

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

a. Purpose. This review plan defines levels and scopes of review required for the feasibility phase products.

b. Authority. Section 506 – Great Lakes Fishery and Ecosystem Restoration (GLFER) of the Water Resources Development Act of 2000, as amended, authorizes USACE to partner with non-Federal sponsors to plan, design, and construct projects to support the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes. It authorizes USACE to enter into a project specific cooperative agreement with the Great Lakes Commission or any other agency established to facilitate active State participation in management of the Great Lakes. Post-construction Monitoring and Adaptive Management Plans will be included in the recommended plan for each ecosystem restoration project (per Section 2039 of WRDA 2007). The GLFER is a delegated authority to plan, design, and construct certain types of aquatic ecosystem restoration projects without specific Congressional authorization.

Study Description. The study area is the immediate vicinity of the Horlick's Dam on the Root River in Racine, Wisconsin. The Horlick's Dam specifically resides on the Root River at river mile 5.3, or 5.3 miles upstream of Lake Michigan. The impoundment resides on the north side of Northwestern Ave between Old Mill drive to the west and Green Bay Rd to the east. The study area consists of various parcels of different land uses and ownership.

Specific water resource problems within the study area that suits Corps expertise and would require technical review include hydrology & hydraulics, cost estimating, plan formulation, NEPA and Real Estate. All other aspects of feasibility level analyses and restoration measures have been implemented by the Chicago District in the past, including dam demolition, earth moving, best management practices and native plant establishment.

Based on site qualitative and quantitative investigations and aside from the past hydrogeomorphic changes to the system, the main aquatic resource problems which the 506 Authority may take opportunity to address are:

- Riverine fragmentation
- Altered natural fluvial processes by dam
- Altered riparian zone
- Water quality degradation
- Human Safety concerns
- Aesthetic degradation of banks and natural areas

Various alternatives would be assessed. They include but are not limited to restoring and creating the hydrogeomorphic setting for native communities through dam removal, provide and restore stream connectivity and habitat diversity, invasive plant species removal and native plant community establishment. USACE anticipates that total project costs including DPR, P&S, Construction, Monitoring, and LERRDs would be approximately \$1.9M.

No policy waiver requests are anticipated.

c. Products.

<b>Table 1. List of Products to Be Prepared and Reviewed</b>					
Product / Document	Prepared By	Type of Review to be Performed			
		DQC	ATR	Type I IEPR	Policy / Legal
Detailed Project Report (DPR) and Environmental Assessment (Main Report / Integrated DPR/EA)	In-house Resources	X	X		X
Planning & Coordination Appendix	In-house Resources	X	X		X
404(b)(1) Analysis Appendix	In-house Resources	X	X		X
Monitoring & Adaptive Management Plan	In-house Resources	X	X		X
Hydrology and Hydraulic (H&H) Engineering Appendix	In-house Resources	X	X		X
Civil Design Appendix	In-house Resources	X	X		X
Cost Engineering Appendix	In-house Resources	X	X		X
Geotechnical Engineering Appendix	In-house Resources	X	X		X
HTRW Report	In-house Resources	X	X		X
Real Estate Appendix	In-house Resources	X	X		X

**2. REVIEW REQUIREMENTS**

a. Types of Review. The feasibility phase activities and documents are required to be reviewed in accordance with ER 1110-1-12 and EC 1165-2-217. Based upon the factors under each heading, this study will undergo the reviews identified and described below.

(1) District Quality Control (DQC): DQC procedures will be performed and formally documented for all study products, including supporting documents.

