

**US Army Corps
of Engineers®
Memphis District**

**Review Plan
for
Bayou Meto
Bayou Meto Basin, Arkansas**

Implementation Phase

04 December 2012

P2# 109378



DEPARTMENT OF THE ARMY

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

REPLY TO
ATTENTION OF:

24 JAN 13

CEMVD-PD-KM

MEMORANDUM FOR Commander, Vicksburg District

SUBJECT: Review Plan (RP) for Bayou Meto Basin, Water
Supply/Flood Control/Water Fowl Project (P2# 109378)

1. Reference memorandum, CEMVM-DE, 9 January 2013, subject as above (encl 1).
2. MVD staff has reviewed the Review Plan and related documents for the subject project. The 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).
3. The subject review plan is approved. The review plan has been coordinated with the Review Management Organization, which concurs (encl 2). Please post the approved Review Plan to your web page.
4. The MVD point of contact for this action is Ms. Sarah Palmer, CEMVD-PD-KM, (601) 634-5910.

2 Encls

EDWARD E. BELK, JR., P.E., SES
Director of Programs



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSISSIPPI VALLEY DIVISION
1400 WALNUT STREET
VICKSBURG, MS 39181-0080

January 9, 2013

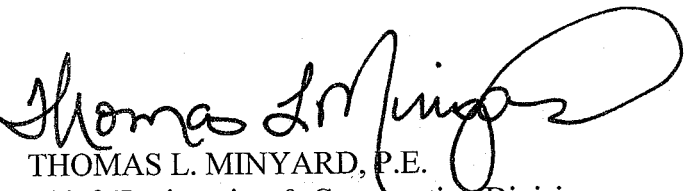
CEMVM-DE

MEMORANDUM FOR Commander, US Army Corps of Engineers, Mississippi Valley Division
(CEMVD-RB-T/Mr. Robert Fitzgerald)

SUBJECT: Review Plan (RP) for Bayou Meto Basin, Water Supply/Flood Control/Water Fowl
Project (P2# 109378) (Encl)

1. The Review Plan for Bayou Meto Basin, Water Supply/Flood Control/Water Fowl Project is attached for Mississippi Valley Division's review and approval. The RP was prepared in accordance with EC 11 65-2-209.
2. The Bayou Meto Basin, Water Supply/Flood Control/Water Fowl Project is currently in the implementation phase. As required by EC 11 65-2-209, request review and approval of the Review Plan.
3. The point of contact for this action is Mr. Tracy James, Project Manager, (901) 544-0673, e-mail: tracy.m.james@usace.army.mil or Mr. Paul Hamm, Project Manager, (901) 544-4229, e-mail: paul.f.hamm@usace.army.mil

Encl
as


THOMAS L. MINYARD, P.E.
Chief, Engineering & Construction Division

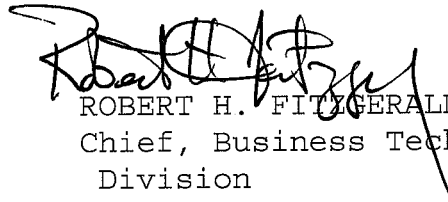
GA r01

16 Jan 13

MEMORANDUM FOR CEMVD-PD-KM (Dennis Norris)

SUBJECT: Review Plan for Bayou Meto Basin, Water Supply/Flood Control/Water Fowl Project (P2# 109378)

1. Reference memorandum, CEMVM-DE, 1 Jan 12, subject as above.
2. This office concurs with subject Review Plan.
3. RB-T POC is Mr. Will Bradley, 601-634-5644.


ROBERT H. FITZGERALD, P.E.
Chief, Business Technical
Division

Review Plan

Bayou Meto Basin, Arkansas Water Supply/Flood Control/Waterfowl Project 4 December 2012

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Review Plan

Bayou Meto Basin, Arkansas Water Supply/Flood Control/Waterfowl Project 4 December 2012

1 INTRODUCTION

1.1 Purpose and Authority

This Review Plan (RP) defines the scope and level of quality management activities for the Bayou Meto Basin, Arkansas, Water Supply/Flood Control/Waterfowl Project (Project). The purpose of this RP is to define the scope and level of review for implementation documents for the Project. This RP is a stand-alone document, and is also included as an appendix to the Project Management Plan. Bayou Meto Basin, Arkansas, authorized by section 204 of the Flood Control Act of 1950 (64 Stat. 174) and de-authorized pursuant to section 1001(b) of the Water Resources Development Act of 1986 (33 U.S.C. 579a(b)), is authorized to be carried out by the Secretary; except that the scope of the project includes ground water protection and conservation, agricultural water supply, and waterfowl management if the Secretary determines that the change in the scope of the project is technically sound, environmentally acceptable, and economic, as applicable. The Memphis District will execute the Project and report to the Mississippi Valley Division (MVD) in Vicksburg, MS.

The project plans were developed keeping the problems and needs of the area relative to flood damage reduction, groundwater protection and conservation, agricultural water supply, and ecosystem and waterfowl management foremost as project objectives. This was done by developing a plan to protect groundwater resources and reduce flooding in the area while providing a supplemental agricultural water supply for irrigation, aquaculture, and fish and wildlife, specifically waterfowl management and conservation.

An Environmental Impact Statement (EIS) was completed during the feasibility study for the Recommended Plan. A record of decision was signed on 13 Nov. 2007. An Environmental assessment (EA) was prepared to supplement the EIS and cover design changes associated with changes of the borrow location for Bayou Meto assessment fishery impact due to isolation of backwater; a finding of No Significant Impact was signed on 22 July 2010.

1.2 Review Requirements

This RP was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of US Army Corps of Engineers (USACE) decision and implementation documents through independent review. This RP describes the scope of review for the current phase of work. All appropriate levels of review, District Quality Control Plan (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR) and Policy and Legal Review, will be included in this RP and any levels not included will require documentation in the RP of the risk-informed decision not to undertake that level of review. The RP identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual Project.

1.3 Primary Points of Contact

1.3.1 DQC

Memphis District	Mr. Tracy James	901-544-0673
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1.3.2 ATR

MVD Review Management Office	To Be Determined As Design is Funded	xxx-xxx-xxxx
RMC Review Management Office	To Be Determined As Design is Funded	xxx-xxx-xxxx

1.4 References

- | | | |
|----|--|--|
| a. | ER 1105-2-100 | <i>Planning Guidance Notebook</i> , 20 November 2007 |
| b. | ER 1110-1-12 | <i>Engineering and Design - Quality Management</i> , 21 July 2006, incorporating Change 1, 30 September 2006 |
| c. | ER 1110-2-1150 | <i>Engineering and Design for Civil Works</i> , 31 August 1999 |
| e. | EC 1105-2-408 | Peer Review of Decision Documents, 31 May 2005 |
| f. | EC 1105-2-410 | <i>Review of Decision Documents</i> , 22 August 2008 |
| g. | EC 1165-2-209 | <i>Civil Works Review Policy</i> 31 January 2010, with Errata Sheet 1 dated 15 July 2010 |
| h. | Army Regulation 15-1, <i>Committee Management</i> , 27 November 1992 (Federal Advisory Committee Act Requirements) | |
| i. | National Academy of Sciences, <i>Background Information and Confidential Conflict Of Interest Disclosure</i> , BI/COI FORM 3, May 2003 | |

2 PROJECT INFORMATION

2.1 Project Description

The Bayou Meto project addresses agricultural flooding and the depletion of the alluvial aquifer, which provides the majority of water used for agricultural irrigation and baitfish farming. The project has 3 components, and was planned as a multi-purpose project. These 3 components are: agricultural water supply, flood damage reduction, and waterfowl management.

