

Independent External Peer Review Final Report

Mississippi River Levees Draft Supplemental Environmental Impact Statement II

29 October 2020

Prepared by: Analysis Planning and Management Institute

Prepared for: Department of the Army
U.S. Army Corps of Engineers
National Ecosystem Restoration Planning Center of Expertise

Blanket Purchase Agreement No. W912HQ20A0004

Delivery Order No. W912HQ20F0089



THIS PAGE INTENTIONALLY BLANK

Executive Summary

This Independent External Peer Review (IEPR) Final Report provides the results of an IEPR of the documents associated with the Mississippi River Levees (MRL) Draft Supplemental Environmental Impact Statement (SEIS) II, hereinafter referred to as MRL SEIS II. The Vicksburg District of the U.S. Army Corps of Engineers (USACE) prepared the MRL SEIS II in coordination with the St. Louis, Memphis, and New Orleans Districts.

Project Background

The Mississippi River and Tributaries (MR&T) Project was authorized by the Flood Control Act of 1928, as amended. The purpose of the MR&T Project is to reduce flood risk from the project design flood (PDF) in the Mississippi River alluvial valley between Cape Girardeau, Missouri and the Head of Passes, Louisiana. The PDF is defined as the greatest flood having a reasonable probability of occurrence.

The USACE identified 143 locations in the MRL system that require the construction of remedial measures necessary to raise and stabilize deficient sections of the existing levees and floodwalls and/or to control seepage through the levees to assure system integrity for the PDF.

The purpose of the MRL SEIS II is to formulate alternatives; identify significant resources; assess the direct, indirect, and cumulative impacts to the significant resources; develop mitigation measures; and evaluate and select a preferred alternative to construct levee segments to the federally authorized design grade at the identified locations to control for the PDF.

The USACE Tentatively Selected Plan consists of constructing levee enlargements, slope flattening, and seepage berms; installing relief wells; and correcting floodwall deficiencies, as appropriate, at 143 identified locations.

Independent External Peer Review Process

Analysis Planning and Management Institute (APM-I) has conducted the IEPR of the MRL SEIS II. The IEPR has been conducted following the procedures described in the guidance provided by the U.S. Office of Management and Budget in OMB (2004) and USACE Engineer Circular No. 1165-2-217 in USACE (2018). The IEPR was conducted to analyze the adequacy and acceptability of methods, modeling, data, and analyses used. The IEPR focused on a technical review and did not involve policy review.

The IEPR review was conducted by a panel of subject matter experts with expertise and experience as Environmental Resources Specialists.

The IEPR Panel was charged with providing a broad technical evaluation of the material contained in the selected technical documents and supporting documentation. The review focused only on the environmental and National Environmental Policy Act (NEPA) compliance issues described and analyzed in the MRL SEIS II and did not consider economic, engineering, or other technical issues not within the scope and expertise of the Review Panel. This report provides the final comments of the IEPR Panel.

Summary of the Independent External Peer Review Results

The IEPR Panel was impressed by the amount and depth of studies brought to bear on the questions regarding the extent of wetland impacts and mitigation required for this large-scale flood

improvement program. The USACE has prepared a lucid document that, in general, is well supported by the data and studies upon which it was based.

The IEPR Panel has identified some issues that need to be addressed in order to meet the requirements of NEPA and other federal laws and regulations and to address the charge questions of the IEPR. These issues are summarized here. An important issue is that the SEIS II does not provide specific criteria to select mitigation sites, relying only on a generic conclusion that reforestation of bottomland hardwood habitat will cover all impact needs. The development and basis for the Preferred Alternative, which seeks to avoid and minimize wetland impacts associated with the project, should have a better explanation as to why an alternative with no wetland impacts was not discussed and screened out. In addition, the assessment of project impacts relies on several models that had certain assumptions, species-based approaches, and sampling protocols that may overestimate impacts in some cases and underrepresent impacts in other cases. Furthermore, some adjustments to model inputs and explanation of methods and biases are recommended to determine mitigation requirements adequately. Moreover, there is a need for greater clarity and transparency for the process to select borrow pit locations that result in wetland impacts. Finally, private lands impacts are not adequately represented in the document.

Summary of Final Panel Comments

Presented below is a summary of the final IEPR Panel comments. Section 5 contains the definitions of comment significance and the complete comments with explanations and recommendations.

No.	Final Panel Comment
Significance: High	
1	The current text about mitigation states that bottomland hardwood reforestation will be the method of mitigation, but it does not specify criteria to select mitigation sites.
Significance: Medium High	
	The Panel did not identify any Medium High comments.
Significance: Medium	
2	The screening analysis of alternatives presented in Section 2 of the SEIS II does not provide sufficient detail to allow the reader to understand why some alternatives were screened out from further consideration or why others were not considered.
3	The screening analysis of alternatives presented in Section 2.2 of the SEIS II does not provide an alternative that meets the Project Purpose and Need but has no wetland impacts.
4	The SEIS II does not allow independent evaluation of whether impacts with fewer wetlands impacts are viable, thereby making it difficult to ascertain whether Alternative 3 is justifiable as the Preferred Alternative and if Alternative 3 meets the requirements of Section 404(b)1 of the Clean Water Act.
5	Future No-Action conditions for several resource areas should not assume that present conditions would remain the same for the 50-year project period.

No.	Final Panel Comment
6	The description of Future No-Action conditions for several resource sections omits the fact that catastrophic floods have a higher probability of occurrence than under the other alternatives; thus, the analysis discounts overall project benefits.
7	The SEIS II summary does not convey which environmental impacts are considered significant or summarize these impacts in plain language understandable to the public.
8	The Environmental Justice (EJ) section of the SEIS II (Section 4.2.1.2) provides significant detail but is not sufficiently focused to allow for evaluation of impacts.
9	The waterfowl impact analyses are based only on mallards, which does not completely represent multiple species present in the Mississippi Alluvial Valley (MAV) project area, species that forage in water depths > 18 inches, and species that use reforested bottomland hardwood areas 5-20 years old.
10	Terrestrial, bat, and threatened and endangered species analyses do not incorporate resource values in non-forested habitats.
11	Wetland impact analyses use an assumption of 100% wetland in the project's ½-mile buffer area, which overestimates the amount of wetland mitigation required.
Significance: Medium Low	
12	Section 4.2.14 of SEIS II on hazardous substances does not contain any comparison between alternatives.
13	The SEIS II states that land cover changes caused by project construction areas are permanent, but this may not be true for some types of construction activities.
Significance: Low	
14	Comments (e.g., page 142 of the SEIS II) about the value of flood frequency and duration do not accurately reflect hydroperiod influences and drivers of resources used by fish and waterfowl.
15	Private hunting/fishing/recreation properties and clubs in the project area are not identified except for two properties in Mississippi. The omission of documenting private recreation lands does not allow for an assessment of project impacts on these properties.

THIS PAGE INTENTIONALLY BLANK

Table of Contents

1	Introduction.....	1
1.1	Introduction and Report Overview	1
1.2	Independent External Peer Review Overview	2
1.3	Independent External Peer Review Management Team.....	2
2	Project Description.....	3
2.1	Background.....	3
2.2	Project Description	4
2.3	Tentatively Selected Plan.....	4
3	Independent External Peer Review Process	5
3.1	Managing the Project	5
3.2	Selecting the Panel	5
3.3	Preparing and Charging the Panel	6
3.4	Performing the Independent External Peer Review	7
3.5	Finalizing the Panel Comments.....	7
3.6	USACE Responses to Panel Comments.....	8
3.7	Panel BackCheck Responses	8
3.8	Addendum to the IEPR Final Report	8
4	Panel Organization	9
4.1	Independent External Peer Review Organization	9
4.2	Independent External Peer Review Panel Members	9
4.3	Independent External Peer Review Process Management Team.....	10
5	Independent External Peer Review Comments.....	13
5.1	Summary of Independent External Peer Review Comments	13
5.2	Independent External Peer Review Panel Comments	13
5.2.1	Significance: High.....	14
5.2.2	Significance: Medium High	15
5.2.3	Significance: Medium.....	15
5.2.4	Significance: Medium Low	22
5.2.5	Significance: Low.....	23
	Appendix A Charging the Independent External Peer Review Panel.....	25
	Appendix B Qualifications of the Panel Members	27
	B.1 Mr. Paul Bovitz.....	27
	B.2 Dr. Mickey Heitmeyer.....	28

List of Figures

Figure 1 - The Project Study Area of the Mississippi Alluvial Valley	3
Figure 2 - Organization for the IEPR	5

Figure 3 - Organization for this IEPR.....9

List of Tables

Table 1 - IEPR Documentation.....6
Table 2 - References.....31
Table 3 - Acronyms.....33

1 Introduction

1.1 Introduction and Report Overview

This Independent External Peer Review (IEPR) Final Report provides the results of an IEPR of the documents associated with the Mississippi River Levees (MRL) Draft Supplemental Environmental Impact Statement (SEIS) II, hereinafter referred to as MRL SEIS II. The Vicksburg District of the U.S. Army Corps of Engineers (USACE) prepared the MRL SEIS II in coordination with the St. Louis, Memphis, and New Orleans Districts.

