



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 14 2012

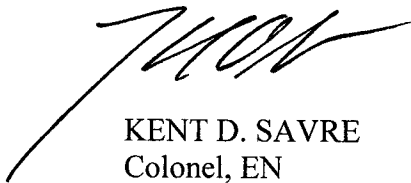
CENAD-PD-PP

MEMORANDUM FOR Commander, Baltimore District, ATTN: CENAB-PP-C

SUBJECT: Review Plan Approval for Anacostia Watershed Restoration, Montgomery County, Maryland Study, Ecosystem Restoration Feasibility Study Report and Integrated Environmental Assessment

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 currently does not include independent external peer review due to a pending approval decision by Headquarters, U.S. 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

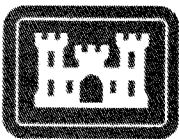
# **REVIEW PLAN**

**Anacostia Watershed Restoration,  
Montgomery County, Maryland Study**

**Ecosystem Restoration Feasibility Report and  
Integrated Environmental Assessment**

**Baltimore District, U.S. Army Corps of Engineers**

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



**US Army Corps  
of Engineers**  
Baltimore District

## REVIEW PLAN

### Anacostia Watershed Restoration, Montgomery County, Maryland Study

#### Ecosystem Restoration Feasibility Report and Integrated Environmental Assessment

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## 1. PURPOSE AND REQUIREMENTS

**Purpose.** This Review Plan defines the scope and level of peer review for the Anacostia Watershed Restoration, Montgomery County, Maryland Study, ecosystem restoration feasibility study report and integrated environmental assessment (EA).

### a. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, Change 1, 31 Jan 2012
- (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) Planning SMART Guide (<http://planning.usace.army.mil/toolbox/smart.cfm>)
- (6) Anacostia Watershed Restoration, Montgomery County, Maryland Study - Project Management Plan
- (7) U.S. Army Corps of Engineers, Baltimore District (USACE) Quality Management Plan

- b. 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

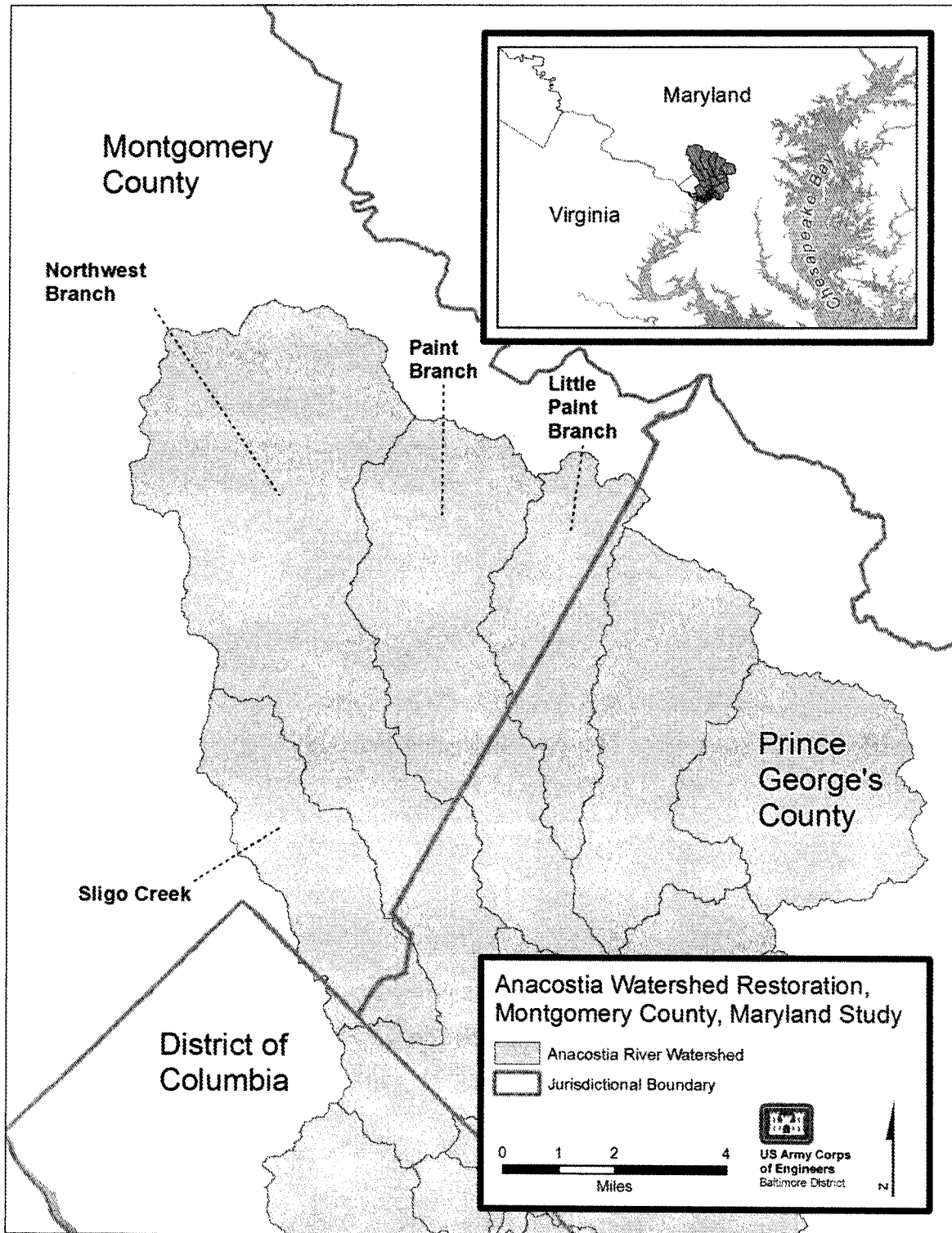
The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the National Ecosystem PCX (ECO-PCX).