The Alluvial aquifer is the shallow aquifer that serves as the principal source of irrigation. The agricultural areas of eastern Arkansas have experienced moderate to severe water level declines in the alluvial aquifer for more than 30 years. The aquifer is being depleted faster than it can be recharged. An alternative water source for the project area is necessary for groundwater protection and for agricultural irrigation. Although depletion of the aquifer is a natural resource loss, it would also devastate the local and regional economy resulting in national economic impacts.

Flooding problems frequently occur on the many streams throughout the Bayou Meto Basin. A flood control plan authorized in 1959 was never constructed due to the lack of a duly constituted local sponsor to furnish items of local cooperation. The area's greatest needs today are flood relief near the wildlife management area, located in the lower portion of the basin, and to areas in the uppermost portion of Bayou Meto. There is an opportunity to develop multipurpose channels to provide outlets that reduce flooding and to improve channels for transferring supplemental irrigation flows.

The Bayou Meto area contains important fish and wildlife resources. Migratory waterfowl use this area extensively during the winter months. Scattered hardwood tracts provide habitat for many game and non-game species. The Bayou Meto Wildlife Management Area (WMA) contains approximately 34,000 acres managed for fish and wildlife purposes. The problems addressed by the project are related to recreation, fish and wildlife. The loss of in-stream flows during the summer months due to the lack of rainfall, withdrawals for crop irrigation, and loss of timber due to impaired drainage are some of the problems. Problems associated within the WMA consist of insufficient surface water for resting and feeding areas for waterfowl during migration and wintering periods. The project provides opportunity to relieve these problems by providing more continuous flow throughout the year and providing additional sources of water for waterfowl conservation and management. A plan for environmental enhancement for the Bayou Meto WMA and Baker's Bayou was developed during feasibility studies. The plan addressed the environmental needs related to migratory waterfowl. Measures included in the plan will provide drainage relief for the management area and additional control for seasonal flooding for waterfowl. The project area consists of 369,874 acres of irrigated cropland and 22,942 acres of fishponds. At present approximately 88 percent of the agricultural water supply comes from groundwater. Surface water accounts for the remaining 12 percent. Groundwater studies conducted by the U.S. Geological Survey and the Arkansas Soil and Water Conservation for the alluvial aquifer in

eastern Arkansas indicated that groundwater could provide approximately 148,565 acre feet annually at a safe yield level in the Bayou Meto Basin.

The Bayou Meto project component was divided into nineteen construction items (See Below). Two of the initial items (Item 3 and Item 7) were subdivided into A and B items to identify existing ditches being utilized as part of the distribution system that were also included in the flood control component plan of improvement. Each of these nineteen items is a complete unit and when constructed in the proposed sequence, will be available for operation. A description of the items of work in by item number is presented below.

- **Item 1** – Canal 500, Pump Station No. 1 (1750 cfs) and regulation reservoir with outlet structure.
- **Item 2** – Canals 1000 and 2000, and pipelines with associated structures.
- **Item 3A** – Indian Bayou Ditch (1500) to confluence of Indian Bayou Proper; ditches 1510, 1520, and 1521; pipelines and miscellaneous structures.
- **Item 3B** – Structures associated with Indian Bayou Ditch (1500) from confluence of Indian Bayou Proper, Canal 1530, pipelines and associated structures.
- **Item 4** – Canals 1400 and 1410, pipelines and associated structures.
- **Item 5** – Canals 2100, 2140, and 2160, Caney Creek (2120), pipelines, Pump Station No. 4 (125 cfs), and associated structures.
- **Item 6** – Canals 2520, 2531, and 2533; Fish Trap Slough (2521), Skinner Branch (2530), Blue Point Ditch (2532), Ditches 2533 and 2534; pipelines and associated structures
- **Item 7A** – Canals 2110 and 2220, Crooked Creek (2200) upstream of mi.10.0, Big Ditch (2240), pipelines and associated structures.
- **Item 7B** – Canals 2260 and 2280, structures associated with Crooked Creek (2200) downstream of mi. 10.0, pipelines and associated structures.
- **Item 8** – Pump Station No. 2 (625 cfs) regulation reservoir, and outlet structure.
- **Item 9** – Canals 2500 and 2510 with associated structures.
- **Item 10** – Canal 3000 and pipelines with associated structures.
- **Item 11** – Oak Branch (2511), Shumaker Branch (2540), pipelines and associated structures.
- **Item 12** – Pipelines with associated structures.
- **Item 13** – Pipelines with associated structures.
- **Item 14** – Pump Station No. 3 (260 cfs), regulation reservoir, and outlet structure
- **Item 15** – Canals 4000 and 4100 with associated structures.
- **Item 16** – Pipelines with associated structures.
- **Item 17** – Canals 4111, 4112, and 4113; Brooks Branch (4200); Rickey Branch (4110); pipelines; and associated structures.

A combination of measures is required to meet the water supply needs of the area. The identified water supply components are (1) conservation - increased irrigation efficiencies, (2) groundwater, (3) additional on-farm storage reservoirs, and (4) an import system.

The on-farm water management element for the Bayou Meto area consists of the installation of conservation practices that improve irrigation efficiencies. These practices provide additional on-farm storage and retrofit existing irrigation systems to utilize the import delivery system. Approximately 552 miles of underground pipelines will be installed which will allow for more efficient management of water and will minimize losses from evaporation and seepage. New on-farm storage reservoirs (9,754 acres) will be constructed to meet peak demands and critical irrigation application times. Approximately 234 miles of new tail water recovery canals will be installed to collect, store, and transport runoff and tail water for reuse on the farm. Pumping plants and water control structures would be required to capture the water and move it through the irrigation system for field application or reservoir filling.

Based on studies conducted to date, groundwater could provide approximately 22 percent, on-farm storage reservoirs 16 percent, and natural runoff/tail water recovery 12 percent of the total water need. The additional 50 percent will have to come from outside sources.

