



DEPARTMENT OF THE ARMY  
US ARMY ENGINEER DIVISION, SOUTHWESTERN  
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FEB 24 2010

REPLY TO  
ATTENTION OF

CESWD-PDS-P (1105)

MEMORANDUM FOR Commander, Little Rock District

SUBJECT: Review Plan for May Branch, Fort Smith, Arkansas Preconstruction Engineering and Design

1. References:

- a. EC 1105-2-410, 22 August 2008, Review of Decision Documents.
- b. Memorandum, CECW-CP, 30 March 2007, subject: Peer Review Process.
- c. Addendum to Reference 1.b., CECW-CP, September 2008, subject: Supplemental Information for the Peer Review Process.

2. The review plan for the subject study, enclosed, has been reviewed and cleared for approval by the Flood Risk Management Planning Center of Expertise. It has been prepared in accordance with the referenced guidance, and public comments received will be incorporated into the plan as the study progresses. It is anticipated to require Type II Independent External Peer Review (Safety Assurance Review).

3. I hereby approve this review plan, which is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent substantial revisions to this plan or its execution will require new written approval from this office.

4. If you have questions or need further information, please contact Jo Ann M. Duman, CESWD-PDS-P, at (469) 487-7065.

Encl

  
ANTHONY C. FUNKHOUSER  
Colonel, EN  
Commanding

CF:  
CESWL-PE (Smethurst)

# **REVIEW PLAN**

**May Branch, Fort Smith, Arkansas  
Preconstruction Engineering and Design**

**Little Rock District**

**12 November 2009**



**US Army Corps  
of Engineers®**

**REVIEW PLAN**

**May Branch, Fort Smith, Arkansas  
Preconstruction Engineering and Design**

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## 1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the May Branch, Fort Smith, Arkansas, Preconstruction Engineering and Design (PED)

### b. References

- (1) Engineering Circular (EC) 1105-2-410, Review of Decision Documents, 22 Aug 2008
- (2) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (3) Engineering Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006
- (4) May Branch PED PMP with QMP, October 2008
- (5) SWD Quality Management Plan, March 2003

c. **Requirements.** This review plan was developed in accordance with EC 1105-2-410, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents through independent review. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review. In addition to these three levels of review, decision documents are subject to policy and legal compliance review and, if applicable, safety assurance review and model certification/approval.

- (1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, including contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review.
- (2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.
- (3) Independent External Peer Review (IEPR). 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. IEPR is generally for feasibility and reevaluation studies and modification reports with Environmental Impact Statements (EISs). IEPR is managed by an outside eligible organization (OEO) that is described in Internal Revenue Code Section 501(c) (3), is exempt from Federal tax under section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The

scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project.

- (4) Policy and Legal Compliance Review. Decision documents will be reviewed throughout the study process for their compliance with law and policy. These reviews culminate in Washington-level 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 Chief of Engineers. Guidance for policy and legal compliance reviews is addressed further in Appendix H, ER 1105-2-100, Planning Guidance Notebook. When policy and/or legal concerns arise during DQC or ATR that are not readily and mutually resolved by the PDT and the reviewers, the District will seek issue resolution support from the MSC and HQUSACE in accordance with the procedures outlined in Appendix H, ER 1105-2-100. IEPR teams are not expected to be knowledgeable of Army and administration policies, nor are they expected to address such concerns. The home district Office of Counsel is responsible for the legal review of each decision document and signing a certification of legal sufficiency.
- (5) Safety Assurance Review. In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007, EC 1105-2-410 requires that all projects addressing flooding or storm damage reduction undergo a safety assurance review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare. A future circular will provide a more comprehensive Civil Works Review Policy that will address the review process for the entire life cycle of a Civil Works project. That document will address the requirements for a safety assurance review for the Pre-Construction Engineering Phase, the Construction Phase, and the Operations Phase. Review would include the relevancy and effectiveness of the Corps inspection of completed works and safety programs in promoting safety and competent performance. The decision document phase is the initial design phase; therefore, EC 1105-2-410 requires that safety assurance factors be considered in all reviews for decision document phase studies.
- (6) Model Certification/Approval. EC 1105-2-407 requires certification (for Corps models) or approval (for non-Corps models) of planning models used for all planning activities. The EC defines planning models 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 EC does not cover engineering models used in planning. Engineering software is being addressed under the Engineering and Construction (E&C) Science and Engineering Technology (SET) initiative. Until an appropriate process that documents the quality of commonly used engineering software is developed through the SET initiative, engineering activities in support of planning studies shall proceed as in the past. 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.

