



DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

CEMVD-PD-N

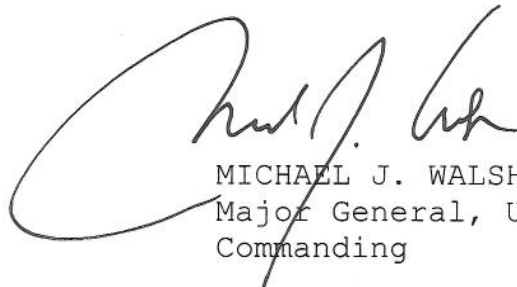
23 Aug 2010

MEMORANDUM FOR Commander, New Orleans District

SUBJECT: Review Plan for Atchafalaya Basin Floodway System,
Louisiana, Project Flood Flow Line Report

1. Reference: EC 1165-2-209, Civil Works Review Policy,
31 Jan 2010.
2. I hereby approve subject Review Plan (RP) and concur in the
conclusion that an external peer review of this project is
necessary. The proposed RP has been coordinated with the Coastal
Storm Damage Reduction Planning Center of Expertise. The RP
complies with all applicable policy and provides an adequate
independent technical review of the work product. Non-substantive
changes to this RP do not require further approval.
3. The District should take steps to post the RP to its web site
and to provide a link to the PCX for their use.
4. The MVD point of contact is Mr. Stephen Stuart, CEMVD-PD-N, at
(601) 634-5829.