The Arkansas River was determined to be the source of import water. A water diversion structure (located off of the Arkansas River immediately north of David D. Terry Lock and Dam at River Mile 109) will be utilized to divert excess surface water into a network of new canals (105 miles), existing streams (116 miles), pipelines (472 miles), and associated structures to deliver water throughout the project area. A combination of measures is required to meet the water supply needs of the area. The identified water supply components are (1) conservation - increased irrigation efficiencies, (2) groundwater, (3) additional on-farm storage reservoirs, and (4) an import system. The cost estimate summary with the Federal and non-Federal shares are as follows:

Federal Share (65 percent)	\$ 399,213,100
Non-Federal Share (State of Arkansas)	<u>214,960,900</u>
Total Estimated Project Cost	\$ 614,174,000

Project Component Cost Summary

Agricultural Water Supply	\$ 501,965,000
Waterfowl Management	\$ 60,386,000
Flood Control	\$ 51,823,000
<hr/>	
Total Project	\$ 614,174,000

Project Component Cost Detail

	<u>Total Cost</u>
Remaining Distribution System (canals, pumps, pipelines, etc.)	- \$300.0M
Agricultural Water Supply Mitigation	- \$ 2.4M
On-Farm Work	- \$ 82.0M
Waterfowl Management Area Improvements	- \$ 54.6M
Flood Control – Channel, Creek and Ditch Improvements	- \$ 39.1M
Flood Control Mitigation	- \$ 5.0M
Sunk PED (Planning, Engineering, and Design) Costs	- \$ 23.3M
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Total Project Cost	- \$614.2M

2.2 Project Location

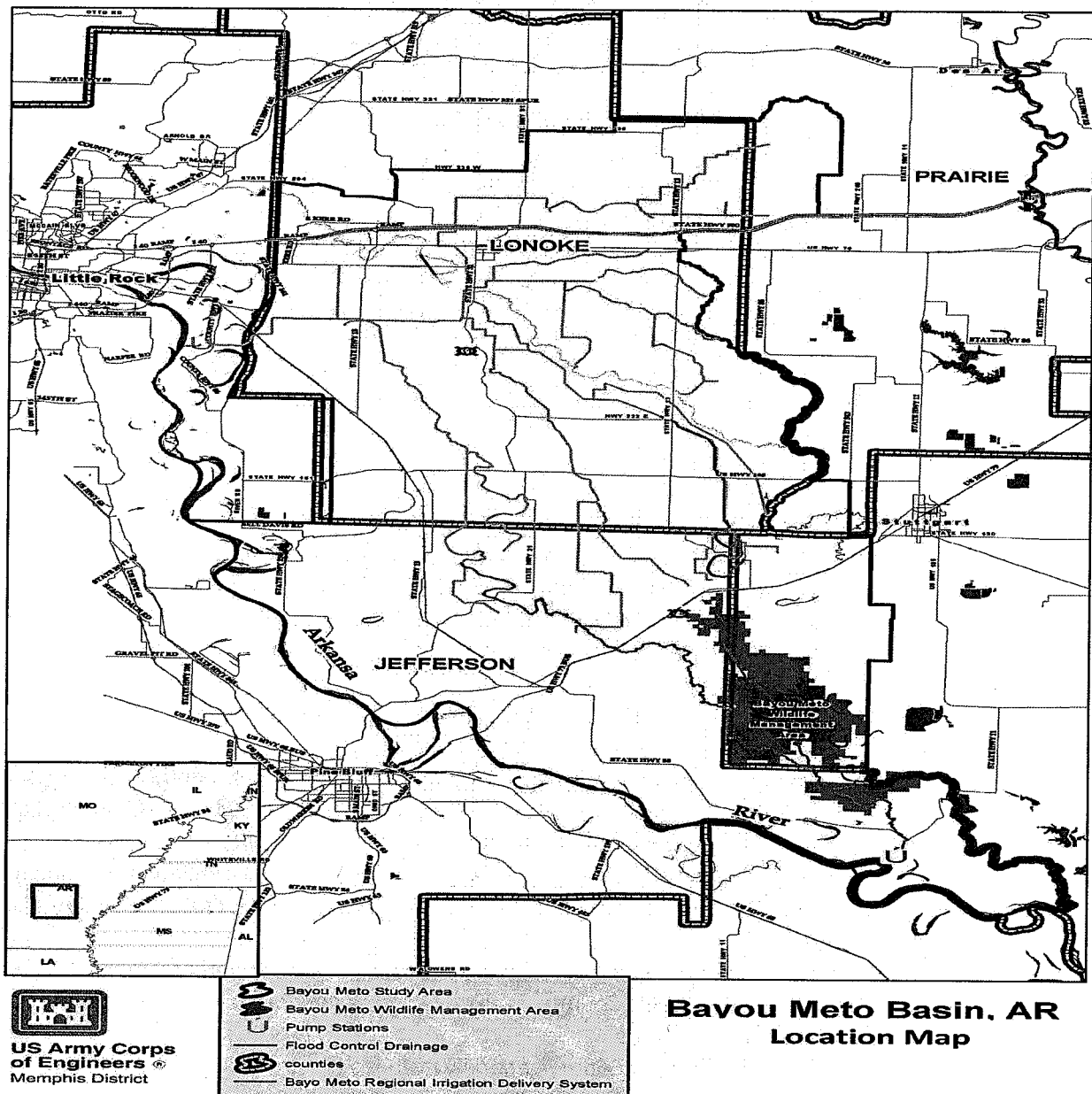
The Project area is located in east central Arkansas in Lonoke, Pulaski, Prairie, Jefferson, and Arkansas Counties which forms the Bayou Meto Improvement Project Area (IPA). The Bayou Meto encompasses approximately 433,166 acres, which includes 276,814 acres of irrigated cropland and 22,079 acres of commercial fish ponds. The IPA includes approximately 323,603 acres in Lonoke County; 80,917 acres in Jefferson County; 16,384 acres in Prairie County; 10,201 acres in Arkansas County; and 2,061 in Pulaski County.

The area within Lonoke County includes, for the most part, lands bounded on the north by Wattensaw Bayou between the Prairie County line and Arkansas Highway 31; Arkansas Highway 236 between Arkansas Highway 31 and Arkansas Highway 89; and Interstate 40 between Arkansas Highway 15 and the Pulaski County line. The area is bounded on the west by Arkansas Highway 165 and Arkansas Highway 15, on the east by Prairie County, and on the south by Jefferson County.

The area within the IPA in Jefferson County generally includes the area bounded on the north by Lonoke County, on the west by Arkansas Highway 15 and Arkansas Highway 88, and on the south and east by Arkansas Highway 79.

The area within IPA area in Prairie County generally includes lands bounded on the north by Wattensaw Bayou, on the west by Lonoke County, on the east in the general vicinity of Arkansas Highway 86, and on the south by Interstate 40.

The area within the IPA in Arkansas County generally includes the area bounded on the north by Lonoke and Prairie County, on the west by Jefferson County, on the east by Big-Ditch, and on the south by Arkansas Highway 79.



2.3 Project Primary Risk Factors

Risk will be minimized using well-coordinated schedules, metrics, and the assignment of specific responsibilities to the PDT members who possess the background and expertise related to those responsibilities. Status review sessions will be held weekly with the project manager and monthly with the other PDT members. Discussions during these sessions will identify issues and problems that cause risk for the program, and to keep the key people on this project focused on execution.

Potential areas of risk include priority conflicts resulting in the non-availability of technical design team (TDT) members. Regular reviews will assess problems of this nature and establish work-around processes to include: Identification of the backup TDT members, use of A-E contractors to accomplish that work at risk., shifting the time for accomplishing non-critical activities to accommodate other priorities, reassignment of manpower resources to the problem areas, and assigning the work to other in-house groups qualified to do the work. Key team members with historical project knowledge will be a priority to retain as a team member to retain a body of project knowledge.