As called for in the USACE Performance Work Statement (PWS) for the IEPR, the review focused only on the environmental and National Environmental Policy Act [NEPA (1969)] compliance issues described and analyzed in the MRL SEIS II. The review did not consider economic, engineering, or other technical issues not within the scope and expertise of the Review Panel.

The Mississippi River and Tributaries (MR&T) Project was authorized by the Flood Control Act of 1928, as amended. The purpose of the MR&T Project is to reduce flood risk from the project design flood (PDF) in the Mississippi River Alluvial Valley (MAV) between Cape Girardeau, Missouri and the Head of Passes, Louisiana. The PDF is defined as the greatest flood having a reasonable probability of occurrence.

The USACE identified 143 locations in the MRL system that require the construction of remedial measures necessary to raise and stabilize deficient sections of the existing levees and floodwalls and/or to control seepage through the levees to assure system integrity for the PDF.

The purpose of the MRL SEIS II is to formulate alternatives; identify significant resources; assess the direct, indirect, and cumulative impacts to the significant resources; develop mitigation measures; and evaluate and select a preferred alternative to construct levee segments to the federally authorized design grade at the identified locations to control for the PDF.

The USACE Tentatively Selected Plan consists of constructing levee enlargements, slope flattening, and seepage berms; installing relief wells; and correcting floodwall deficiencies as appropriate at the 143 identified locations.

Section 1 of the IEPR Final Report provides a description of the objectives of this IEPR, general background information on the IEPR, and unique corporate characteristics of Analysis Planning and Management Institute (APM-I), which managed the IEPR process and supported and assisted the IEPR Panel.

Section 2 provides an overview description of the USACE project and documents reviewed in this IEPR.

Section 3 summarizes the process followed to perform the IEPR.

Section 4 describes the IEPR Panel composition and the expertise of the IEPR Panel Members.

Section 5 presents the IEPR Panel comments along with basis of comments, their significance, and recommendations.

Appendix A reproduces the USACE Charge to Reviewers provided to the IEPR Panel to use as guidance for the IEPR.

Appendix B includes short resumes of the IEPR Panel Members.

1.2 Independent External Peer Review Overview

The USACE lifecycle review strategy for civil works projects provides for a review of project documents from initial planning through the project phases of design; construction; and operation, maintenance, repair, replacement, and rehabilitation. The strategy provides procedures for ensuring the quality and credibility of USACE decision, implementation, and operations and maintenance documents and work products.

Peer reviews, such as this IEPR, are one of the important procedures used to ensure that the quality of USACE published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The objective of this IEPR was to review the MRL SEIS II and associated appendices. The review focused only on the environmental and NEPA compliance issues described and analyzed in the MRL SEIS II and did not consider economic, engineering, or other technical issues not within the scope and expertise of the Review Panel.

The IEPR has been conducted in accordance with the procedures described in USACE (2018) in compliance with congressional requirements in WRDA (2007).

1.3 Independent External Peer Review Management Team

This IEPR was conducted by a panel of independent experts under the auspices of APM-I. APM-I is a not-for-profit science and technology company that provides impartial independent assistance, free of conflict of Interest (COI), to federal government organizations. APM-I meets the requirements for an Outside Eligible Organization (OEO) for conducting an IEPR as described in WRDA (2007). APM-I has not performed or advocated for nor against any federal water resources projects and has no real or perceived COI for conducting IEPRs. APM-I and the Panel Members for this IEPR have not been involved in any capacity with the efforts documented in the MRL SEIS II.

2 Project Description

The USACE is implementing the MR&T Project as authorized by the Flood Control Act of 1928, as amended. The goal of the project is to provide an environmentally sustainable project for comprehensive flood damage control, protection, and risk reduction in the MAV by means of levees, floodwalls, floodways, reservoirs, banks stabilization, and channel improvements in and along the Mississippi River and its tributaries.

2.1 Background

The purpose of the MR&T Project is to reduce flood risk from the PDF in the MAV between Cape Girardeau, Missouri and the Head of Passes, Louisiana. The PDF is defined as the greatest flood having a reasonable probability of occurrence. The MAV ranges in width from approximately 40 to 110 miles and extends through parts of seven states: Missouri, Illinois, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. Several USACE districts are involved in implementing the MR&T Project (Figure 1).

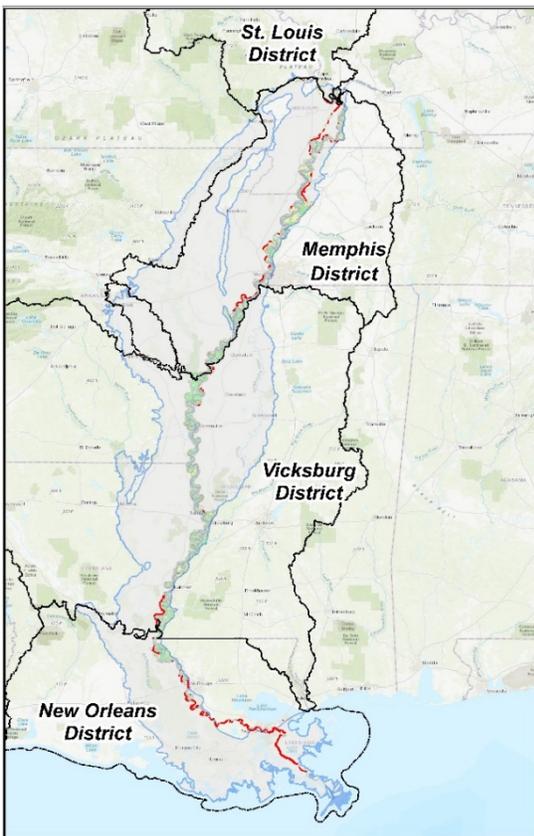


Figure 1 - The Project Study Area of the Mississippi Alluvial Valley

The MR&T Project comprises an extensive system of infrastructure and river control systems within the MAV. This infrastructure consists of levee system; floodways to divert excess flows past critical reaches; channel improvement and stabilization features to protect the integrity of flood risk management measures and to ensure proper alignment and depth of the navigation channel; and a system of reservoirs to regulate flows and backwater areas to provide storage during extreme events. The integrity of the levee system is also bolstered by control measures, such as landside berms; drainage trenches; drainage blankets; relief wells; and tributary basin improvements such as levees; headwater reservoirs; and pumping stations that expand flood risk management coverage and improve drainage into adjacent areas within the MAV.

The MRL feature of the MR&T Project, consisting of levees and floodwalls, extends for nearly 1,610 miles along the Mississippi River between the northern end of the alluvial valley near Cape Girardeau, Missouri and approximately 10 miles above Head of Passes, Louisiana near the Gulf of Mexico. The MRL is considered the backbone of the

MR&T flood risk management system. The MRL helps protect the 36,000 square-mile MAV from periodic overflows of the Mississippi River.

2.2 Project Description

The USACE has identified 143 locations in the MRL system that are deficient in varying ways. Certain remedial measures need to be undertaken at these locations to control seepage and to raise and/or stabilize the levee to protect the MAV against the PDF and to maintain the structural integrity of the MRL system.

2.3 Tentatively Selected Plan

The USACE has selected several types of project features that would be constructed as appropriate to correct the deficiencies identified at each of the 143 locations. The corrective measures that would be constructed as appropriate for each location are the following: levee enlargements, slope flattening, or seepage berms; installing relief wells; or correcting floodwall deficiencies. Project features would improve sections of deficient MRL and floodwalls to provide the required protection for the PDF.

3 Independent External Peer Review Process

This section summarizes the process for conducting this IEPR. APM-I performed the IEPR in accordance with its Work Plan in APM-I (2020), which addresses the requirements and procedures described in USACE (2018).

3.1 Managing the Project

The organizational structure for managing the IEPR is shown in Figure 2. The purpose of this organizational structure was to assure the independence of the review. As shown, APM-I mediated any interactions between the Panel and USACE. There was no direct interaction of Panel Members with USACE except for the meetings mediated by APM-I.



Figure 2 - Organization for the IEPR

3.2 Selecting the Panel

APM-I identified experts who met and exceeded the technical expertise and requirements established for this IEPR. APM-I identified any potential COI issues that candidate Panel Members could have with the project following the standards of the National Academy of Sciences in NAS (2003) and of the U.S. Office of Management and Budget in OMB (2004). The following criteria were considered in the screening of the candidates:

Expertise: Ensuring the selected reviewer has the knowledge, experience, and skills necessary to perform the review.

