



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
550 MAIN STREET
CINCINNATI, OH 45202-3222

CELRD-PD-G

16 May 13

MEMORANDUM FOR Commander, U.S. Army Engineer District, Chicago (Susanne Davis/CELRC-PM-PL), 111 N. Canal, Suite 600, Chicago, IL, 60606-7206

SUBJECT: Decision Document Review Plan for Des Plaines River Phase II

1. The attached Review Plan (RP) for Des Plaines River Phase II was presented to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-214 "Civil Works Review" dated 15 Dec 2012.
2. The study area of the upper Des Plaines Feasibility Phase II Study includes the entire drainage area upstream of Salt Creek and is approximately 485 square miles in area, 87 miles from north to south and 10 miles wide from east to west. Tributaries within the study area include about 331 miles of perennial and intermittent streams.
3. The Upper Des Plaines River Feasibility Phase II Study is a continuation of the Upper Des Plaines River Feasibility Phase I Study that was approved November 1999. The Feasibility Cost Sharing Agreement was signed in 2002. The Phase I study focused primarily on flooding problems along the main stem of the upper Des Plaines River (upstream of its confluence with Salt Creek), and recommended implementation of six projects to reduce main stem flooding. Study recommendations were authorized in the Water Resources Development Act of 1999 (P.L. 106-53). The Phase I study was preceded by a Reconnaissance study that was completed in 1989.
4. The Phase II study has two primary purposes: flood risk management (mainstem and tributary damages) and environmental restoration of degraded ecosystems within the basin. Secondary purposes include water quality, recreation, and related purposes as noted in the authority. The study will consider sites located within tributary watersheds and along the main stem for both Flood Risk Management (FRM) and Ecosystem Restoration (ER) potential. The effects of FDR sites located within tributary watersheds on mainstem flooding will also be evaluated.
5. The Phase II study is taking a systems approach to planning by building upon the Phase I analyses and integrating analyses aimed at multi-purpose solutions to problems across the entire watershed.
6. The RP defines the scope and level of peer review for the activities to be performed for the subject project. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes the scope of review for work phases and addresses all appropriate levels of review consistent with the requirements described in EC 1165-2-214.

CELRD-PD-G

SUBJECT: Review Plan for Des Plaines River Phase II

7. I concur with the recommendations of the RMO and approve the enclosed RP for the Des Plaines River Phase II project.
8. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP should be removed.
9. If you have any questions please contact Dr. Hank Jarboe, CELRD-PDP, at (513) 684-6050, or Pauline Thorndike, CELRD-PDG, at (513) 684-6212.

2 Encls

1. Review Plan
2. FRM-PCX memo, 19 Apr 2013


MARGARET W. BURCHAM
Brigadier General, USA
Commanding

DECISION DOCUMENT REVIEW PLAN

**Upper Des Plaines River and Tributaries, Illinois and Wisconsin
Integrated Feasibility Report and Environmental Assessment**

Chicago District

MSC Approval Date: *17 May 2013*

Last Revision Date: *16 April 2013*



**US Army Corps
of Engineers®**

DECISION DOCUMENT REVIEW PLAN

**Upper Des Plaines River and Tributaries, Illinois and Wisconsin
Integrated Feasibility Report and Environmental Assessment**

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS..... 1

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION 1

3. STUDY INFORMATION..... 1

4. DISTRICT QUALITY CONTROL (DQC)..... 3

5. AGENCY TECHNICAL REVIEW (ATR) 3

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

7. POLICY AND LEGAL COMPLIANCE REVIEW 8

8. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION 8

9. MODEL CERTIFICATION AND APPROVAL..... 8

10. REVIEW SCHEDULES AND COSTS 10

11. PUBLIC PARTICIPATION 11

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

13. REVIEW PLAN POINTS OF CONTACT 12

ATTACHMENT 1: TEAM ROSTERS..... 13

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS..... 14

ATTACHMENT 3: REVIEW PLAN REVISIONS..... 15

1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the for the Upper Des Plaines River and Tributaries, Illinois and Wisconsin, Feasibility Report and Integrated Environment Assessment project.

b. References

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 December 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) Upper Des Plaines River and Tributaries, Illinois and Wisconsin, Feasibility Study Project Management Plan, October

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-214, 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 1165-2-214) 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 Flood Risk Management Planning Center of Expertise (FRM-PCX) in coordination with the Risk Management Center (RMC).

