



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND OR 97208-2870

CENWD-PDD

27 NOV 2013

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-CJ/Melissa Corkill)

SUBJECT: Review Plan (RP) Approval for the Turkey Creek Basin, Kansas City, Kansas and Kansas City, Missouri Flood Damage Reduction Project Post Authorization Change Report (PACR).

1. Reference EC 1165-2-214, Civil Works Review, 13 June 2013.
2. The RP for the Turkey Creek Basin, Kansas City, Kansas and Kansas City, Missouri Flood Damage Reduction Project PACR has been prepared in accordance with the reference guidance.
3. The RP has been revised to incorporate Northwestern Division review comments.
4. I hereby approve this RP, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this RP or its execution will require review by CENWD-PDD and approval by this office.
5. The RP should be posted to the internet and available for public comment.
6. Please contact Jeremy Weber, at 503-808-3858, if you have further questions regarding this matter.


JOHN S. KEM
BG, USA
Commanding

REVIEW PLAN

**Turkey Creek Flood Damage Reduction Project
Kansas City, Kansas
Kansas City, Missouri**

**Post Authorization Change Report/
Limited Reevaluation Report
Decision Document**

**Kansas City District
Northwestern Division**

**P2#: 125446 and 401707
AMSCO No.: 012381**

**MSC Approval Date: Pending
Last Revision Date: 24 OCT 2013
Original Submittal Date: 05 AUG 2013**



**US Army Corps
of Engineers ®**

REVIEW PLAN

Turkey Creek Flood Damage Reduction Project
Kansas City, Kansas
Kansas City, Missouri
Post Authorization Change Report/Limited Reevaluation Report

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Turkey Creek Flood Damage Reduction Project Post Authorization Change Report/Limited Reevaluation Report (PACR/LRR). It has been determined that the projected total project cost may exceed the authorized Section 902 limit for the project, which is now 70% constructed. Other than costs, the project features and benefits have not significantly changed. The PACR/LRR is a decision document and based on a Level II Economic Update.

b. References. The following documents have been used are references for this PACR Review Plan:

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 DEC 12
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 MAR 11
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 SEP 06
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 NOV 07
- (5) US Army Field Manual 5-19, Composite Risk Management, 21 AUG 06
- (6) Turkey Creek Restored Channel Project Management Plan, 12 JUL 13
- (7) Kansas City District Quality Management Plan (QMS Site)
- (8) Director of Civil Works' Policy Memorandum CWPM 12-001, 8 MAR 12

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).

d. Project Authority. The Turkey Creek project was authorized by the Water Resources Development Act of 1999 (PL 106-53) and reauthorized by Section 123 of the Consolidated Appropriations Act of 2003 (PL 108-7), dated 03 February 2003.

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. In this case, because the effort is focused primarily on the determination of the total project cost, with minimal changes to the authorized project features, the RMO for the peer review effort described in this Review Plan is the Major Subordinate Command (MSC), Northwestern Division. The PACR/LRR will be formalizing the elimination of the Mission Interceptor, one minor element of the authorized project, which was part of the Locally Preferred Plan (LPP) and was to be 100% non-Federal sponsor funded. The elimination of the Mission Interceptor does not adversely impact the overall purpose of the Project. As the project components have been analyzed with current data, the Mission Interceptor provides no significant benefits relative to the project outputs, and removal requires no reformulation. The sponsor also sees no tangible benefit and wants to formally remove that component from the project. It is solely a cost savings measure at this point.

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 and contingencies.

3. REPORT INFORMATION

a. Decision Document. The Turkey Creek Post Authorization Change Report/Limited Reevaluation Report (PACR/LRR) is intended to recommend an increase to the maximum amount that the USACE is authorized to spend to complete the project and document the reasons for recommendation. The Turkey Creek project is a single-purpose flood damage reduction project. A significant portion of the overall project is all ready constructed. A PACR/LRR is being prepared to determine the cost of the project features not yet constructed, determine if the total estimated project cost will exceed the 902 limit, and (if it does) provide sufficient supporting documentation to support an increase to the authorized project cost. If the PACR/LRR recommends an increase in the authorized project cost, the PACR/LRR will require approval by the Chief of Engineers and the projects new total cost will need Congressional authorization. The report is not anticipated to recommend any significant changes to the authorized project features or locations of those features. The Mission Interceptor, a 100% buy-up feature included within the LPP, will be removed per the request of the non-Federal sponsor. Mission Interceptor was not included with the NED due to its insignificant impacts to the overall purpose of the Project. The Mission Interceptor provides no tangible benefits above the NED Plan, and would not require any reformulation of plans. Removal of that component will be formalized in the PACR and is a cost savings measure only. There is no plan to modify the existing NEPA documentation.