The ECO-PCX 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 decision document to be prepared will be the Anacostia Watershed Restoration, Montgomery County, Maryland Study, ecosystem restoration feasibility report and integrated EA, which will seek to identify a recommended plan for authorization and construction.

- b. **Study/Project Description.** The study area is located in the Montgomery County portion of the Anacostia River watershed. Montgomery County, Maryland is located northwest of and adjacent to the District of Columbia. The following figure presents the location of the study area.



The Anacostia Restoration Plan (ARP), completed in February 2010, identified over 3,000 candidate projects for the restoration of the Anacostia River watershed, including projects that USACE could potentially implement as well as actions for others. The candidate projects represent concept opportunities associated with the following restoration strategies: stormwater retrofits; stream restoration; wetland creation/restoration; fish blockage removal/modification; riparian reforestation, meadow creation, and street tree and invasive management; trash reduction; and parkland acquisition. Further investigation and evaluation is necessary for the implementation of the ARP candidate projects.

As part of the ARP project management plan, one objective was "...to assist in the development of future cost-shared feasibility projects." In coordination with the USACE vertical team, those candidate projects included in the ARP that represented possible USACE-led feasibility studies leading to planning, design, and construction consist of the following ARP-defined restoration strategies: fish passage blockage removal or modification, riparian or upland reforestation, meadow creation, street tree, and invasive species management, stream restoration, and wetland creation or restoration.

The Anacostia Watershed Restoration, Montgomery County, Maryland Study, is one of two separate ecosystem restoration feasibility studies in the Anacostia River watershed to succeed the ARP. The other is Anacostia Watershed Restoration, Prince George's County, Maryland Study. The focus of the Anacostia River Watershed Ecosystem Restoration Feasibility Study, Montgomery County, Maryland, is primarily stream restoration and non-tidal wetland restoration associated with geomorphic stabilization measures with floodplain reconnection. Fish passage blockage remediation will be addressed within those areas where stream restoration would occur. Montgomery County recognizes the need for a systematic restoration effort at the watershed scale. Accordingly, Montgomery County is interested in partnering with USACE to restore the Anacostia River watershed's degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition, in sequence with its effort to treat stormwater runoff associated with its regulatory requirement to comply with the Clean Water Act (the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Sanitary Sewer System (MS4) Phase I permit and Anacostia River Sediment and Nutrient Total Maximum Daily Loads (TMDLs)). The Anacostia TMDLs represent one of the 92 segments that comprise the Chesapeake Bay Sediment and Nutrient TMDLs. It is anticipated that the range of costs of a potentially recommended plan are \$20-\$30 million.

The Anacostia River watershed includes numerous public organizations that advocate for the restoration of its streams, tributaries and subwatersheds. Existing subwatershed organizations within the Montgomery County portion of the Anacostia River watershed include the Neighbors of Northwest Branch, the Eyes of Paint Branch, Friends of Little Paint Branch, and the non-profit organization Friends of Sligo Creek (Anacostia, 2011). USACE staff will coordinate with the Anacostia Watershed Restoration Partnership along with specifically targeted citizen subwatershed groups within the Montgomery County portion of the Anacostia River watershed.

The Anacostia Watershed Restoration, Montgomery County, Maryland Study will include the preparation of an EA to comply with the National Environmental Policy Act (NEPA). The EA will provide a formal opportunity for public and agency review and ensure compliance with environmental laws.