The RMO will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. Because this is a multi-purpose study also addressing Ecosystem Restoration, the review has been closely coordinated with the Ecosystem Restoration Planning Center of Expertise (ECO-PCX) to ensure that all relevant expertise is represented on the review teams. The RMO for ATR reviews shall be the FRM-PCX.

3. STUDY INFORMATION

a. **Decision Document.** The Upper Des Plaines River and Tributaries, Illinois and Wisconsin, Feasibility Report and Integrated Environmental Assessment is being prepared to document Feasibility Study findings and recommendations. The study was authorized by Section 419 of Water Resources Development Act of 1999 (WRDA 1999). Congressional authorization will be required to implement

the study recommendations. NEPA documentation is included in the report as an integrated Environmental Assessment.

- b. Study/Project Description.** The Upper Des Plaines River and Tributaries Feasibility Study has two primary purposes: flood risk management (mainstem and tributary damages) and ecosystem restoration of degraded habitats within the basin. Secondary purposes include water quality, recreation, and related purposes as noted in the authority. The study will consider sites located within tributary watersheds and along the main stem for both Flood Risk Management (FRM) and Ecosystem Restoration (ER) potential. The effects of FRM sites located within tributary watersheds on mainstem flooding will also be evaluated.

The upper Des Plaines River watershed originates in an agricultural landscape in Racine and Kenosha counties of southeastern Wisconsin. The watershed then slopes south to where it meets with the confluence of the Salt Creek watershed near Riverside, Illinois. The Des Plaines River then flows southwest on to its confluence with the Kankakee River, which together combine to form the Illinois River. The study area includes the entire drainage area upstream of Salt Creek and is approximately 485 square miles in area, 87-miles from north to south and 10-miles wide from east to west. Tributaries within the study area include about 331-miles of perennial and intermittent streams.

The Upper Des Plaines River and Tributaries Feasibility Study (Phase II study) builds on analysis conducted for the previous Upper Des Plaines River Feasibility Study (Phase I study) approved in November 1999. The Phase I study focused on flooding problems along the mainstem of the upper Des Plaines River (upstream of its confluence with Salt Creek) in Illinois, and recommended implementation of six projects to reduce mainstem flooding. Phase I Study recommendations were authorized in WRDA 1999. The Phase II study investigates flooding problems along the mainstem upper Des Plaines River in Illinois and in Wisconsin as well as along tributaries. In addition, the Phase II study investigates ecosystem restoration opportunities within the watershed. This plan addresses peer review requirements for the Phase II study only. Peer review of project implementation for the Phase I project is conducted through a separate plan.

- c. Factors Affecting the Scope and Level of Review.** The District Chief of Technical Services Division has determined that the project does involve a significant threat to human life/safety, as the products include design and construction of levees and floodwalls. The project is not likely to involve significant public dispute as to the economic or environmental costs or benefits of the project. The information in the anticipated project design is not likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices. Similar flood risk management projects, authorized as a result of the Phase I Study, have been recently constructed in the watershed.
- 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: modeling of certain tributaries and portions of the mainstem of the Des Plaines River, portions of the design analysis, and information vital to the completion of the feasibility report.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

- a. **Documentation of DQC.** A signed routing slip will indicate that internal review of the document has been completed. Supporting documentation of changes to the report may include e-mails and word documents indicated the requested changes. DQC documentation will be provided to the ATR team prior to initiating ATR of any products.
- b. **Products to Undergo DQC.** Drafts of the report and all supporting appendices will undergo review prior to submission of the products for milestone review by the ATR team, MSC and HQUSACE.

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.** Drafts of the report and all supporting appendices will undergo review prior to submission of the products for milestone review by MSC and HQUSACE.
- b. **Required ATR Team Expertise.**

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional preferably with experience in flood risk management and ecosystem restoration projects and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (Planning, Economics, etc). The ATR Lead MUST be from outside the home district.
Plan Formulation - FRM	The Planning FRM reviewer should be a senior water resources planner with experience in Flood Risk Management planning products at a watershed level, including the understanding of the application of levees and floodwalls, non-structural solutions involving flood warning systems and flood proofing, etc.