b. Report/Project Description. Turkey Creek is an urban stream that flows for approximately 15 miles throughout the Kansas City metropolitan area, including both Kansas City, Kansas and Kansas City, Missouri. Frequent flooding occurs along Turkey Creek and poses significant damages, as well as risk to loss of life, to the existing residential, commercial, and industrial areas along the Turkey Creek corridor. The project has two (2) non-Federal sponsors – (1) Kansas City, Missouri (KCMO) and (2) the Unified Government of Wyandotte County and Kansas City, Kansas (UG).

The overall Turkey Creek project consists of several features that have been constructed, currently under construction, and planned to be constructed. The project is divided into two major types of flood protection; including the Turkey Creek channel improvements and the hillside interceptor systems. The channel improvements include various features, which are at various stages of completion. The Tunnel, Trapezoidal and Benched Channel, Levee and Environmental Enhancement Area, Walled Channel and Restored Channel Phase 1 are fully constructed. The remaining phases of the Restored Channel (Phase 2 and 3) are currently under design. In addition to the channel improvements, two (2) BNSF railroad bridges have been or are being relocated and two (2) auto bridges have been or are being relocated. The hillside interceptor systems collect storm water runoff from the adjacent hillsides and convey the runoff into Turkey Creek via underground pipe systems. The authorized project includes four (4) separate interceptors – Cherokee, Rainbow, Missouri, and Mission. Mission Interceptor is within the LPP and, if built, would be 100% funded by the non-Federal sponsor. The non-Federal sponsor has requested that Mission Interceptor not be constructed. Construction is complete on Cherokee Interceptor, Rainbow Interceptor is currently under construction, and the Missouri Interceptor is under design. Missouri Interceptor is designed to convey the 10-year storm event; however, the non-Federal sponsor has elected to “buy up” the project to increase the conveyance to the 15-year storm event as the LPP.

In summary, the following table provides the status of all aspects of the overall Turkey Creek project:

TABLE 1-1: STATUS OF TURKEY CREEK IMPROVEMENTS

	UNDER DESIGN	UNDER CONSTRUCTION	CONSTRUCTION COMPLETED
CHANNEL IMPROVEMENTS			
Tunnel			X
Trapezoidal and Benched Channel			X
Levee			X
Environmental Enhancement Area			X
Walled Channel			X
BNSF 3.8 Bridge Relocation			X
BNSF 4.4 Bridge Relocation		X	
Access Road Bridge Relocation			X
Mill Street Bridge Relocation		X	
Restored Channel Phase 1			X
Restored Channel Phase 2	X		
Restored Channel Phase 3	X		
HILLSIDE INTERCEPTORS			
Cherokee Interceptor			X
Rainbow Interceptor		X	
Missouri Interceptor	X		
Mission Interceptor	NOT STARTED		

In accordance with the above mentioned authorization, the total project cost was authorized at \$73,380,000 (2003 price levels). Using this authorized cost, the calculated 902 limit is \$123,512,000. The goal of the current project is to construct all flood damage reduction features in order to provide the full level of flood level risk reduction, as originally authorized, except for Mission Interceptor.

c. Factors Affecting the Scope and Level of Review.

- **Level of Difficulty.** The study is anticipated to include minor design efforts of authorized features to support a cost update, as well as a confirmation of economic benefits. These efforts will utilize standard practices and models. There are no changes to the National Economic Development (NED) Plan scope of the authorized project, no changes to the project purpose, and no changes to the local cooperation requirements. The emphasis of the PACR/LRR will be documenting the project cost increases that have occurred since authorization in 2003, most of which are historical in nature. There are also no significant changes to project outputs, benefits or level of protection. Based on these factors, the PACR/LRR does not warrant a high level review.