The schedule shown in the cost estimate has no contingency built in for time delays. Where delays occur on critical path activities, the impact could result in project delays. Contingencies to manage financial risks have been incorporated into the cost estimate for each item.

Other areas of risk include the allocation of funds to perform the work. While the PDT has little control over the allocation of funds, the awareness of funding shortage situations will allow the PDT to alter the schedule and reassign the resources that would have otherwise been working on this project. Conversely, if more funds are provided than anticipated, the PDT may use alternate methods for accomplishing that work that can be advanced in a logical manner. Those methods follow generally the work-around methods discussed above.

2.4 Project Authority

The Bayou Meto Basin, Arkansas, project authorized by section 204 of the Flood Control Act of 1950 (64 Stat. 174) and de-authorized pursuant to section 1001(b) of the Water Resources Development Act of 1986 (33 U.S.C. 579a (b)), is authorized to be carried out by the Secretary; reauthorized by WRDA 1996, Section 363.

2.5 Product Information

The results of the Implementation Phase of the Project will be design, specifications, and supporting documentation for the Project to go to solicitation.

The following is a partial list of products produced during the course of the Project:

- A.** Plans and Specifications
- B.** Design Documentation Report (DDR)
- C.** Design Quality Control Plan (DQCP)
- D.** Cost Estimate
- E.** Engineering Considerations and Instructions to the Field.

Implementation documents will be designed with in-house capabilities to include regional assistance from other Districts within MVD. The purpose of implementation documents is to provide a detailed plan for construction. The implementation products listed above will be developed by a USACE project delivery team (PDT). A construction contractor will complete the construction.

3 SCOPE OF REVIEWS

All work products undergo DQC and ATR. However, there is a level of judgment applied to determine if an IEPR is required. Each level of review and how it applies to the Project is explained in Paragraphs 3.3 through 3.33. Documentation for risk-informed decision on IEPR is included in Attachment 5.

The Mississippi Valley Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 4. 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 vertical team members i.e. the RMO and home MSC.

3.1 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 under review. The design products for the Project will be developed entirely internal to the Corps of Engineers by the PDT. Basic quality control tools used on the Project include a QMP providing for seamless review, peer quality checks and reviews, supervisory reviews, PDT reviews, a bid ability, constructability, operability, and environmental (BCOE) review, in-house product development checklists, and established Business Quality Practices (BQPs) used to ensure quality procedures are followed. Prior to implementation of EC 1165-2-209, the Project plans and specifications also received an Independent Technical Review (ITR) from reviewers of disciplines similar to those used for the ATR on the Project. DQC also includes certification of the plans, specifications, and the DDR by a BCOE signoff certification, which includes the chiefs of construction, engineering, and operations divisions and the chiefs of the civil construction and geotechnical functional elements.

DQC efforts include the necessary expertise to address compliance with published Corps policy. When policy and/or legal concerns arise during DQC efforts that are not readily and mutually resolved by the PDT and the reviewers, the district seeks issue resolution support from the vertical team in accordance with the procedures outlined in Appendix H, ER 1105-2-100 or other appropriate guidance.

DQC comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

1. The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
2. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not 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.

Quality checks and reviews will be conducted during the development process and are carried out as routine management practice. Quality checks will 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 will not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts.

Project Delivery Team (PDT) reviews are performed by members of the PDT to ensure consistency and effective coordination across all project disciplines. 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 Memphis District Commander.

A copy of all comments and responses from DQC will be provided to the ATR team at each review in the form of a Quality Assurance Review Memo.

The MVD and Memphis District Quality Management Plans (QMPs) address the conduct and documentation of this fundamental level of review. DQC is required for this Project.

3.1.1 Peer Reviews (District Quality Review)

Prior to ATR, all implementation documents will receive a peer review. The peer review is conducted by a peer in the same discipline and double checks calculations, assumptions, and other design details used in the design and specifications. 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 MVM Chief of Engineering and Construction Division. The certification will state that the PDT team concurs with the Project design and that it is ready for advertising. Peer review disciplines are listed in Paragraph 3.1.2.

3.1.2 A/E Product Reviews

Although there is no intent of A/E design for the Bayou Meto Basin, Arkansas Project, if products are produced by A/E firms, at the submittal of their final products, the A/E shall provided certification that

the products that they produced had undergone the A/E's quality control procedure. It is also noted that the A/E is required to have all the design drawings stamped by a registered professional engineer.

3.1.3 Biddability, Constructability, Operability, and Environmental (BCOE) Review

The BCOE reviews all aspects of the documents used to bid for a construction contract to ensure they will result in a biddable and constructible project. The BCOE Review occurs prior to advertising the contract for bids. The BCOE Review disciplines are listed in Paragraph 5.2.1.

3.2 Agency Technical Review (ATR)

ATR is an in-depth review undertaken to ensure the quality and credibility of the government's scientific information, 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. ATR is mandatory for all decision and implementation documents. For other work products, a case specific risk-informed decision is made as to whether ATR is appropriate. The purpose of ATR is to ensure proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. The ATR review package includes the certified DQC review package. ATR teams are comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team is selected from outside MVD.

DQC efforts include the necessary expertise to address compliance with published Corps policy. When policy and/or legal concerns arise during DQC efforts that are not readily and mutually resolved by the PDT and the reviewers, the district seeks issue resolution support from the vertical team in accordance with the procedures outlined in Appendix H, ER 1105-2-100 or other appropriate guidance.

3.2.1 Required ATR Team Expertise

The ATR team consists of 9 members including the ATR team leader. ATR reviewers will be comprised of individuals that have not been involved in the development of the design documents. The following paragraphs describe the list of required disciplines as well as the experience required by each of the ATR team members. Other disciplines/functions may be added to the ATR team as necessary, in which case the added team member(s) will have the appropriate experience and educational requirements. See Paragraph 5.1.5 for a list of the assigned ATR team members.

3.2.1.1 ATR Team Leader

The ATR team leader shall hold a professional license in structural or civil engineering with a BS degree or higher in civil 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 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.

3.2.1.2 Structural

The reviewer for structural features shall be a registered professional engineer with a BS degree or higher in civil or structural engineering. The reviewer shall have a minimum of 10 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, removable flood walls, closure structures, interior drainage facilities, concrete placement, and relocation of underground utilities. The reviewer should have experience with static and seismic design per industry code standards and USACE design regulations for Civil Works projects including soil-structure interaction evaluation and design. The reviewer shall also have a working knowledge of the software MathCAD 15, CWALSHT - USACE sheet pile design, CPGA - USACE pile group analysis, CFRAME - USACE frame analysis, CTWALL – USACE cantilever wall analysis, STAAD Pro- Finite element analysis, RISA-3D- Finite element analysis, and Microsoft Excel.

3.2.1.3 Hydraulics

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 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 participated in review of riverine flood risk management projects.

3.2.1.4 Civil Design

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, design of access roads, and relocation of underground utilities. The reviewer must be familiar with USACE regulations and standards.