ATR Team Members/Disciplines	Expertise Required
Plan Formulation - ER	The Planning ER reviewer should be a senior biologist planner with experience in designing environmental restoration projects involving large and small tracts of land with multiple types of native habitat planned into the restoration, and experience with the application of environmental planning models. This person should also have experience with environmental and cultural compliance laws and regulations.
Economics	The economics reviewer should be a senior economist, an expert in the field of economics, and have knowledge of economic analysis of flood risk management projects on a watershed level including analysis of flood damages and transportation damages.
Hydraulic Engineering	Hydraulic engineering reviewer shall be a senior engineer, an expert in the field of hydraulics, and have a thorough understanding of the application of levees and floodwalls, non-structural solutions involving flood warning systems and flood proofing, etc and computer modeling techniques that will be used such as HEC-1, HEC-HMS, HEC-2, HEC-RAS, etc. The hydraulic engineer shall be a licensed Professional Engineer.
Geotechnical Engineering	The Geotechnical Engineer shall be a senior engineer, an expert in the field of engineering, and have knowledge of advance engineering concepts, principles and practices of geotechnical engineering including design of levees, floodwalls, and reservoirs. The reviewer shall have thorough understanding of soil mechanics, subsurface investigation, groundwater hydrology and seepage, slope stability analyses, earthwork construction and other geotechnical applications. The geotechnical engineer shall be a licensed Professional Engineer.
Civil Engineering	The civil engineer shall be a senior engineer, an expert in the field, and have a thorough understanding of the application of levees floodwalls, retaining walls and reservoirs. The reviewer shall have experiences in the design and layout of floodwalls, retaining walls levee structures, and reservoirs. The civil engineer shall demonstrate engineering knowledge regarding hydraulic structures, earthwork, utility relocation, erosion control and general site development features. The civil engineer shall be a licensed Professional Engineer
NEPA/Environmental Resources	Team member will have a strong knowledge of the National Environmental Policy Act and its procedures and documentation requirements.
Real Estate	The Real Estate reviewer will be thoroughly knowledgeable in the real estate planning process for cost shared and federal civil works projects and have expertise in underlying real estate policies and the implementation of such projects. If relocations are anticipated the Regional Relocation Technical Specialist for Real Estate must also be included as a team member.

ATR Team Members/Disciplines	Expertise Required
Flood Risk Analysis	The flood risk analysis reviewer should have extensive experience with multi-discipline flood risk analysis to ensure consistent and appropriate identification, analysis and written communication of risk and uncertainty. The flood risk analysis reviewer may also serve as a reviewer for a specific discipline (for example, hydraulics or economics).

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 been 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 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- **Type I IEPR.** Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.
 - **Type II IEPR.** Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare. A Type II IEPR will be required for the implementation phase of the flood risk management features of the project. A Type II IEPR will not be required for the ecosystem restoration features of the project.
- a. Decision on IEPR.** Type I IEPR will be performed for the project based on an anticipated total project cost in excess of \$45M. Preliminary estimates of the total project cost are approximately \$380M. However, it is unlikely that the recommended plan will include controversial or complex projects or features.

Additionally, the tentatively selected plan includes levee/floodwall features that may pose a risk to life-safety. A Type II IEPR will only be required for the design and implementation phase of the flood risk management features (including floodwalls and levees) authorized for construction. Because

feasibility level design does not permit a thorough assessment of system performance, a Type II IEPR during the design and construction phase of the project is appropriate. Safety assurance will be considered in the Type I IEPR consistent with the requirements in EC 1165-2-214, Appendix D.

- b. Products to Undergo Type I IEPR.** The draft feasibility report and integrated environmental assessment will undergo the Type I IEPR either during or immediately prior to public review of the document and will conclude prior to finalization of the report.
- c. Required Type I IEPR Panel Expertise.**

IEPR Panel Members/Disciplines	Expertise Required
Plan Formulator	Plan Formulator with experience in public works planning, flood risk management, ecosystem restoration and multi-purpose planning. The plan formulator should also be familiar with USACE plan formulation standards and procedures for flood risk management and ecosystem restoration.
Environmental	The environmental expert shall be a senior-level ecologist with demonstrated experience with projects in Illinois and Wisconsin. The ecologist shall have knowledge of ecological value of wetlands, wet prairies, streams, and interconnected habitat Familiar with the Habitat Evaluation Procedure (HEP) model produced by the U.S Fish and Wildlife Service (USFWS), Hydrogeomorphic Model (HGM) produced by USACE-ERDC, Index of Biotic Integrity (IBI) and Floristic Quality Assessment (FQA). The Ecologist must be familiar with USACE regulations and planning procedures.
Economics	The Economics Panel Member should have extensive experience in flood risk management and risk based economic analyses including familiarity with HED-FDA. The Economist must be familiar with USACE regulations and planning procedures.
Hydraulic Engineer	Hydraulic Engineer with extensive experience in the analysis and design of levees. The Hydraulic Engineer must have performed work in hydrologic analysis and design of hydraulic structures. In addition, at least one of the expert reviewers shall have recent and relevant experience on multi-million dollar projects verifying the constructability of the proposed designs.
Geotechnical/Civil	Geotechnical/Civil Engineer will be a recognized expert in the field of geotechnical/civil engineering analysis, design and construction of levees, floodwalls, and retaining walls along with extensive experience in subsurface investigations, soil mechanics, seepage and slope stability evaluations, erosion protection design and construction, interior drainage facilities, earthwork, concrete placement, design of access roads, relocation of underground utilities, and earthwork construction. The Geotechnical/Civil Engineer must be familiar with USACE regulations and building codes.