- **Life Safety.** This study will not result in any change to the authorized project and will not affect the life safety risks that are already present. Approval of the PACR/LRR would ensure that the project remains on track to move forward and preserve the protection it will afford.

- **Public Support.** There is strong public support for this project as existing residents, businesses, and infrastructure benefit greatly from the completion of the project. Turkey Creek is supported by both Kansas and Missouri. Benefits are realized on both sides of the state line, with the majority of the construction occurring in Kansas and the majority of the benefits in Missouri. Little or no public controversy is expected.

- **Standard USACE Practices.** There is no information in the decision document or any designs in support of the cost estimate which are 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. The methods being utilized for design, cost estimating and economic calculations are standard USACE practices.

- **Project Visibility.** The project has very strong support from the Congressional delegation, the local governments, residents in the area, the business community, and the local media. This PACR/LRR has minimal effects on the performance of the project, but will ensure future viability of the project and continued support from the local community. The project also results in visible channel modifications to Turkey Creek to the public, most of which is highly visible from Interstate 35.

d. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services were completed in the early 2000s prior to Review Plan requirements, which were determined to be integral features to the project authorization, and have been credited to the non-Federal sponsors.

e. Causes for Total Project Cost Increase. Various factors caused the cost increases that are to be presented within the PACR/LRR. The following is summary of the more significant factors:

- Excessive flooding occurred during construction of the Tunnel. Damages were paid for by the Government;
- Deterioration of the Tunnel was more significant than assumed during the GRR and quantities of concrete were substantially higher than estimated;

- Onsite borrow material was found to be unsuitable during construction of various features of Turkey Creek. A more expensive offsite borrow source had to be used to complete construction;
- Foundation conditions of the Levee and Environmental Enhancement Area were found to be unsuitable fill material. Offsite material was necessary to be brought in to replace the unsuitable material; and
- BNSF railroad bridge relocation requirements changed during design and required the installation of switches and communication equipment to facilitate rail traffic during construction.
- Cost risk analysis has added significantly to the current cost estimates for the remaining work.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) 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 manages DQC. Documentation of DQC activities is required in accordance with the Quality Manual of the District and the home MSC. DQC is overseen by the District’s Chief of Engineering and Chief of Geotechnical Branch.

a. Documentation of DQC. The Kansas City District’s process for QC requires documentation of DQC comments and responses. Certification of DQC is provided to the ATR team.

b. Products to Undergo DQC. The final draft PACR/LRR will undergo DQC.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

a. Products to Undergo ATR. The final draft of the PACR will undergo ATR.

b. Required ATR Team Expertise.

TABLE 5-1: ATR TEAM EXPERTISE

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as Civil Works Project Management).
Civil Works Project Management	The Civil Works Project Management reviewer shall have experience in Civil Works flood damage reduction projects and also in-depth knowledge of the PACR/LRR requirements and process. The ATR lead may also be the Civil Works Project Management team member.

Economics	Team member will be experienced in civil works and related flood risk reduction projects.
Cost Engineering	Team member will be familiar with cost estimating for similar civil works projects using the Microcomputer Aided Cost Engineering System (MCACES) model. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. It is anticipated the Cost Engineering ATR will be NWW Cost DX.
Real Estate	Team member will be experienced in Federal civil work real estate laws, policies and guidance. Member will have experience working with relevant non-federal sponsor real estate issues.

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 are limited to those required to ensure adequacy of the product. The four key parts of a quality review comment 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 prepares a Review Report summarizing the review. Review Reports are an integral part of the ATR documentation and also:

- 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 is 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 prepares a Statement of Technical Review certifying that the issues raised by the ATR team are resolved (or elevated to the vertical team). 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 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. 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. Decision on IEPR. The estimated total project cost is \$139 million, and therefore, triggers a mandatory Type I IEPR per EC 1165-2-214. However, the project does not increase any life safety risks inherent to the original project; does not consider any changes to the authorized features; involves minimal design work in support of the update to the cost estimate, as well as confirmation of the economic costs and benefits; is limited in scope or impact, addressing only a change in the total project costs that it would not significantly benefit from an independent peer review; is not controversial and neither the Governor nor a member of congress has requested an IEPR. The non-Federal sponsors and local project stakeholders strongly support completing the project and completing the PACR/LRR for approval and inclusion into the earliest budget cycle. In accordance with EC 1165-2-214 and with sufficient funds available to complete the PACR/LRR within the 902 limit, the review of the PACR/LRR will be scaled, thorough, and risk-informed; commensurate with

the limited scope and the low risk level of the PACR/LRR. Therefore, no other mandatory conditions presented within EC 1165-2-214 are met and Type I IEPR exclusion will be requested from the Chief of Engineers.