Independence: The reviewer was not involved with projects for the MRL SEIS II or in producing the documents to be reviewed.

Conflict of interest: Any financial or other interest that conflicts with the service of an individual on the Panel because it could impair the individual’s objectivity or could create an unfair competitive advantage for a person or organization as defined in NAS (2003).

Availability: Assessing the candidate’s availability to meet the project schedule.

APM-I conducted an initial screening of candidates to exclude those with inadequate expertise or having potential COI issues. APM-I then selected several candidates for further in-depth screening and evaluation to ensure they met or exceeded the requirements of this task. The list was subsequently narrowed down to identify the most qualified candidates who would be available to serve on the IEPR Panel while ensuring a balanced panel representing perspectives from academia, industry, and government to the extent possible. APM-I provided the list of selected panelists along with their summary qualifications relevant to this IEPR and detailed résumés to the USACE. The USACE used this information to determine if any proposed Panel Members had a potential COI based on USACE’s general knowledge of the candidate’s past employment or current involvement with the project. USACE acknowledged the relevancy of

Panel Members’ experience relative to the requirements of the IEPR and that there were no real or perceived COI issues. Information about the Panel Members is in Appendix B.

3.3 Preparing and Charging the Panel

The USACE provided to APM-I the documents to be reviewed by the IEPR Panel. Table 1 lists the documents used in this review. APM-I provided these documents to the Panel Members along with the final Charge to Reviewers. These charge questions established the general boundaries for the IEPR. The Charge to Reviewers is provided in Appendix A.

Table 1 - IEPR Documentation

Documents for Review
Main Report – MRL SEIS II
Appendix 1 – Work Item Description and Maps
Appendix 2 – Draft Fish and Wildlife Coordination Act Report
Appendix 3 – Preliminary Section 404(b)(1) Evaluation
Appendix 4 – Engineering
Appendix 5 – Waterfowl Assessment (Duck Use Days)
Appendix 6 – Terrestrial Habitat Evaluation Procedures
Appendix 7 – Bats
Appendix 8 – Migratory Birds
Appendix 9 – Endangered Species
Appendix 10 – Wetlands Assessment
Appendix 11 – Aquatic Analysis
Appendix 12 – Water Quality
Appendix 13 – Air Quality
Appendix 14 – Cultural Resources
Appendix 15 – Socioeconomic Analysis
Appendix 16 – Environmental Justice
Appendix 17 – Recreation
Appendix 18 – Esthetics
Appendix 19 – Hazardous, Toxic, and Radioactive Waste (HTRW) Evaluations
Appendix 20 – Mitigation
Appendix 21 – Public Involvement and Coordination

The Panel was provided templates and instructions for preparing their comments to ensure proper coverage of important issues and consistency in preparing the IEPR comments. The Panel was instructed that APM-I would be the conduit for information exchange between the Panel and USACE throughout the project to ensure a truly independent review.

3.4 Performing the Independent External Peer Review

This review involved conducting an independent technical peer review of the MRL SEIS II to analyze the adequacy and acceptability of methods, models, data, and analyses presented in the documents. The review focused on conducting a technical review and did not involve policy issues. The Panel used the charge questions as guidance for identifying relevant information and developing their comments and recommendations.

A kickoff meeting was held at the start of the IEPR with the Panel, USACE, and APM-I. At this meeting, introductions were made among the Panel members, USACE, and APM-I. The main purpose of this meeting was for the USACE to present an overview briefing of the USACE project that was the subject of this IEPR. The Panel asked questions of the USACE and discussed any initial issues of interest.

A teleconference was held with the Panel, USACE, and APM-I at the approximate midpoint of the IEPR, but before the Panel Members had finalized their comments. The purpose of the meeting was for the Panel to ask the USACE questions about the project and the documents under review, discuss project technical issues, and identify any additional USACE documentation and information that could help the Panel in its review. The Panel used the information from the meeting to help prepare and finalize its comments submitted in the Panel Final Report.

Throughout the review process, APM-I communicated to the Panel all relevant project information, instructions, and required actions and deadlines. APM-I acted as the conduit for information exchange between the Panel and USACE throughout the project in order to maintain the integrity and independence of the IEPR process.

3.5 Finalizing the Panel Comments

After completing the review, Panel Members submitted a draft of their comments to APM-I. We collated the Panel comments and ensured they were complete and responsive to the charge. We identified overall themes that were presented by multiple peer reviewers or repeated by one reviewer, comments that indicated conflicting peer review opinions, and other noteworthy comments. We ensured that the Panel comments focused on performing a technical review of the documents and did not comment on policy-related issues.

APM-I coordinated with the Panel to reach consensus on the comments, identify any overlapping comments, and resolve any contradictions. Further refinement and consolidation of the comments occurred via e-mail exchange and telephone discussions.

Each IEPR Final Panel Comment (FPC) consisted of four parts:

Comment: A clear statement of the concern.

Basis for Comment: An explanation of the basis for the concern.

Significance: A significance rating (see Section 5) of the concern (the importance of the concern with regard to project implementability) as well as a statement supporting this significance rating. Comments are rated as High, Medium High, Medium, Medium Low, or Low to indicate the general significance of the comment to project implementability.

Recommendation[s] for Resolution: Recommended actions necessary to resolve the concern, including a description of any additional research that would appreciably influence the conclusions.

3.6 USACE Responses to Panel Comments

After submitting this IEPR Final Report to the USACE, APM-I entered the FPCs into the Design Review and Checking System (DrChecks) for USACE internal tracking of the FPCs and recommendations as well as the formal responses by the USACE and IEPR Panel's responses (called the BackCheck) to complete the IEPR process. DrChecks is an Internet-based review and checking application that the USACE uses.¹

As part of IEPR process, the USACE will review and respond to the FPCs. The USACE will either "Concur" or "Non-Concur" with each Panel comment and will "Adopt" or "Not Adopt" each recommendation provided with that comment. The USACE will prepare a draft written Evaluator Response (ER) to each comment.

The IEPR Panel will then review the USACE draft ERs. APM-I will hold a meeting with the Panel Members and the USACE evaluators so that the Panel and USACE can discuss the draft ERs and ensure there is a clear understanding of the intent of FPCs. After this meeting, the USACE will finalize their ERs and enter them into DrChecks. The USACE's responses usually indicate whether documentation will or will not be expanded, revised, or changed in response to the FPCs.

3.7 Panel BackCheck Responses

After the USACE final ERs are submitted and entered into DrChecks, APM-I will meet with the Panel, as needed, to discuss the responses and the approach for preparing the Panel's BackCheck. As part of the BackCheck process, the Panel will select either "Concur" or "Non-Concur" with each USACE final ER and provide comments (as needed) to indicate whether each response adequately addresses the Panel's identified concerns. APM-I will enter the Panel's BackCheck responses to each USACE ER into DrChecks.

3.8 Addendum to the IEPR Final Report

The public comments received by the USACE on the MRL SEIS II during the public review period were not available to the IEPR Panel to consider in preparing the FPC because the public comment period closed after the Panel completed its review.

When the public comments are available, the USACE will provide them to APM-I to be considered by the IEPR Panel. APM-I will prepare an addendum to the IEPR Final Report that documents the results of the Panel's consideration of the public comments.

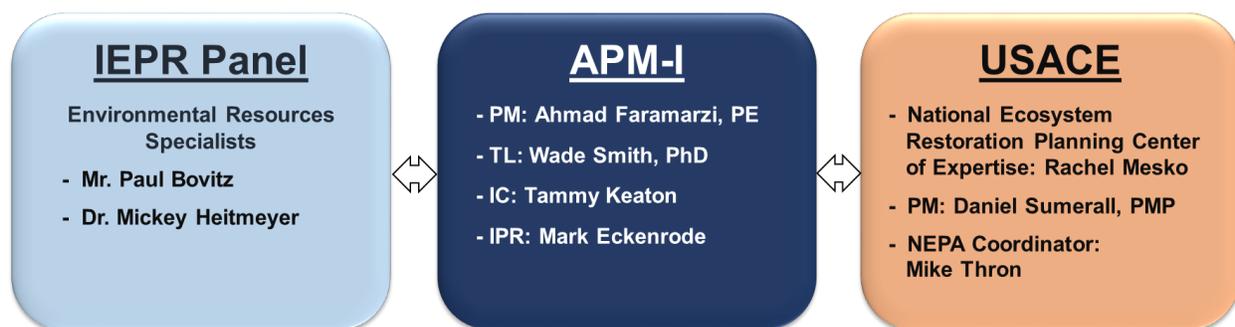
¹ Hosted on the USACE's PROject extraNET (ProjNet), a web service that allows the secure exchange of information.

