



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NORTHWESTERN DIVISION
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CENWD-RBT

04 FEB 2013

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-C, Ms. Corkill)

SUBJECT: Turkey Creek Flood Damage Reduction Project Review Plan (RP) – Revision 2, Kansas City District, Northwestern Division

1. References:

a. Memorandum, CENWK-ED, 16 January 2013, subject: Turkey Creek Flood Damage Reduction Project Review Plan, Kansas City, Kansas, Kansas City District, Northwestern Division, Review Plan Submittal – Revision 2 (Encl 1).

b. EC 1165-2-214, Civil Works Review, 15 December 2012.

c. Memorandum, CEIWR-RMC, 23 January 2013, subject: Risk Management Center Endorsement – Turkey Creek Flood Damage Reduction Project, Kansas City, KS, Review Plan – Revision 2 (Encl 2).

2. Reference 1.a. above has been prepared in accordance with reference 1.b. above.

3. The original RP was approved in July 2011 by Dr. James Hearn, Regional Business Director for the Northwestern Division (NWD), U.S. Army Corps of Engineers, with Revision 1 approved in November 2012 by the NWD Commander. The RP includes District Quality Control, Agency Technical Review (ATR), and Type II Independent External Peer Review (IEPR). The Risk Management Center (RMC) endorses the revised plan and recommends approval (reference 1.c).

4. The RMC would typically be the Review Management Office (RMO) during the implementation phase for a project which involves life safety concerns. However, the RMC has recommended that NWD perform the RMO duties for the ATR for this project, with the RMC serving as the RMO for the IEPR. The NWD Point of Contact (POC) is Steve Bredthauer at (503) 808-4053; the RMC POC is Tom Bishop at 303-963-4556.

5. I hereby approve this RP, which is subject to change as circumstances require, consistent with the study development process and the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require written approval from this office.

6. For further information, please contact Mr. Steve Bredthauer at (503) 808-4053.

2 Encls

ANTHONY C. FUNKHOUSER, P.E.
BG, USA
Commanding

2108 8:34 0



DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
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601 E. 12TH STREET
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REPLY TO
ATTENTION OF

CENWK-ED

16 January 2013

MEMORANDUM FOR Commander, Northwestern Division, USACE

SUBJECT: Turkey Creek Flood Damage Reduction Project Review Plan, Kansas City, Kansas, Kansas City District, Northwestern Division, Review Plan Submittal – Revision 2

1. Enclosed for Major Subordinate Command (MSC) Commander approval is the Turkey Creek Flood Damage Reduction Project Review Plan. This Review Plan was approved by Mr. James Hearn in July 2011, approved again by COL Funkhouser in November 2012. It has undergone revision and is now prepared according to EC 1165-2-214, Civil Works Review. No significant changes have been made to the proposed review levels.
2. The District point of contact (POC) for questions or requests for additional information may be referred to Ms. Melissa Corkill, Project Manager, at (816) 389-3697 or email at Melissa.R.Corkill@usace.army.mil.

A handwritten signature in black ink, appearing to read "D. Mathews", with a long horizontal line extending to the right.

David L. Mathews, P.E.
Chief, Engineering Division
Kansas City District

Encl 1

REVIEW PLAN

*Turkey Creek Basin Flood Damage Reduction Project
Kansas City, Kansas and Kansas City, Missouri
Implementation Phase*

*Kansas City District
Northwestern Division*

P2#: 125446

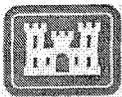
Date: January 16, 2013

Last MSC Approval Date: November 2012

Last Revision Date: July 2011

This review plan is an update of the previous plan approved in November 2012 by Northwestern Division. This update reformats the review plan using the Risk Management Center's (RMC) Decision Document Template dated 15 June 2011 (with modification for use with Implementation Documents).

The level of review recommended has not changed from previously approved Review Plans.



**US Army Corps
of Engineers®**

REVIEW PLAN

***Turkey Creek Basin Flood Damage Reduction Project
Kansas City, Kansas and Kansas City, Missouri
Implementation Phase***

***Kansas City District
Northwestern Division***

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1. PURPOSE AND REQUIREMENTS

Purpose. This Review Plan defines the scope and level of review for the *Turkey Creek Basin Flood Damage Reduction Project, Kansas City, Kansas and Kansas City, Missouri, Implementation Phase, Kansas City District, Northwestern Division*

a. 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) US Army Field Manual 5-19, Composite Risk Management, 21 August 2006
- (6) Turkey Creek Restored Channel PMP dated January 2012

b. 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.

c. Project Authority. The Turkey Creek project is authorized by Section 101(a)(24) of the Water Resources Development Act of 1999, Public Law 106-53 as amended by Section 123 of Division D of the Consolidated Appropriations Resolution, 2003, Public Law 108-7.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION – NWK and RMC

The RMO is responsible for managing the overall review effort described in this Review Plan. Typically the Risk Management Center would perform RMO duties for a project in the implementation phase involving Dam Safety Modifications projects and Levee Safety Modification projects. For Turkey Creek, the RMC recommends that Northwestern Division (NWD) perform the RMO duties for the ATR portion of this project. The RMC will be the RMO for the Independent External Peer Review (IEPR).

3. STUDY INFORMATION

a. Implementation Documents. The implementation documents will be plans, specifications, design documentation reports (DDR), and operations and maintenance (O&M) manuals for the various phases of the project. These documents will be used as a detailed plan for construction of the project features. The documents will not require congressional authorization. No updates to the National Environmental Policy Act (NEPA) documentation will be necessary.

b. Project Description. Turkey Creek is a relatively small urban stream that flows for about 15 miles in metropolitan Kansas City. Frequent flooding occurs along Turkey Creek. The project is a single purpose project – flood damage reduction. This project has two non-Federal sponsors: 1)

Kansas City, Missouri (KCMO) and 2) The Unified Governments of Wyandotte County and Kansas City, Kansas (UG).