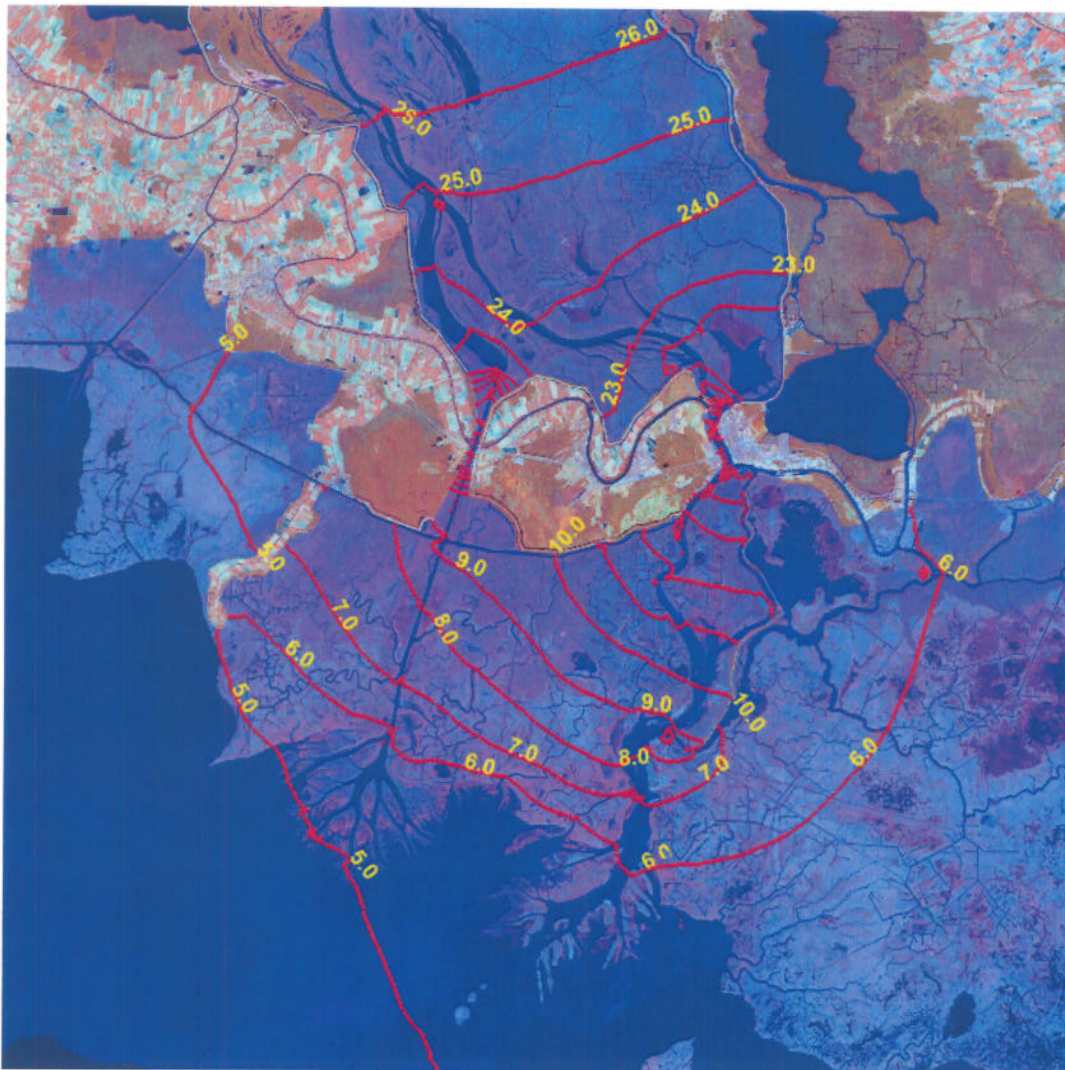
Encl


MICHAEL J. WALSH
Major General, USA
Commanding

CF:
CENAB (Costal-PCX, Fritz)
CEMVN-PM-W (Sims)
CECW-CP

REVIEW PLAN
for
ATCHAFALAYA BASIN FLOODWAY SYSTEM,
LOUISIANA,
PROJECT FLOOD FLOW LINE REPORT
New Orleans District

July 2010



**US Army Corps
of Engineers®**

Encl

REVIEW PLAN

***ATCHAFALAYA BASIN FLOODWAY SYSTEM, LOUISIANA,
PROJECT FLOOD FLOW LINE REPORT***

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS	1
2. STUDY INFORMATION	2
3. IN-DISTRICT QUALITY REVIEWS (DQR)	3
4. INTERNAL TECHNICAL REVIEW (ITR)	4
5. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)	5
6. MODEL CERTIFICATION AND APPROVAL	6
7. REVIEW SCHEDULES AND COSTS	7
8. PUBLIC PARTICIPATION	7
9. PCX COORDINATION	7
10. MSC APPROVAL	7
11. REVIEW PLAN POINTS OF CONTACT	7
ATTACHMENT 1: TEAM ROSTERS	8

1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Atchafalaya Basin Floodway System, Louisiana, Project Flood Flow Line Study.

b. References

- (1) Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010
- (2) Engineer Regulation (ER) 1110-2-12, Quality Management, 30 Sep 2006
- (3) Atchafalaya Basin, LA Project Flood Flow Line Study, Project Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, 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). It provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and work products. The EC outlines three levels of review: District Quality Control, Internal Technical Review, and Independent External Peer Review.

- (1) District Quality Control (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). 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. It is managed in the home district. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. Additionally, the PDT is responsible for a complete reading of any reports and accompanying appendices prepared by or for the PDT to assure the overall coherence and 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. DQC is not addressed further in this review plan.
- (2) Internal Technical Review (ITR). ITR 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 ITR team reviews the various work products and assures that all the parts fit together in a coherent whole. ITR teams was comprised of senior USACE personnel, recognized subject matter experts with the appropriate technical expertise such as Regional Technical Specialists (RTS), and was supplemented by outside experts as appropriate. To assure independence, the leader of the ITR team was 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. For clarity, IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents.

It was decided by the PDT (from guidance provided by MVN) that a Type II IEPR (SAR) would be conducted. It was conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. The review was 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 that good science, sound engineering, and public health, safety and welfare are the most important factors that determine a project's fate.

2. STUDY INFORMATION

- a. **Study Description.** The Atchafalaya Basin Floodway System is part of the comprehensive Mississippi River and Tributaries (MR&T) flood control project that was authorized in the Flood Control Act of 1928. The principal role of the Atchafalaya Basin Floodway system is to convey one-half of the overall project design flood of 3,000,000 cfs, or 1,500,000 cfs, to the Gulf of Mexico. The MR&T project is operated and maintained by the Corps of Engineers. The purpose of the Project Flood Flow Line Report was three-fold: 1) to reanalyze the present project flood flow line developed in 1987, taking into account the changing conditions in the Atchafalaya Basin Floodway system; 2) to determine the effects of the Atchafalaya Basin Floodway system project features on the project flood flow line, including changes to those features since the 1982 Feasibility Report and 3) to recommend a project flood flow line for design purposes. To determine future flood profiles, the study computed (project) channel changes and floodplain changes over a 50-yr future. Channel geometry changes were computed with the HEC-6T program and floodplain changes were based on a geologic study of subsidence and sedimentation. The report compared the current and future flood profiles to the existing levee elevations to determine if changes to the top of levee elevations are required to provide the authorized level of protection. Existing project grades were compared with the design elevations in this report to determine areas where additional work will be required. This flowline study started in 2006 and is ongoing. The Project Flood Flow Line Report provided the following profiles: 1) existing conditions flood profiles (1997 conditions), 2) 2058 conditions without the Avoca Island Levee Extension (AILE), 3) 2058 conditions with AILE, and 4) 2058 conditions with a levee east of Morgan City that replaces AILE. The 2058 conditions included sea level rise expected by that time.