4 Panel Organization

APM-I assembled a panel of experts that met and exceeded the qualifications set forth by the USACE in the PWS for the task. We supported and assisted the Panel in carrying out its review and served as the intermediary for communications between the Panel and USACE during the IEPR process.

4.1 Independent External Peer Review Organization

Figure 8 shows the organization of this IEPR. The purpose of this organization is to ensure the independence of the review.



(Note: For the acronyms see the List of Acronyms)

Figure 3 - Organization for this IEPR

4.2 Independent External Peer Review Panel Members

The IEPR Panel Members satisfied the qualifications for an Environmental Resources Specialist called for in the USACE PWS.

Mr. Paul Bovitz

Role: Environmental Resources Specialist

Mr. Bovitz is a certified professional wetlands scientist and ecologist with an MS degree in Ecology and over 30 years of experience nationwide and internationally, much of it directly applicable to the issues being addressed in this peer review. He is experienced in NEPA compliance, having completed several environmental impact statements, environmental assessments, Dredged Material Management Plans, and other NEPA documents. He also has extensive USACE contracting experience in preparing NEPA-compliant feasibility studies for habitat restoration and environmental remediation projects and is familiar with the USACE planning process for Civil Works projects. Mr. Bovitz has conducted ecological assessments for several NEPA-related projects, evaluated endangered species issues, has worked in both lake and river ecosystems, having performed aquatic surveys and ecological risk assessments at several sites. Mr. Bovitz is experienced with habitat equivalency analysis as applied to wetland mitigation and natural resources damages projects and has worked on ecotoxicological evaluation of fish and wildlife at many remediation sites nationwide. He has worked in the lower Mississippi River watershed evaluating environmental impacts of hurricane damage after Katrina, Rita, and several other

major storm events. As a peer reviewer he has evaluated NEPA compliance and natural resources issues for many flood control projects on behalf of several USACE districts, including New York, Jacksonville, St. Louis, and Albuquerque.

Dr. Mickey Heitmeyer

Role: Environmental Resources Specialist

Dr. Heitmeyer has over 40 years of experience with wildlife and wetland ecology. He holds a PhD in Wildlife Ecology from the University of Missouri-Columbia and was a postdoctoral fellow at the University of California-Davis. He has special expertise in the science and ecology of wetland and floodplain ecosystems throughout North America including major river systems in the Lower Mississippi Alluvial Valley, Missouri River ecosystem, Pacific Northwest, Great Basin, Central Valley of California, Great Lakes, Gulf Coast, and Southeast Atlantic Coast. He is recognized as a leading expert in several scientific areas. He helped establish the science and conservation foundation for wintering waterfowl ecology, especially mallards. His career research on wintering and migration ecology of waterfowl helped develop strategic applied conservation programs throughout North America. He helped initiate the concept of “cross-seasonal” effects in waterfowl ecology where energetic, physiological, and behavioral adaptations of species during nonbreeding periods and locations influence eventual reproductive success and survival. He helped establish ecological knowledge of bottomland hardwood forested wetlands, including greentree reservoirs, throughout the Lower Mississippi River Valley and elsewhere. He helped develop concepts of the hydrogeomorphic methodology to understand community relationships and management/restoration potential of lands in relation to geomorphic surface, soils, topography, and hydrology. He helped initiate integration of working agricultural lands with waterfowl conservation strategies in California and the Lower Mississippi Alluvial Valley. He has over 150 scientific publications in peer-reviewed journals, monographs, books, symposia, and technical reports. He is a member of the Arkansas Waterfowler Hall of Fame and the California Waterfowl Hall of Fame.

4.3 Independent External Peer Review Process Management Team

The APM-I IEPR process management team consisted of the following members.

Mr. Ahmad Faramarzi, PE, PMP

Role: Project Manager

Mr. Faramarzi, Project Manager (PM), is a registered professional engineer (PE) and a project management professional with over 35 years of experience providing managerial and technical expertise to government clients, including the Office of the Secretary of Defense (OSD), the U.S. Army, the U.S. Air Force, Institute for Defense Analysis (IDA), USACE, and the Defense Nuclear Facility Safety Board. He has organized and managed several important and highly visible standing expert panels in response to recommendations by the National Academy of Sciences (NAS), has been an expert on several panels developing recommendations to cabinet level positions and Congress. He has also conducted Environmental Assessments (EA) and is familiar with NEPA process for the U.S. Army. He has conducted over two dozen IEPRs of water resources projects under the jurisdiction of USACE. Mr. Faramarzi has an applied scientist/engineer degree in Fluid Mechanics, an MS in Mechanical Engineering, and a BS in

Nuclear Engineering. He is on the Board of Directors of the Washington, DC Section of the American Society for Mechanical Engineers and a member of American Society of Civil Engineers (ASCE).

Dr. Wade Smith

Role: Task Leader

Dr. Smith, Task Leader (TL), is an ecologist and environmental scientist who received his PhD in Environmental Engineering Sciences from the University of Florida. He has over 38 years of experience with environmental regulations, including the NEPA process, and with analyzing the environmental impacts of a wide variety of types of federal projects. Examples include dredging and dredged material disposal, offshore oil and gas exploration and production, domestic and industrial wastewater disposal, operation of electric power generating stations, construction and operation of coastal recreational developments, pipeline construction and operation, realignment and re-stationing of military forces, closing of military installations, operation of chemical munitions destruction facilities, and dismantling of chemical warfare agent production facilities. Dr. Smith is experienced in working on scientific and engineering issues involving complex and controversial projects. He has prepared programmatic and site-specific environmental impact statements (EIS), environmental assessments, and subject-specific environmental analyses. Dr. Smith has been responsible for all elements of analysis of the physical, biological, and socioeconomic environments. He has participated in all NEPA phases: scoping, draft EIS, public hearings, response to public comments, final EIS, and record of decision. Dr. Smith has also prepared NEPA and environmental analysis guidance documents to be used by federal environmental managers and planners. He has managed and participated in independent reviews of federal projects.

Ms. Tammy Keaton

Role: IEPR Coordinator

Ms. Keaton, IEPR Coordinator (IC), was responsible for supporting the PM and TL in the execution of the requirements of this IEPR, including coordinating and organizing meetings and assisting in the development of intermediate and final work products and deliverables. Ms. Keaton has over 20 years of experience leading and supporting programs and projects for federal government (e.g., DOJ, DOE, DOI) and commercial clients where she was responsible for achieving quality, schedule, and budget requirements. She managed technology requirements and coordinated resources towards accomplishing multiple, simultaneous projects and task orders. She utilized insights from her membership at the Project Management Institute to support federal agencies.

Mr. Mark D. Eckenrode

Role: Internal Peer Reviewer

Mr. Eckenrode, Internal Peer Reviewer (IPR), conducted an internal Quality Assurance review of the major deliverables under this IEPR, including an internal peer review of the final IEPR reports. Over the course of his 40-year career, he has provided technical, management, and contract administration leadership and expertise in support of projects for U.S., Asian, and European companies. He has interacted with senior leaders in U.S. Federal agencies and European authorities on a variety of engineering, environmental, and safety issues. He served as an emergency response coordinator for the operation of nuclear facilities in Mississippi and Louisiana during the hurricane Katrina disaster. Mr. Eckenrode has taught classes in environmental science,

health physics, and chemistry and has analyzed associated field tests. He holds an MBA from Millsaps College and an MS and a BS degree in nuclear engineering and science from Virginia Tech. Mr. Eckenrode is an active member of the American National Standards Institute and a member of the reactor physics board, which is a collegial Panel of experts establishing standards and providing guidance for the industry.

5 Independent External Peer Review Comments

The IEPR Panel has completed a detailed independent technical review of the MRL SEIS II prepared by the USACE Vicksburg District. As called for in the PWS, the review focused only on the environmental and NEPA issues described and analyzed in the SEIS II and did not consider economic, engineering, or other technical issues not within the scope and expertise of the Review Panel.

Section 5.1 provides a summary of the IEPR Panel comments. Section 5.2 presents the complete set of IEPR Panel comments.

5.1 Summary of Independent External Peer Review Comments

There were 15 Panel comments². The following is a summary of issues identified by the Panel.

The IEPR Panel was impressed by the amount and depth of studies brought to bear on the questions regarding the extent of wetland impacts and mitigation required for this large-scale flood improvement program. The USACE has prepared a lucid document that, in general, is well supported by the data and studies upon which it was based.