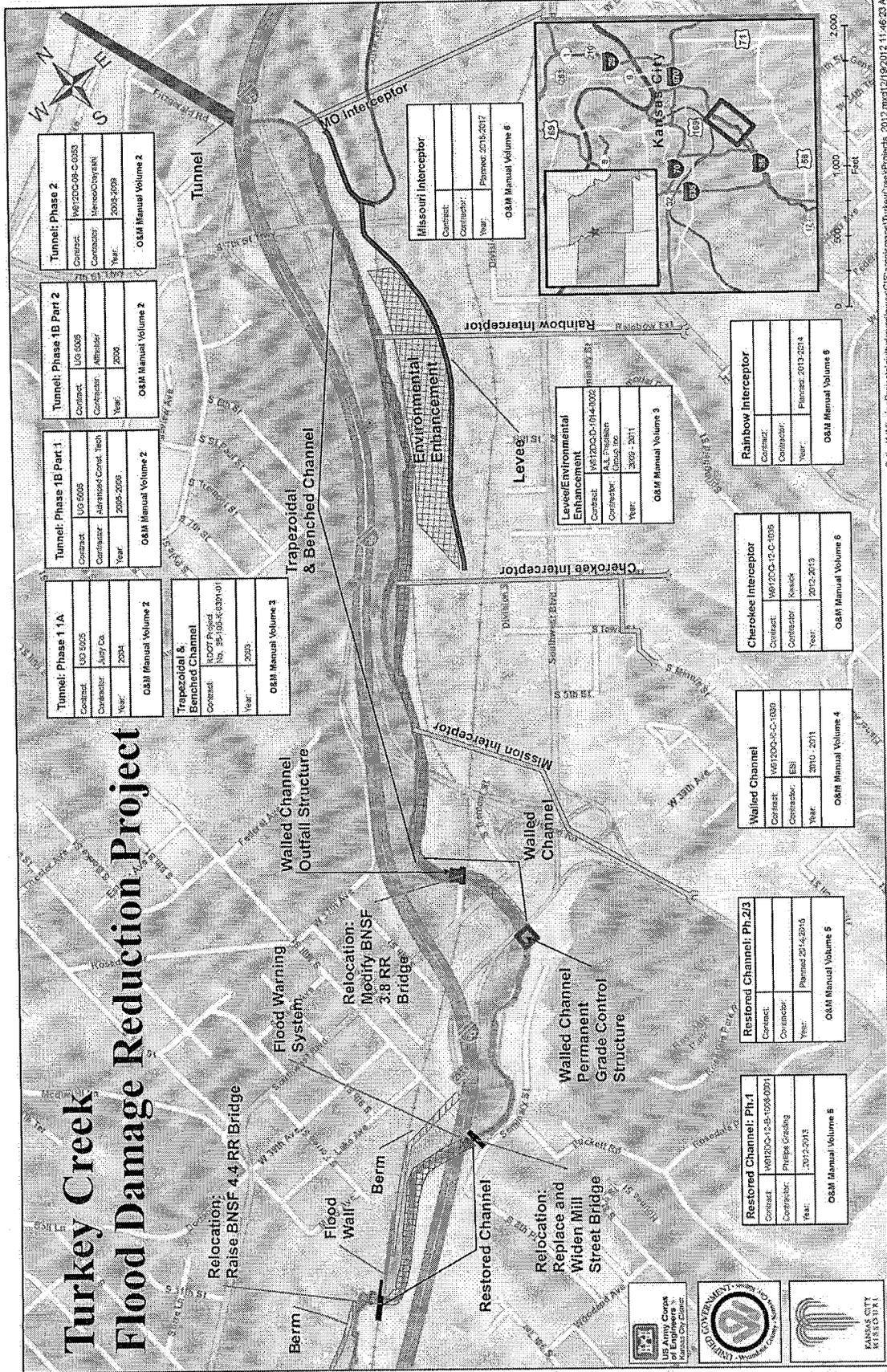
The Turkey Creek Project consists of several features that are being constructed and have been constructed as part of various construction contracts. The Turkey Creek Project can be divided into two major types of flood protection: 1) Turkey Creek Channel and 2) Hillside Interceptors. The Turkey Creek Channel consist of the following features which are at various stages from design through construction completion: Tunnel, Trapezoidal and Benched Channel, Levee, Environmental Enhancement, Walled Channel, Restored Channel, two railroad bridge relocations, and two auto bridge relocations. The Hillside Interceptors have not been constructed and will take water from an adjacent hillside and route it through underground stormwater pipes to Turkey Creek, reducing the flooding currently associated with the lack of hillside drainage. The Hillside Interceptors have been subdivided into smaller projects and are referred to as the following: Cherokee Interceptor, Rainbow Interceptor, Missouri Hillside Interceptors. The Mission Hillside Interceptor is currently a locally preferred plan that would be 100% funded by UG. For the purposes of this review plan, the Hillside Interceptors will be referred to as the Hillside Interceptors with no subdivision necessary as they are all similar in nature, design, use, and complexity.

The first construction project on Turkey Creek was the Turkey Creek Tunnel and was awarded in 2006 and completed in 2009. This same year the Operations and Maintenance Manual was completed and the tunnel turned over to the project sponsors. Also completed are the Trapezoidal Channel, Levee, and Environmental Enhancement Area. The Tunnel, Levee and Environmental Enhancement Area were designed and constructed prior to Review Plan requirements but did undergo District Quality Control and Independent Technical Review in accordance with Corps quality requirements. Also constructed is the Walled Channel project, one RR bridge relocation, and one auto bridge relocation. The Walled Channel was the first Turkey Creek Project to be designed and constructed following the Review Plan requirements. Currently in design and construction is the last channel project referred to as the Restored Channel. The Interceptors are in design and the first project, Cherokee Interceptor is under construction. These remaining projects are all covered in this Turkey Creek Basin Review Plan.

The figure on the following page depicts the various Turkey Creek construction projects that have been completed or have yet to be completed.

Turkey Creek Project

Turkey Creek Flood Damage Reduction Project



Tunnel: Phase 2	
Contract:	WB72DC09-C-0353
Contractor:	Meredith-Chapman
Year:	2008-2009
O&M Manual Volume 2	

Tunnel: Phase 1B Part 2	
Contract:	US 5005
Contractor:	Meredith
Year:	2008
O&M Manual Volume 2	

Tunnel: Phase 1B Part 1	
Contract:	US 5005
Contractor:	Advanced-Creek Tech
Year:	2005-2006
O&M Manual Volume 2	

Tunnel: Phase 1A	
Contract:	US 5005
Contractor:	Judy Cox
Year:	2004
O&M Manual Volume 2	

Trapezoidal & Benched Channel	
Contract:	1007 Project No. 98-100-4-0301(01)
Year:	2000
O&M Manual Volume 3	

Missouri Interceptor	
Contract:	
Contractor:	
Year:	2010-2017
O&M Manual Volume 6	

Levee Environmental Enhancement	
Contract:	WB72DC12-B-1000-0001
Contractor:	URS
Year:	2008-2011
O&M Manual Volume 3	

Rainbow Interceptor	
Contract:	
Contractor:	
Year:	2013-2014
O&M Manual Volume 6	

Cherokee Interceptor	
Contract:	WB72DC12-C-1035
Contractor:	Kiewit
Year:	2012-2013
O&M Manual Volume 6	

Walled Channel	
Contract:	WB72DC12-C-1030
Contractor:	ESI
Year:	2010-2011
O&M Manual Volume 4	

Restored Channel: Ph.2/3	
Contract:	
Contractor:	
Year:	2014-2015
O&M Manual Volume 5	

Restored Channel: Ph.1	
Contract:	WB72DC12-B-1000-0001
Contractor:	Phillips Exelting
Year:	2012-2013
O&M Manual Volume 5	

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c. **Project Status.** As of January, 2013, the project is approximately 70% constructed or under contract to be constructed. The President's budget has included Turkey Creek in its annual budget on a regular basis for several years and Turkey Creek is expected to continue receiving funding into the near future. The table below outlines the status of the various phases that Turkey Creek has been broken into.

