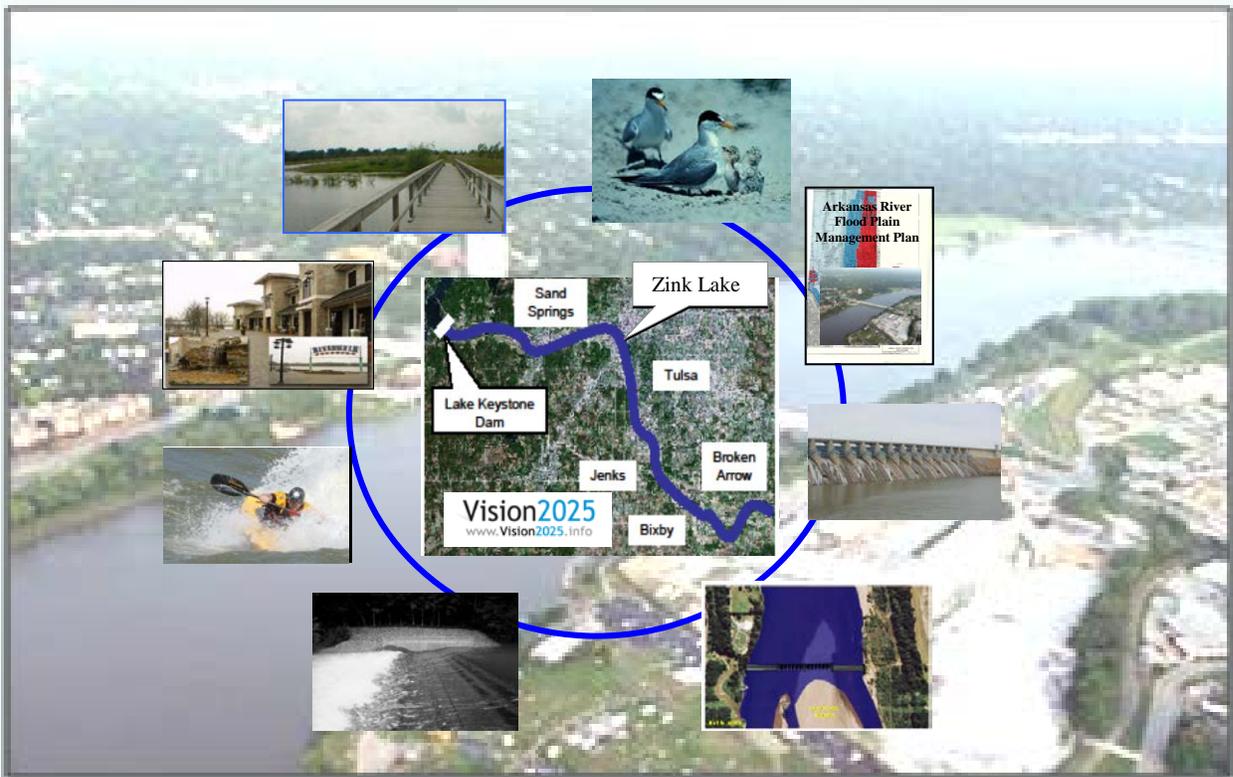


# REVIEW PLAN

## Arkansas River Corridor, Tulsa County, Oklahoma Feasibility Study

U.S. Army Corps of Engineers  
Tulsa District



**MSC Approval Date: Pending**

**Last Revision Date: None**



**US Army Corps  
of Engineers®**

**REVIEW PLAN**

**Arkansas River Corridor, Tulsa County, Oklahoma  
Feasibility Study**

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## 1. PURPOSE AND REQUIREMENTS

- a. Purpose.** This Review Plan defines the scope and level of peer review for the Arkansas River Corridor, Oklahoma Feasibility Study. Based on the outcomes of the October 2013 Charette, the primary purpose of this study is to evaluate ecosystem restoration (ER) opportunities along the Arkansas River Corridor in Tulsa County from the Lake Keystone Dam downstream to the Wagoner County line. The authorized purposes of the Lake Keystone Project are flood control, water supply, hydroelectric power, navigation, and fish and wildlife.