The feasibility study is authorized in response to the September 8, 1988, resolution of the Committee on Public Works and Transportation, U.S. House of Representatives, which reads as follows:

*“Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, that the Board of Engineers for Rivers and Harbors is hereby requested to review the report of the Chief of Engineers on the Anacostia River and Tributaries, District of Columbia and Maryland, published as House Document No. 202, 81<sup>st</sup> Congress, 1<sup>st</sup> Session, with a view to determining if further improvements for flood control, navigation, erosion, sedimentation, water quality and other related water resources needs are advisable at this time.”*

**c. Factors Affecting the Scope and Level of Review.** The Anacostia Watershed Restoration, Montgomery County, Maryland Study ecosystem restoration feasibility report and integrated EA will include the predefined milestone meetings with the PDT, ECO-PCX, and vertical team following the USACE Planning SMART Guide (<http://planning.usace.army.mil/toolbox/index.cfm>). With the single-purpose ecosystem restoration feasibility study, there is no life safety concern.

- Montgomery County, Maryland is the non-Federal sponsor for the feasibility study.
- The decision document will include a characterization of existing conditions and a forecast of future without-project conditions.
- The decision document will include three alternatives for each stream reach, including the no-action alternative.
- The feasibility study will coordinate with the Anacostia Watershed Restoration Partnership along with specifically targeted citizen subwatershed groups within the Montgomery County portion of the Anacostia River watershed.
- The decision document will include a combination of procedures to compute ecosystem restoration benefits. For wetlands restoration and fish passage remediation measures, U.S. Fish and Wildlife habitat suitability index (HSI) models will be used. For instream habitat restoration benefits, procedures developed by other non-Federal government agencies (i.e., State of Maryland and Montgomery County) will be used. These procedures have applicability to USACE planning as it relates to the evaluation of potential effects of alternatives and to decision-making. The procedures relate stream habitat condition and Index of Biotic Integrity (IBI) to existing conditions in Montgomery County and the state. It is anticipated that ECO-PCX staff will not only serve in a review capacity, but be involved in team discussions refining use of the above ecosystem restoration benefit procedures.
- The decision document will include a cost effectiveness/incremental cost analysis (CE/ICA) of concept designs and costs, which will be completed using corporate IWR Planning Suite software.
- The CE/ICA will determine which alternatives will be selected for feasibility level design, which will include a cost estimate completed using corporate TRACES software.
- ATR of decision document and various milestone read-ahead packages are required in accordance with EC 1165-2-209, “Risk Informed Decisions on Appropriate Reviews.”
- There is no request by the Governor of Maryland for a peer review by independent experts.
- Due to the anticipated construction cost estimates below \$45 million and no request by the Governor of Maryland to conduct a peer review by independent experts, a request to waive

independent external peer review (IEPR), as prescribed in EC 1165-2-209, will be submitted to HQUSACE for review and approval.

- It is not anticipated alternative designs would 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.
  - It is not anticipated alternative designs will involve unique construction sequencing, or a reduced or overlapping design schedule.
  - It is not anticipated the feasibility study will generate public dispute as to the economic or environmental cost or benefit of the potentially recommended plan.
  - The potentially recommended plan has minimal life safety risk.
- 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 coordination and project management, public involvement support, field work associated with geomorphic and habitat assessment, biological sampling of fish and benthic macroinvertebrates, evaluation of alternative plans, and reviews. Additional information related to the in-kind contributions from Montgomery County is available in the project management plan (PMP).

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

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC prior to ATR. 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.

- a. **Documentation of DQC.** DQC will be documented via a memorandum signed by USACE, Baltimore District division or branch chiefs for various organizational branches/sections involved in preparation of the decision document or supporting analyses. This document will certify that DQC has been accomplished and will serve as the Quality Control Review Report. This memorandum will be provided to the ECO-PCX as proof that DQC occurred.
- b. **Products to Undergo DQC.** The decision document including appendices and its preceding milestone read ahead materials (e.g., study synopsis and risk register, Tentatively Selected Plan Milestone Meeting draft feasibility report, Agency Decision Milestone feasibility report synopsis of review comments, and the Draft Final Feasibility Report) and technical products produced during the study, including any products included as in-kind services.
- c. **Required DQC Expertise.** DQC will be conducted by USACE, Baltimore District staff and supervisors.