## **2. STUDY INFORMATION**

- a. **Decision Document.** May Branch, Fort Smith, Arkansas, is an authorized flood damage reduction project that will have a Safety Assurance Review of its Preconstruction Engineering and Design

documents. These documents will be approved by Little Rock District; however, the project partnership agreement will be approved by ASA(CW). NEPA documentation, an Environmental Assessment, was done in the feasibility phase. Public review did not result in significant interagency interest or controversy.

- b. Study Description.** May Branch flows through a covered conduit within the city limits of Fort Smith, the sponsor, into the Arkansas River. Flooding causes an estimated \$1,800,000 in average annual damages. The project would consist of 2.77-mile long open channel to convey flood waters from the May Branch Basin to the Arkansas River. The new channel alignment would require 15 structure relocations, 5 rail and 9 road crossings, and a gated hydraulic control structure at the Fort Smith (Arkansas River) Levee. The project would nearly eliminate the flood damages expected to be caused by a 100-year event. The project was authorized by the Water Resources Development Act of 2007 based on the Report of the Chief of Engineers dated December 19, 2006, at a total cost of \$30,850,000, with an estimated Federal cost of \$15,010,000 and an estimated non-Federal cost of \$15,840,000.

- c. Factors Affecting the Scope and Level of Review.**

Some of the more complex design will be for the gated structure, railroad crossings with traffic management plans, a distance of vertical wall channel, and bridges. However, the design will be standard with none of the design considered to be innovative, precedent –setting, unduly complicated, or vulnerable.

A risk during construction would be Arkansas River flooding and /or May Branch flooding. The construction schedule will have to take into account Arkansas River flows such that there is not backwater flooding into the lower section of the May Branch channel while at the same time channeling through to the Arkansas River as soon as feasible to alleviate any upstream flooding that may occur along May Branch.

Project failure is unlikely to cause significant loss of life. The project would have resilience as there are ample alternatives to reroute traffic around any structure if it had signs of possible failure. Project failure would not cause greater flood damage than would have occurred prior to project construction and the project would still provide some flood reduction. There is redundancy with outlets for May Branch to the Arkansas River as the gated structure will have the backup of the maintained existing pumping station and outlet.

The channel width was sized sufficiently robust to accommodate flows that might occur slightly more frequent than originally determined. If a failure of a short stretch of vertical wall located within a business's property limits occurred, the general public does not have access and would not be at risk. Surveys will be checked against aerial photography and site visit information. Previous geotechnical information will be checked against currently obtained geotechnical information to spot check the design effort. The design schedule does not overlap other design or construction.

- d. In-Kind Contributions.** The expected in-kind contributions to be provided by the sponsor are design team coordination activities that will not require peer review.

### **3. AGENCY TECHNICAL REVIEW (ATR)**

- a. General.** ATR for decision documents covered by EC 1105-2-410 are managed by the appropriate Planning Center of Expertise (PCX) with appropriate consultation with the allied Communities of Practice such as engineering and real estate. The ATR shall ensure that the product is consistent 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 the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the home district. The ATR lead will be from outside the home MSC. The leader of the ATR team will participate in milestone conferences and the Civil Works Review Board (CWRB) to address review concerns.

- b. Products for Review.** ATR will not be done as ATR is not required for the project design.
- c. Required ATR Team Expertise.** NA
- d. Documentation of ATR.** NA

#### **4. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)**

- a. General.** IEPR is conducted for decision documents if there is a vertical team decision (involving the district, MSC, PCX, and HQUSACE members) that the covered subject matter meets certain criteria (described in EC 1105-2-410) where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside the USACE is warranted. IEPR is coordinated by the appropriate PCX and managed by an Outside Eligible Organization (OEO) external to the USACE. IEPR panels shall evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, the review panels should be given the flexibility to bring important issues to the attention of decision makers; however, review panels should be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. IEPR panels will accomplish a concurrent review that covers the entire decision document and will address all the underlying engineering, economics, and environmental work, not just one aspect of the study. Whenever feasible and appropriate, the office producing the document shall make the draft decision document available to the public for comment at the same time it is submitted for review (or during the review process) and sponsor a public meeting where oral presentations on scientific issues can be made to the reviewers by interested members of the public. An IEPR panel or OEO representative will participate in the CWRB.