An early study milestone, identified during the Charette, is a Vertical Team (VT) decision associated with operation of the Lake Keystone Project. The decision would identify the appropriate feasibility study assessment, if any, of future Lake Keystone Project functions that would potentially re-establish provisions for smoothing hydropower releases and/or providing instream flows between hydropower releases. Following the VT decision, the scope and associated peer review requirements will be refined.

### b. References

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 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) Project Management Plan (under development)

- 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). Guidance on quality assurance for engineering models is contained in ER 1110-2-1150, Engineering and Design for Civil Works Projects.

## 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 U.S Army Corps of Engineers Ecosystem Restoration PCX located in Mississippi Valley Division (MVD).

The RMO 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, risk analysis, Total Project Cost Summary (TPCS), and contingencies.

### 3. STUDY INFORMATION

This Arkansas River Corridor General Investigation is authorized by the Water Resources Development Act (WRDA) of 2007, Section 3132. The Section 3132 citation is shown below.

*Section 3132. ARKANSAS RIVER CORRIDOR.*

(a) IN GENERAL.—The Secretary is authorized to participate in the ecosystem restoration, recreation, and flood damage reduction components of the Arkansas River Corridor Master Plan dated October 2005. The Secretary shall coordinate with appropriate representatives in the vicinity of Tulsa, Oklahoma, including representatives of Tulsa County and surrounding communities and the Indian Nations Council of Governments.

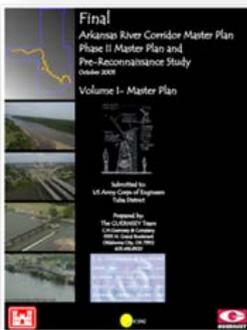
(b) AUTHORIZATION OF APPROPRIATIONS.— There is authorized to be appropriated \$50,000,000 to carry out this section.

Although Section 3132 of the WRDA of 2007 authorized Federal participation of up to \$50 million in components of the Arkansas River Corridor Master Plan, subsequent implementing guidance has directed completion of a cost-shared feasibility study, to be processed in accordance with guidelines for projects authorized without a report in ER 1105-2-100, Appendix H. Upon approval by the Assistant Secretary of the Army for Civil Works, the project may be considered for implementation in accordance with existing budgetary policies and procedures. No project construction may be initiated until funds are specifically appropriated to accomplish the work.

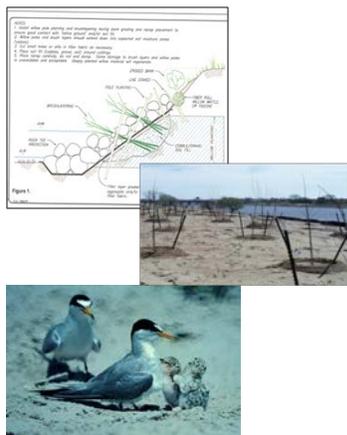
a. **Decision Document.** The decision document is the Arkansas River Corridor Feasibility Report (FR). The purpose of the report is: 1) to document the formulation of an integrated Arkansas River Corridor System Plan that will identify multiple organizations that could potentially be leveraged to help implement separate components of the plan and 2) submit recommendations for consideration by the ASA(CW). An Environmental Impact Statement will be prepared.

b. **Study/Project Description.** Vision 2025 is a Tulsa, Oklahoma regional initiative creating a Greater Tulsa area. Vision 2025 propositions were supported when voters approved a one-penny, 13-year

increase in the Tulsa County tax on September 9, 2003. One of the four Proposition cornerstones of Vision 2025 is Community Enrichment. An important component of the Vision 2025 Proposition 4 devotes sales tax revenues to quality of life and economic development improvements associated with the 42 mile Arkansas River Corridor between Keystone Dam and the Tulsa County / Wagoner County line. Some examples of Proposition 4 provisions include Low-Water Dams (tentatively located at Sand Springs and South Tulsa/Jenks), Zink Lake Shoreline Beautification, and Zink Lake Catch Basin and Silt Removal. Zink Lake is an urban lake adjacent to downtown Tulsa that was created by a low water dam that was constructed in the 1980s. Tulsa County is currently undergoing extensive gate renovation as well as upstream catch basin silt removal at the Zink Lake. Zink dam is a critical site for the multi-billion dollar Striper Bass fishery in Oklahoma.



