US Army Corps of Engineers ®

Pittsburgh District

Great Lakes and Ohio River Division

Mahoning River Aquatic Ecosystem Restoration Study

Trumbull County, Ohio

Continuing Authorities Program Section 206

P2/Project Number: 479308

# **Review Plan** – Decision Document

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APPROVAL DATE:

## I. PURPOSE, AUTHORITY, STUDY DESCRIPTION, AND PRODUCTS

**A. Purpose**. This Review Plan defines the scope and level of peer review for the Mahoning River Aquatic Ecosystem Restoration Study project decision document.

**B. Authority.** Continuing Authorities Program (CAP), Section 206 of the Water Resources Development Act (WRDA) 1996 as amended for Aquatic Ecosystem Restoration [Public Law 104-303-0CT 12, 1996].

**C. Review Management Organization (RMO).** The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for CAP Section 206 projects is the Great Lakes and Ohio River Division (LRD); however, LRD has delegated this authority for CAP Section 206 projects to the Pittsburgh District (LRP).

**D. Study/Project Description.** The goal for this project is to restore the aquatic ecosystem within the Mahoning River near Girard, Ohio, to a more natural condition. The Mahoning River has been degraded from decades of industrial activities, and its natural flow regime has been altered by low-head dams. Without project implementation, it's likely that the aquatic ecosystem of the Mahoning River will remain degraded for the foreseeable future. Restoration efforts may include: low-head dam removal, sediment management measures such as capping or removal, control of polluted stormwater runoff, construction of in-stream habitat structures, and invasive species control. These restoration measures are to be evaluated in the feasibility study, which will be documented within the feasibility study decision document referred to as the Detailed Project Report (DPR).

**E. Requirements.** This review plan was developed in accordance with Engineer Regulation (ER) 1165-2-217, 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. The ER outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Safety Assurance Review (SAR). In addition to these levels of review, decision documents are subject to cost engineering review and certification (per ER 1165-2-217), policy and legal compliance review, 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 Engineer Circular 1105-2-412). Each level and type of review is described in more detail as they pertain to this study in Sections II and III below.

**F. Products to be Reviewed**. The Mahoning River Aquatic Ecosystem Restoration Section 206 Project decision document will be prepared in accordance with Engineer Pamphlet (EP) 1105-2-58. The approval level of the decision document (if policy compliant) for this study is LRP. National Environmental Policy Act (NEPA) compliance for this study will be accomplished with an Environmental Assessment (EA), which will be presented within the decision document as an integrated DPR/EA. Products and analyses provided by non-Federal sponsors as in-kind services are subject to all applicable reviews, similar to any products developed by the Corps. In-kind products provided by the non-Federal sponsor for this study will likely include HEC-RAS modeling and a sediment characterization report.

The feasibility study products/documents to be reviewed for this study will include the primary DPR/EA report, as well as all associated appendices. Appendices for this DPR/EA will include: Civil Design Sheets; Cost Engineering; Real Estate Plan; Hazardous, Toxic, and Radioactive Waste (HTRW) and Sediment Characterization Report; Monitoring and Adaptive Management Plan; Planning Information; Cultural Resources Report; and H&H Analysis.

## II. FACTORS AFFECTING LEVEL OF REVIEW

**This study is considered routine and will not require an IEPR or a SAR.** The Governor of Ohio has not requested any peer review by independent experts, and the implementation cost of this project will be less than $200 million. No novel construction methods are required by any alternatives and therefore should not present any challenges to a competent construction firm. Per ER 1165-2-217, Section 9.3.2.2, CAP project documents are excluded from IEPR unless an Environmental Impact Statement (EIS) is required. This study does not require an EIS, and therefore will not require IEPR. The project does not constitute a threat to human safety and therefore a SAR is also unnecessary.

## III. REVIEW EXECUTION PLAN

This section describes each level of review to be conducted for this study. Based upon the factors discussed in Section 2, this study will undergo the following types of reviews:

### A. DQC

All decision documents (including supporting data) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). LRP will manage DQC for this study.

Supervisors within each area of responsibility will assign appropriate, qualified staff to perform QC on their respective products. Personnel performing QC shall have the necessary expertise to address compliance with Corps policy.