Turkey Creek Phase	Status (as of January 2013)
Phase 0: Trapezoidal and Benched Channel	Construction Complete, O&M Manual in ATR
Phase 1 and 2: Tunnel	Construction Complete, O&M Manual Complete
Phase 3: Relocations	1 Railroad bridge and 1 auto bridge relocated; 1 Railroad bridge and 1 auto bridge under construction. These relocations are not part of this Review Plan
Phase 4: Levee/ Environmental Enhancement	Construction Complete, O&M Manual in ATR
Phase 5: Walled Channel	Design underwent ATR, Construction Complete, O&M Manual in ATR
Phase 6: Kansas Interceptors – Cherokee	Design underwent ATR, Construction on-going, O&M Manual not started
Phase 6: Kansas Interceptors – Rainbow	Design on-going, O&M Manual not started
Phase 7: Missouri Interceptors	Not started
Phase 8: Restored Channel Ph. 1	Design underwent ATR, Construction on-going, O&M Manual not started
Phase 8: Restored Channel Ph 2 and 3	Design on-going

d. **Factors Affecting the Scope and Level of Review.**

- **Life Safety.** The project includes levees and floodwalls that protect human life. It is critical that these features are designed to current criteria, and are designed, constructed and ultimately perform as intended.
- **Project Cost.** The total cost of the project is authorized at \$121,500,000 (FY12 Basis). This cost includes preliminary engineering and design, completion of the design, reviews required by law, construction supervision and administration, contracting costs, project management, quality assurance labor costs, LERRD (lands, easements, rights of way, relocations, and disposal) costs, project coordinatin team costs, and construction.
- **Public Support.** There is strong public support for this project. The project features will help protect businesses and infrastructure from flooding, which in turn helps support jobs in the area. Turkey Creek is a bi-state project with support from 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 being in Missouri.

- **Project Visibility and Area Disturbed.** The project has and will result in visible channel improvements, levees and floodwalls. Much of this project is visible from Interstate-35.

e. Factors considered but not deemed influential. The engineering employed to support the implementation documents is structural design, hydraulics and hydrology, biology, geotechnical evaluation, and civil engineering. The design and design methods in the implementation documents are not to be based on novel methods, do not present complex challenges for interpretation, do not contain precedent-setting methods or models, and do not present conclusions that are likely to change prevailing practices. This project does not have significant environmental impacts nor does it disturb known cultural or historically significant sites. Little to no public controversy is expected.

f. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services was completed in the early 2000s prior to Review Plan requirements. The work completed by the non-Federal sponsor included some initial stabilization to the Turkey Creek Tunnel. The Government finalized the design and construction to the Turkey Creek Tunnel prior to Review Plan requirements.

4. DISTRICT QUALITY CONTROL (DQC)

All implementation documents (including supporting data, analyses documents, etc.) will 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 will manage DQC. Documentation of DQC activities is required and will be in accordance with the Quality Manual of the District and the home MSC. DQC will be overseen by the District's Chief of Engineering and Chief of Geotechnical Branch.

a. Conduct of DQC, AE-Developed Products. A-E developed products are not expected for the remainder of the Turkey Creek Project. However, if AE developed products are provided. This procedure would be followed. For AE-developed products, the AE will develop a quality control plan (QCP) that will be reviewed by a Quality Assurance Team (QAT) and approved by the District's contracting officer's representative of the design contract. The QAT will ensure the QCP meets the necessary criteria and standards for the conduct of quality control. The QCP will, at a minimum, include an independent technical review by the AE. When the AE submits their design products, the QAT will conduct a quality assurance (QA) review to ensure the QCP was followed and the terms of the contract are met by the deliverables. The QAT will enter any comments they may have at this time into DrChecks (see paragraph below). The AE will respond to the DrChecks comments and the comments will be resolved by the AE prior to submitting the products for ATR review. The AE's independent technical review comments (which often take the form of marked-up drawings) and the QAT's DrChecks comments from the QAT review will be provided to the ATR team.

b. Conduct of DQC, District-Developed Products. For products developed by the District, the District will conduct both QC and QA. QC at this level will be conducted by the PDT and includes peer review and an interdisciplinary review, with a focus on ensuring the design meets current criteria and standards, and is technically acceptable. QA will be conducted by the district and includes oversight on the quality control processes, a legal review, and a Biddability, Constructibility, Operability, and Environmental (BCOE) review prior to advertisement of a construction contract. Comments from the interdisciplinary review will be provided to the ATR team.

c. Documentation of DQC. DQC documentation will be provided to the ATR team at the start of the ATR review. Basic quality tools used on the project include a Quality Management Plan, quality assurance team (QAT) reviews for AE products, a BCOE review, AE product developed checklists, and established Business and Quality Procedures (BQPs) used to ensure quality procedures are followed. The remaining Turkey Creek implementation documents will be produced by in-house designers with quality procedures followed as described in the district's Business Quality Processes (BQPs). If an AE is used, the districts' BQPs for AE-developed products will be followed which includes the development of an AE QCP. The AE QCP would be reviewed by the district QAT and approved by the Contracting Officer's Representative.

d. DQC Review Descriptions.

- (1) Peer Reviews. Both AE's and the District conduct peer reviews as part of DQC. The peer review is conducted by a peer in the same discipline who double checks calculations, criteria, assumptions, and other design details used in the design, specifications, and DDR. A certification will be prepared once issues raised by the reviewers have been addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a quality assurance certification statement by the AE, the District's QAT leader, or the District's Project Development Team (PDT) for in-house products.
- (2) A/E's Product Reviews. Although AE-developed products are not anticipated at this time, an AE would conduct checks for work progress and accuracy, compliance reviews to ensure products meet criteria and scope requirements, and an independent technical review (ITR). The ITR will verify the technical applicability and accuracy of the work, assumptions, information and design clarity, technical coordination, compliance with the technical requirements in the scope and associated criteria documents, quality of biddability and constructability. The ITR is performed by qualified professionals independent of the task order. The ITR comments are provided to the District.
- (3) Interdisciplinary Review. The District conducts an interdisciplinary review on District-developed products. This review ensures the work developed by one discipline does not conflict or interfere with the work of another discipline. As the project progresses, check prints or draft documents will be provided to all members of the PDT. Each member will check other discipline's work for coordination with their work and comment on work by other team members that does not appear to satisfy criteria or client requirements. Included is a review of correctness of application of methods, validity of assumptions, adequacy of basic data, correctness of calculations, and completeness of documentation, compliance with guidance and standards, and BCOE considerations. The term "interdisciplinary review" for the purpose of this document is synonymous to the internal portion of the "PDT Review" defined in Chapter 3 of ER 1110-1-12.
- (4) Plan in Hand Review. Before a construction contract is advertised, the PDT (and AE, if applicable) will conduct a plan in hand review. Aptly named, this review is conducted onsite with the plans "in hand". The PDT, including construction branch and field office representatives, will conduct the review. This review is to determine if any significant changes to the site have occurred since the last site visit and to visualize the completed plan from the perspective of standing at the site. Following the plan in hand, the PDT tech lead

will produce a memorandum to document comments and the planned resolution of any issues.