3.2.1.5 Mechanical

The reviewer for mechanical features shall be a registered professional engineer with a BS degree or higher in mechanical engineering. Reviewer shall have a minimum of 10 years in mechanical design of pump stations. The reviewer must be familiar with USACE regulations and standards.

3.2.1.6 Geotechnical

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, seepage and slope stability

evaluations, erosion protection design, and construction and earthwork construction. The reviewer must be familiar with USACE regulations and standards.

3.2.1.7 Electrical

The reviewer for electrical features shall be a registered professional engineer with a BS degree or higher in electrical engineering. Reviewer shall have a minimum of 10 years in electrical design of pump stations. The reviewer must be familiar with USACE regulations and standards.

3.2.1.8 Cost

The reviewer for cost estimating shall be a registered or certified cost engineer with a BS degree or higher in engineering or construction management. Reviewer shall have a minimum of 10 years in cost estimating and have experience with estimating large urban flood risk management projects. The reviewer shall have extensive knowledge of MII software and the Total Project Cost Summary (TPCS) as required during ATR.

3.2.1.9 Cultural Resources

The team member will be an archaeologist familiar with records searches, cultural resource survey methodology, area of potential effects, Section 106 of the National Historic Preservation Act, and state and Federal laws/executive orders pertaining to American Indian Tribes.

3.2.1.10 Biologist / Environmental

The team member will be experienced in NEPA/CEQA process and analysis, and have a biological or environmental background that is familiar with the project area and ecosystem restoration. The team member will be an expert in environmental evaluation and compliance requirements pursuant to the "Procedures for Implementing NEPA" (ER 200-2-2), national environmental statutes, applicable executive orders, and other Federal planning requirements, into the planning of Civil Works projects.

3.2.2 Documentation, Issue Resolution, and Certification of ATR

DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not 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.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the District, MSC, RMC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample ATR certification is included as Attachment 2.

3.3 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. Any work product that undergoes ATR may also undergo Type I and/or

Type II IEPR. In general, decision documents undergo Type I IEPR and implementation documents undergo Type II IEPR (or Safety Assurance Review). Meeting the specific conditions identified for possible exclusions is not, in and of itself, sufficient grounds for recommending exclusion.

3.3.1 Type I IEPR

Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

3.3.2 Type II IEPR

Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

3.3.3 Decision on IEPR

MVM has determined that the Bayou Meto Basin, Arkansas project does not require a Type II IEPR for the following reasons:

- It is not justified by life safety nor would failure of the project would pose a significant threat to human life;
- It does not involve the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations; does not contain precedent-setting methods or models; and does not present conclusions that are likely to change prevailing practices;
- It does not require redundancy, resiliency, and/or robustness; and
- It does not involve unique construction sequencing or a reduced or overlapping design construction schedule.

3.4 Model Certification and Approval

EC 1165-2-209 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; however engineering software used for models is currently addressed under the Engineering and Construction 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 will proceed as in the past. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and will follow the professional practice of documenting the application of the software and modeling results.

The models to be employed in the Project have either been developed by or for the use by USACE. More specifically, the models to be employed in the completion of design are:

- MCACES (MII): This is a cost estimated model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989.
- HEC-FDA: This model, developed by the Corps' Hydrologic Engineering Center, will assist the PDT in applying risk analysis methods for flood damage reduction studies as required by EM 1110-2-1419. This program
 - provides a repository for both the economic and hydrologic data required for the analysis;
 - provides the tools needed to understand the results;
 - calculates the Expected Annual Damages and the Equivalent Annual Damages;
 - computes the Annual Exceedance Probability and the Conditional Non-Exceedance Probability; and
 - implements the risk-based analysis procedures contained in EM 1110-2-1619.
- HEC-RAS: The function of this model is to complete one-dimensional hydraulic calculations for a full network of natural and manmade channels. HEC-RAS major capabilities are
 - User interface;
 - Hydraulic Analysis;
 - Data storage and Management; and
 - Graphics and reporting.
- HEC-HMS: The function of this model is to simulate precipitation-runoff process in watershed systems. This program provides:
 - Hydrologic simulations
 - Parameter estimation
 - Simulation analyses
- MathCAD 15 – ideal for knowledge capture, calculation, sharing and reuse. MathCAD lets individuals work with update-able, interactive designs, so users can capture the critical methods and values behind each of their engineering projects.

- MathCAD automatically creates an auditable trail of documented calculations, thus simplifying compliance, reporting, verification, and troubleshooting.
- CSETT: The function of this model is to compute consolidation settlement of compressible soils resulting from simple and complex loading conditions. Capabilities include:
 - ultimate settlement and time-rate of consolidation for the total soil mass specified and for the individual compressible soil layers within the soil mass.
 - in situ overburden pressures and the induced stresses
 - analysis of multiple soil layers and a variety of drainage conditions.
-
- GeoStudio: Geostudio includes 8 modeling programs: Slope/W for slope stability; SEEP/W for groundwater seepage; SGMA/W for stress deformation; QUAKE/W for dynamic earthquake; TEMP/W for geothermal; CTRAN/W for contaminant transport; AIR/W for airflow; VADOSE/W for vadose zone and covers
-
- CPGA: The function of this model is basic pile group analysis. It eliminates inaccuracies inherent in hand analysis methods.
-
- CFRAME: The function of this model is to utilize the stiffness methods of structural analysis. The Cholesky decomposition method is used to solve the resulting matrix equation. Automatic generation routines are available to simplify the data input.
-
- CWALSHT: The function of this model is to design and/or analyze either cantilever or anchored sheet pile walls. It determines the required depth of penetration of a new wall or assesses the factors of safety for an existing wall
-
- STAAD.Pro is used for analyzing and designing buildings, bridges, towers, transportation, industrial and utility structures. It provides static, dynamic, and seismic analyses, load types and generation, finite element calculations, steel, timber, and concrete design analyses.
-
- RISA-3D: This modeling software analyzes and optimizes all types of structures and common structural materials including steel, concrete, wood, aluminum and masonry.
-
- MathCAD 15 calculates design computations, analyzes and plots data in a user friendly platform.
-
- giNT stores all types of subsurface data and creates reports, boring logs, and lab reports, etc. from data.
-
- Microstation v8i is software used to design, model, visualize, document, and map projects. It is primarily used to layout design plans.
 - InRoads, a tool within Microstation, provides site analysis and graphic coordinate geometry

MicroStation V8i is the CAD Software used by engineers, architects, GIS professionals, constructors, and owner operators to design, model, visualize, document, map, and sustain infrastructure projects.

MicroStation is their preferred CAD software foundation because it delivers an integrated and proven suite of intuitive, interactive, and highly interoperable capabilities to the desktop.

InRoads Site also offers sophisticated, easy-to-use site analysis tools; comprehensive, interactive graphic coordinate geometry; and user-definable XML reports.

3.5 Policy Compliance and Legal Review

The Memphis District Office of Counsel is responsible for legal review of decision and implementation documents and signs a certification of legal sufficiency prior to construction of the Project.

4 POSTING of REVIEW PLANS and PUBLIC COMMENT

To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, this RP will be published on the district's public internet site following approval by MVD. A link to the RP is available at the District's "Review Plan" hyperlink.