#### 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 following: Alternatives Meeting documentation including study synopsis and risk register, Tentatively Selected Plan Milestone Meeting draft feasibility report and risk register, Agency Decision Milestone feasibility report synopsis of review comments, and Draft Final Feasibility Report. It is anticipated robust ATR of the draft feasibility report would be the most intensive review by the ATR team, and would occur concurrent with public and policy reviews. The other products to undergo ATR will be reviewed by the ATR team during the course of the study primarily for the team members' preparation to participate in SMART Planning milestone meetings with Baltimore District staff and the vertical team. Robust ATR of other in-progress review documentation would occur depending on the study needs and the requirements of the MSC quality management plan.
- b. **Required ATR Team Expertise.** The number of ATR reviewers participating in the various reviews of feasibility study milestone documentation will depend on the corresponding segment of the feasibility study (i.e., Scoping, Alternative Formulation and Analysis, Feasibility-Level Analysis, and Chief's Report). The disciplines identified to serve as the ATR team include an ATR lead, plan formulation, economics, environmental resources, hydrology, hydraulic engineering, and civil engineering.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Plan Formulation	The Plan Formulation reviewer should be a senior water resources planner with experience in ecosystem restoration. The Planner should have experience associated with stream restoration and non-tidal wetland restoration actions with preference toward ecosystem restoration in urban watersheds
Economics	The economics reviewer should have experience with CE/ICA associated with ecosystem restoration feasibility studies.
Environmental Resources	The environmental resources reviewer should be a senior water resources planner or biologist with experience in ecosystem restoration. The reviewer should have knowledge of aquatic and wetland ecology, with extensive experience developing or reviewing HSI, HEP, and IBI methodologies and scoring.
Hydrology	The hydrologic engineering reviewer will be an expert in the field of hydrology, and be experienced using GISHydro2000 software, but not required. Experience with ESRI ArcGIS software (version

ATR Team Members/Disciplines	Expertise Required
	9.1 or later) is required. Experience forecasting future without-project conditions hydrology using changes in land use and other available information is required.
Hydraulic Engineering	The hydraulic engineering reviewer will be an expert in the field of hydraulics and have experience using HEC-RAS, version 4.0, and have experience developing and reviewing hydraulic models associated with ecosystem restoration by evaluating changes in existing geometry, future without-project changes based on future hydrologic conditions (which is dependent on planned or anticipated landuse changes), and with project conditions associated with geomorphic stabilization measures. The reviewer must be experience comparing existing conditions, future without-project conditions, and proposed conditions water surface elevations for standard recurrence intervals, including 2-, 5-, 10-, 25-, 50-, 100-, 200-, and 500-year storm events. The reviewer must also be experienced reviewing shear stress within the channel in order to evaluate appropriate structure material and corresponding sizes associated with proposed conditions.
Civil Engineering	The civil engineering reviewer will be an expert in the field of civil engineering, and be experienced with stream restoration design using Rosgen-type restorative measures for streambank stabilization and floodplain reconnection. The reviewer should also have experience designing non-tidal wetlands as part of floodplain reconnection practices.
Cost Engineering	The cost estimating reviewer will be an expert when preparing cost estimates based on detailed quantities developed as part of civil engineering and feasibility level designs. The Cost Engineering Directory of Expertise (DX) will complete the Cost Engineering review.

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 (SAR)) 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 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.** It is anticipated that Type I IEPR will not be required to be completed on the draft feasibility report and integrated environmental assessment following the Tentatively Selected Plan milestone meeting and based on the risk informed decision as prescribed in EC 1165-2-209, Section 11.d(1). A request to waive the IEPR requirement will be submitted to HQUSACE for review and approval. Additionally, with the study purpose identified as single-purpose ecosystem restoration, there is not a significant threat to human life that would require a Type II IEPR, or SAR, during the engineering design and construction phases following the feasibility phase
- There is not a significant threat to human life associated with proposed measures to include in the single-purpose ecosystem restoration potentially recommended plan.
  - It is anticipated that the total construction costs will be less than \$45 million based on a reasonable cost estimate at the end of the reconnaissance phase.
  - The Governor of Maryland has not requested a peer review by independent experts.
  - The DCW or the Chief of Engineers have not made a determination that the feasibility study is controversial due to significant public dispute over either the size, nature, or effects of the potentially recommended plan or the economic or environmental costs or benefits of the project.
  - The consequences of non-performance on project economics are likely not to have significant adverse impact to environmental and social well-being.
  - The analyses to be performed as part of the feasibility study are likely not to contain influential scientific information or include highly influential scientific assessment.
  - It is anticipated that the potentially recommended plan is likely not to have significant adverse impact on environmental, cultural, or other resources.
  - The feasibility study will prepare an environmental assessment as opposed to an environmental impact statement to comply with NEPA.
  - It is anticipated that the potentially recommended plan will have no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources. The Anacostia River watershed has experienced extensive development and corresponding disturbances within its stream network and floodplain.
  - It is anticipated that the potentially recommended plan will have no adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures. The purpose of the feasibility is single-purpose ecosystem restoration to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural

condition. It is anticipated that the potentially recommended plan will not have mitigation measures.