e. Products to Undergo DQC. Plans, specifications, DDRs, and O&M manuals for each phase have all received and will receive DQC.

f. Timing of DQC. DQC on each product will be completed prior to ATR of the particular product, with the exception of the plan in hand review, which may be completed after ATR but before advertisement of a construction contract.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all implementation documents (including supporting data, analyses, 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. Plans, specifications, DDRs, (design documents) and O&M manuals for each phase started prior to the first approved Turkey Creek Review Plan will receive ATR. The following products have and will receive ATR:

- (1) Phase 4: Levee/Environmental Enhancement O&M Manual
- (2) Phase 5: Walled Channel Design Documents and O&M Manual
- (3) Phase 6: KS Interceptors Design Documents and O&M Manual
- (4) Phase 7: MO Interceptors Design Documents and O&M Manual
- (5) Phase 8: Restored Channel Design Documents and O&M Manual

b. Timing of ATR. ATR on Phase 4 and 5 O&M Manuals will occur in January 2013. ATR on Phase 6 Rainbow Interceptor will occur in the spring of 2013 at 65% and 95% complete milestones. Phase 7 will receive ATR in 2014 and 2015 once the design is complete. Phase 8 Restored Channel will be designed in 2013 and will undergo ATR in the spring and summer of 2013. O&M manuals for all remaining phases will undergo ATR just before project construction is complete. It is desired to have the same ATR team for each phase of Turkey Creek although this is not required nor is it anticipated that all people will be available over the next three to four years in which the reviews will be conducted.

c. Required ATR Team Expertise.

ATR Team Members/Disciplines	Expertise Required
ATR Lead (All Phases)	The ATR team leader shall hold a professional license in structural, geotechnical, or civil engineering with a BS degree or higher in civil, geotechnical or structural engineering. The ATR leader shall have a minimum of 15 years of design experience and experience with multi-million dollar flood risk management

	<p>projects. The team leader shall be a recognized leader with good communication skills to lead a diverse review team comprised of individuals located at various districts across the nation. The ATR lead should be a senior professional with extensive experience in preparing Civil Works implementation 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 leader may also serve as a reviewer for one of the specific disciplines below, if applicable.</p>
Environmental (Phase 4 only)	<p>The reviewer for environmental shall be an experienced landscape architect, environmental designer, or biological reviewer with at least 10 years of similar experience and a BS degree or higher in the environmental field, biological, or landscape architect field.</p>
Hydraulic Engineering (All Phases)	<p>The reviewer for hydraulics shall be a registered professional engineer with a minimum of a BS degree or higher in engineering science. The reviewer shall have a minimum of 10 years experience in hydrologic analysis and design of hydraulic structures as it relates to riverine flood risk management projects. Reviewer should have experience in the analysis and design involving interior drainage and riverine models using hydrology models HEC-HMS, stormwater model SWMM, and hydraulic models HEC-RAS. This member should also be knowledgeable in coincidence of frequency and the application of USACE risk and uncertainty analyses on flood risk management projects. Reviewer should be experienced with similar projects in an urban setting and should have participated in review of riverine flood risk management projects.</p>
Geotechnical Engineering (All Phases)	<p>The reviewer for geotechnical features shall be a registered professional engineer with a minimum BS degree or higher in civil or geotechnical engineering. Reviewer shall have a minimum of 10 years experience in subsurface investigations, floodwall and levee design, auger cast pile or drilled shaft foundations, seepage and slope stability evaluations, erosion protection design, and construction and earthwork construction. The reviewer must be familiar with USACE regulations and standards.</p>
Civil Engineering (All Phases)	<p>The reviewer for civil features shall be a registered professional engineer with a minimum BS degree or higher in civil or construction engineering. The reviewer shall have a minimum of 10 years experience in the design, layout, and construction of a large urban flood risk management projects to include knowledge regarding levees, interior drainage facilities, earthwork, concrete placement, roadway design and relocation of underground utilities. The reviewer must be familiar with USACE regulations and standards.</p>
Structural Engineering (All Phases)	<p>The reviewer for structural features shall be a registered professional engineer with a BS degree or higher in civil or</p>

	<p>structural engineering. The reviewer shall have a minimum of 10 years experience in the design, layout, and construction of large flood risk management projects. Reviewer should be familiar with the design and construction of tall (15 feet high) flood walls, closure structures, interior drainage facilities, concrete placement, and relocation of underground utilities. The reviewer should have experience with USACE design regulations for Civil Works projects.</p>
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d. 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 PDT will work with the PM to ensure resolution of all issues raised by USACE reviews. 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 be 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.

When resolution on ATR comments is not readily achievable, the RMO should engage the MSC subject matter experts (SMEs) to help facilitate resolution, and they in turn may choose to engage HQUSACE SMEs. The Agency Technical Review team will identify significant issues that they believe are not satisfactorily resolved and will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

Significant unresolved ATR concerns that are documented by the RMO will be forwarded through the MSC to the HQUSACE RIT, including basic research of USACE guidance and an expression of desired outcome, for further resolution. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. At this point the ATR documentation for the concern may be closed with a notation that the concern has been elevated for resolution by HQUSACE. Subsequent submittals of reports for MSC and/or HQUSACE review and approval shall include documentation of the issue resolution process.

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 ensuing discussion, including any vertical coordination, and lastly the agreed upon resolution.

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. Before the ATR certification is completed, the PDT shall ensure that all agreed upon changes have been incorporated into the final product. For those cases where commitments are made to incorporate changes in the next phase of work, agreed upon deferrals shall be documented in the ATR certification. 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. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for implementation 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. This project is not anticipated to require Type I IEPR because it is in the implementation phase and not the study phase.
 - 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 any project where potential hazards pose a significant threat to human life (public safety). 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.** Based on the analysis provided in Attachment 3, it is recommended that the Turkey Creek Basin Phase 8 Restored Channel project receive a Type II IEPR. All other remaining phases will receive DQC and ATR. The risk informed decision explicitly considered:
- Whether requests to conduct IEPR from a head of a Federal or state agency charged with reviewing the project. None were received.
 - Whether the proposed project meets the criteria for conducting Type II IEPR described in Paragraph 2 of Appendix E of EC 1165-2-214, including:
 - Whether the Federal would pose a significant threat to human life (public safety).
 - Whether the project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices. The project does not use innovative materials or techniques.
 - Whether the project design requires redundancy, resiliency, and robustness.