The IEPR Panel has identified some issues that need to be addressed in order to meet the requirements of NEPA and other federal laws and regulations and to address the charge questions of the IEPR. These issues are summarized here. An important issue is that the SEIS II does not provide specific criteria to select mitigation sites, relying only on a generic conclusion that reforestation of bottomland hardwood habitat will cover all impact needs. The development and basis for the Preferred Alternative, which seeks to avoid and minimize wetland impacts associated with the project, should have a better explanation as to why an alternative with no wetland impacts was not discussed and screened out. In addition, the assessment of project impacts relies on several models that had certain assumptions, species-based approaches, and sampling protocols that may overestimate impacts in some cases and underrepresent impacts in other cases. Furthermore, some adjustments to model inputs and explanation of methods and biases are recommended to determine mitigation requirements adequately. Moreover, there is a need for greater clarity and transparency for the process to select borrow pit locations that result in wetland impacts. Finally, private lands impacts are not adequately represented in the document.

5.2 Independent External Peer Review Panel Comments

This section contains the complete set of comments of the IEPR Panel. Each comment consists of four parts:

Comment

Basis for comment

Significance of the concern

Recommendation for resolution of the comment.

² Panel comments consisted of 1 High significance, 0 Medium High significance, 10 Medium significance, 2 Medium Low significance, and 2 Low significance.

Comments were rated to indicate the general significance related to the project impact and implementation using the following definitions:

- **High** – There is a fundamental issue within study documents or data that will influence the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
- **Medium High** – There is a fundamental issue within study documents or data that has a strong probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
- **Medium** – There is a fundamental issue within study documents or data that has the low probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.
- **Medium Low** – There is missing, incomplete, or inconsistent technical or scientific information that affects clarity, understanding, or completeness of study documents, and there is uncertainty whether the missing information will affect selection of, justification of, or ability to implement the recommended plan.
- **Low** – There is a minor technical or scientific discrepancy or inconsistency that affects clarity, understanding, or completeness of study documents but does not influence the selection of, justification of, or ability to implement the recommended plan.

5.2.1 Significance: High

COMMENT 1
The current text about mitigation states that bottomland hardwood reforestation will be the method of mitigation, but it does not specify criteria to select mitigation sites.
Basis for Comment
The range of project work sites from Cape Girardeau, Missouri to the Gulf Coast includes many diverse floodplain locations with variable hydrogeomorphic settings, soil types, hydrological regimes, land cover types, and distinct forest communities and composition. However, the Supplemental Environmental Impact Statement (SEIS) II text states that only bottomland hardwood (BLH) reforestation will be used for mitigation and does not account for work site impact variation. Specifically, the text does not outline a temporal or spatial process of mitigation selection including preference for sites or non-BLH habitats such as riverside vs. landside, Potential Natural Vegetation community type, flood frequency or duration, future desired condition, vegetation and water management, and potential management to address invasive fish, wildlife and plant species.
Significance: High
The project requires appropriate mitigation to compensate for project impacts. However, without clear guidance about when, where, and how mitigation will be implemented it is unclear if project impacts can be mitigated successfully. This will affect the ability to implement the recommended plan.
Recommendation for Resolution
Recommendation #1: Develop, and include in the SEIS II, the method that the U.S. Army Corps of Engineers (USACE) will use to select mitigation sites. For example, the method could be a decision-tree type matrix about how mitigation sites will be selected based on geographical area, size and type of

habitat impacted, Potential Natural Vegetation and Hydrogeomorphic-based community objectives, and required management and monitoring of mitigation sites over time.

5.2.2 Significance: Medium High

The Panel did not identify any Medium High comments.

5.2.3 Significance: Medium

COMMENT 2
The screening analysis of alternatives presented in Section 2 of the SEIS II does not provide sufficient detail to allow the reader to understand why some alternatives were screened out from further consideration or why others were not considered.
Basis for Comment
Section 2.2 describes six alternatives. In some cases, it does not clearly indicate which of these alternatives would satisfy the Project Need “to design, build, maintain, operate, and repair the mainline Mississippi River Levees (MRL) to ensure that the MRL system provides protection up to the congressionally authorized level of the Project Design Flood (PDF)” (page 1). It also does not indicate which alternative would meet the Project Purpose of reducing the likelihood of future catastrophic floods within the project area. Clearly, the No-Action Alternative would not meet the Project Purpose and Need, and the likelihood of catastrophic flooding would be much greater over time. Further detail for why Alternatives 4, 5 and 6 were rejected is warranted in terms of backup analysis.
Significance: Medium
Clarification for how alternatives are screened out is an important revision of the SEIS II since it affects the justification for the alternatives that were carried forward.
Recommendation for Resolution
Recommendation #1: Provide a more detailed description of what Alternative 4 would require for implementation in order to document why it would not meet the Project Purpose and Need. This could include, for example, the economic costs of property buyouts and other elements compared to the alternatives carried forward. Recommendation #2: More information is needed for Alternative 5 regarding the effectiveness of nature-based alternatives versus fixing the existing levee system. For example, willow thatch and similar stabilization measures could be inadequate to handle the force of catastrophic floods in the area. However, nature-based alternatives could be used within specific project elements such as mitigation design (as noted in the SEIS II), and therefore these elements do not necessarily constitute a discrete mutually exclusive alternative that can be rejected. Recommendation #3: Alternative 6, the Levee Set Back Alternative, should provide a reference or link to the backup analysis showing that the specific design elements required would not be economically viable compared to the alternatives carried forward.

COMMENT 3
The screening analysis of alternatives presented in Section 2.2 of the SEIS II does not provide an alternative that meets the Project Purpose and Need but has no wetland impacts.
Basis for Comment
Section 2.2 describes six alternatives, but raises the following question: if Alternative 3 is the Avoidance and Minimization Alternative, why was an alternative with no wetland impacts not presented and screened out?
Significance: Medium
Adding another Alternative could affect the conclusions of the SEIS II; however, it is likely that the USACE can screen out a No Wetland Impact Alternative based on the existing data. Clarification for how alternatives are screened out is an important revision of the SEIS II.
Recommendation for Resolution
Recommendation #1: The screening analysis of the SEIS II should consider an Alternative with no wetland impacts and analyze this alternative for its ability to meet the Project Purpose and Need. Discussion could be provided as to why this Alternative would not be economically or logistically viable as the reason for not carrying it forward. If it is carried forward, the document should discuss the difference in environmental impacts from that Alternative versus other alternatives carried forward.

COMMENT 4
The SEIS II does not allow independent evaluation of whether alternatives with fewer wetlands impacts are viable, thereby making it difficult to ascertain whether Alternative 3 is justifiable as the Preferred Alternative and if Alternative 3 meets the requirements of Section 404(b)1 of the Clean Water Act.
Basis for Comment
The alternatives analysis lacks a detailed description of the methodology used to avoid and minimize wetlands impacts, particularly regarding borrow pits, impeding the ability to ascertain whether alternatives with fewer impacts are practicable. This is a critical point since Section 404 (b) 1 of the Clean Water Act and subsequent codified Environmental Protection Agency (EPA) regulations indicate <i>"no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."</i> 40 CFR 230.10(a).
The ranking system introduced on page 19 of the SEIS II under Alternative 3 explains part of the process by which borrow pit selection was made in order to obtain sufficient material to address project requirements while minimizing impacts. However, more detail is required to allow transparent evaluation of how project impacts were avoided and minimized prior to identification of mitigation requirements. The panel understands that a single criterion (such as sites within 0.5 miles from the item location) cannot be used as a basis for this discussion. However, it may well be possible to include a hierarchical description of the process used by USACE to avoid and minimize impacts. Otherwise the reader is left questioning why the USACE could not just consider sites farther away to obtain borrow material and avoid impacts entirely.

Significance: Medium
This comment is important for the purposes of National Environmental Policy Act (NEPA) and Section 404 compliance, and it could potentially affect the conclusions of the Environmental Impact Statement (EIS) and final formulation of the Preferred Alternative.
Recommendation for Resolution
Recommendation #1: Add a description of the methodology used to avoid and minimize impacts to wetlands. One way of doing this could be a hierarchical decision-making tree or flow chart summarizing how borrow pit impacts were avoided and then minimized. For example, a single radius (distance) could be used as a preferred starting point for obtaining material in a cost effective and logistically feasible manner. The minimum criteria that would need to be met would be distance from the construction site of ≥ 0.5 -mile, presence of geotechnically suitable borrow material, and complete avoidance of wetlands. Of the 143 items (sites) summarize the number that meet that criteria. For the next set of sites, consider expanding the radius to a mile and then repeat the analysis. Summarize the number of sites that meet those criteria. Repeat 0.5-mile (or a mile, etc.) farther until for a given reach it is deemed economically or logistically infeasible to go farther to obtain suitable material without affecting wetlands. Summarize those remaining sites for which wetland impacts would have to occur and then use the ranking system to minimize impacts. If this approach is not adopted, describe in a backup document what was done so the reader can understand how Alternative 3 compares to an alternative that would have no wetland impacts. It is understood that the latter alternative may not be viable, but a transparent analysis is warranted.