This risk informed decision explicitly considered that:

- This PACR/LRR meets only one (1) of the identified mandatory triggers for Type I IEPR described in EC 1165-2-214. The estimate total project cost is \$139 million and exceeds the \$45 million threshold identified within the Type I IEPR criteria. However, the project does not meet any other prompts, including:
 - Minimal, if any, consequences of non-performance on Project economics, the environmental and social well-being (public safety and social justice);
 - The PACR/LRR contains no influential scientific information or highly influential scientific assessment; and
 - The PACR/LRR decision document will meet the exclusions described in Appendix D of EC 1165-2-214:
 - The project is not controversial;
 - The project has no adverse impacts on scarce or unique tribal, cultural, or historic resources;
 - The project has no adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures; and
 - The project has no adverse impacts on a species listed as endangered or threatened under the Endangered Species Act of 1973 or the critical habitat of such species.
- There are no requests to conduct IEPR from a head of a Federal or state agency charged with reviewing the Project; and
- Due to the very limited scope change covered by this PACR/LRR, there is no reformulation of plans or changes to benefits, outputs, performance, or level of protection. Therefore, this PACR/LRR is in effect an implementation document and not a major decision document requiring a Type I IEPR.
- Per Paragraph 11.d.(2).b of Appendix D of EC 1165-2-214, a project that exceeds the \$45 million threshold, but does not meet any other mandatory conditions, may be excluded from a Type I IEPR, pending the approval from the Chief of Engineers. NWK will be approaching the Chief of Engineers with a request for exclusion of a Type I IEPR for the Project.

b. Products to Undergo Type I IEPR. Not applicable.

c. Required Type I IEPR Panel Expertise. Not applicable.

d. Documentation of Type I IEPR. Not applicable.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents are 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 DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents are coordinated with the Cost MCX, located in the Walla Walla District. The Cost MCX will assist in determining the expertise needed on the ATR team and in the development of the review charge(s). The MCX will also provide ATR certification. The RMO is responsible for coordination with the Cost 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 and ATR.

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 USACE 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 and ATR.

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

TABLE 9-1: PLANNING MODELS

MODEL NAME AND VERSION	BRIEF DESCRIPTION OF THE MODEL AND HOW IT WILL BE APPLIED IN THE STUDY	CERTIFICATION/ APPROVAL STATUS
Section 902 Analysis Certified Tool	Section 902 of the Water Resources Development Act (WRDA) of 1986 defines the maximum amount that a project can cost. This is often called the 902 Limit or Project Cost Cap. It is “The maximum project cost limit imposed by Section 902 is a numerical value specified by law which must be computed in a legal manner (ER 1105-2-100 Appendix G).” The agency-approved Excel spreadsheet for performing 902 calculations will be used.	Certified
HEC-FDA (Hydrologic Engineering Center Flood Damage Analysis program)	The damages and benefits developed for previous, authorizing Turkey Creek project documents were computed using a risk analysis program developed by the Omaha District (CENWO). Original plans to continue using the Omaha program for the PACR (as allowed under the economic update guidance memorandum of 8 March 2012) have changed due to technical difficulties with the program. It was not designed to run on more recent generations of computers without modification, there is no existing tech support for it, and it will not be possible to utilize it for the PACR as originally planned. However, HEC-FDA accomplishes the same analytical tasks formerly performed by the Omaha program using almost identical input data, techniques, and outputs. Both programs estimate economic damages, damages reduced (i.e., benefits) and project performance using a similar Monte Carlo-based process accounting for uncertainty in both economic and hydrologic/hydraulic variables. The HEC-FDA model will initially be loaded with the identical H&H input data, including uncertainty parameters, from the 2003 GRR. Economic occupancy data will then be loaded with minimal changes from the GRR, but in cases where official depth-damage functions have been released by the agency subsequent to the GRR, we will switch over to those functions. The overall aim will be to incorporate only the most critical changes in the H&H and occupancy input data so that the final product will as much as possible reflect real changes in the economic base of the study area and not simply changes in economic analysis procedures. Finally, a new structure inventory with updated occupant and structure condition data and values in FY 2014 dollars will be loaded, and the model will be executed to calculate expected annual damages and benefits.	We will use HEC-FDA version 1.2.5, which is certified.