- b. Decision on IEPR.** IEPR will be conducted for SAR.

- c. Products for Review. SAFETY ASSURANCE REVIEW (SAR)**

A safety assurance review will be done for the Pre-Construction Engineering Phase (PED), the Construction Phase, and the Operations Phase. The above safety assurance factors will be considered in all the SARs. All aspects of the project may be included in the review but it will focus on the public safety aspects. A future circular will provide a more comprehensive review policy. The PED phase SAR is scheduled for FY 12 to be done at the record of final design and at the completion of plans, specifications, and cost estimate at an estimated cost of \$34,000. The SAR panel would be managed by SWD. Subsequent SAR will have estimates developed for construction at the conclusion of PED. These will be conducted at the midpoint of construction, prior to final inspection, and at critical construction milestones.

- d. Required SAR Panel Expertise.** Four panel members would be needed. It is not anticipated that the public, scientific or professional societies will be asked to nominate reviewers.
  - **Geotechnical Engineering:** The panel member should have an extensive experience in geotechnical evaluation of flood risk management structures such as static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and under seepage through the foundation of the flood risk management structures, including concrete

channel bottoms and side slopes, vertical concrete channel banks, bearing capacity and settlement, and control of water, closure structures and other pertinent features.

- **Structural Engineering:** Experience is needed in the design of vehicular and railroad bridges and culverts, an outlet structure, channel retaining walls and invert, a hydraulic control structure, and repairs to an existing storm sewer.
- **Cost Engineering –** The member should have experience in the current MCACES generation software (MII), developing fully funded project cost estimates, preparing construction schedules, and estimating costs that include real estate, facility and utility relocations, excavated material disposal and borrow areas, construction, engineering and design, and construction management with appropriate contingencies, and estimating operation, maintenance, repair, replacement, and rehabilitation.
- **Civil Engineering:** Experience is needed in the assessment of topographical surveys, setting alignments, profiles, land cross-sections; demolition, road removal and road re-routing; and detail sheets for the hydraulic control structure, culverts and utility relocations (gas, water and sewer). Where the existing storm drains cross the proposed channel alignment, they will have to be demolished. These lines will be replaced with new storm drains and headwalls.

**e. Documentation of SAR.** DrChecks review software will be used to document SAR comments and aid in the preparation of the Review Report. Comments should evaluate whether the interpretations of analysis and conclusions are reasonable. The SAR will focus on whether the SAR panel will prepare a Review Report and SWL's and HQUSACE's responses shall be made available to the public, including being posted on the Internet, 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
- Represent the views of the group as a whole, including any disparate and dissenting views and why.

## **5. MODEL CERTIFICATION AND APPROVAL**

**a. General.** The use of certified or approved models for all planning activities is required by EC 1105-2-407. This policy is applicable to all planning models currently in use, models under development and new models. The appropriate PCX will be responsible for model certification/approval. The goal of certification/approval is to establish that planning products are theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The use of a certified or approved model does not constitute technical review of the planning product. Independent review of the selection and application of the model and the input data and results is still required through conduct of DQC, ATR, and, if appropriate, IEPR. Independent review is applicable to all models, not just planning models. Both the planning models (including the certification/approval status of each model) and engineering models used in the development of the decision document are described below:

**b. Planning Models.** The following planning models are anticipated to be used:

- **HEC-FDA 1.2.4 (Certified).** The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program may be used to evaluate designed plan increments along May

Branch in Fort Smith, Arkansas to aid in the selection of a design plan increment to manage flood risk and for updating benefits.

c. **Engineering Models.** The following engineering model is anticipated to be used:

- HEC-RAS 4.0. The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate design changes and betterments that differ from the feasibility study design that are required or requested by the sponsor along May Branch.