COMMENT 5
Future No-Action conditions for several resource areas should not assume that present conditions will remain the same for the 50-year project period.
Basis for Comment
<p>Pages 79 and 81 of the Future No-action conditions seem to assume that the current case will remain stagnant. Yet many resources would change due to natural conditions over the 50-year project window being analyzed. Land use cover types may change regardless of whether the project is built (e.g. increasing suburban development in agricultural areas and non-wetland habitats over time). Waterfowl populations may be showing an increasing or decreasing trend. Duck days may stay the same, but the population may not. Populations of individual waterfowl species may be declining (e.g. black duck) or increasing (e.g. resident Giant Canada geese).</p> <p>On page 98 of the Future No-action conditions, the text suggests that wetland inputs would remain stable over time. Over the 50-year assessment period, vegetation succession alone would result in significant changes (as indicated in the Appendix of the document).</p> <p>On page 102 of the Future No-action conditions borrow pits are described under Future No Action as essentially remaining the same but the text does not address impacts of siltation, changes in shoreline area and bathymetry of these ponds over the 50-year analysis window.</p> <p>Section 4.2.4 Migratory Birds; a similar assumption is made that under No Action that the situation will remain the same. Migratory bird populations are likely to continue over the next 50 years. Examples are the decline of Neotropical migrants and the increase of nuisance non-migratory species such as house sparrows, starlings, etc. as development continues over the project area.</p>

Significance: Medium
The above examples are not likely to significantly affect the findings of the SEIS II, but careful consideration of Future No-Action conditions is required to accurately assess impacts of the Preferred Alternative relative to Future No-Action conditions.
Recommendation for Resolution
Recommendation #1: Revise the above sections and any other sections that assume present conditions will remain the same for the next 50 years, because that is seldom the case when a detailed analysis is undertaken. The text on page 110 for Cultural Resources is a good model of projecting Future No-Action conditions.

COMMENT 6
The description of Future No-Action conditions for several resource sections omits the fact that catastrophic floods have a higher probability of occurrence than under the other alternatives; thus, the analysis discounts overall project benefits.
Basis for Comment
The Purpose and Need section of the SEIS II establishes the need for the project in order to minimize the potential for future catastrophic floods. Under the Future No-Action Alternative, the project would not be built, and it is only a matter of time before such floods would occur. No one can say for certain if a flood would occur within the 50-year period, but the probability would be much higher, and hence the possibility of adverse impacts from flooding is much higher under the Future No-Action Alternative. Presently the SEIS II does not capture this important concept. This would be true, not only to human health and the economy but for a host of environmental issues as well. For example, the 1,400 acres of habitat required for project mitigation might easily be exceeded by flood impacts from the Future No-Action alternative since destructive floods can impact habitats, recreational access to hunting and fishing areas, direct mortality to terrestrial species of wildlife, and release of hazardous substances to the environment, such as occurred after hurricanes Katrina, Ike, Gustav, and several other major flood events in the area.
Significance: Medium
This could affect overall findings of the EIS by indirectly omitting significant project benefits.
Recommendation for Resolution
Recommendation #1: The description of the Future No-Action condition should discuss the potential impacts of catastrophic floods discussed above so that project benefits are evaluated in an appropriate context.

COMMENT 7
The SEIS II summary does not convey which environmental impacts are considered significant or summarize these impacts in plain language understandable to the public.

Basis for Comment
<p>The Council on Environmental Quality regulations implementing NEPA were recently revised (July 2020) and seemed to place less emphasis on the term “significance” of impacts. However, Section 1502.1 states that the Environmental Impact Statement “shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.” While the document has largely done this, the summary at the front (specifically S2, Major Conclusions and Findings) does not call out what the significant project impacts would be in simple terms. Moreover, Table S-1 that summarizes impacts between Alternatives is not likely to be accessible and easily understood by the public. People understand acreage, but using terminology such as FCUs, HSUs, AAHUs, etc., in a summary table up front does not meet the regulatory requirement in Section 1502.8 of “writing in plain language”.</p>
Significance: Medium
<p>The issue is important but is rated as “Medium” because it can be easily addressed; the conclusions of the SEIS II are unlikely to change, but document revision is recommended to comply with regulations.</p>
Recommendation for Resolution
<p>Recommendation #1: In the summary section in the front of the SEIS II, use Table 4-21, which is an excellent, transparent table summarizing both acreage impacts and functional values to arrive at estimates of mitigation required. Alternatively, simply discuss acreage of impacts and then mention the mitigation in acres required that USACE calculated. If the readers want additional information, they can refer to the backup numbers in the appropriate sections of the EIS where they appear.</p> <p>Recommendation #2: Include in the summary section at the front of the SEIS II a succinct description of impacts considered significant. Presumably, these are unavoidable wetland impacts that are proposed for mitigation. Other issues may be added if necessary pending public and agency review.</p>

COMMENT 8
<p>The Environmental Justice (EJ) section of the SEIS II (Section 4.2.1.2) provides significant detail but it is not sufficiently focused to allow for evaluation of impacts.</p>
Basis for Comment
<p>Section 4.2.1.2 Environmental Justice - The first sentence indicates that without the project no EJ impacts would occur. This could be misinterpreted by the reader to infer that the project would result in EJ impacts. However, EJ impacts are more likely to occur under the Future No Action alternative since flooding could displace residents without project improvements over the next 50 years.</p> <p>The EJ section does not indicate whether any residents would be displaced by the proposed action and if so, whether they would disproportionately affect EJ populations.</p> <p>The EJ section lacks sufficient detail on projected adverse impacts and does not indicate whether there are any residential structures located within 0.5 mile of the proposed 143 sites. It does not indicate how EJ populations might be adversely affected, for example, whether any levee improvements would adversely affect aesthetics, transportation, property values, etc. It does not identify which sites have the most structures or highest populations associated with them. It is understood that final design plans have not yet been prepared but it should be possible at this stage to evaluate the extent of unavoidable</p>

impacts (if any) to EJ communities. Some potential impacts (e.g., levee modifications in areas with greatest seepage) would clearly be higher priority than others would (e.g., construction of borrow pits for material). It should be possible at this point to evaluate which priority sites would have unavoidable EJ impacts, if any.

Significance: Medium

An important topic that needs to be better addressed in the SEIS II since it can potentially influence what and how a plan is implemented at a location.

Recommendation for Resolution

Recommendation #1: Revise text to clarify what will happen under Future No Action conditions to EJ populations versus the Preferred Alternative.

Recommendation #2: Revise text to indicate that most of the levee system has already been constructed. Implementation of the additional 143 items to fill gaps in the flood control network is not likely to have major impacts on EJ. The text should clearly address the items USACE provided in their written responses to the mid-point review questions.

Recommendation #3: Revise text to address issues raised above under “Basis for Comment.” The analysis could then focus on those sites most likely to have EJ impacts assuming flood wall characteristics are similar at all sites, affecting aesthetics, transportation, property value, etc. The prioritization of levee modifications should be compared with the presence of EJ populations to evaluate impacts and reach conclusions. For example, “EJ impacts in this particular area are unavoidable because this section of the levee system is high priority for repair to prevent future loss of life.”

COMMENT 9

The waterfowl impact analyses are based only on mallards, which does not completely represent multiple species present in the Mississippi Alluvial Valley (MAV) project area, species that forage in water depths > 18 inches, and species that use reforested bottomland hardwood areas 5-20 years old.

Basis for Comment

The current waterfowl analyses used only mallard duck-energy days calculations to determine project impacts, but many diverse species use resources in the project areas ranging from small teal to large geese that have different daily energy requirements.

The diverse waterfowl species present in the MAV have a wide range of preferred foraging depths and adaptations to do so, but the current analyses restricts impact assessment to areas flooded < 19 inches deep.

The current waterfowl analyses assign no waterfowl food values to reforested areas 5-20 years old, yet these areas have substantial moist-soil, invertebrate, and vegetation that provide waterfowl foods.

Significance: Medium

Inclusion of multiple waterfowl species, water depths > 18 inches, and resource values in the 5-20 -year post reforestation period could change projected project impacts and mitigation requirements.

Recommendation for Resolution
Recommendation #1: Calculate a portion of project impacts based on non-mallard species.
Recommendation #2: Assess a portion of project impacts to water depths up to 30 inches.
Recommendation #3: Assign resource values to reforested areas 5-20 years old using shrub/scrub habitat values in the duck-use-days manual.