- It is anticipated that the potentially recommended plan will have no more than a negligible adverse impact on species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C 1531 et seq.) (ESA) or the critical habitat of such species designated under ESA. At this time, there are no federally listed species or critical habitat pursuant to ESA in the Anacostia River watershed.
- The feasibility study will not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood risk management gates within the same footprint and for the same purpose of an existing water resources project.
- USACE and the industry have ample experience to complete the analyses to be performed during the feasibility study and design and construction activities associated with the potentially recommended plan to treat as being routine.
- The potentially recommended plan has minimal life safety risk.
- It is not anticipated that proposed recommendations will increase flooding risk or pose a risk to property.

**b. Products to Undergo Type I IEPR. N/A**

**c. Required Type I IEPR Panel Expertise. N/A**

**d. Documentation of Type I IEPR. N/A**

## **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 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.** It is anticipated that coordination with CENAD and the ECO-PCX will occur to ensure approved USACE planning models to be used in this feasibility study are appropriately applied within the extent and context of the model's domain.

Montgomery County and the State of Maryland are leaders among state and county governments in assessing stream habitats and aquatic biotic integrity. Montgomery County Department of Environmental Protection (MCDEP) has monitored Montgomery County streams since the mid-1990s using protocols that were peer-reviewed by state, local, and federal agencies. MCDEP monitors streams at fixed stations in the county, and collects habitat, biological, and water quality data (MCDEP, 2010).

Also in the mid-1990s, Maryland Department of Natural Resources (DNR) developed the Maryland Biological Stream Survey (MBSS). MBSS utilizes standardized methods to monitor streams based on a combination of metrics modified and adapted from the U.S. Environmental Protection Agency's (USEPA) Rapid Bioassessment Protocols. MBSS conducts stratified random sampling to monitor conditions in wadeable streams and rivers across Maryland, including streams in Montgomery County. MBSS monitors random stations within the county on a 5-year rotation (DNR, 2010).

In 2000, MCDEP and the U.S. Environmental Protection Agency (EPA) executed a Memorandum of Understanding that committed MCDEP and EPA to work together to share information and develop joint products. As a result, in 2001, MCDEP revised its field monitoring methods to directly compare to those of the MBSS (MCDEP, 2010 and DNR, 2010).

The planning models proposed to be used as part of the feasibility study are approved (HEP/HSI), or will require robust ATR to determine whether a model developed by an entity outside of USACE (MCDEP and MBSS habitat assessment and IBI determination procedures) to be considered for approval for use during the planning process pursuant to EC 1105-2-412 by evaluating the model's appropriate application to compute ecosystem restoration benefits. Neither of the proposed planning models will require certification pursuant to and prescribed in EC 1105-2-412. It should be noted that a separate but potentially concurrent ecosystem restoration feasibility study in adjacent Prince George's County, Maryland, portion of the Anacostia River Watershed will utilize the same or similar planning models to be used as part of this feasibility study in Montgomery County.

IWR Planning Suite software will be used to complete the CE/ICA.

The USACE planning modernization initiative is underway to revise and modernize the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) to align objectives associated with USACE Civil Works water resources planning studies with the redefined National objectives for water resources development as prescribed in the Water Resources Development Act of 2007 (WRDA 2007), Section 2031. The new policy stated in WRDA 2007 is “it is the policy of the United States that all water resources projects should reflect national priorities, encourage economic development, and protect the environment....” In order to evaluate proposed conditions using the proposed objectives associated with the revised USACE planning modernization paradigm to respond to the revised P&G, a supplemental GIS analysis will be used to evaluate Other Social Effects (OSE).

The Urban Waters Federal Partnership selected the Anacostia River watershed as one of seven urban watersheds across the nation to serve as a pilot watershed to implement the Partnership’s goals. Consistent with the USACE planning modernization initiative, the Urban Waters Federal Partnership’s vision is “through our partnership, we will revitalize urban waters and the communities that surround them, transforming overlooked assets into treasured centerpieces and drivers of urban revival.” In addition, the Partnership’s mission is to “help urban and metropolitan areas, particularly those that are under-served or economically distressed, connect with their waterways and work to improve them.” The mission will address the need, which is that many of the Nation’s urban rivers, streams, and wetlands are polluted, degraded, and/or inaccessible, and that the surrounding communities often are not reaping the environmental, economic, and social benefits that living near a water body can provide.