- d. Documentation of Type I IEPR.** The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-214, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key

parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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; 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.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

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 MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering MCX, located in the Walla Walla District. The Cost Engineering MCX 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 Cost Engineering MCX will also provide the Cost Engineering MCX certification. The RMO is responsible for coordination with the Cost Engineering MCX.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the

users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

a. Planning Models. The following planning models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Qualitative habitat Evaluation Index (QHEI)	Evaluation of stream habitat quality based on physical characteristics, providing a quantitative index.	Approved for single use
Index of Biotic Integrity (IBI)	Quantifies response of the in-stream fish community to disturbance and/or restoration.	Under review for regional certification
Floristic Quality Assessment (FQA)	Assigns to plant species a rating that reflects the fundamental conservatism that the species exhibits for natural habitats and changes in plan community composition.	Approved for regional use
Community Models for the Upper Des Plaines River Watershed, Illinois and Wisconsin	Using the Habitat Evaluation Procedure, these models quantify changes in community attributes (e.g., function and structure) that are targeted for ecosystem restoration.	Under Review for study-specific Use
Hydrogeomorphic Models (HGM)	Using the Hydrogeomorphic Approach, these models quantify changes in wetland structure and function that are expected to respond based on alternative restoration scenarios	Under review for regional certification
Flood Damage Analysis (HEC-FDA) ver 1.2.4	Based on economic and hydrologic inputs, computes risk based equivalent annual damages for various hydrologic conditions.	Certified for general use
Visual Interactive System for Transportation Algorithms (VISTA)	This commercial off-the-shelf transportation model was developed for the Chicago Area Transportation Study (CATS). Based on road characteristics and conditions as well as user demand data, estimates travel distance and times in a transportation network.	Under review for study-specific use

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

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-1	The Hydrologic Engineering Center's flood hydrograph package HEC-1 can perform all ordinary flood hydrograph computations associated with a single recorded or hypothetical storm.	HH&C CoP Allowed for Use
HEC-2	The Hydrologic Engineering Center's HEC-2 program computes water surface profiles for one-dimensional steady, gradually varied flow in rivers of any cross section. Flow may be subcritical or supercritical.	HH&C CoP Allowed for Use
HEC-RAS version 4.0	The Hydrologic Engineering Center's River Analysis System (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 future without- and with-project conditions along the Wild River and its tributaries.	HH&C CoP Preferred Model

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** ATR is being conducted prior to submission of the documentation for policy review by the vertical team review at each planning milestone (FSM, AFB, Draft, Final). Cost Engineering MCX certification will be conducted prior to submission of the final feasibility report for approval.

Product	Date	Cost (\$1,000)
Feasibility Scoping Meeting Document	July 2007	\$3.1
Baseline Economics	July 2009	\$4.5
Alternative Formulation Briefing Document	December 2011	\$62.5
Draft Feasibility Report*	March 2013	\$40.0
Final Feasibility Report*/**	Sept 2013	\$25.0

*Estimated date and cost provided for reviews not yet completed

** Cost Engineering MCX certification included in review of the final report

- b. Type I IEPR Schedule and Cost.** The contract for the Type I IEPR has been developed at a cost of \$265K and district participation will cost \$30,000 to \$50,000. Type I IEPR is Federally funded but District participation uses cost-shared Feasibility funds. Funding for the IEPR was provided as a part of the American Recovery and Reinvestment Act (ARRA). If possible, the Type I IEPR will be conducted in conjunction with the public release of the feasibility report, but due to limitations on the use of ARRA funds, the IEPR must be completed by the end of June 2013.