During its 12 year study history, the project has had two non-federal sponsors. Following the passage of Vision 2025 Proposition 4 a comprehensive public involvement and planning effort, led by the Indian Nations Council of Governments, began the National Environmental Policy Act process. The Arkansas River Corridor Master Plan was completed in October 2005 and was approved for inclusion as an element in Tulsa's and Tulsa County's Comprehensive Plan in March 2006. In 2007 it was recognized in authorizing WRDA language. The plan identified opportunities and constraints that exist; identified and developed conceptual plans for river environmental, flood risk management, recreation, and economic improvements; and researched possibilities to leverage federal funding. In 2007 a study to obtain baseline environmental data and analyze low water dam requirements was conducted with Tulsa County who remains the non-federal sponsor.



The following are examples of ecosystem restoration measures , identified during the 2013 Charette, that are consistent with the Master Plan:

- Restoration habitat on Franklin Creek
- Diversion bench to restore water flow to Prattville Creek
- Habitat improvement at Vensel Creek
- Bank Stabilization
- Riparian corridor restoration
- Construction of Least Tern islands
- Construction and restoration of wetlands

Measures identified to facilitate development of diversity of flows and/or smooth hydropower releases include:

- Reallocation of storage and alterations of dam flows (Lake Keystone and/or Kaw Lake)
- Reregulation dam downstream of Lake Keystone.

It is anticipated that the plan formulation of these measures would consider policy guidance provided by ER 1110-2-8154, Water Quality and Environmental Management for Corps Civil Works Projects in addition to ER 1105-2-100, Planning Guidance Notebook.

- c. Factors Affecting the Scope and Level of Review.** This section discusses factors pertinent to the risk informed decisions on the appropriate scope and level of review. The discussion is intended to be detailed enough to assess the level and focus of review needed to support the PDT, PCX, and vertical team decisions. The discussion will help determine the types of expertise required and the various review teams to adequately review the document. The following is a discussion of pertinent risk factors:

Is total project cost estimate to exceed \$45 M?

Yes, the total project cost is on the order of \$77M.

Does the project pose significant technical, institutional, social, or other challenges?

Common ER measures are not anticipated to have significant challenges. Risks to life safety and can be engineered in sufficient detail in the report for the development of an accurate cost estimate. Failure of any of the proposed measures would only allow continuation of erosion and loss of critical, endangered species habitat already occurring in the region.

Contingent on a VT decision, other measures considered, associated with providing diversity of flows and smoothing hydropower releases, could be technically complex and include considerations for operating in conjunction with the multi-purpose operation of Lake Keystone as well as other downstream low water dams; dam and levee safety considerations; and floodplain impacts.

Where are significant project risks likely to occur and at what magnitude (e.g., what are the uncertainties and how might they affect the success of the project)? Primary risks associated with common ER measures are establishment of plantings. Measures associated with provisions for providing diversity of flows and/or smoothing of hydropower releases have potential safety risks but these risks can be reduced to acceptable levels through engineering design.

Is the project likely to have significant economic, environmental, and/or social effects to the Nation?

No.

Does the project likely involve significant threat to human life/safety assurance?

A project consisting of common ER measures would not likely involve threat to human life or safety. A project that would include measures associated with providing diversity of flows and/or smoothing of hydropower releases could have potential risks, however current design standards would reduce these risks to acceptable levels.

Is the project/study likely to have significant interagency interest?

Yes.

Is the project/study highly controversial?