(1) Redundancy. Redundancy is the duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or fail-safe. The design does require redundancy.

(2) Resiliency. Resiliency is the ability to avoid, minimize, withstand, and recover from the effects of adversity, whether natural or manmade, under all circumstances of use. The project will require resiliency.

(3) Robustness. Robustness is the ability of a system to continue to operate correctly across a wide range of operational conditions (the wider the range of conditions, the more robust the system), with minimal damage, alteration or loss of functionality, and to fail gracefully outside of that range. The project will require robustness.

- Whether the project has unique construction sequencing or a reduced or overlapping design construction schedule; for example, significant project features accomplished using the Design-Build or Early Contractor Involvement (ECI) delivery systems. The project does not have a unique construction sequence or reduced/overlapping design construction schedule.

b. Products to Undergo Type II IEPR. The flood damage reduction feature plans, specifications, DDR, and O&M Manual for Phase 8 – Restored Channel.

c. Timing of IEPR. Type II IEPR will occur after DQC and either concurrent with ATR or after ATR, depending on schedules. The IEPR team shall perform reviews (and a site visits, as necessary) at the completion of the plans, specifications, at the midpoint of construction, and other important milestones as determined by the RMO. The current plan is to conduct Type II IEPR on the Phase 8 design package in FY13, in order to have a fully reviewed design by the start of FY14. Type II IEPR of the construction and O&M manual will occur in FY14.

d. Required Type II IEPR Panel Expertise. The IEPR team consists of approximately 4 members. The A/E firm that is eventually selected to perform this project's IEPR will include a project manager who will serve as the team leader. See Attachment 1 for a list of the IEPR team members. The IEPR team will be coordinated through the RMO.

External panels will conduct reviews of the design and construction activities prior to the 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. The Review Management Organization (RMO) for Type II IEPR review is the Risk Management Center (RMC), and for all other Reviews the RMO is the MSC, NWD. Panel members will be selected using the National Academies of Science (NAS) policy for selecting reviewers. Type II IEPR is not exempted by statute from the Federal Advisory Committee Act (FACA).

The IEPR will be performed by an A/E firm, using a USACE Indefinite Delivery Indefinite Quantity (IDIQ) Contract. The A/E firm will provide the USACE with the final independent external expert reviewer list, including their credentials. Expert reviewers shall have experience in design and construction of projects similar in scope to the project. Expert reviewers shall be registered professional engineers in the United States, or similarly credentialed in their home country. The

expert reviewers must have an engineering degree. A Master's degree in engineering is preferable, but not required, as hands-on relevant engineering experience in the listed disciplines is also important. Expert reviewers shall have a minimum of 15 years experience and responsible charge of engineering work in the following disciplines (at a minimum):

The Type II IEPR panel members will be comprised of individuals that have not been involved in the development of the decision document, meet the National Academy of Sciences guidelines for independence, and will be chosen by and outside organization. The following types of expertise may be represented on the Type II IEPR team:

IEPR Panel Members/Disciplines	Expertise Required
Structural	The reviewer for structural features shall be a registered professional structural engineer with a MS degree or higher in civil or structural engineering. The reviewer shall have a minimum of 15 years experience in the design, layout, and construction of large urban flood risk management projects. Reviewer should be familiar with the design and construction of tall (15 feet high) flood walls, closure structures, interior drainage facilities, box culverts, drilled shafts, and concrete placement. The reviewer should have experience USACE design regulations for Civil Works projects.
Geotechnical/Civil	The reviewer for geotechnical features shall be a registered professional engineer with a minimum BS degree or higher in civil or geotechnical engineering. Reviewer shall have a minimum of 15 years experience in subsurface investigations, floodwall and levee design, drilled shafts, seepage and slope stability evaluations, erosion protection design, and construction and earthwork construction. The reviewer must be familiar with USACE regulations and standards.
Hydraulics/Hydrology	The reviewer for hydraulics shall be a registered professional engineer with a minimum of a MS degree or higher in engineering science. The reviewer shall have a minimum of 15 years experience in hydrologic analysis and design of hydraulic structures as it relates to riverine flood risk management projects. Reviewer should have experience in the analysis and design involving interior drainage and riverine models using HEC-RAS, stormwater models using SWMM, and hydrology models using HEC-HMS. This member should also be knowledgeable in coincidence of frequency and the application of USACE risk and uncertainty analyses on flood risk management projects. Reviewer should be experienced with similar projects in an urban setting and participated in review of riverine flood risk management projects.

e. Panel Selection. When selecting panel members, the National Academy of Sciences' policy for committee selection with respect to evaluating the potential for conflicts (e.g., those arising from investments; agency, employer, and business affiliations; grants, contracts and consulting income)

shall be adopted or adapted. Peer reviewers shall not have participated in development of the submittal to be reviewed. External Reviewers will be paid labor and any necessary travel and per diem expenses in accordance with their contract.

Peer reviewers will be advised whether information about them (name, credentials, and affiliation) will be disclosed. The RMO shall notify reviewers in advance regarding the extent of disclosure and attribution planned by USACE. The RMO shall comply with the requirements of the Privacy Act. Review shall be conducted in a manner that respects confidential business information and intellectual property.

f. IEPR Panel Approval. The RMO will approve the panel members selected by the A/E. The RMO may only disapprove a selected panel member if the member does not meet the objective criteria established in this review plan.

g. IEPR Charge. The RMO will prepare the charge to the reviewers, containing the instructions regarding the objective of the peer review and the specific advice sought. Reviewers shall be charged with reviewing scientific and technical matters, leaving policy determinations for USACE and the Army. The charge should specify the structure of the review comments to fully communicate the reviewer's intent by including: the comment, why it is important, any potential consequences of failure to address, and suggestions on how to address the comment. It should include specific technical questions while also directing reviewers to offer a broad evaluation of the overall document. The charge should be determined in advance of the selection of the reviewers.

The District shall provide reviewers with sufficient information, including background information about the project, to enable them to understand the data, analytic procedures, and assumptions. Reviewers shall be informed of applicable access, objectivity, reproducibility and other quality standards under the federal laws governing information access and quality. Information distributed for review must include the following disclaimer: "This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It has not been formally disseminated by USACE. It does not represent and should not be construed to represent any agency determination or policy."