- The District will perform and manage DQC procedures in accordance with the District DQC process.
- DQC will be documented with a summary report / certification.
- 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 be playing a critical role in the DQC for this flood risk management study:

Technical Discipline	Peer DQC Reviewer	Chief Level DQC Reviewer
Biologist/Planner	Each peer-level DQC reviewer will have no production role in the study/project and will have the necessary expertise/experience to thoroughly review the study products identified in Table (1).	PMD-EF Chief
Economist		
Civil Engineer		TSD-DC Chief
Cost Estimator		
Geotechnical Engineer		TSD-DG Chief
Geospatial		
Real Estate Specialist		RE Chief (Regional)
Hydraulic Engineer		TSD-DH Chief
Environmental Engineer		

(2) Agency Technical Review (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 is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.).

- 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
- All ATR reviewers must be certified to perform ATR by USACE. Multiple disciplines may be covered by a single reviewer based on appropriate experience, expertise, and certification.
- The team lead will be from outside LRD.
- The ATR review will be documented using DrChecks, and an ATR Summary Report and certification will be completed.

**Table 2b. ATR Technical Disciplines and Expertise Required**

ATR Disciplines	Expertise Required	Justification / Rationale
ATR Lead/Planning/ Environmental Resources	The ATR lead should be a senior professional preferably with experience in preparing CAP decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. For this study, the ATR lead will also serve as a reviewer for a specific discipline (such as planning, ecosystem valuation via certified models, NEPA, and other environmental resources as applicable). The ATR Lead will be Monique Savage from MVP.	Coordinate all ATR activities.
Hydrology & Hydraulic Engineering	This member should also be familiar with stream restoration. The project intent is to restore natural sediment transport and hydrologic connectivity of the river.	Necessary to ensure model results are accurate to ensure post project hydrology impacts are avoided.
Cost Engineering Reviewer	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, glacio-fluvial stone material sources, invasive plant species eradication and native planting and establishment.	Required by EC/ER
Civil Engineering		Not required, resulting project would be demolition, not construction.
Environmental Engineering		Not required because it is anticipated there are no HTRW issues and the sediment behind dam is clean.
Geotechnical Engineering		Not required. All potential alternatives are demolition, not construction.

Real Estate Reviewer	This member should be familiar with USACE policies pertaining to LERRDs for NER purposes. This project will specifically require a member familiar with a mix of land owners as a result of new land created through dam removal.	study will evaluate alternatives that may require ROE for investigation or acquisition of RE for structural / nonstructural alternatives
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(3) Type I Independent External Peer Review (IEPR): A Type I IEPR is not required based on the mandatory triggers outlined in the Memorandum for Major Subordinate Command (MSC) and District Commanders dated April 05, 2019; the memorandum provides interim guidance on streamlining IEPR for improved civil works product delivery. Paragraph 4 states a project study may be excluded Type I IEPR if the project does not meet any of the three mandatory IEPR triggers. This feasibility study does not meet any of the three mandatory IEPR triggers for the following reasons:

- The estimated total cost of the project, including mitigation costs, is not greater than \$200 million.
- The Governor of Wisconsin has not requested a peer review by independent experts.
- The study is not controversial due to significant public dispute over size, nature, or effects of the project or the economic or environmental costs or benefits of the project.
- Preliminary analysis has indicated that an Environmental Impact Statement is not required.

When none of the three mandatory triggers for IEPR are met, MSC Commanders have the discretion to conduct IEPR on a risk-informed assessment of the expected contribution of IEPR to the project. An IEPR would not provide additional benefit to the study for the following reasons:

- a. This study does not include the development or use of any novel methods.
- b. This project does not pose likely threats to health and public safety.
- c. There is no anticipated inter-agency interest.
- d. Chicago District has not received a request from the head of any Federal or State agency for an IEPR.
- e. The proposed project is not anticipated to have unique construction sequencing or a reduced or overlapping design construction schedule.

(4) Type II Independent External Peer Review (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. Since this document does not involve life safety concerns, as confirmed by the LRC Chief of Engineering and Construction in the District Chief of Engineering Assessment of Life-Safety Risk, a Type II IEPR would not be considered.

(5) Policy and Legal Review: All decision documents will be reviewed for compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100.

(6) Public Participation.