To align with the desire to realize the non-tangible benefits associated with proximity to water within an urban context, a GIS proximity analysis to evaluate the location of problem areas to existing parkland and trails, schools and community centers, and residential population will be completed using U.S. Bureau of Census TIGER data and other GIS data layers to estimate the non-tangible ecosystem restoration benefits realized by proposed conditions. The modernized approach to ecosystem restoration benefits will evaluate ecosystem services that not only restore degraded habitat but also those that contribute to the human, social, and community welfare. By evaluating ecosystem restoration benefits based upon the services that the natural environment provides within an urban context, broader evaluations of the true value that ecosystem restorative actions provide can be made.

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

<b>Model Name and Version</b>	<b>Brief Description of the Model and How It Will Be Applied in the Study</b>	<b>Certification / Approval Status</b>
HEP/HSI Procedure	For wetlands restoration and fish passage remediation measures, U.S. Fish and Wildlife HSI models for target or representative species will be	Approved

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
	used.	
<p>MCDEP and MBSS habitat assessment and IBI determination procedures.</p>	<p>For stream habitat restoration benefits, procedures developed by other non-Federal government agencies (i.e., MBSS and MCDEP) that relate stream habitat condition to IBI under existing conditions will be used (listed below). Forecasting with project change in habitat conditions allows forecasting change in IBI under a limited range of watershed and habitat conditions.</p> <p>Maryland Department of Natural Resources. 2005. New biological indicators to better assess the condition of Maryland streams. Maryland Biological Stream Survey 2000-2004. Volume XVI. CBWP-MANTA-EA-05-13. Publication # DNR-12-0305-0100. 42 pages plus appendices. Available at: <a href="http://www.dnr.state.md.us/irc/docs/00007726.pdf">www.dnr.state.md.us/irc/docs/00007726.pdf</a>.</p> <p>Maryland Department of Natural Resources. 2005. Maryland Biological Stream Survey 2000-2004, Volume IX: Aquatic Biodiversity. <a href="http://www.dnr.state.md.us/streams/mbss/current_act.html">http://www.dnr.state.md.us/streams/mbss/current_act.html</a></p> <p>Maryland Department of Natural Resources. 2005. Maryland Biological Stream Survey 2000-2004, Volume XIV: Stressors Affecting Maryland Streams. <a href="http://www.dnr.state.md.us/streams/mbss/current_act.html">http://www.dnr.state.md.us/streams/mbss/current_act.html</a></p> <p>Maryland Department of Natural Resources. 2010. Sampling Manual: Field Protocols. Rev. Jan. 2010. Maryland Biological Stream Survey. CBWP-MANTA-EA-07-01. Publication # 12-2162007-190. Available at <a href="http://dnr.maryland.gov/streams/mbssseasons.asp">http://dnr.maryland.gov/streams/mbssseasons.asp</a>.</p> <p>Montgomery County Department of Environmental Protection. 1997. Montgomery County Water Quality Monitoring Program: Stream Monitoring Protocols.</p> <p>Montgomery County Department of Environmental Protection. 2010. Biological Monitoring Program Design website. Updated March 2010, accessed August 2010. <a href="http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/de p/water/monitoringBioProgram.asp">http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/de p/water/monitoringBioProgram.asp</a></p> <p>Montgomery County Department of Environmental Protection. 2010. Habitat Monitoring website, updated 3/31/2010, accessed August 2010: <a href="http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/de p/water/monHabitat.asp">http://www.montgomerycountymd.gov/dectmpl.asp?url=/content/de p/water/monHabitat.asp</a></p>	<p>Request approval for use with a robust ATR requirement</p>
IWR Planning Suite	This software will be used to complete the CE/ICA.	Certified



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

<b>Model Name and Version</b>	<b>Brief Description of the Model and How It Will Be Applied in the Study</b>	<b>Approval Status</b>
GISHydro2000	GISHydro2000 is a GIS-based software program for performing hydrologic analysis within the State of Maryland. GISHydro2000 is an extension within the ESRI ArcGIS software (version 9.3.1) developed in collaboration between the University of Maryland and Maryland State Highway Administration. Using spatial database input from a digital elevation model, land use, and solis data for the Maryland drainage area, the software delineates watershed and channels, computes watershed statistics (drainage area, runoff curve numbers, time of concentration, etc.), and peak discharge estimates from U.S. Geological Survey regression equations with corresponding confidence intervals. GISHydro2000 also allows interface with TR-2o for rating tables and channel routing. Public website: <a href="http://www.gishydro.umd.edu/">http://www.gishydro.umd.edu/</a> .	Request Approval of GIS Application/Extension Developed by Others
HEC-RAS, Version 4.0	HEC-RAS program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the existing, future without-, and with-project conditions. Both steady and unsteady flow analysis will be used in order to evaluate the compare the results of proposed floodplain reconnection measures.	HH&C CoP Preferred Model