Since the study addresses features that are already identified in the Arkansas River Corridor Master Plan, which was developed with considerable public involvement, it is not anticipated that there would be significant controversy. If the project includes provisions for diversity of flows and/ or smoothing hydropower releases there may be concerns by resource agencies. During development of the Master Plan, resource agencies expressed concerns that low water dams would impact a striper fishery and the shovel nose sturgeon.

Is the project/study likely to contain influential scientific information or be a highly influential scientific assessment?

No. It is not anticipated that the project/study has, or will have, a clear and substantial impact on important public policies of private sector decisions.

Is there information in the decision document or proposed project design that will likely 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?

No. Existing methods and techniques are anticipated for developing, evaluating, and designing alternatives.

Will the proposed project design require redundancy, resiliency, and or robustness?

EC 1165-2-214, Appendix E, paragraph 2 is the basis for this response. A project comprised of common ER features would not require redundancy, resiliency, or robustness since this would be addressed with OMRR&R. A project that includes provisions for providing diversity of flows and/or smoothing of hydropower releases could potentially require a design that incorporates resiliency and robustness considerations.

Does the proposed project have unique construction sequencing or a reduced or overlapping design construction schedule?

The timing and/or sequencing of construction activities could be influenced by Lake Keystone operations, least tern nesting season, or other Arkansas River corridor construction activities.

- 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: environmental/water quality studies, hydrologic studies and engineering studies associated with bank stabilization, preliminary and final designs, cost estimation, value engineering and real estate matters.

#### **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. DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements. It is managed by the Tulsa District and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. The PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. For the Arkansas River Corridor FR, non-PDT members and/or supervisory staff will conduct this review for major draft and final products. Planning, Economics and Environmental DQC reviewers will likely come from SWD Regional Planning and Environmental Center (RPEC). It is expected that the Major Subordinate Command (MSC)/District Quality Management Plan addresses the conduct and documentation of this fundamental level of review. DQC will be documented using the Dr. Checks review software/website.

- a. Documentation of DQC.** DrChecks will be utilized to document DQC reviews. The final DrChecks will be supplied to the ATR team prior to initiation of their review efforts.

#### **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. The ATR for this RP will be managed by the Ecosystem Restoration Planning Center of Expertise. A qualified ATR team shall be selected by the RMO. ATR team members shall not be recommended by Tulsa District or the MSC. The ATR team will

be comprised of senior USACE personnel that may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC. The public, including scientific or professional societies, will not be asked to nominate potential peer reviewers

**a. Products to Undergo ATR.** Products to undergo ATR will be the Draft and Final FR, EIS and Appendices. ATR will be performed immediately after a successful TSP Milestone Meeting and again after the ADM if there were substantial changes to the plan formulation of the project based on additional data collection. ATR is required for this study and will focus on the following:

- (1) Review of the planning study process,
- (2) Review of the economic analysis/appendix.
- (3) Review of anticipated ecosystem restoration features.
- (4) Completeness of study and support documentation.

Focused technical reviews on the read-aheads will be provided at the Alternatives and TSP milestones, involving, at a minimum, the ATR lead, as well as economics, environmental, and if applicable engineering reviewers will occur prior to the concurrent review of the draft report.

**b. Required ATR Team Expertise.** ATR review members will be selected from the appropriate Community of Practice approved lists of reviewers.

<b>ATR Team Members/Disciplines</b>	<b>Expertise Required</b>
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATRs for ER studies. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience related to ER.
Economics	The reviewer will have expertise in socio-economics associated with ER.
Environmental Resources	The reviewer will have expertise in the preparation of NEPA documents and assessing benefits of habitat restoration projects using HEP and CE/ICA. The reviewer should also have experience related to Hazardous, Toxic and Radioactive Waste (HTRW).
Geotechnical Engineering	The reviewer should have an extensive knowledge of the design of ER features.
Cost Engineering/ Estimating	Cost DX Staff or Cost DX Pre-Certified Professional with a strong knowledge of the cost estimating practices for ER.
Real Estate	The Real Estate reviewer should be experienced in real estate requirements for ER projects and will be selected from the enterprise level RE CoP list of approved qualified reviewers.
Hydrology and Hydraulics	The H&H Engineer Reviewer should have experience with ER features.
Civil Engineering	The Civil Engineering Review should have experience with ER.
Construction/Operations	N/A.