The panel of experts established for a review for a project shall:

- Conduct the review for the subject project in a timely manner in accordance with the study and RP schedule;
- Follow the "Charge", but when deemed appropriate by the team lead, request other products relevant to the project and the purpose of the review.
- Receive from USACE any public written and oral comments provided on the project;
- Provide timely written and oral comments throughout the development of the project, as requested;
- Assure the review avoids replicating an ATR and focuses on the questions in the "Charge", but the panel can recommend additional questions for consideration. The IEPR panel may recommend to the RMO additional or alternate questions.
- Offer any lessons learned to improve the review process.
- Submit reports in accordance with the review plan milestones.

- The team panel lead shall be responsible for insuring that comments represent the group, be non-attributable to individuals, and where there is lack of consensus, note the non-concurrence and why.
- Record of Review. The review team will prepare a review report. All review panel comments shall be entered as team comments that represent the group and be non-attributable to individuals. The team lead is to seek consensus, but where there is a lack of consensus, note the non-concurrence and why. A suggested report outline is an introduction, the composition of the review team, a summary of the review during design, a summary of the review during construction, any lessons learned in both the process and/or design and construction, and appendices for conflict of disclosure forms, for comments to include any appendices for supporting analyses and assessments of the adequacy and acceptability of the methods, models, and analyses used. All comments in the report will be finalized by the panel prior to their release to USACE for each review plan milestone.

h. Documentation of Type II IEPR. The IEPR panel will be selected and managed in accordance with EC 1165-2-214, Appendix E. A contractor will be used to carry out the IEPR including selecting panel members. Panel comments will be compiled by the contractor 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 contractor 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.

After receiving the report from the IEPR panel, the District will consider all comments contained in the report and prepare a written response for all comments and note concurrence and subsequent action or non-concurrence with an explanation. The District Chief of Engineering shall submit the panel's report and the District's responses shall be submitted to the MSC for final MSC Commander approval, and then make the report and responses available to the public on the District's website (<http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx>).

7. POLICY AND LEGAL COMPLIANCE REVIEW

The Kansas City District Office of Counsel is responsible for legal review of implementation documents and signs a certification of legal sufficiency prior to construction of the project. The proposed IEPR responses will be coordinated with the MSC District Support Teams and HQUSACE to ensure consistency with law, policy, project guidance, ongoing policy and legal compliance review, and other USACE or National considerations.

8. REVIEW SCHEDULES AND COSTS.

This section will discuss ATRs and Type II IPER yet to be completed on the Turkey Creek Basin project. Phase 0, 1, 2, and 4 were completed prior to the first approved review plan and prior to EC-1165-2-209/214. Phase 3 consists of relocations being completed by the project sponsors and the railroad. Bridge relocations are considered Phase 3. ATR and IEPR concerning bridge relocations are addressed in their respective phases of the Turkey Creek Basin project. For instance, the 3.8 RR bridge relocation is addressed in the Phase 5 Walled Channel project that passes under this RR bridge. The 4.4 RR bridge relocation is addressed in Phase 8 Restored Channel that passes under this RR bridge. ATR has been completed on the design documents for the Phase 5 Walled Channel and Phase 6 Cherokee Interceptor. ATR will be completed on all phases of Turkey Creek O&M manuals except for the Tunnel which was completed in 2009 prior to the first approved review plan and EC 1165-2-209/214. The remaining implementation documents for Turkey Creek Basin will receive ATR's and one Type II IEPR as listed in the tables below.

TURKEY CREEK SUMMARY OF DQC, ATR AND IEPR II REVIEWS

Turkey Creek Phase ¹	DQC	ATR	IEPR II (SAR)
Phase 0: Trapezoidal and Benched Channel (KDOT Channel)	NA ^{2,3}	NA ^{2,3}	No
Phase 1 and 2: Tunnel	DQC Completed	NA ²	No
Phase 3: Relocations	NA ²	NA ³	No
Phase 4: Levee/ Environmental Enhancement	DQC Completed	NA ²	No
Phase 5: Walled Channel	DQC Completed	DQC Completed	No
Phase 6: Kansas Interceptor –Cherokee	DQC Completed	DQC Completed	No
Phase 6: Kansas Interceptor –Rainbow	Yes 2013	Yes 2013	No
Phase 7: Missouri Interceptors	Yes 2014 and 2015	Yes 2014 and 2015	No
Phase 8: Restored Channel	Yes 2013	Yes 2013	Yes 2013 and 2014

¹O&M manuals for all phases of Turkey Creek except for Phase 1, 2, and 3 will undergo ATR.

²Project features constructed prior to first approved review plan and EC 1165-2-209 or 214

³Phase involves relocations or other work completed by project sponsors, railroad, or Kansas Dept of Transportation. Hydraulics and channel work in the area is considered as part of the implementation documents in other phases.

a. Phase 6: Kansas Interceptor - Rainbow

RAINBOW ATR SCHEDULE	
Action/Activity	Calendar Days After ATR Start
DQC Complete; review documents and ATR charge sent to ATR Team	0
ATR milestone to enter comments in DrChecks	14
NWK milestone to complete DrChecks evaluations	25
NWK PDT completes revisions	35
ATR DrChecks backchecks complete	40
ATR certification form signed	40
ATR final report complete	45
Report sent to RMO	46

RAINBOW INTERCEPTOR ATR Cost	
Discipline	Estimated Labor Cost
ATR Team Lead	\$1000
Supporting Disciplines	\$7000 ea. @ 4 =\$28,000
TOTAL	\$29,000

b. Phase 7: Missouri Interceptor

MISSOURI INTERCEPTOR ATR SCHEDULE	
Action/Activity	Calendar Days After ATR Start
DQC Complete; review documents and ATR charge sent to ATR Team	0
ATR milestone to enter comments in DrChecks	14
NWK milestone to complete DrChecks evaluations	25
NWK PDT completes revisions	35
ATR DrChecks backchecks complete	40
ATR certification form signed	40
ATR final report complete	45
Report sent to RMO	46
MISSOURI INTERCEPTOR ATR Cost	
Discipline	Estimated Labor Cost
ATR Team Lead	\$1000
Supporting Disciplines	\$7000 ea. @ 4 =\$28,000
TOTAL	\$29,000

c. Phase 8: Restored Channel

RESTORED CHANNEL ATR SCHEDULE	
Action/Activity	Calendar Days After ATR Start
DQC Complete; review documents and ATR charge sent to ATR Team	0
ATR milestone to enter comments in DrChecks	14
NWK milestone to complete DrChecks evaluations	25
NWK PDT completes revisions	35
ATR DrChecks backchecks complete	40
ATR certification form signed	40
ATR final report complete	45
Report sent to RMO	46

RESTORED CHANNEL ATR Cost	
Discipline	Estimated Labor Cost
ATR Team Lead	\$1000
Supporting Disciplines	\$7000 ea. @ 4 =\$28,000
TOTAL	\$29,000

d. O&M manual (per each)