4.1 District Posting of Review Plans on Internet

The Memphis District maintains a web site that hosts electronic versions of review plans for its studies/projects as well as a list of the current and active Review Plans with links to the documents. In posted documents, lists of the names of USACE reviewers may be displayed. The MVD and HQUSACE postings also link to the District's site. The district will establish a mechanism on their web site for allowing the public to comment on the adequacy of the RP, and will consider public comments on RPs. The RP is published on the Memphis District's public internet site following approval by MVD. The Memphis District website is located at <http://www.mvm.usace.army.mil/PPPM/PPMD/reviewplans.asp>.

4.2 Division Posting of Review Plans on Internet

MVD will post on its website, and update at least every three months, an agenda of RPs. The agenda describes all decision and implementation documents, the RP for each entry on the agenda, and provides a link from the agenda to each document made public. MVD's website is located at <http://www.mvd.usace.army.mil>.

4.3 Comment Period and Handling of Comments

The public comment period is 30 days.

If and when comments are received, the PDT will consider them and decide if revisions to the Review Plan are necessary. Public comments on the Review Plan may be made by writing or emailing the following contact:

Memphis District, Corps of Engineers
ATTN: PM-M (Tracy James)
167 N. Main St. 5th Fl. RM. 511
Memphis, TN. 38103
Email: tracy.m.james@usace.army.mil

The Memphis District will consider public comments and recommend changes to the RP if necessary to MVD. Significant and relevant public comments will also be provided to reviewers prior to conduct of the review.

Due to changes in the Project, the RP may require updates. Updates are posted to the same website and the Public will have a similar opportunity to comment on RP updates.

REVIEW SCHEDULE AND COSTS

The recommended schedule should show the timing and sequence of all reviews, to include a milestone schedule with the critical features of the Project design and construction. All costs for reviews should be provided to include expected in-kind contributions provided by the sponsor.

4.4 Review Plan Schedule

Review Plan receives District approval	January 15, 2013
Review Plan sent to MSC (MVD)	January 30, 2013
Review Plan sent to RMO (RMC)	February 10, 2013
RMC reviews and endorse Review Plan	March 10, 2013
MVD approves Review Plan	March 20, 2013
Review Plan sent to RIT	April 1, 2013

4.5 DQC Schedule and Cost

The DQC, which includes peer reviews, an ITR, and a BCOE review, is accomplished prior to ATR. The DQC costs are paid from Project funds. The schedule for completing major products for this Project is:

Plans Complete	June 7, 2010
Specifications Complete	June 7, 2010
DDR Complete	June 7, 2010
O&M Manual Updates Complete	September 30, 2015

4.6 ATR Schedule and Cost

4.6.1 ATR Schedule

See Appendix B for specific schedule dates. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process.

Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the documents; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;

- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

4.6.2 ATR Cost

The ATR costs are paid from Project funds. Upon establishment of an ATR team, the organization performing the reviews will provide a cost estimate along with information on how to fund this work to the MVM POC so that funding can be set up.

4.7 Model Certification/Approval Schedule and Cost

Not Applicable.

5 REVIEW TEAMS

5.1 District Quality Control Activities

This is the list of the review teams who will perform the DQC activities. It should be stated that the DQC will be managed by the home district in accordance with Major Subordinate Command (MSC) and District Quality Management Plans.

When policy and/or legal concerns arise during review efforts that are not readily and mutually resolved by the PDT and the reviewers, the District seeks issue resolution support from the vertical team in accordance with the procedures outlined in Appendix H, ER 1105-2-100 or other appropriate guidance.

5.1.1 Project Delivery Team

See Appendix A

5.1.2 Peer Reviewers

See Appendix A

5.1.3 BCOE Reviewers

NAME ¹	DISTRICT / SECTION	DISCIPLINE
Tom Morgan	CEMVM-EC-C	Construction Branch
Edward Lambert	CEMVN-PD-E	Environmental Branch
Shane Callahan	CEMVM-EC-D	Design Branch
Matt Turner	CEMVM-EC-G	Geotechnical Branch
James Pendergrass	CEMVM-EC-H	Hydraulic Branch

¹ Names will be removed in version posted for public review to protect privacy.

5.1.4 Drawing Approval for In-House Design

NAME ¹	DISTRICT / SECTION	DISCIPLINE
Thomas Minyard	CEMVM-EC	Engineering- Construction Division
David Berretta	CEMVM-EC-H	Hydraulic Branch Chief
Janet Berry	CEMVM-EC-D	Design Branch Chief
Cory Williams	CEMVM-EC -G	Geotechnical Chief
Roger Funderburk	CEMVM-EC-T	Technical Services Chief

¹ Names will be removed in version posted for public review to protect privacy.

5.1.5 Agency Technical Review

NAME ¹	DISTRICT / ORGANIZATION	DISCIPLINE
TBD	TBD	MSC Point of Contact
TBD	TBD	RMO Point of Contact
TBD	TBD	ATR Team Leader
TBD	TBD	Structural Engineer
TBD	TBD	Hydraulics Engineer
TBD	TBD	Civil Design Engineer
TBD	TBD	Mechanical Engineer
TBD	TBD	Geotechnical Engineer
TBD	TBD	Electrical Engineer
TBD	TBD	Cost Engineer
TBD	TBD	Cultural Resources
TBD	TBD	Biologist / Environmental

¹ Names will be removed in version posted for public review to protect privacy.

6 SUMMARY OF REVIEW PLAN UPDATES

Revision No.	Date	Description of major change(s)

7 APPENDICES (Listing/History of Completed Review Packages)

Review Date	Type of Review	Review Title / Description)
June 7, 2010	DDR	Design Documentation Report Bayou Meto Basin Design Report (A/E Firm Design Co)

7.1 APPENDIX A – Project Teams

Attachment 1: Team Rosters

Attachment 1: Team Rosters

Product Delivery Team

<u>Name</u>	<u>Role</u>	<u>Phone Number</u>	<u>E-mail</u>
Tracy James, P.E.	Project Manager	901-544-0673	Tracy.W.James@usace.army.mil
William Grantham	Civil Designer	901-544-0210	William.B.Grantham@usace.army.mil
Bill Snapp	Geographic Information System	901-544-3237	William.B.Snapp@usace.army.mil
Nicholas Bidlack	Geotechnical Engineer	901-544-4017	Nicholas.Bidlack@usace.army.mil
Neal Newman	Cost Engineering	901-544-0890	Neal.E.Newman@usace.army.mil
Mark Smith	Biologist/Environmental Lead	901-544-0705	Mark.Smith@usace.army.mil
Dr. Robert Dunn	Cultural Resources	901-544-0706	Robert.A.Dunn@usace.army.mil
Douglas Young	Real Estate	901-544-3154	Douglas.B.Young@usace.army.mil
Allen Scott Black	Office of Counsel	901-544-3662	Allen.S.Black1@usace.army.mil

DQC Team

<u>Name</u>	<u>Role</u>	<u>Phone Number</u>	<u>E-mail</u>
Tracy James, P.E.	Project Manager	901-544-0673	Tracy.M.James@usace.army.mil
Carter Bagley	Civil Designer	901-544-0661	Carter.Bagley@usace.army.mil
Jeremy Carpenter	Relocations	901-544-0810	Jeremy.Carpenter@usace.army.mil
Gary Billingsley	Construction Branch	901-544-4085	Gary.Billingsley@usace.army.mil
Richard Hurst	Cost Engineering	901-544-0886	Richard.H.Hurst@usace.army.mil
Roger Gaines	Hydrology	901-544-3055	Roger.A.Gaines@usace.army.mil
Kevin Pigott	Environmental Branch	901-544-4309	Kevin.R.Pigott.@usace.army.mil
Lee Fletcher	Area Office	901-544-3851	Robert.L.Fletcher2@usace.army.mil
Gene McAvoy	Area Office	901-544-3856	Richard.E.McAvoy@usace.army.mil

7.2 APPENDIX B – Review Plan Documents

Attachment 2: Sample Statement of Technical Review for Decision Documents**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the <type of product> for <project name and location>. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. 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, 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.