- a. A public involvement program will be included to satisfy NEPA requirements and solicit public and government agency input.
- b. The District shall contact agencies with regulatory review for coordination as required by applicable laws and procedures.
- c. The District will review comments resulting from public and agency review, and will provide the ATR team copies of public and agency comments and responses.

3. MODEL CERTIFICATION OR APPROVAL. The following models may be used to develop the decision documents:

Table 3a. Planning Models		
Model Name and Version	Model Description and How It Will Be Used	Certification / Approval Status & Date
IWR Planning Suite	IWR Planning Suite assists with plan formulation by combining user-defined solutions to planning problems and calculating the effects of each combination, or “plan.” The program can assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are best financial investments and displaying the effects of each on a range of decision variables.	Certified & Approved 31 May 2018
FQI (Floristic Quality Index)	This assessment tool was designed to be used as an all-inclusive method for assessing the quality of plant communities. The FQI was originally developed for the Chicago Region, but has since been developed for regions and states throughout North America. This method assesses the sensitivity of individual plant species that inhabit an area. Each native species is assigned a coefficient of conservatism ranging from “0 to 10, with “0” assigned to species that are highly tolerant to disturbance and are considered general in their habitat distribution and “10” assigned to species with a very low tolerance to disturbance and displaying a very specific relationship to a certain habitat type. This model will be used to assess the ecological value of the existing site condition, determine whether there is a need for mitigation, and evaluate proposed mitigation measures, based on the function of the plant community.	Certified & Approved 07 March 2017
Qualitative Habitat Evaluation	The QHEI in flowing waters was originally developed by the Ohio EPA as an index of macro-habitat quality of streams in Ohio and associated ecoregions. The QHEI was designed to provide a measure of habitat that generally corresponds to the physical and	Certified 11 December 2014

<p>Index (QHEI)</p>	<p>chemical characteristics which influences the presence and abundance of stream fishes, and which are generally important to other aquatic life (e. g., invertebrates). The author described the goal of the QHEI as “filling a gap between completely subjective habitat descriptions and more labor intensive Habitat Suitability Indices developed for each species in a fish community.” As a macro-scale approach, the QHEI measures 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).</p> <p>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.</p>	
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Table 3b. Engineering Models		
Model Name and Version	Model Description and How It Will Be Used	Approval Status
<p>HEC-RAS (v5.0.7)</p>	<p>HEC-RAS is a hydraulic model developed by the Hydrologic Engineering Center. The program is designed to perform one and two-dimensional steady and unsteady flow calculations as well as sediment transport and water quality modeling. It will be used to evaluate the hydraulic impacts of the project on the study reach.</p>	<p>Certified 9/9/2013</p>
<p>HEC-HMS (v4.5)</p>	<p>HEC-HMS is a hydrologic model developed by the Hydrologic Engineering Center. The program is designed to perform watershed-scale hydrologic rainfall runoff computations and flood routing. It may be used to evaluate the hydrology of the Root River watershed and determine flows for evaluation in the hydraulic model.</p>	<p>Certified 9/9/2013</p>
<p>HEC-SSP (v2.2)</p>	<p>HEC-SSP is a computational software that was developed by the Hydrologic Engineering Center. The program is used to perform statistical analyses of hydrologic data, particularly of flood flow frequency analysis. It may be used to perform flood frequency analysis on the Root River to determine frequency flows for evaluation in the hydraulic model.</p>	<p>Certified 9/9/2013</p>