O&M MANUAL ATR SCHEDULE	
Action/Activity	Calendar Days After ATR Start
DQC Complete; review documents and ATR charge sent to ATR Team	0
ATR milestone to enter comments in DrChecks	14
NWK milestone to complete DrChecks evaluations	25
NWK PDT completes revisions	35
ATR DrChecks backchecks complete	40
ATR certification form signed	40
ATR final report complete	45
Report sent to RMO	46
O&M MANUAL ATR Cost	
Discipline	Estimated Labor Cost
ATR Team Lead	\$1000
Supporting Disciplines	\$3000 ea. @ 4 =\$12,000
TOTAL	\$13,000

e. Phase 8: Restored Channel Type II IEPR Approximate Schedule of Deliverables and Milestones

Deliverable (D) or Milestone (M)	Action/Activity	Calendar Days After NTP	Comments
M	Type II IEPR Safety Assurance Review NTP		
D	Submit Final Peer Review QCP (PRQCP)	14	
D	Submit list of final IEPR expert reviewers	14	
M	Expert reviewers under contract	21	
D	Peer Review Critical Items List	35	
M	Corps provides materials for Orientation Briefing	35	
M	Orientation Briefing at Kansas City MO and KS	42	
M	Final Charge to Expert Reviewers	56	
M	Corps provides 95% Plans & Specs and DDR to IEPR Contractor	70	

M	95% Plans & Specs and DDR Review Complete	84	
M	95% Plans & Specs and DDR Review Comments Closed in DrChecks	98	
D	Comment Review Conference Call	100	
D	Submit IEPR Review Report on 95% Plans & Specs and DDR	128	
M	Corps provides 50% Construction Documentation to IEPR Contractor	300	
M	50% Construction Documentation Review Complete	314	
M	50% Construction Documentation Review Comments Closed in DrChecks	328	
D	Comment Review Conference Call	330	
D	Submit IEPR Review Report on 50% Construction Documentation	358	
M	Corps provides OMRR&R Documentation to IEPR Contractor	480	
M	OMRR&R Documentation Review Complete	494	
M	OMRR&R Documentation Review Comments Closed in DrChecks	508	
D	Comment Review Conference Call	510	
D	Submit IEPR Review Report on OMRR&R Documentation	538	
D	Submit Final IEPR SAR Report	600	
M	Project Closeout	720	

This table will be updated as the project progresses. Days are estimates.

f. **Type II IEPR Cost.** The IEPR is expected to cost between \$150,000 - \$250,000. Type II IEPR costs are cost shared between the Federal and Non-Federal sponsor in accordance with the project partnership agreement.

9. PUBLIC PARTICIPATION

Public comments are welcome on the review plan. The review plan is posted on the Kansas City District's web page located here:

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

The public comment period is 30 days. The Kansas City District will consider 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 conduct of the review. Also, due to changes in the project, the review plan may require updates. Updates are posted to the same website and the Public will have a similar opportunity to comment on review plan updates. The Public will not be asked to nominate potential reviewers because the decision has been made to use an independent A/E firm. Public comments on the review plan may be made by writing or emailing the following contact:

Kansas City District, Corps of Engineers

c/o Melissa Corkill, CENWK-PM-CJ
601 E. 12th St.
Kansas City, MO 64106
Email: melissa.r.corkill@usace.army.mil

10. REVIEW PLAN APPROVAL AND UPDATES

The Northwestern Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, RMC, and HQUSACE members as applicable) as to the appropriate scope and level of review for the implementation documents. Like the PMP, the Review Plan is a living document and may change as the project progresses. The home district is responsible for keeping the Review Plan up to date. 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.

11. REVIEW PLAN POINTS OF CONTACT

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

District Quality Control

Kansas City District.....Ms. Melissa Corkill (816) 389-3697

Review Management Office

Northwestern Division.....Mr. Stephen Bredthauer (503) 808-4053

Review Coordination

Risk Management Center.....Mr. Tom Bishop (303) 963-4556

--Attachments follow--

ATTACHMENT 1: Team Rosters

District-level names will be redacted on the version posted for public comment to protect privacy.

AE Designers

Name	Product
HNTB	HNTB has completed some of the design work that has already been constructed. They are not expected to complete any significant work remaining on Turkey Creek. HNTB is under contract to UG for relocations, to BNSF for their relocations, and to the COE for some O&M manual support

Project Delivery Team

Name	District	Discipline
Melissa Corkill	CENWK	Project Management
Jared Memaw*	CENWK	Civil
Scott Mensing*		
Dan Newman		
Pendo Duko	CENWK	Geotechnical
John Calcara		
Jesse Granet	CENWK	Environmental
Steve Jirousek	CENWK	Geology
Anthony Hall	CENWK	Hydraulics/Hydrology
William Otero		
Katrina Marx	CENWK	Structural
Clint Mason		
Ken Olsen		
Pat Miramontez	CENWK	Cost Estimating
Steve Hadel	CENWK	Construction
Carla Buatte	CENWK	Real Estate

*Technical Lead

Vertical Team

Name	District	Discipline
Steven Bredthauer	CENWD	Quality Assurance Manager
Tom Bishop	CEIWR-RMC	Civil Engineer

Agency Technical Review Team (all Phases)

Name	District	Discipline
Neil Schwanz	CEMVP	ATR Team Lead and Geotech
Tim Grundhoffer	CEMVP	Structural
Greg Fischer	CEMVP	Civil
Ken Halstead	CELRH	Hydraulics/Hydrology
Aaron Mikonowicz	CEMVP	Civil/Landscape Architect/Environmental

BCOE Certifiers and Quality Assurance Team for In-House Products

Name	District	Discipline
TBD	CENWK	Construction Branch Chief
Rex Ostrander	CENWK	Construction Division Chief
Jacob Owen	CENWK	Geotechnical Engineering Branch Chief
David Mathews	CENWK	Engineering Division Chief

IEPR Reviewers (for both the design and construction phases)

Name	Firm	Discipline
TBD	TBD	IEPR Team Lead
TBD	TBD	Structural
TBD	TBD	Hydraulics/Hydrology
TBD	TBD	Geotechnical

ATTACHMENT 2: Sample Statement of Technical Review for Implementation 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

[Name]

ATR Team Leader

[Office Symbol or Name of AE Firm]

Date

SIGNATURE

[Name]

Project Manager (home district)

[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 and specifically list any agreed-upon deferrals to be completed in the next phase of work.

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

SIGNATURE

[Name]

Chief, Engineering Division

[Office Symbol]

Date

ATTACHMENT 3: Documentation of Type II IEPR Risk-Informed Decision

The project is in the implementation phase and therefore does not require a Type I IEPR. This attachment documents the vertical team’s risk informed recommendation to conduct Type II IEPR.

The following table, based on the US Army Field Manual 5-19, *Composite Risk Management*, was used to assess each identified risk.