SIGNATUREName

ATR Team Leader

Office Symbol/CompanyDateSIGNATUREName

Project Manager

Office SymbolDateSIGNATURENameArchitect Engineer Project Manager¹Company, locationDateSIGNATUREName

Review Management Office Representative

Office SymbolDate**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

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

SIGNATUREName

Chief, Engineering Division

Office SymbolDate

¹ Only needed if some portion of the ATR was contracted

Attachment 3: Certification of Legal Review

All implementation documents have been reviewed for their compliance with law and policy. This Review Plan and all associated documents, has been fully reviewed by the Office of Counsel, Memphis District and is approved as legally sufficient.



Name Stephan C. Roth
Chief, District Counsel
CEMVM- DC

Date 1/9/13

Attachment 4: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number

Attachment 5: STATEMENT OF RATIONALE FOR DECISION TO HAVE/NOT HAVE AN IEPR

Attachment 5: Statement of Rationale for Decision to Have/Not Have an IEPR

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. According to EC 1165-2-209, the vertical team must make a risk-informed decision whether or not to conduct Type II IEPR, make a risk-informed decision to conduct Type II IEPR or make a risk informed recommendation to the Chief of Engineers or Director of Civil Works to not conduct Type II IEPR.

Table 1, based on the US Army Field Manual 5-19, Composite Risk Management, was used to assess each risk in the IEPR tables.

TABLE 1: RISK ASSESSMENT MATRIX

		Risk Probability			
		Frequent	Likely	Seldom	Unlikely
Severity	Catastrophic	E	E	H	M
	Critical	E	H	M	L
	Marginal	H	M	M	L
	Negligible	M	L	L	L
E (Extremely High)		Loss of ability to accomplish Project			Red
H (High)		Significantly degrades capabilities to accomplish Project			Blue
M (Moderate)		Degrades Project accomplishment capabilities			Yellow
L (Low)		Little or no impact on Project accomplishment			Green

Table 2 details the risks, frequency, severity, risk assessment, and how the risk contributes to the IEPR decision

TABLE 2: TYPE II IEPR RISK ASSESSMENT (FOR IMPLEMENTATION DOCUMENTS)

Risk	Probability	Severity	Assessment	Contributes to IEPR Decision?	Notes
The 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
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	Unlikely	Marginal	Low	No	
The Project design requires redundancy, resiliency, and robustness	Unlikely	Critical	Low	No	Floodwalls and levees in urban areas require redundancy, resiliency and robustness to ensure proper level of protection.
The Project has unique construction sequencing or a reduced or overlapping design construction schedule	Unlikely	Critical	Moderate	No	
Risk of interrupting power generation	Likely	Marginal	Low	No	Pump stations will maintain generator power in the event power is lost by the local utility supplier. This mitigates the risk of power generation interruption

Risk	Probability	Severity	Assessment	Contributes to IEPR Decision?	Notes
Risk of a faulty or incomplete design making it to construction	Unlikely	Critical	Low	No	DQC and ATR by personnel with experience on similar projects will mitigate the risk of a faulty or incomplete design
Risk of contractor misinterpreting design, which results in Project failure	Unlikely	Critical	Low	No	Construction quality control procedures will mitigate this risk

Based on the above assessment, as well as the fact that the Project is flood risk management, it is the risk-informed recommendation of the vertical team that Type II IEPR will not be required for this Project.

Attachment 6: Review Plan Checklist

Date: 04 December 2012
Originating District: Memphis District (MVM)
Project/Study Title: Bayou Meto Basin, Arkansas, Water Supply/Flood Control/
 Waterfowl Management Project
P2 #: 109378
District POC: Tracy James
PCX Reviewer: N/A

Please fill out this checklist and submit with the draft Review Plan when coordinating with the appropriate RMO. For DQC, the District is the RMO; for ATR of Dam and Levee Safety Studies, the Risk Management Center is the RMO; and for non-Dam and Levee Safety projects and other work products, MVD is the RMO; for Type II IEPR, the Risk Management Center is the RMO. Any evaluation boxes checked 'No' indicate the RP possibly may not comply with EC 1165-2-209 and should be explained. Additional coordination and issue resolution may be required prior to MSC approval of the Review Plan.

REQUIREMENT	REFERENCE	EVALUATION
1. Is the Review Plan (RP) a stand alone document?	EC 1165-2-209, Appendix B Para 4a	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
a. Does it include a cover page identifying it as a RP and listing the project/study title, originating district or office, and date of the plan?		a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
b. Does it include a table of contents?		b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
c. Is the purpose of the RP clearly stated and EC 1165-2-209 referenced?	EC 1165-2-209 Para 7a	c. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
d. Does it reference the Project Management Plan (PMP) of which the RP is a component including P2 Project #?	EC 1165-2-209 Para 7a (2)	d. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
e. Does it include a paragraph stating the title, subject, and purpose of the work product to be reviewed?	EC 1165-2-209 Appendix B Para 4a	e. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
f. Does it list the names and disciplines in the home district, MSC and RMO to whom inquiries about the plan may be directed?*	EC 1165-2-209, Appendix B, Para 4a	f. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

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<p><i>*Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.</i></p>		
<p>2. Documentation of risk-informed decisions on which levels of review are appropriate.</p>	<p>EC 1165-2-209, Appendix B, Para 4b</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>a. Does it succinctly describe the three levels of peer review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent External Peer Review (IEPR)?</p> <p>b. Does it contain a summary of the CW implementation products required?</p> <p>c. DQC is always required. The RP will need to address the following questions:</p> <p>i. Does it state that DQC will be managed by the home district in accordance with the Major Subordinate Command (MSC) and district Quality Management Plans?</p> <p>ii. Does it list the DQC activities (for example, 30, 60, 90, BCOE reviews, etc)</p> <p>iii. Does it list the review teams who will perform the DQC activities?</p> <p>iv. Does it provide tasks and related resource, funding and schedule showing when the DQC activities will be performed?</p> <p>d. Does it assume an ATR is required and if an ATR is not required does it provide a risk based decision of why it is not required? If an ATR is required the RP will need to address the following questions:</p> <p>i. Does it identify the ATR District, MSC, and RMO points of contact?</p>	<p>EC 1165-2-209,7a</p> <p>EC1165-2-209 Para 15</p> <p>EC1165-2-209 Para 15a</p> <p>EC1165-2-209 Para 8a</p> <p>EC 1165-2-209 Appendix B (1)</p> <p>EC 1165-2-209 Appendix B, 4g</p> <p>EC 1165-2-209 Appendix B Para 4c</p> <p>EC1165-2-209 Para 15a</p> <p>EC 1165-2-209 Para 7^a</p> <p>EC 1165-2-209</p>	<p>a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>i. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>ii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>iii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>iv. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>d. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>i. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>ii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