**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 Lead 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 Team 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.
- a. Decision on IEPR.** Based on existing information and the criteria in EC 1165-2-214, the Arkansas River Corridor Investigation will require a Type I IEPR. Contingent on a VT decision, a Type II IEPR and coordination with the Risk Management Center will be required if alternatives associated with the Lake Keystone operations to diversify flows and smooth hydropower releases are carried forward for consideration. If needed, the SAR will also be addressed during the Type I IEPR per Paragraph 2.c.(3) of Appendix D of EC 1165-2-214.

**b. Products to Undergo Type I IEPR.** The Type I IEPR will be performed for the entire decision document (including supporting documentation), which will be available prior to and at the draft report stage. The IEPR will be performed for key interim technical products and major milestone documents (e.g., AM and TSP).

**c. Required Type I IEPR Panel Expertise.**

IEPR Panel Members/Disciplines	Expertise Required
Environmental Resources	The reviewer will have expertise in the preparation of NEPA documents and assessing benefits of habitat restoration projects using HEP and CE/ICA. The reviewer should also have experience related to Hazardous, Toxic and Radioactive Waste (HTRW).
Hydrology and Hydraulics	The H&H Engineer Reviewer should have experience with ER features.
Civil Engineering	The Civil and Geotechnical Engineering Review should have experience with ER.
Construction/Operations	N/A.

**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 5.c 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. Policy and legal compliance reviews of all documents related to this FR shall be conducted by Tulsa District officials.

## **8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION**

All decision documents shall be coordinated with the Cost Engineering Mandatory Center of Expertise (MDX), located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR (if required) team and in the development of the review charge(s). The MDX will also provide the Cost Engineering certification. The Ecosystem Restoration PCX is responsible for coordination with the Cost Engineering MDX.

## **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.

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.

**a. Planning Models.** The following planning 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>Certification / Approval Status</b>
Habitat Evaluation Procedure (EXHEP)	This model may be used for assessing terrestrial and riparian habitat and possible impacts from different alternatives. The species models considered include Green Sunfish, Slider Turtle, Yellow Warbler, and Shovel Nose Sturgeon.	Approved for Use
IWR-PLAN	This model will be used to conduct cost effectiveness and incremental analyses for various ecosystem restoration alternative features.	Approved for Use

**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>
HEC-RAS 4.1.0 (River Analysis System)	The Hydrologic Engineering Center’s River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady state and unsteady flow river hydraulics calculations. The program will be used for unsteady flow analysis to evaluate the future without – and with-project conditions along the Arkansas River. Stage data from the model will be used to determine wetted areas.	Approved Model
CEQUAL2E	CEQUAL2E is a two-dimensional longitudinal/vertical hydrodynamic and water quality model. The program will be used to evaluate water quality associated with various conditions.	Approved Model
Mii - cost estimating models	Cost Engineering’s model for developing cost.	Cost Engineering Approved Model
Crystal Ball Risk Based Analysis	Cost Engineering’s model for determining risk in cost estimating.	Cost Engineering Approved Model

## 10. REVIEW SCHEDULES AND COSTS

### a. ATR Schedule and Cost.

#### Estimated schedule for ATR of the draft IFR and EA

ATR - Initiate Coordination with Eco Res PCX	May 2015
ATR Alternatives Documentation	June 2015
Alternatives Milestone	July 2015
ATR of TSP Read Ahead	May 2016
ATR of Draft Report	August 2016
ATR Certification	October 2016
Public Review of Draft Reports	October 2016
Agency Decision Milestone	November 2016
ATR (Backcheck) of Final Report	April 2017
Senior Leader's Meeting	July 2017
Director's Report	October 2017

The estimated cost for ATR is \$50,000 including the participation of the ATR Lead in milestone conferences and any meeting to address the ATR process and any significant and/or unresolved ATR concerns.