Risk Assessment Matrix

	Risk Probability			
Risk Severity	Frequent	Likely	Seldom	Unlikely
Catastrophic	Extremely High	Extremely High	High	Moderate
Critical	Extremely High	High	Moderate	Low
Marginal	High	Moderate	Moderate	Low
Negligible	Moderate	Low	Low	Low

The following table details the risks, frequency, severity, risk assessment, and how the risk contributes to the IEPR decision. The risks were developed by reviewing the IEPR triggers from EC 1165-2-214.

Turkey Creek Phase 8 Restored Channel

Type II IEPR Risk Assessment for Implementation Documents

Risk	Risk Probability	Risk Severity	Risk Assessment	Risk Contributes to IEPR Decision?	Notes
Project poses a significant threat to human life	Unlikely	Catastrophic	Moderate	Yes	The completed project will have some effect on the threat to human life. This is a flood damage reduction project in an urban area.
Project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices	Unlikely	Marginal	Low	No	This project does not involve any innovative materials or techniques based on novel methods or complex challenges.
The project design requires redundancy, resiliency, and robustness to minimize risk of failure	Seldom	Critical	Moderate	Yes	Mill Street closure mechanism may need some redundancy to prevent the public from crossing the bridge during some storm events.
The project has unique construction sequencing or a reduced or overlapping design construction schedule	Seldom	Marginal	Moderate	Yes	The 4.4 RR bridge may require specific sequencing to minimize an increased risk of flooding during construction.
Risk of a faulty or incomplete design making it to construction	Seldom	Marginal	Moderate	No	DQC and ATR by personnel with experience on similar projects will mitigate the risk of faulty or incomplete design
Risk of contractor misinterpreting design which results in project failure	Unlikely	Catastrophic	Moderate	No	Construction quality control procedures will mitigate this risk.

Based on the above assessment, it is the risk-informed recommendation of the vertical team that Type II IEPR is required for Phase 8 Restored Channel implementation documents. This decision is based on the following:

1. The above assessment.
2. Due to height restriction below the I-35 bridge, the relocated Mill Street bridge will overtop during a 10 % flood event. The flood gate across Mill Street, when closed, will prevent a 1% storm event from escaping the channel. Traffic control devices/structures will be required to prevent traffic from crossing the bridge during more frequent storm events as the bridge will be inundated more frequently than the need for the flood gate to be closed. The life safety risk inherent with a bridge that is flooded as frequently as during a 10% flood event is possible cause for IEPR review.
3. During construction of the new 4.4 Railroad bridge over Turkey Creek and before the old bridge can be demolished, the floodway along Turkey Creek will change such that a 1% storm event could cause some flooding in areas not currently flooded by Turkey Creek. These areas are industrial and don't constitute a large area. The sequence of construction and concern for increased flooding during construction is possible cause for IEPR review.
4. The impacts to the I-35 bridge foundation caused by increased flow within Turkey Creek should be evaluated. The bridge supports are located within the 1% storm event area and will see increased flows over before project conditions. Scour potential will be evaluated in this area and is possible cause for IEPR review.

Turkey Creek Phase 7 and 8: Kansas and Missouri Hillside Interceptors
 Type II IEPR Risk Assessment for Implementation Documents

Risk	Risk Probability	Risk Severity	Risk Assessment	Risk Contributes to IEPR Decision?	Notes
Project poses a significant threat to human life	Unlikely	Catastrophic	Moderate	No	The completed project will have a negligible effect on the threat to human life.
Project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices	Unlikely	Marginal	Low	No	This project does not involve any innovative materials or techniques based on novel methods or complex challenges.
The project design requires redundancy, resiliency, and robustness to minimize risk of failure	Unlikely	Marginal	Low	No	This project does not require redundancy, resiliency or robustness
The project has unique construction sequencing or a reduced or overlapping design construction schedule	Seldom	Negligible	Low	No	This project does not have unique construction sequencing
Risk of a faulty or incomplete design making it to construction	Seldom	Marginal	Moderate	No	DQC and ATR by personnel with experience on similar projects will mitigate the risk of faulty or incomplete design
Risk of contractor misinterpreting design which results in project failure	Unlikely	Marginal	Moderate	No	Construction quality control procedures will mitigate this risk.

Based on the above assessment, as well as the fact that the project is limited in scope and impact that it would not significantly benefit from Type II IEPR, it is the risk-informed decision of the vertical team that **Type II IEPR is not required for Turkey Creek Hillside Interceptors**. The Turkey Creek Hillside Interceptors are storm water pipes that act just like municipal storm water collection systems except that the flows intercepted are limited to flows entering above the 1% flood elevation and are designed to intercept flows that would normally reach the "State Line Ponding Area". The State Line Ponding Area is a commercial area along Southwest Blvd that consists of restaurants, retail stores, and industrial sites.

ATTACHMENT 4: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number
16 January 2013	Reformatting to RMC suggested template.	Throughout.



DEPARTMENT OF THE ARMY
RISK MANAGEMENT CENTER, CORPS OF ENGINEERS
12596 W. BAYAUD AVENUE SUITE 400
LAKEWOOD, CO 80228

REPLY TO
ATTENTION OF
CEIWR-RMC-WD

CEIWR-RMC

23 January 2013

MEMORANDUM FOR: Commander, Kansas City District, ATTN: CENWK-PM-CJ

SUBJECT: Risk Management Center Endorsement – Turkey Creek Flood Damage Reduction Project, Kansas City, KS, Review Plan – Revision 2

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for the Turkey Creek Project, dated 16 January 2013, and concurs that this RP provides for an adequate level of peer review and complies with the current peer review policy requirements outlined in EC 1165-2-214 "Civil Works Review", dated 15 December, 2012.
2. This review plan was prepared by the Kansas City District, reviewed by the Northwestern Division and the RMC, and all review comments have been satisfactorily resolved.
3. The RMC endorses this document to be approved by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander's approval memorandum, and a link to where the RP is posted on the District website to Tom Bishop, RMC Senior Review Manager (thomas.w.bishop@usace.army.mil).
4. Thank you for the opportunity to assist in the preparation of this RP. Please coordinate all aspects of the Type II IEPR. For further information, please do not hesitate to contact me at (303) 963-4556.

Sincerely,

BISHOP.THOMAS.WA
LDRON.1228686030

Digitally signed by
BISHOP.THOMAS.WA
DN: cn=BISHOP.THOMAS.WA, o=USACE, ou=HQ, email=BISHOP.THOMAS.WA@USACE.ARMY.MIL, c=US
Date: 2013.01.23 13:30:07 -0700

THOMAS W. BISHOP, P.E.
Senior Review Manager
Risk Management Center

CF:
CEIWR-RMC-ZA (Mr. Snorteland)
CENWD (Division Quality Manager)

Encl 2