Factors Affecting the Scope and Level of Review. The work performed for this report will not directly lead to construction and the report does not require congressional authorization.

- Since this work was a modeling effort and not a full project study a formal Project Management Plan and an Environmental Impact Statement were not applicable and not prepared.
- Since this was not a project study there is no study cost but the analysis for this report cost approximately \$3,000,000.
- The technical review of the report consisted of District Quality Control (DQC), Internal Technical Review (ITR) and an Independent External Peer Review (IEPR). An additional level of policy review for the Atchafalaya Flow Line study will be performed by the Mississippi River Commission (MRC). The review process ensured that a technically correct flow line was developed. Technical review assured accountability for the technical quality of the product. Each technical review objective in the RP was satisfied through a seamless review process performed outside regional team's districts (Internal Technical Review and Independent External Peer Review), MVD (quality assurance of technical products), and MRC (policy review).

- The original review plan was based upon applicable guidance from higher authority including the Engineering Circular 1165-2-209, titled: CIVIL WORKS REVIEW POLICY, dated July 1, 2009. The study and the ITR were underway prior to the release of this EC, which requires an Agency Technical Review (ATR), with the ATR lead being from outside the originating MSC. As a result, the ITR lead for this study is from within MVD but outside the home district for the study. Given the existing ITR lead was well-qualified, and was outside the home district, the New Orleans District believes the current ITR lead was best for the study continuity and met the **intent** (if not the letter) of EC 1165-2-209.
 - After consultation with Eric Thaut (Program Manager, Flood Risk Management National Planning Center of Expertise South Pacific Division, U.S. Army Corps of Engineers, San Francisco, CA) on 10 May 2010, he said that “The ABFS Flow Line Report appears to be an “other work product” as defined in EC 1165-2-209. It isn’t a decision document or an implementation product. Per EC 209 (Paragraph 9.c.(2)), MVD is the appropriate Review Management Organization (RMO) for the Review Plan and ITR on this effort: “(2) Other Work Products. For other work products, the ITR shall be managed and performed outside of the home district. The USACE Risk Management Center (RMC) shall serve as the RMO for Dam Safety Modifications projects and Levee Safety Modification projects. For all other projects, the MSC shall serve as the RMO. There shall be appropriate coordination and processing through CoPs; relevant PCXs, and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished.” He also stated “The review plan should be coordinated with and approved by MVD; formal concurrence from the FRM-PCX isn’t required. Any remaining ITR requirements should also be coordinated with MVD. The FRM-PCX is available to assist in identifying ITR team members if needed, but it appears most of the ITR for this project has been completed. Note: The Review Plan should be revised to reflect MVD as the Review Management Organization (RMO) for the Review Plan and ITR (rather than the FRM-PCX). Also, per EC 209 (Paragraph 12.d.), the RMC is the appropriate RMO for Type II IEPR. David Carlson is the RMC point of contact for Type II IEPRs.” Because it may be used to support detailed design and plans and specifications in the future, the review will follow that of a (SAR) Type II IEPR.
 - NAB performed the role of the review management office. At the time the IEPR was scheduled, the Risk Management Center was not fully functional. They were in the process of getting A/E firms on board, and due to the project schedule, the review could not be delayed. NAB performed the role of RMO for all of the HSDRRS work in New Orleans. HQ (David Pezza, an authority on engineering IEPRs) concurred with the use of NAB as RMO for the IEPR of the Atchafalaya Basin Flow Line Report. Thus, the Coastal PCX at NAB managed the IEPR process.
- b. **Recommended Plan.** The recommended Design Flood Flow Line(s) that will be used for project designs in the future will be determined not by this study directly but by the district and division offices using the results of the study as one point of reference.
- c. **In-Kind Contributions.** There are no in-kind services anticipated as part of the cost share.