## 10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The USACE planning modernization initiative incorporates the assumption that feasibility studies will be completed within three years. In order to comply with the current guidance presented in ER 1105-2-100 (Planning Guidance Notebook, Appendix H, Policy Compliance Review) and Approval of Decision Documents (Amendment #1, 20 Nov 2007), activity milestones, particularly the review requirements associated with EC 1165-2-209 (Civil Works Review Policy, 31 Jan 2012), must be completed within predefined and accepted durations. The following table presents the ATR schedule and corresponding cost to complete various reviews of feasibility study products and milestone documentation:

<b>ATR Team (Disciplines)</b>	<b>Product/Documentation to Undergo ATR</b>	<b>Proposed Review Start Schedule*</b>	<b>Estimated Duration**</b>	<b>Estimated Budget</b>
ATR Lead, Plan Formulation, and Environmental Resources	Review Plan Review and Endorsement	June 2012	5 days	\$1,600
ATR Lead, Hydrology,	Feasibility Study Synopsis and Risk Register	April 2013	10 days	TBD

<b>ATR Team (Disciplines)</b>	<b>Product/Documentation to Undergo ATR</b>	<b>Proposed Review Start Schedule*</b>	<b>Estimated Duration**</b>	<b>Estimated Budget</b>
Hydraulics, Plan Formulation, and Environmental Resources				
ATR Lead, H&H, Plan Formulation, Environmental Resources, Economics, Civil Engineering, and Cost Engineering DX	Tentatively Selected Plan Milestone Meeting Draft Feasibility Report and Risk Register	July 2014	10 days	TBD
ATR Lead, H&H, Plan Formulation, Environmental Resources, Economics, and Civil Engineering	Agency Decision Milestone Feasibility Report Synopsis of Review Comments and Risk Register	December 2014	10 days	TBD
ATR Lead, H&H, Plan Formulation, Environmental Resources, Economics, Civil Engineering, and Cost DX	Final Feasibility Report and Integrated Environmental Assessment and Risk Register	May 2015	10 days	TBD
<b>Total</b>				<b>TBD</b>

\*Schedule presented in PMP scope narrative (Assume FCSA January 2013)

\*\*Working days

**b. Type I IEPR Schedule and Cost. N/A.**

**c. Model Certification/Approval Schedule and Cost.** Some of the planning models that are anticipated to be used in the development of the decision document as described in the preceding sections are approved for use. Others are not currently approved, but are identified for robust ATR and approval for use. These include the MCDEP and MBSS habitat assessment and IBI determination procedures. GISHydro2000 is an engineering model that represents engineering systems and will be used to perform hydrologic analyses, which is not a Planning model as defined in EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011. The SET program is in development, and Engineering and Construction Bulletin No. 2007-6, dated 10 Apr 2007 provides interim guidance that the application and proper use of the engineering software is to be documented during ATR. The review and application and proper use of GISHydro2000 by the hydrologic ATR team member will occur during

the ATR of the scoping phase study synopsis. The following table presents the model approval schedule and corresponding cost:

<b>ATR Team (Disciplines)</b>	<b>Product/Documentation to Undergo ATR</b>	<b>Proposed Review Start Schedule*</b>	<b>Estimated Duration**</b>	<b>Estimated Budget</b>
ATR Lead and Environmental Resources	Review of Application of Approved Models and Supporting Documentation for MCDEP/MBSS Procedures	March 2013	TBD	TBD
<b>Total</b>				<b>TBD</b>

\*Schedule presented in PMP scope narrative (Assume FCSA January 2013)

\*\*Working days

## **11. PUBLIC PARTICIPATION**

The Anacostia River watershed includes numerous public organizations that advocate for the restoration of its streams, tributaries and subwatersheds. Coordination with any existing subwatershed organization that includes proposed restoration efforts as part of the feasibility study is required. Existing subwatershed organizations within the Montgomery County portion of the Anacostia River watershed include the Neighbors of Northwest Branch, the Eyes of Paint Branch, Friends of Little Paint Branch, and the non-profit organization Friends of Sligo Creek (Anacostia, 2011).

The Anacostia Watershed Restoration, Montgomery County, Maryland Study will include the preparation of an EA to comply with the NEPA. The EA will provide a formal opportunity for public and agency review and ensure compliance with environmental laws. The draft feasibility report and integrated EA will be posted on the CENAB webpage for public review by navigating through to civil works projects, and then to the public notice page. The public comments received during the public comment period would be made available to all reviewers prior to the Agency Decision Milestone meeting or sooner, if available.

## **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. Baltimore 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, will be posted on North Atlantic Division's approved Review Plan 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:

- David Robbins, Quality Control Manager, Baltimore District, (410) 962-0685.
- Joseph Vietri, MSC Environmental Team Leader, North Atlantic Division, (347) 370-4562.
- Sue Ferguson, North Atlantic Division Account Manager for ECO-PCX (615) 736-7192.

