzer  | Surveying  | WR-ON  |
| Gary Szymanski  | Cost Estimating  | EC-EE |
| Marsha Turner  | Finance and Accounting  | RM |
| Marty Underwood  | Environmental  | WR-PE |
| John White  | Storm Water Management  | CITY  |
| Amy Ballard  | Civil Engineering  | EC-EC |

1. Other PDT members may be added as warranted.

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

**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the Feasibility Study for the Pretty Lake Watershed, Norfolk, VA, CAP 205 Detailed Project Report. 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 DrCheckssm.

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|  |  |  |
| *Name* |  | Date |
| ATR Team Leader |  |  |
| *Office Symbol/Company* |  |  |

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| --- | --- | --- |
|  |  |  |
| *Name* |  | Date |
| Project Manager |  |  |
| *Office Symbol* |  |  |

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| --- | --- | --- |
|  |  |  |
| *Name* |  | Date |
| Architect Engineer Project Manager1 |  |  |
| *Company, location* |  |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| *Name* |  | Date |
| Review Management Office Representative |  |  |
| *Office Symbol* |  |  |

**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.

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| *Name* |  | Date |
| Chief, Engineering Division |  |  |
| *Office Symbol* |  |  |

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|  |  |  |
| *Name* |  | Date |
| Chief, Planning Division |  |  |
| *Office Symbol* |  |  |

1 Only needed if some portion of the ATR was contracted

**ATTACHMENT 3: REVIEW PLAN REVISIONS**

|  |  |  |
| --- | --- | --- |
| **Revision Date** | **Description of Change** | **Page / Paragraph Number** |
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**ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS**

| **Term** | **Definition** | **Term** | **Definition** |
| --- | --- | --- | --- |
| 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 |
| Home District/MSC | The District or MSC responsible for the preparation of the decision document | RMC | Risk Management Center  |
| HQUSACE | Headquarters, U.S. Army Corps of Engineers | RMO | Review Management Organization |
| IEPR | Independent External Peer Review | RTS | Regional Technical Specialist |
| ITR | Independent Technical Review | SAR | Safety Assurance Review |
| LRR | Limited Reevaluation Report | USACE | U.S. Army Corps of Engineers  |
| MSC | Major Subordinate Command | WRDA | Water Resources Development Act |
|  |  |  |  |