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<p>ii. Does it identify the ATR lead from outside the home MSC?</p> <p>iii. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)? If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?*</p> <p>iv. Does it provide tasks and related resource, funding and schedule showing when the ATR activities will be performed?</p> <p>v. Does the RP address the requirement to document ATR comments using Dr Checks?</p>	<p>Para 9c</p> <p>EC 1165-2-209 Appendix B 4g</p> <p>EC 1165-2-209 Appendix C Para 3e</p> <p>EC 1165-2-209 Para 7d (1)</p>	<p>iii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>iv. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>v. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p><i>*Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.</i></p>		
<p>e. Does it assume a Type II IEPR is required and if a Type II IEPR is not required does it provide a risk based decision of why it is not required including RMC/ MSC concurrence? If a Type II IEPR is required the RP will need to address the following questions:</p>	<p>EC1165-2-209 Para 15a</p>	<p>e. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>i. Does it provide a defensible rationale for the decision on Type II IEPR?</p>	<p>EC 1165-2-209 Para 7a</p>	<p>i. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>ii. Does it identify the Type II IEPR District, MSC, and RMO points of contact?</p>	<p>EC 1165-2-209 Appendix B Para 4a</p>	<p>ii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>iii. Does it state that for a Type II IEPR, it will be contracted with an A/E contractor or arranged with another government agency to manage external to the USACE</p>	<p>EC 1165-2-209 Appendix B Para 4k (4)</p>	<p>iii. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>iv. Does it state for a Type II IEPR, that the selection of IEPR review panel members will be made up of</p>	<p>EC 1165-2-209 Appendix B, Para 4k(1) & Appendix E,</p>	<p>iv. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

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<p>independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of expertise suitable for the review being conducted?</p> <p>v. Does it state for a Type II IEPR, that the selection of IEPR review panel members will be selected using the National Academy of Science (NAS) Policy which sets the standard for "independence" in the review process?</p> <p>vi. If the Type II IEPR panel is established by USACE, has local (i.e. District) counsel reviewed the Type II IEPR execution for FACA requirements?</p> <p>vii. Does it provide tasks and related resource, funding and schedule showing when the Type II IEPR activities will be performed?</p> <p>viii. Does the project address hurricane and storm risk management or flood risk management or any other aspects where Federal action is justified by life safety or significant threat to human life?</p> <p><i>Is it likely? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></i> <i>If yes, Type II IEPR must be addressed.</i></p> <p>ix. Does the RP address Type II IEPR factors?</p> <p>Factors to be considered include:</p> <ul style="list-style-type: none"> Does the project involve 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? Does the project design require 	<p>Para's 1a & 7</p> <p>EC 1165-2-209 Para 6b (4) and Para 10b</p> <p>EC1165-2-209 Appendix E, Para 7c(1)</p> <p>EC1165-2-209 Appendix E, Para 5a</p> <p>EC1165-2-209 Appendix E Para 2</p>	<p>v. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>vi. Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/></p> <p>vii. Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/></p> <p>viii. Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/></p> <p>ix. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
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<p>redundancy, resiliency and robustness?</p> <ul style="list-style-type: none"> Does the project have unique construction sequencing or a reduced or overlapping design construction schedule; for example, significant project features accomplished through Design Build or Early Contractor delivery systems? <p><i>Is it likely? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></i> <i>If yes, Type II IEPR must be addressed.</i></p> <p>g. Does it address policy compliance and legal review? If no, does it provide a risk based decision of why it is not required?</p>	<p>EC 1165-2-209 Para 14</p>	<p>g. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>3. Does the RP present the tasks, timing, and sequence of the reviews (including deferrals)?</p>	<p>EC 1165-2-209, Appendix B, Para 4c</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>a. Does it provide and overall review schedule that shows timing and sequence of all reviews?</p>	<p>EC 1165-2-209, Appendix C, Para 3g</p>	<p>a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>4. Does the RP address engineering model certification requirements?</p>	<p>EC 1165-2-209, Appendix B, Para 4i</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>a. Does it list the models and data anticipated to be used in developing recommendations?</p> <p>b. Does it indicate the certification /approval status of those models and if certification or approval of any model(s) will be needed?</p> <p>c. If needed, does the RP propose the appropriate level of certification and/or approval for the model(s) and how it will be accomplished?</p>		<p>a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>c. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>5. Does the RP explain how and when there will be opportunities for the public to comment on the study or project to be reviewed?</p>	<p>EC 1165-2-209, Appendix B, Para 4d</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>a. Does it discuss posting the RP on the District website?</p> <p>b. Does it indicate the web address, and</p>		<p>a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

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schedule and duration of the posting?		
6. Does the RP explain when significant and relevant public comments will be provided to the reviewers before they conduct their review?	EC 1165-2-209, Appendix B, Para 4e	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
a. Does it discuss the schedule of receiving public comments?		a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
b. Does it discuss the schedule of when significant comments will be provided to the reviewers?		b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
7. Does the RP address whether the public, including scientific or professional societies, will be asked to nominate professional reviewers?*	EC 1165-2-209, Appendix B, Para 4h	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
a. If the public is asked to nominate professional reviewers then does the RP provide a description of the requirements and answer who, what, when, where, and how questions? <i>* Typically the public will not be asked to nominate potential reviewers</i>		a. Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
8. Does the RP address expected in-kind contributions to be provided by the sponsor?	EC 1165-2-209, Appendix B, Para 4j	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
a. If expected in-kind contributions are to be provided by the sponsor, does the RP list the expected in-kind contributions to be provided by the sponsor?		a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
9. Does the RP explain how the reviews will be documented?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
a. Does the RP address the requirement to document ATR comments using Dr Checks and Type II IEPR published comments and responses pertaining to the design and construction activities summarized in a report reviewed and approved by the MSC and posted on the home district website?	EC 1165-2-209, Para 7d	a. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

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<p>b. Does the RP explain how the Type II IEPR will be documented in a Review Report?</p>	<p>EC 1165-2-209 Appendix B Para 4k (14)</p>	<p>b. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>c. Does the RP document how written responses to the Type II IEPR Review Report will be prepared?</p>	<p>EC 1165-2-209 Appendix B Para 4k (14)</p>	<p>c. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>d. Does the RP detail how the district/PCX/MSD and CECW-CP will disseminate the final Type II IEPR Review Report, USACE response, and all other materials related to the Type II IEPR on the internet?</p>	<p>EC 1165-2-209 Appendix B Para 5</p>	<p>d. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>10. Has the approval memorandum been prepared and does it accompany the RP?</p>	<p>EC 1165-2-209, Appendix B, Para 7</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>