The following disciplines will play a critical role in the DQC for this aquatic ecosystem restoration study: Plan Formulation; Environmental; Hazardous, Toxic, and Radioactive Waste (HTRW); Real Estate; Hydrology & Hydraulics (H&H); Climate Preparedness and Resilience; Civil Engineering; and Cost Engineering. Some disciplines may overlap (such as environmental and HTRW, for example), and therefore some reviewers may have the expertise to address multiple disciplines.

1. **Documentation of DQC**. A specific certification of DQC completion is required at the draft and final report stages of the DPR/EA, and will be documented with a summary report and signed certification. DQC comments on the draft DPR/EA will be documented using DrChecks (ProjNet) software. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. Documentation of completed DQC should be provided to the MSC, RMO, and ATR Team Leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort.

### B. ATR

ATR will be scaled to a level commensurate with the risk and complexity of the products to be reviewed. 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 will be conducted for the DPR/EA and all associated appendices. 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. The ATR team lead for this study must be from outside LRD.

1. **Required ATR Team Expertise.** Multiple disciplines may be covered by a single reviewer based on appropriate experience, expertise, and certification. All ATR reviewers must be certified to perform ATR by USACE. The table below lists the technical disciplines and requisite expertise deemed appropriate to successful accomplishment of the study objectives. Geotech involvement will be minimal in this project and thus no Geotech ATR team member is needed. If geotechnical considerations become necessary over the course of the feasibility study, a Geotech ATR reviewer will be added and this review plan will be updated.

| ATR Team Member Discipline | Expertise Required |
|---|---|
| **ATR Lead** | Senior professional, preferably with experience in preparing CAP decision documents and conducting ATR. Will also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc). ATR Lead MUST be from outside LRD. |
| **Planning** | Senior professional with experience in preparing CAP decision documents, and should have experience conducting aquatic ecosystem restoration planning studies. |
| **Environmental** | Senior professional with experience conducting NEPA compliance for planning studies, experience using Cost Effectiveness/Incremental Cost Analysis (CE/ICA) for ecosystem restoration studies, and broad technical knowledge regarding freshwater aquatic ecology. |
| **HTRW** | Senior professional with experience evaluating sediment sampling and analysis plans, site characterization reports, and contaminated sediment management. Should also be familiar with USACE policy regarding HTRW. |
| **Hydrology & Hydraulic Engineering** | Reviewer should be familiar with aquatic habitat restoration projects, and the effects of low-head dam removal on channel hydrology. |
| **Structural/ Civil Engineer** | Experience with low-head dam demolition and demolition plans. |
| **Cost Engineering** | Cost Mandatory Center of Expertise (MCX) Staff or Cost MCX Pre-Certified Professional as assigned by the Walla Walla Cost Engineering MCX with experience preparing cost estimates. Cost engineers performing the review should be well versed in ecosystem features and methods generally including concepts of construction in a riverine environment, sediment dredging, low-head dam removal, invasive plant species eradication, and native planting and establishment. |
| **Climate** | The Climate Preparedness and Resiliency (CPR) reviewer must be CERCAP certified. |

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| **Real Estate** | This member should be familiar with USACE policies pertaining to LERRDs for NER purposes, and be familiar with how real estate is considered in CAP studies. |

2. **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 been 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 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 LRP, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1165-2-217 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.

## C. POLICY AND LEGAL COMPLIANCE REVIEW

The draft and final document will be reviewed 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 report and the supporting analyses and coordination comply with law and policy.

## D. MODEL CERTIFICATION AND APPROVAL

The models presented in the table below will be used for this feasibility study. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC and ATR.