### b. Type I IEPR Schedule and Cost.

<u>TASK</u>	<u>Date</u>
IEPR – Initiate Coordination	June 2016
IEPR Review Period	September 2016
IEPR Report/Comments in Dr. Checks	October 2016
District Addresses Comments in Dr. Checks	October 2016
IEPR Backcheck/Closeout Comments	November 2016
IEPR Certification/Final Report	December 2016

The estimated cost for IEPR is \$180,000.

### c. Model Certification/Approval Schedule and Cost.

As part of the feasibility study, the District will use existing, certified models. No spreadsheet models will be required for this purpose.

## 11. PUBLIC PARTICIPATION

As part of the NEPA public involvement process, a draft Environmental Impact Statement (DEIS) and a draft feasibility report will be made available for public comment. The feasibility report and the DEIS will be posted on the District's website with a point of contact for comments and questions. The District and the non-federal sponsor will hold meetings with stakeholder groups throughout the course of the study. Public meetings/workshops are anticipated to occur in the August 2016 timeframe.

## 12. REVIEW PLAN APPROVAL AND UPDATES

The Southwestern 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, of which this document is a component, 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, will be posted on the Home District's 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:

Robert Heinly	RPEC, Chief, Plan Formulation Section	409-766-3992
TBD	ATR Team Lead	
Jodi Creswell or Marshall Plumley	Ecosystem Restoration PCX	309-794-5448 309-794-5447

**ATTACHMENT 1: TEAM ROSTERS**

<b>PDT Roster</b>			
<b>NAME</b>	<b>TITLE/ORG.</b>	<b>PHONE</b>	<b>EMAIL</b>
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TBD	Economics		
TBD	Environmental Resources/NEPA		
TBD	Geotechnical Engineering		
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TBD	Civil Engineering		
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**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 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**

<b>Term</b>	<b>Definition</b>	<b>Term</b>	<b>Definition</b>
ADM	Agency Decision Milestone	NED	National Economic Development
AFB	Alternative Formulation Briefing	NER	National Ecosystem Restoration
ASA(CW)	Assistant Secretary of the Army for Civil Works	NEPA	National Environmental Policy Act
ATR	Agency Technical Review	O&M	Operation and maintenance
CSDR	Coastal Storm Damage Reduction	OMB	Office and Management and Budget
CWRB	Civil Works Review Board	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DPR	Detailed Project Report	OEO	Outside Eligible Organization
DQC	District Quality Control/Quality Assurance	OSE	Other Social Effects
DX	Directory of Expertise	PCX	Planning Center of Expertise
EA	Environmental Assessment	PDT	Project Delivery Team
EC	Engineer Circular	PAC	Post Authorization Change
EIS	Environmental Impact Statement	PMP	Project Management Plan
EO	Executive Order	PL	Public Law
ER	Ecosystem Restoration	QMP	Quality Management Plan
FDR	Flood Damage Reduction	QA	Quality Assurance
FEMA	Federal Emergency Management Agency	QC	Quality Control
FRM	Flood Risk Management	RED	Regional Economic Development
FSM	Feasibility Scoping Meeting	RMC	Risk Management Center
GRR	General Reevaluation Report	RMO	Review Management Organization
Home District/MSD	The District or MSD responsible for the preparation of the decision document	RTS	Regional Technical Specialist
HQUSACE	Headquarters, U.S. Army Corps of Engineers	TSP	Tentatively Selected Plan
IEPR	Independent External Peer Review	SAR	Safety Assurance Review
ITR	Independent Technical Review	USACE	U.S. Army Corps of Engineers
LRR	Limited Reevaluation Report	WRDA	Water Resources Development Act
MSC	Major Subordinate Command		