COMMENT 10
Terrestrial, bat, and threatened and endangered species analyses do not incorporate resource values in non-forested habitats.
Basis for Comment
Current analyses of terrestrial wildlife impacts using Habitat Evaluation Procedure models rely on species that are associated with BLH habitats and do not include other common species in the MAV project areas that often use non-forested habitats for a portion of their life cycle needs.
Current assessment of habitat use and project impacts on bats discount bat use of forest edge, agricultural, and pasture/grassland areas.
Current assessment of threatened and endangered species habitat use and project impacts discount use of non-forested habitats and resources.
Significance: Medium
Inclusion of common terrestrial wildlife, bat, and threatened and endangered species that rely on non-forested habitats could change assessment of project impacts and calculations of mitigation requirements.
Recommendation for Resolution
Recommendation #1: Add at least a wading bird or shorebird to Habitat Evaluation Procedure model analyses.
Recommendation #2: Include a discussion of bat, songbird, and small mammal foraging and resource use in non-forested habitat areas with suggestions for mitigation of these resources.
Recommendation #3: Change wording in Appendix 7, page 8 to address the probability that all borrow areas will be converted to open water habitats.

COMMENT 11
Wetland impact analyses use an assumption of 100% wetland in the project ½-mile buffer area, which overestimates the amount of wetland mitigation required.
Basis for Comment
The entire ½-mile buffer area around project work site locations was assumed to be wetland. Substantial areas within work sites ranging from southeast Missouri to New Orleans contain non-wetland land cover include roads, building and farm compounds, upland agriculture and grassland, and idle areas. The

inclusion of these land cover types in the wetland assessment of impacts creates an overestimate of wetland impacted areas and biases the modeling and determination of mitigation needed. Given the variable amount of wetland in project work site locations, some estimate of variation in true wetland area should be provided in the form of acknowledged stochasticity and confidence intervals so that readers can evaluate the degree of overestimation of impacts.

Significance: Medium

Assuming that the entire 1/2-mile buffer area is wetland could overestimate potential project impacts and mitigation requirements.

Recommendation for Resolution

Recommendation #1: Include a discussion of why the 1/2-mile project buffer area was assumed to be wetland, and how a different evaluation using more technically based wetland determination could have affected assessment of project impacts and mitigation requirements. Then provide estimates of project site variation in true wetland area impacts and stochasticity.

5.2.4 Significance: Medium Low

COMMENT 12

Section 4.2.14 on hazardous substances does not contain any comparison between alternatives.

Basis for Comment

Section 4.2.14 appears to have a different format than other sections and does not compare consequences of different alternatives. Under Future No Action conditions, the risks of releases of hazardous substances from facilities would be greater due to catastrophic floods, which could result in pipeline breakage, floating tanks, chemical and petroleum spills, and related issues causing environmental damage. This was a major impact of flood events associated with hurricanes Katrina and Rita and other major storms in the lower MAV system.

Significance: Medium Low

While this issue is unlikely to affect the conclusions of the SEIS II, the section presently does not contain a comparison of alternatives.

Recommendation for Resolution

Recommendation #1: Revise the text to provide a comparison of alternatives.

COMMENT 13

The SEIS II states that land cover changes caused by project construction areas are permanent, but this may not be true for some types of construction activities.

Basis for Comment
As written, the text assumes all project construction activities will cause permanent land cover changes, which is unlikely. For example, many activities will be temporary such as haul roads, cleared areas, and small excavations.
Significance: Medium Low
Because some construction activities will create only temporary land cover changes, the assessment of project impacts may not be as substantial as assumed, which could change mitigation requirements.
Recommendation for Resolution
Recommendation #1: Develop at least a two-tier evaluation of land cover changes caused by construction activities to include both short-term temporary vs. long-term permanent changes.

5.2.5 Significance: Low

COMMENT 14
Comments (e.g., page 142 of the SEIS II) about the value of flood frequency and duration do not accurately reflect hydroperiod influences and drivers of resources used by fish and waterfowl.
Basis for Comment
As written, the comments on flood frequency and duration could be interpreted that extensive deep flooding creates greater resource values to fish and wildlife. But considerable literature [e.g., Middleton (2002)] indicates that seasonal short duration flood pulses and/or temporary inundation of floodplain wetlands creates higher primary and secondary production that increases seasonal resources used by many fish and wildlife species using floodplain habitats.
Middleton (2002): Middleton, B.A., <i>Flood Pulsing in Wetlands: Restoring the Natural Hydrological Balance</i> ; John Wiley and Sons, Inc. New York; 2002.
Significance: Low
While the comments described above may not directly alter assessment of project impacts per the various models used, it does potentially cause confusion about hydrology driers in large river floodplains and eventual selection criteria for mitigation sites and long-term management of those sites.
Recommendation for Resolution
Recommendation #1: Revise the discussion about flood frequency and duration to best reflect the state of understanding accurately about flood pulse and hydroperiod influences on resource values for fish and waterfowl.

COMMENT 15
Private hunting/fishing/recreation properties and clubs in the project area are not identified except for two properties in Mississippi. The omission of documenting private recreation lands does not allow for an assessment of project impacts on these properties.

Basis for Comment
Currently Appendix 17 provides a detailed list of public recreation and conservation lands in the study area, but only identifies two private club properties in Mississippi, yet many more exist in the project area. Project impacts on private recreational properties could be substantial and different from those on public recreation lands or private agricultural areas. For example, many private clubs have substantial infrastructure devoted to habitat and water management that could be at risk from construction, or conversely of non-repair, of deficient work items listed in the SEIS II. Further indirect project construction activities could impact private land resources and use by fish and wildlife, which could impact private land conservation and financial value.
Significance: Low
The current text understates the current state of private recreational properties in the project area and the potential impacts on these areas.
Recommendation for Resolution
Recommendation #1: If possible, identify the locations and habitat types of private recreational lands in the project area. At the very least, include text in the SEIS II that states that the USACE will identify private recreation lands in and near the 143 work item locations when these sites are repaired, and determine impacts and appropriate mitigation activities at that time.

Appendix A Charging the Independent External Peer Review Panel

The text below reproduces the Charge to Reviewers. APM-I provided the charge questions to the review Panel at the beginning of the review process. The Panel Members used these charge questions to guide their review.

MISSISSIPPI RIVER LEVEES (MRL) SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS) II CHARGE TO REVIEWERS

The following Review Charge to Reviewers outlines the objectives of the Independent External Peer Review (IEPR) for the subject study and identifies specific items for consideration for the IEPR Review Panel.

The objective of the IEPR is to obtain an independent evaluation of whether the interpretations of analysis and conclusions based on analysis are reasonable for the subject study. The IEPR Review Panel is requested to offer a broad evaluation of the overall study decision document in addition to addressing the specific technical and scientific questions included in the Review Charge. The Review Panel has the flexibility to bring important issues to the attention of decision makers, including positive feedback or issues outside those specific areas outlined in the Review Charge. The Review Panel can use all available information to determine what scientific and technical issues related to the decision document may be important to raise to decision makers.

The Panel review is to focus on scientific and technical matters, leaving policy determinations for USACE and the Army. The Panel should not make recommendations on whether a particular alternative should be implemented or present findings that become “directives” in that they call for modifications or additional studies or suggest new conclusions and recommendations. In such circumstances the Review Panel would have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review.

Panel review comments are to be structured to fully communicate the Panel’s intent by including the comment, why it is important, any potential consequences of failure to address, and suggestions on how to address the comment. The IEPR Performance Work Statement (PWS) provides additional details on how comments should be structured.

The Review Panel is asked to consider the following items as part of its review of the decision document and supporting materials.

Broad Evaluation Review Charge Questions

1. Is the need for and intent of the Environmental Impact Statement (EIS) clear?
2. Does the EIS adequately address the stated need and intent relative to scientific and technical issues?

Given the need for and intent of the EIS, assess the adequacy and acceptability of the following:

3. Project evaluation data used in the study analyses;
4. Environmental assumptions that underlie the study analyses;
5. Environmental methodologies, analyses, and projections;

6. Models used in the evaluation of affected environment as well as environmental impacts of alternatives;
7. Methods for integrating risk and uncertainty;
8. Formulation of alternative plans and the range of alternative plans considered;
9. Quality and quantity of the surveys, investigations, and environmental analyses sufficient for conceptual design of alternative plans, and;
10. Overall assessment of significant environmental impacts and any biological analyses.

Further,

11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable, and;
12. Assess the considered and tentatively selected alternatives from the perspective of systems, including systemic aspects being considered from a temporal perspective, including the potential effects of climate change.

Appendix B Qualifications of the Panel Members

The qualifications of the IEPR Panel Members are provided in this appendix. The Panel Members met and significantly exceeded the minimum requirements of the identified positions for this IEPR. APM-I considered the experience of Panel Members gained from working in academia, industry, and government to ensure a balanced panel to the extent possible.

B.1 Mr. Paul Bovitz

Position: Environmental Resources Specialist

Affiliation: Ecological Consulting, LLC

Mr. Bovitz holds an MS in Ecology from Rutgers and a BS in wildlife biology from Colorado State University. He also holds an MBA, so he understands finance issues such as benefit/cost ratios that come into play in environmental impact analyses. Mr. Bovitz is a certified Senior Professional Wetland Scientist, Society of Wetland Scientists; a Licensed Site Remediation Professional, New Jersey Department of Environmental Protection; and a LEED® Accredited Professional, U.S. Green Building Council.