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

TABLE 9-2: ENGINEERING MODELS

MODEL NAME AND VERSION	BRIEF DESCRIPTION OF THE MODEL AND HOW IT WILL BE APPLIED IN THE STUDY	CERTIFICATION/ APPROVAL STATUS
Crystal Ball Software, Version 11.1.1.3.00	Excel based model will be used to identify, quantify, and analyze risk related to total project costs, to include planning, engineering and design costs. The model will be used to develop a contingency percentage that will be applied to the remaining work.	Allowed for Use

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. Due to the limited scope of the study, a single ATR is anticipated for the final draft of the report. The cost of the ATR is estimated to be approximately \$30,000 and is scheduled for November 2013.

b. Type I IEPR Schedule and Cost. Not applicable.

c. Model Certification/Approval Schedule and Cost. All models anticipated for use on this project are already certified or approved for use.

11. PUBLIC PARTICIPATION

The final draft PACR is shared with the public for review and comment. The non-Federal sponsors are aware of the cost increases and support the completion of the project. Since public comments are a part of the decision document development process, they are not required on this review plan.

The public comment period is 30 days. The Kansas City District will consider all public comments and recommend changes to the Review Plan, if necessary, to the RMO. Significant and relevant public comments will also be provided to reviewers prior to conducting the review. The Review Plan is posted to the Kansas City District's webpage, located at the path below:

<http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx>

Public comments to the Review Plan may be made in writing or emailing the following contact:

U.S. Army Corps of Engineers, Kansas City District
c/o Scott Mensing, CENWK-PM-CJ
Rm 556, Federal Building
601 East 12th Street
Kansas City, MO 64106
Email: scott.p.mensing@usace.army.mil

12. REVIEW PLAN APPROVAL AND UPDATES

The Northwestern Division Commander issues approval of 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) are 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, is posted on the Home District's webpage.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to Scott Mensing, Project Manager, Kansas City District at (816) 389-2321.

ATTACHMENT 1: TEAM ROSTERS

District-level names are redacted from the version posted for public comment to protect privacy.

Product Delivery Team:

Project Manager	Scott Mensing, CENWK-PM-CJ
Economics	Allen Holland, CENWK-PM-PF
Cost Estimating	Pat Miramontez, CENWK-ED-DC
Environmental	Curtis Hoagland, CENWK-PM-PR

Agency Technical Review Team:

ATR Lead	TBD
Civil Works Project Management	TBD
Economics	TBD
Cost Estimating	James Neubauer, CENWW-EC-X
Cost Estimating	Marc Masnor, CESWT-PE-P
Real Estate	TBD

Vertical Team:

Review Management Office	Jeremy Weber, CENWD-PDD
NWD Point of Contact	Jeremy Weber, CENWD-PDD
NWD Regional Integration Team	Andy Miller, CECW-NWD

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 Post Authorization Change Report for the Blue River Basin, Dodson Industrial District, Flood Damage Reduction Project, Kansas City, Missouri. 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

Name
ATR Team Leader
Office Symbol/Company

Date

SIGNATURE

Name
Project Manager
Office Symbol

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

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
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
DPR	Detailed Project Report	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OEO	Outside Eligible Organization
DX	Directory of Expertise	OSE	Other Social Effects
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
EIS	Environmental Impact Statement	PAC	Post Authorization Change
EO	Executive Order	PACR	Post Authorization Change Report
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
Home District/MS	The District or MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
NED	National Economic Development	WRDA	Water Resources Development Act