3. IN-DISTRICT QUALITY REVIEWS (DQR)

- a. **General.** Multiple districts were involved in this study and personnel followed their district’s quality control guidelines and plan. Besides the normal district quality reviews, this study had special reviewers with past experience with the Mississippi River and Tributaries Project. Special quality control also included close association and review of the HEC-6T sediment modeling by the primary author of the program, Mr. Tony Thomas. Unlike HEC-6, HEC-6T handled channel network and was

chosen for the analysis because the study area included a distributary (Wax Lake Outlet), a flow split (Whiskey Bay Pilot Channel and Old Atchafalaya River Channel) as well as several distributary channels (East/West Access and Freshwater channels). The USACE program HEC-6 was not capable of modeling these situations. The PDT member doing the subsidence and sedimentation study, Dr. Rebecca Soileau, consulted with geologists Del Britsch from MVN and Charlie Demas from the USGS who are very familiar with the Atchafalaya Basin, received their input and had them review her results.

4. INTERNAL TECHNICAL REVIEW (ITR)

- a. **General. ITR** was managed and performed outside of the New Orleans District. The Final Internal Technical Review for this study was started in November 2009, before the requirements in EC 1165-2-209 were established. Therefore, the previous criteria of having the team members and team lead from outside the home district with no previous involvement in the work was applied. The ITR ensured that the product was consistent with established criteria, guidance, procedures and policy. The ITR assessed whether the analyses presented were technically correct and complied with published USACE guidance, and that the document explained the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ITR team are all from outside the New Orleans District.
- b. **Products for Review.** The ITR team reviewed the Atchafalaya Basin Project Flood Flow Line Report.
- c. **Required ITR Team Expertise.** ITR teams comprised senior USACE personnel (Regional Technical Specialists (RTS), etc.), and were supplemented by outside experts as appropriate. The disciplines represented on the ITR team reflected the significant disciplines involved in the engineering effort. These disciplines included geology and hydraulics. Independence was assured at the previous level of guidance by having the leader outside of the home district. The ITR team was led by Mr. Tom Gambucci of Rock Island District. Other members were Mr. Roger (Andy) Gaines of Memphis District and Mr. Dan Pridal of Omaha District. Mr. Gambucci was selected for his expertise in multi-dimensional modeling, Mr. Gaines for his expertise in sediment transport, and Mr. Pridal for his expertise in one-dimensional modeling. Mr. Joe Dunbar of ERDC, a geologist with experience in the Gulf Region, was added to the initial ITR team to review the analysis on subsidence and sedimentation within the basin. The members of the ITR team were all technical specialists and none were involved with the Atchafalaya flood control study or project. A list of the ITR members and disciplines is provided in ATTACHMENT 1. The chief criterion for being a member of the ITR team is knowledge of the technical discipline and relevant experience.
- d. **Documentation of ITR.** DrChecks review software was used to document all ITR comments, responses and associated resolutions accomplished throughout the review process. Comments were limited to those that were required to ensure adequacy of the product. The four key parts of a quality review comment normally included:
 - (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, ASA (CW)/USACE policy, guidance or procedure that has not been properly followed;
 - (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

- (4) The probable specific action needed to resolve the concern – identify the action(s) that must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments sought clarification in order to then assess whether further specific concerns existed. The ITR documentation in DrChecks included the text of each ITR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ITR team prepared a Review Report which included a summary of each unresolved issue; each unresolved issue was raised to the vertical team for resolution. Review Reports were considered an integral part of the ITR documentation.

ITR was certified when all ITR concerns were either resolved or referred to HQUSACE for resolution and the ITR documentation was complete.

5. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

- a. **General.** WRDA 2007, Section 2035, Safety Assurance Review, requires a review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. This review will be 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. SARs will be conducted during the Design Documentation Report (DDR) phase, the Plans and Specifications (P&S) phase and intermittently throughout the construction phase. The purpose of the SAR is to ensure that good science, sound engineering, and public health, safety and welfare are the most important factors that determine a project's fate. The SAR shall focus on whether the assumptions made for hazards remain valid as additional knowledge is gained and the state-of-the-art evolves. Additionally, the SAR team shall advise whether project features adequately address redundancy, robustness, and resiliency; and findings during construction reflect the assumptions made during design.
- b. **Decision on Type I IEPR.** As previously stated, in accordance with EC 1165-2-209, the Project Flood Flow Line Report is not a decision document. Therefore, a Type I IEPR was not performed.
- c. **Decision on Type II IEPR.** In accordance with EC 1165-2-209 a Type II IEPR (SAR) shall be conducted on design and construction activities for flood risk management projects. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. The Project Flood Flow Line Report will be used to make decisions about the adequacy of the existing levee system and if there are any required modifications. Inadequate levee design could pose a loss of life threat. The study also uses complex hydraulic and sediment transport modeling and the subsidence and sedimentation study is somewhat novel and could be controversial. As previously stated, a Type II IEPR was performed.
- d. **Products for Review.** IEPR was performed on the Atchafalaya Basin Floodway System, Louisiana, Project Flood Flow Line Report.
- e. **IEPR Expert Reviewers.** Type II IEPR Expert Reviewers were established, in consultation with MVD, through a contract with the U.S. Bureau of Reclamation administered by NAB. Expert Reviewers were selected based on their technical qualifications and experience. The Expert Reviewers were independent of USACE and free of conflicts of interests. The Expert Reviewers were able to evaluate whether the interpretation of analysis and conclusions based on analysis were reasonable. The Expert Reviewers were given the flexibility to bring important issues to the attention

of decision makers. However, the Expert Reviewers were 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. The Expert Reviewers, however, offered their opinion as to whether there were sufficient analyses upon which to base a recommendation. The Expert reviewers focused on the methods used and key assumptions that formed the basis for the design flow line and compared them to industry standard practices. Reviewers were needed with expertise in the following disciplines: Hydraulic Engineering – the team member(s) were experts in the field of hydraulics, had a thorough understanding of the dynamics of open channel flow systems and sediment transportation, and had an understanding of computer modeling techniques that were used for this project ; Geology – team member had extensive experience with subsidence and sedimentation in areas similar to the Gulf Region (see ATTACHMENT 1 for the required experience in the required disciplines).

e. **Documentation of IEPR.** Word processing software was used to document IEPR comments and aid in the preparation of the Review Report. Comments addressed the adequacy and acceptability of the methods, models and analyses used. IEPR comments generally included the same four key parts as described for ITR comments in Section 3. The NAB was responsible for compiling comments. The IEPR team prepared a Review Report that will accompany the publication of the final report for the project 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 prepared by the NAB;
- Describe the nature of their review and their findings and conclusions; and
- Insure that comments represent the group, be non-attributable to individuals, and where there is lack of consensus, not the non-concurrence and why.
- A suggested report outline is an introduction, the composition of the review team, a summary of the review 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.

6. MODEL CERTIFICATION AND APPROVAL

a. **General.** The computational models used in the Atchafalaya Basin Floodway System Project Flood Flow Line Study have either been developed by or for USACE.

b. **Models.** The certified engineering models used in this study included:

- HEC-RAS Version 4.0 and the BETA VERSION 4.0 (This is a Corps of Engineers program): The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and man made channels. HEC-RAS major capabilities are:
 - User interface
 - Hydraulic analysis
 - Data storage and management
 - Graphics and reporting
- ADH for the flood profiles at the Gulf. This is a Corps of Engineers program.
- HEC-6T for future channel geometry. This is a modification of HEC-6 and HEC-6WES, which are both Corps of Engineers H&H Community of Practice – Preferred (Corps Endorsed) programs.
- No planning models were used in this study.

7. REVIEW SCHEDULES AND COSTS

- a. **ITR Schedule and Cost.** The estimated cost for ITR was \$70,000. ITR occurred during key stages in the model development, calibration and verification. The ITR team was invited to take part in relevant team meetings. ITR of the Project Flood Flow Line Report was completed 12 March 2010 (which included resolution of all comments).
- b. **IEPR Schedule and Cost.** The estimated cost for Type II IEPR (SAR) was in the range of \$28,000 to \$35,000. The IEPR of the Project Flood Flow Line Report occurred from 30 April 2010 to 29 June 2010 (which included resolution of all comments).
- c. **Model Certification/Approval Schedule and Cost.** Not Applicable.

8. PUBLIC PARTICIPATION

There was no public review of this study since it's purely technical in nature with no recommendations for construction projects. If this study leads to proposed construction projects there will be a review plan for that effort that includes full public participation.