Mr. Bovitz has over 35 years of experience with consulting and A/E companies conducting environmental evaluation and review, particularly in habitat evaluation methods, which he began early in his career. He is familiar with the USACE plan formulation process. Mr. Bovitz has both conducted and reviewed numerous projects during his career in which NEPA analysis was required, ranging from environmental assessments to large environmental impact statements and flood projects. His NEPA compliance experience includes projects as varied as flood control, habitat restoration projects and coastal resiliency. His area of expertise includes mitigation analysis, as he works regularly with restoring contaminated habitats and must deal with regulators in compensating for any project impacts.

Mr. Bovitz has extensive experience with habitat evaluation models. One of his first academic research efforts involved the PATREC (pattern recognition method) for habitat evaluation of wildlife species on the northern Great Plains. He has attended training in the use of Habitat Evaluation Procedures and has used/reviewed them on several projects. As a certified Senior Wetlands Scientist from the Society of Wetland Scientists, he has extensive experience in wetland functional assessment methodologies, including the Hydrogeomorphic Assessment methodology, Indicator Value Assessment methodology, Evaluation for Planned Wetlands, and others. He has applied these models to assess mitigation requirements at different sites. He is familiar with the Duck-Use-Day methodology and the Wetland Value Assessment methodology.

Mr. Bovitz has worked in riverine systems throughout the U.S., having conducted sediment and fish/wildlife investigations to support ecological risks assessments and addressing contamination issues at National Priority List and other sites. He has performed USACE Independent External Peer Reviews of over half a dozen flood control projects in different areas of the country, including on the Mississippi River. Geographically he is familiar with the flora and fauna of the region having worked in Louisiana, Arkansas, Mississippi, and Illinois. He has also collaborated with and visited the USACE Engineering Research and Development Center, so he is familiar with USACE activities in the region.

Mr. Bovitz was a project manager on a contract to USACE New York District for a 3-year review of the largest proposed wetland fill project east of the Mississippi River that had been proposed by a private developer. The high-profile project received over 13,000 public comment letters.

Mr. Bovitz contributes regularly to the New Jersey Science Advisory Board Ecological Services Committee. As a group, the Board prepares written reports summarizing technical responses to charge questions provided by the New Jersey Department of Environmental Protection. For example, recent charge questions have involved evaluation of a Geographic Information Systems database tool for assessing habitat connectivity in the state and review of assessment methods for submerged aquatic vegetation.

B.2 Dr. Mickey Heitmeyer

Position: Environmental Resources Specialist

Affiliation: Private consulting

Dr. Heitmeyer holds a PhD in Wildlife Ecology from the University of Missouri-Columbia. He was a postdoctoral fellow (Biology) at the University of California-Davis. He also holds an MS in Wildlife Biology from Oklahoma State University and a BS in Fish and Wildlife Conservation from the University of Missouri-Columbia.

Dr. Heitmeyer has over 40 years of experience focusing on wildlife and wetland ecology with special expertise in science and ecology of wetland and floodplain ecosystems throughout North America including major river systems in the Lower Mississippi Alluvial Valley, Missouri River ecosystem, Gulf Coast, Pacific Northwest, Great Basin, Central Valley of California, Great Lakes, and Southeast Atlantic Coast. He has extensive experience with habitat evaluation models and indices. He has conducted Hydrogeomorphic evaluations of ecosystem restoration and management options in more than 30 states on more than 300 Federal, state, community, and private land sites. Primary sponsors of the projects include the U.S. Army Corps of Engineers, Bureau of Reclamation, Bureau of Land Management, Department of Defense, Fish and Wildlife Service, Forest Service, Natural Resource Conservation Service and state conservation and natural resource agencies and private property owners.

Dr. Heitmeyer helped establish the science and conservation foundation for wintering waterfowl ecology. His career research on wintering and migration ecology of waterfowl helped develop strategic applied conservation programs throughout North America. He helped initiate the concept of “cross-seasonal” effects in waterfowl ecology in which energetic, physiological, and behavioral adaptations of species during nonbreeding periods and locations influence eventual reproductive success and survival. He helped establish ecological knowledge of bottomland hardwood forested wetlands, including green tree reservoirs, throughout the Lower Mississippi River Valley and elsewhere. He developed concepts of the Hydrogeomorphic methodology to understand community relationships and management/restoration potential of lands in relation to geomorphic surface, soils, topography, and hydrology. He helped initiate integration of working agricultural lands with waterfowl conservation strategies in California and the Lower Mississippi Alluvial Valley.

Dr. Heitmeyer is the author of a manual for calculating Duck Use Days to determine habitat resource values and waterfowl population energetic requirements in the Mississippi Alluvial Valley. This model is currently used for wetland-waterfowl evaluations throughout the Mississippi and Missouri River systems and floodplains nationwide.

Dr. Heitmeyer has participated in more than 50 scientific reviews of U.S. federal resource agency environmental impact statements, Comprehensive Conservation Plans, and state agency environmental planning documents and of feasibility and value engineer reports for the U.S. Army Corps of Engineer. He has been a scientific reviewer of several U.S. Congressional and State legislative bills on natural resource issues.

Dr. Heitmeyer has more than 150 scientific publications in ecological science in peer-reviewed journals, monographs, books, symposia, and technical reports. He has participated in and organized more than 200 wetland, wildlife, and landscape management/conservation workshops.

Dr. Heitmeyer has been inducted into the Arkansas Waterfowler Hall of Fame and the California Waterfowl Hall of Fame. He has received many awards, including the Excellence Award from the U.S. Fish and Wildlife Service for a Lower Missouri River Project and the Outstanding Achievement Award for the Ducks Unlimited Continental Conservation Plan. He has coordinated dozens of workshops for federal agencies, state Fish and Wildlife agencies, and private foundations.

THIS PAGE INTENTIONALLY BLANK

Table 2 - References

APM-I (2020)	GR-2020-COE-02, <i>Work Plan for Independent External Peer Review of the Mississippi River Levees Supplemental Environmental Impact Statement II</i> , Analysis Planning and Management Institute, 7 August 2020.
Middleton 2002	Middleton, B.A., <i>Flood Pulsing in Wetlands: Restoring the Natural Hydrological Balance</i> ; John Wiley and Sons, Inc. New York; 2002.
NAS (2003)	<i>Policy on Committee Composition and Balance and Conflicts of Interest</i> , National Academy of Science, 2003.
NEPA (1969)	National Environmental Policy Act of 1969, as amended, 42 U.S.C. §§ 4321-4347
OMB (2004)	Bulletin M-05-03, <i>Final Information Quality Bulletin for Peer Review</i> , Office of Management and Budget, 14 January 2004.
USACE (2018)	EC 1165-2-217, <i>Review Policy for Civil Works</i> , U.S. Army Corps of Engineers, 20 February 2018.
WRDA (2007)	<i>The Water Resources Development Act of 2007</i> , as amended by Section 1044 of the <i>Water Resources Reform and Development Act of 2014</i> and Section 1141 of <i>America's Water Infrastructure Act of 2018</i> , U.S. Congress.

THIS PAGE INTENTIONALLY BLANK

Table 3 - Acronyms

ASCE	American Society of Civil Engineers
APM-I	Analysis Planning and Management Institute
BLH	Bottomland hardwood
BPA	Blanket Purchase Agreement
BS	Bachelor of Science
CFR	Code of Federal Regulations
COI	Conflict of Interest
DC	District of Columbia
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOJ	U.S. Department of Justice
DrChecks	Design Review and Checking System
EC	Engineer Circular
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ER	Evaluator Response
FPC	Final Panel Comment
HTRW	Hazardous, Toxic, and Radioactive Waste
IC	IEPR Coordinator
IEPR	Independent External Peer Review
IPR	Internal Peer Reviewer
LEED	Leadership in Energy and Environmental Design
LLC	Limited Liability Company
MAV	Mississippi Alluvial Valley
MBA	Master of Business Administration
MRL	Mississippi River Levees
MR&T	Mississippi River & Tributaries
MS	Master of Science
MSCE	Master of Science in Civil Engineering
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
OEO	Outside Eligible Organization
OMB	U.S. Office of Management and Budget
PATREC	Pattern Recognition Method
PDF	Project Design Flood
PE	Professional Engineer
PhD	Doctor of Philosophy
PM	Project Manager
PMP	Project Management Professional
PWS	Performance Work Statement

MRL SEIS II IEPR Final Report

SEIS	Supplemental Environmental Impact Statement
TL	Task Leader
U.S.	United States
USACE	U.S. Army Corps of Engineers
WRDA	Water Resources Development Act