## 6. REVIEW SCHEDULES AND COSTS

a. **ATR Schedule and Cost.** not-applicable

b. **IEPR Schedule and Cost.** See item d. below.

c. **Model Certification/Approval Schedule and Cost.** All the models anticipated to be used are already certified or approved for use.

d. **SAR Schedule and Cost.** The PED phase SAR is scheduled for FY 12 to be done at the record of final design and at the completion of plans, specifications, and cost estimate. SAR for PED is estimated to cost \$34,000.

## 7. PUBLIC PARTICIPATION

At the conclusion of the design phase and prior to the SAR, the project will be presented to the public for comment. Public comments will be made available to the SAR panel.

## 8. PCX COORDINATION

Review plans for decision documents and supporting analyses outlined in EC 1105-2-410 are coordinated with the appropriate Planning Center(s) of Expertise (PCXs) based on the primary purpose of the basic decision document to be reviewed. The lead PCX for this study is Flood Risk Management.

## 9. MSC APPROVAL

The MSC that oversees the home district is responsible for approving the review plan. Approval is provided the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, PCX, 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. Changes to the review plan should be approved by following the process used for initially approving the plan. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

## 10. REVIEW PLAN POINTS OF CONTACT

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

- SWL Project Manager, 501.324.5602
- SWD Reviewer, 469.487.7038
- Flood Damage Reduction Planning Center of Expertise, 415.503.6862

**ATTACHMENT 1: TEAM ROSTERS**

1. The SWL individuals below have been assigned to the design team for the subject project.

Norm Gartner, P.E.	Civil	Design Coordinator	CESWL-EC-DG
Nick Barner, P.E.	Civil	Designer	CESWL-EC-DG
Joe Maresh, P.E.	Mechanical	Lead Designer	CESWL-EC-C
Tuan Dang, P.E.	Electrical	Lead Designer	CESWL-EC-D
Paul Wagener, P.E.	Cost Eng	Lead	CESWL-EC-D
Elmo Webb, P.E.	Geotech	Lead Engineer	CESWL-EC-DI
Craig Evans, P.E.	Structures	Lead Engineer	CESWL-EC-DI

2. Other SWL team members, if and as needed.

Krieger, Joshua D	H&H		CESWL-EC-H
Penn, William	Biologist	NEPA	CESWL-PE
Bridges, Ronald	Appraiser	Real Estate	CESWL-OP-R
Gibbs, Cheryl M	Economist	Economist	CESWL-PE
Smethurst, Julia	Economist	Project Manager	CESWL-PE

3. The individuals below have been designated as independent design reviewers on the subject project. Also listed beside each name is their professional registration, current grade and years of experience.

Civil: Scott Hodge, P.E.

Geotechnical: Leroy Arnold, P.E.

Structural: Larry Winters, P.E.

Mechanical: James McKinnie, P.E.

Electrical: Marvin Emmerling, P.E.

Cost: George Losak, P.E., C.C.E., YD--, note that coordination with the Cost Engineering Directory of Expertise will be done, if necessary, during review of the cost estimates and construction schedules as documented in the PED PMP.

4. The individuals below have been designated as independent reviewers on the subject project,.

Ellis, Jim D	Biologist	NEPA	CESWL-PE
Raible, Glen, P.E.	H&H	H&H	CESWL-EC-H
Gardner, Rick	SWT	Lead Realty Specialist	CESWT-RE-A
Wegner-Johnson, Maria	Regional Economist		CESWT-PE-P
Wright, Renee	Civil Engineer	Study Manager	CESWL-PE

5. Vertical team

Johanning, Margaret	SWD	CESWD-PDT
Haberer, Yvonne L	HQ02	CEMP-SWD

6. PCX points of contact

Thaut, Eric W	SPD	CESPD-PDS-P
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**ATTACHMENT 2: ITR CERTIFICATION TEMPLATE  
COMPLETION OF INDEPENDENT TECHNICAL REVIEW**

The District has completed the *(type of product)* of *(project name and location)*. Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the independent technical review, 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 result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by *(an independent team)*. All comments resulting from ITR have been resolved.

(Signature) Technical Review Team Leader

(Date)

(Signature) Project Manager

(Date)

**CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows:

*(Describe the major technical concerns, possible impact, and resolution)*

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

(Signature) (Date) Chief, Engineering Division

**ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS**

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