9. PCX COORDINATION

The Atchafalaya Basin Project Flood Flow Line Report is classified as an "other work product" as defined in EC 1165-2-209, 31 January 2010. It is not a decision document or an implementation product. Per EC 209 (Paragraph 9.c.(2)), MVD is the appropriate Review Management Organization (RMO) for the Review Plan. The Coastal PCX at NAB (Julia Fritz (410-962-4895)) managed the IEPR process.

10. MSC APPROVAL

As part of the Mississippi River and Tributaries Project, the Atchafalaya Basin Levees are under the purview of the Mississippi River Commission. The draft report will be circulated among the relevant offices at the MRC and, once comments are resolved, presented to the MVD commander and MRC head for approval. Messrs. Eddie Brooks (prior to his retirement) and Chuck Shadie of MVD represent the MRC and have been involved throughout the study as a start of the seamless MRC review.

11. REVIEW PLAN POINTS OF CONTACT

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

- Patrick Foley, St. Paul District Technical and Review Plan Lead 651-290-5630
- Rebecca Seal Soileau, St. Paul District, Geologist and Review Plan, 651-290-5756
- Marti Lucore, New Orleans District Project Manager, 504-862-2057
- Jean Vossen, New Orleans Review Plan, 504-862-2404

ATTACHMENT 1: TEAM ROSTERS

TABLE 1: Product Delivery Team		
Functional Area	Name	Office
Project Manager	Marti Lucore	CEMVN
Technical Lead, Review Plan Lead	Patrick Foley	CEMVP
Delta Modeling (ADH)	Steve Ayres	CEMVN
Hydraulics	Don Alette	CEMVN
General Engineering-GIS	Jeremy Daigle	CEMVN
Project Coordination	Walter Teckmeyer	CEMVN
Sediment Modeling (HEC-6T)	Tom Kirkeeng	CEMVR
Geology	Rebecca Seal Soileau	CEMVP
Basin Modeling (HEC-RAS)	Scott Goodfellow	CEMVP

TABLE 2: Internal Technical Review Team		
NAME	DISCIPLINE	OFFICE
Tom Gambucci	ITR Lead & Hydraulics (ADH)	CEMVR
Roger (Andy) Gaines	Sediment Modeling (HEC-6T)	CEMVM
Dan Pridal	Hydraulics (HEC-RAS)	CENWO
Joe Dunbar	Geology	CEERD

TABLE 3: Special Quality Control Reviewers		
NAME	DISCIPLINE	AFFILIATION
Tony Thomas	Sediment Modeling (HEC-6T)	Private Firm
Eddie Brooks (ret. Jan 09)	Hydraulics	CEMVD (ret.)
Chuck Shadie	Hydraulics	CEMVD
Charlie Demas	Geology	USGS
Del Britsch	Geology	CEMVN

TABLE 3: Independent External Peer Review Expert Reviewers		
NAME	DISCIPLINE	EXPERIENCE
TBD	Hydrology and Hydraulics (H&H)	The H&H Independent Experts should be registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses related to hydraulic and sediment transport modeling. Panel member will hold at a minimum a M.S. degree in Civil Engineering or Hydrology and Hydraulics. Experience with 1D, 2D hydraulic modeling of large river and coastal environments is required. Active participation in related professional societies is encouraged. The panel member should be familiar with standard Corps 1D and 2D hydrodynamic and 1D sediment transport computer models.
TBD	Geologist or Geotechnical Engineer	The Geotechnical Engineering Independent Expert should be a professional from academia, a public agency, or an Architect-Engineer or consulting firm with 10 years experience related to fluvial sedimentation and coastal zone subsidence. The expert should have experience with the geology of the Gulf Coast region. Experience needs to encompass large riverine system sedimentation both in channel and in floodplain and overbank areas and subsidence mechanisms related to coastal, delta and inland delta environments. Active participation in related professional societies is encouraged.

Vertical Team

The Vertical Team consisted of members of the HQUSACE and Mississippi River Valley Division Offices. The Vertical Team played a key role in facilitating execution of the project in accordance with the PMP. The Vertical Team was responsible for providing the PDT with Issue Resolution support and guidance as required. The Vertical Team remained engaged seamlessly throughout the project via monthly teleconference calls as required. Messrs. Eddie Brooks and Chuck Shadie of MVD represented the MRC and were involved throughout the study as a part of the seamless MRC review.