Product	Date	Cost (\$1,000)
Alternative Formulation Briefing Document	December 2011 (informal review)	Total cost \$265.0
Draft Feasibility Report *	June 2013	

*Estimated date and cost provided for reviews not yet completed

- c. Model Certification/Approval Schedule and Cost.**

Model Name	Date of Review Completion	Cost (\$1,000)
Qualitative habitat Evaluation Index (QHEI)	Review documentation completed – approved for single use	\$3.0
Index of Biotic Integrity (IBI)	Review documentation completed – awaiting final decision on regional use	\$1.5
Floristic Quality Assessment (FQA)	Review documentation completed – approved for regional use	\$4.0
Community Models for the Upper Des Plaines River Watershed, Illinois and Wisconsin	Review documentation ongoing – awaiting final decision on single use	\$180.6
Hydrogeomorphic Models (HGM)	Review documentation ongoing – awaiting final decision on regional use	
Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA)	Corporate certification for general use	
Visual Interactive System for Transportation Algorithms (VISTA)	Review documentation completed – awaiting final decision on single use	\$10.0

11. PUBLIC PARTICIPATION

The District will solicit public input regarding elements of a potential Recommended Plan. The District will solicit input from the Executive Steering Committee, which includes concerned municipalities, local, state and federal agencies, and local interest groups, on the contents and approach of the review plan. In order to satisfy requirements of the National Environmental Policy Act (NEPA), an environmental compliance document will be developed as part of the feasibility study process and released for public review. Comments received through these activities will be reviewed, incorporated into the feasibility report where appropriate and formal responses prepared by District staff. Significant and relevant

comments on the study process will be provided to the ATR and Type I IEPR teams as part of the review package.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander (LRD) is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC. Upon project authorization, the Review Plan will be resubmitted to the MSC for review and approval to reflect the appropriate reviews for the Design and Implementation Phase.

13. REVIEW PLAN POINTS OF CONTACT

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

Chicago District

- Susanne Davis Chief, Planning Branch 312-846-5580
- Jeff Zuercher Project Manager 312-846-5558
- David Bucaro Chief, Economic Formulation and Analysis Section 312-846-5583
- Gene Fleming Chief, Environmental Formulation and Analysis Section 312-846-5585

Great Lakes and Ohio River Division

- Pauline Thorndike District Liaison 513-684-6212

Flood Risk Management Planning Center of Expertise

- Eric Thaut Program Manager, FRM-PCX 415-503-6852

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team

Role	Name	Telephone
Project Manager	[REDACTED]	[REDACTED]
Lead Planner	[REDACTED]	[REDACTED]
Plan Formulation	[REDACTED]	[REDACTED]
Economics	[REDACTED]	[REDACTED]
Environmental Resources	[REDACTED]	[REDACTED]
Environmental Resources	[REDACTED]	[REDACTED]
Cultural Resources	[REDACTED]	[REDACTED]
Hydraulic Engineer	[REDACTED]	[REDACTED]
Environmental Engineer	[REDACTED]	[REDACTED]
Civil Engineer	[REDACTED]	[REDACTED]
Cost Engineer	[REDACTED]	[REDACTED]
Geotechnical Engineer	[REDACTED]	[REDACTED]
Real Estate	[REDACTED]	[REDACTED]

Agency Technical Review Team

Role	Name	Telephone
ATR Leader/ER Plan Formulation	[REDACTED]	[REDACTED]
FRM Plan Formulation	[REDACTED]	[REDACTED]
Civil Engineer	[REDACTED]	[REDACTED]
Economics/Flood Risk Analysis	[REDACTED]	[REDACTED]
Hydraulic Engineering	[REDACTED]	[REDACTED]
Cost Engineering	[REDACTED]	[REDACTED]
NEPA/Environmental Compliance	[REDACTED]	[REDACTED]
Real Estate	[REDACTED]	[REDACTED]

Independent External Peer Review Team – Type I

Role	Name	Telephone
Plan Formulation	[REDACTED]	[REDACTED]
Economics	[REDACTED]	[REDACTED]
Hydraulic Engineering	[REDACTED]	[REDACTED]
Ecology	[REDACTED]	[REDACTED]
Geotechnical/Civil Engineering	[REDACTED]	[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 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer’s needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

SIGNATURE _____ Date _____
Name
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ Date _____
Name
Project Manager
Office Symbol

SIGNATURE _____ Date _____
Name
Architect Engineer Project Manager¹
Company, location

SIGNATURE _____ Date _____
Name
Review Management Office Representative
Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE _____ Date _____
Name
Chief, Engineering Division
Office Symbol

SIGNATURE _____ Date _____
Name
Chief, Planning Division
Office Symbol

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
8 Feb 2008	Initial Review Plan Approval	N/A
18 May 2009	Added decision to conduct IEPR based on initial estimate of project costs and IEPR review requirements (Changes coordinated with MSC)	Throughout
16 April 2013	Update to new template and to comply with latest review guidance	Throughout