4. REVIEW SCHEDULE AND BUDGET. The schedule and budgets for reviews are shown in below table.

Table 4. Product and Review Schedule				
Product(s) to undergo Review	Review Level	Start Date	Finish Date	Budget (\$)
[List interim reviews first]	[DQC or ATR]			
PMP Approval	District Quality Control	14 JULY 2020	14 SEPT 2020(A)	10K
Submit RP	Agency Technical Review	14 JULY 2020	15 OCT 2020(A)	10K
Execute FCSA		14 JULY 2020	03 DEC 2020(A)	10K
Approval of Review Plan		16 OCT 2020	14 JAN 2021*	N/A
District Quality Control (DQC)	District Quality Control	29 JULY 2021	11 AUG 2021*	\$10K
Agency Technical Review (ATR)	Agency Technical Review	11 AUG 2021	22 SEPT 2021*	\$15K
Evaluate ATR		23 SEPT 2021	13 OCT 2021*	N/A
ATR Back-Check		14 OCT 2021	03 NOV 2021	N/A
*Scheduled Dates will be revised with Actual Dates				



## ATTACHMENT 1 – Contacts

Function	Name (Last, First)	Phone	Office
RMO Contact	Jarboe, Hank	(513) 684-6050	CELRD-PDS-P
MSC Contact – District Support Program Manager	Burkett, Matthew	(513) 684-2049	CELRD-PD-S

PROJECT DELIVERY TEAM			
Function/Discipline	Name (Last, First)	Phone	Office
Project Manager	Toth, Nicole	(312) 846-5517	CELRD-PDP-S
(Lead) Planner/Fish Biologist	Frank Veraldi	(312) 846-5589	CELRD-PDB-R
Biologist	Samantha Belcik	(312) 846-5467	CELRD-PDB-R
Geotechnical Engineer	Richard Realza	(312) 846-5469	CELRD-ENG-G
Environmental Engineer	Margaret Dove	(312) 846-5502	CELRD-ENG-H
Hydraulic Engineer	Brett Hanson	(312) 846-5511	CELRD-ENG-H
Civil Engineer	Matthew Lindeen	(312) 846-5492	CELRD-ENG-C
Cost Engineer	Jeremiah Gadbois	(312) 846-5357	CELRD-ENG-C
Geospatial	Adam Raynor	(312) 846-5464	CELRD-ENG-G
Real Estate	Nick Laluzerne	(312) 846-5492	CELRD-RE
Economist	Zach Hartley	(312) 846-5415	CELRD-PDB-M

DISTRICT QUALITY CONTROL (DQC) TEAM			
Function/Discipline	Name (Last, First)	Phone	Office
DQC Lead	Fleming, Eugene	(312) 846-5585	CELRD-PMD-EF
Regional Technical Specialist	Herleth-King, Shawna	(312) 846-5407	CELRD-PMD-EF
Geotechnical	Rochford, William	(312) 846-5450	CELRD-TSD-DG
Civil Engineer	Schiemann, David	(312) 846-5426	CELRD-TSD-DC
Cost Engineer	Druzbecki, Dave	(312) 846-5433	CELRD-TSD-DC
Hydraulic Engineer	Meyer, Kristine	(312) 846-5510	CELRD-TSD-DH
Environmental Engineer	Miller, Jennifer	(312) 846-5505	CELRD-TSD-DH
Real Estate	Shelton, Andrew	(313) 226-3480	CELRD-RE

AGENCY TECHNICAL REVIEW (ATR) TEAM*			
Function/Discipline	Name (Last, First)	Phone	Office
ATR Lead	Savage, Monique	(314) 331-8450	CEMVP-PD-F
Cost Engineering Reviewer	TBD		
Real Estate Reviewer	TBD		
Hydrology & Hydraulic Engineering Reviewer	TBD		
District will coordinate with LRD and appropriate PCX to determine the ATR Lead and composition of the ATR Team.			

**MSC / Policy and Legal Compliance Review Team**

Function/Discipline	Name (Last, First)	Phone	Office
Review Manager	TBD		
Planning Reviewer	TBD		
Economics Reviewer	TBD		
Technical Design Reviewer	TBD		
Environmental Reviewer	TBD		
Hydrology and Hydraulic Engineering/Climate Reviewer	TBD		
Cost Engineering Reviewer	TBD		
Real Estate Reviewer	TBD		