| **Planning Models** | | |
|---|---|---|
| *Model Name* | *Description and Use* | *Certification/Approval Status* |
| Institute for Water Resources (IWR) Planning Suite II, Version 2.0.9 | The Cost Effectiveness/ Incremental Cost Analysis (CE/ICA) provides analysis for formulating and evaluating ecosystem restoration plans with incremental cost analysis methods. This program may be used to aid in identifying the most cost effective ecosystem restoration project. | Certified |
| Floristic Quality Assessment (FQA) | The FQA is a tool used to assess an area's ecological integrity based on its plant species composition. This is accomplished through a system of assigning plant species a coefficient of conservatism based on the region in which the study area occurs. These coefficients vary from 0-10, and indicate the degree to which a species is able to tolerate environmental degradation. Plants are given a low rating if they are able to tolerate a very wide range of conditions and are found in a variety of habitats/locations. A high rating is given to species which have very specific requirements and cannot exist outside of those conditions. Non-native species are generally given a rating of zero. | Approved |
| Qualitative Habitat Evaluation Index (QHEI) | The QHEI was originally developed by the Ohio EPA as an index of macro-habitat quality of streams in Ohio (this study is located in Ohio) and associated ecoregions. The QHEI was designed to provide a measure of habitat that generally corresponds to the physical and chemical characteristics which influences the presence and abundance of stream fish, and which are generally important to other aquatic life (e.g., invertebrates). As a macro-scale approach, the QHEI measures | Approved |

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| | emergent properties of habitat (e.g., sinuosity, pool/riffle development, bank erosion) rather than the individual factors which shape these characters (e.g., current velocity, depth). The QHEI is as a rapid, index-based, community-focused, ecological assessment. Calculation of the index is based on field observations and scoring of reach-scale habitat metrics organized under substrate quality, riffle-pool quality, bank and riparian quality, channel morphology development, and instream cover. Local stream gradient is scored using topographic maps. Each metric contains submetrics – for instance, the "channel morphology" metric is scored based on sinuosity, development, channelization, and stability. The metrics are individually scored and then summed to provide the total QHEI site score, with a maximum possible score of 100. The QHEI model is extensively used within Ohio and adjacent ecoregions, generally for the purposes of biological monitoring or determining stream impairment. | |
| **Engineering Models** | | |
| *Model Name* | *Description and Use* | *Certification Status* |
| HEC-RAS | Hydraulic and hydrologic conditions will be modeled to show the environmental benefits achieved through the proposed alternatives. | Certified |

## IV. REVIEW SCHEDULES AND COSTS

**A. DQC Schedule and Cost.** The cost to complete the DQC review of the DPR/EA and associated appendices is estimated to be $10,800. The DQC will take approximately four weeks to complete. A breakdown of the schedule is: 1) Initial DQC review – 10 business days, 2) PDT evaluation of the DQC comments – 5 business days, and 3) DQC backcheck of the PDTs evaluation comments – 5 business days.

**B. ATR Schedule and Cost.** The ATR results up to this point will be evaluated and the report revised as appropriate. The revised report will then be reviewed by the new ATR team. The cost to complete the ATR is estimated to be $25,500. The ATR will take approximately four weeks to complete. A breakdown of the schedule is: 1) Initial ATR review – 10 business days, 2) PDT evaluation of the ATR comments – 5 business days, and 3) ATR backcheck of the PDTs evaluation comments – 5 business days. The ATR will occur within one month of the Tentatively Selected Plan milestone.

## V. PUBLIC PARTICIPATION

State and Federal resource 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 public and agency comments. As required by NEPA, the public will also have the opportunity to review and comment on the DPR/EA.

## VI. REVIEW PLAN APPROVAL AND UPDATES

The home District Commander is responsible for approving this review plan and ensuring that use of this review plan is appropriate for the specific project covered by the plan. 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 will be posted on the home district's webpage.

## VII. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact: Kristi Dobra, Lead Planner, Pittsburgh District; kristi.s.dobra@usace.army.mil.

redacted.

## 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 1165-2-217. 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[sm].

*SIGNATURE* _____ _____

*Name* Date

ATR Team Leader

*Office Symbol/Company*

*SIGNATURE* _____ _____

*Name* Date

Project Manager (home district)

*Office Symbol*

*SIGNATURE* _____ _____

*Name* Date

Architect Engineer Project Manager[1]

*Company, location*

*SIGNATURE* _____ _____

*Name* Date

Review Management Office Representative (or Delegate)

*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.

*SIGNATURE* _____ _____

*Name* Date

Chief, Engineering Division (home district)

*Office Symbol*

*SIGNATURE* _____ _____

*Name* Date

Chief, Planning Division (home district)

*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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