**ATTACHMENT 1: TEAM ROSTERS**

The following table presents the anticipated team roster for the Anacostia Watershed Restoration, Montgomery County, Maryland Study.

<b>Name</b>	<b>Role</b>	<b>Affiliation/Office Symbol</b>
<b><i>Non-Federal Team members</i></b>		
Steven Shofar	Chief, Watershed Management Section	MCDEP
Craig Carson	Manager, Capital Improvement Projects	MCDEP
Mark Wilcox	Engineer, Stream Design	MCDEP
Jennifer St. John	Biologist	MCDEP
Doug Redmond	Biologist	Maryland-National Capitol Park and Planning Commission (M-NPPC)
Stephen Reid	Planner	M-NCPPC
<b><i>Federal Team Members</i></b>		
Claire O'Neill	Project Manager	CENAB-PP-C
Kim Gross	Project Manager	CENAB-PP-C
Amy Guise	Chief, Planning Division	CENAB-PL-P
Daniel Bierly	Plan Formulation and Policy Advisor, General Investigations Program Manager	CENAB-PL-P
David Robbins	Plan Formulation, Study Manager	CENAB-PL-P
Christopher Spaur	Biologist	CENAB-PL-P
Angela Sowers, PhD.	Environmental Resources Quality Control	CENAB-PL-P
Scott Watson	Cultural Resources	CENAB-PL-E
Carol Ohl	Design Manager	CENAB-EN-WC
TBD	Hydrologic and Hydraulic Engineer, Stream Design	CENAB-EN-WW
Michael Martyn	Civil Engineering	CENAB-EN-WE
James Snyder	Geotechnical Engineering	CENAB-EN-GF
Luan Ngo	Cost Engineering	CENAB-EN-DT
Clyde Lichtenwalner	HTRW	CENAB-EN-HT
Adam Oestrich	Real Estate	CENAB-RE-C
James Bemis	Assistant District Counsel	CENAB-OC
George Ruddy	Biologist	USFWS
Rich Starr	Stream Restoration Planner	USFWS

<b>Name</b>	<b>Role</b>	<b>Affiliation/Office Symbol</b>
<b><i>Federal Team Members, ATR</i></b>		
Jodi Creswell	Operational Director, ECO-PCX	CEMVD-PD-N
Sue Ferguson	CENAD Manager, ECO-PCX	CELRN-PM-P
TBD	ATR Lead	TBD
TBD	Plan Formulation	TBD
TBD	Economics	TBD
TBD	Environmental Resources	TBD
TBD	Hydrology	TBD
TBD	Hydraulic Engineering	TBD
TBD	Civil Engineering	TBD
<b><i>Federal Team Members, CENAD</i></b>		
Rena Weichenberg	Plan Formulation	CENAD
Roselle Henn	Biologist	CENAD
Cliff Jones	Policy Review	CENAD
<b><i>Federal Team Members, HQUSACE</i></b>		
Catherine Shuman	Plan Formulation, RIT	HQUSACE
TBD	Plan Formulation, Office of Water Policy Review	HQUSACE
TBD	Biologist, Office of Water Policy Review	HQUSACE

**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>



**ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS**

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	MBSS	Maryland Biological Stream Survey
ARP	Anacostia Restoration Plan	MCDEP	Montgomery County Department of Environmental Protection
AWCAC	Anacostia Watershed Citizens Advisory Committee	MSC	Major Subordinate Command
CE/ICA	Cost Effectiveness/Incremental Cost Analysis	NEPA	National Environmental Protection Act
CWRB	Civil Works Review Board	NPDES	National Pollutant Discharge Elimination System
DNR	Department of Natural Resources	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OSE	Other Social Effects
DX	Directory of Expertise	P&G	The Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
ECO-PCX	National Ecosystem Planning Center of Expertise	PMP	Project Management Plan
EPA	Environmental Protection Agency	QMP	Quality Management Plan
ER	Engineering Regulation	RAM	Read Ahead Material
FSM	Feasibility Scoping Meeting	RMC	Risk Management Center
GIS	Geographic Information System	RMO	Review Management Organization
HEP	Habitat Evaluation Procedure	SAR	Safety Assurance Review
HSI	Habitat Suitability Index	SET	Scientific and Engineering Technology
HQUSACE	Headquarters, U.S. Army Corps of Engineers	TMDL	Total Maximum Daily Load
IBI	Index of Biotic Integrity	USACE	U.S. Army Corps of Engineers
IEPR	Independent External Peer Review	WRDA 2007	Water Resources Development Act of 2007
IWR	Institute of Water Resources		