

Final Independent External Peer Review Report Blanchard River Watershed, Ohio, Feasibility Report and Environmental Impact Statement

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Flood Risk Management Planning Center of Expertise
Baltimore District

Contract No. W912HQ-10-D-0002
Task Order: 0081

June 18, 2015

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Battelle
505 King Avenue
Columbus, Ohio 43201

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Executive Summary

PROJECT BACKGROUND AND PURPOSE

The Blanchard River Watershed, a portion of the Maumee River Watershed, is located within the counties of Putnam, Hancock, Seneca, Allen, Hardin, and Wyandote in northwest Ohio. The Blanchard River has flooded numerous times in its history causing significant damages in the City of Findlay and Village of Ottawa. Serious flooding in Findlay was reported in Findlay newspaper articles dating back to January 1846. According to the U.S. Geological Survey (USGS) stream gage data at Findlay, the Blanchard River has reached flood stage at least once in 15 of the last 20 years. More recently, between December 2006 and March 2008, Findlay experienced four flooding events that were considered larger than the 10 percent annual chance flood; two of the four floods were within the top five floods ever recorded in Findlay (Source: National Weather Service).

The purpose of the study was to investigate alternative measures and plans for providing flood risk management in the Blanchard River Watershed; to determine the economic, social, and environmental effects of alternative plans; to produce a Feasibility Study Report; and to recommend a project for authorization by the Congress. Measures investigated for flood risk management included upstream impoundments, levees, floodwalls, diversion channels, and channelization and non-structural flood proofing actions.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the Blanchard River Watershed, Ohio, Feasibility Report/Environmental Impact Statement (FR/EIS)¹ (hereinafter: Blanchard River IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2012). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate the IEPR of the Blanchard River. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2012) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel).

¹ The actual document reviewed was Blanchard River Watershed, Ohio, Draft Detailed Project Report/ Environmental Impact Statement (DPR/EIS). Per the Performance Work Statement, we are referring to it as the Feasibility Report/Environmental Impact Statement.

Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the Blanchard River review documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: civil/structural engineering, biological resources and environmental law compliance, hydrologic and hydraulic engineering, and economics/Civil Works planning. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of final candidates to confirm that they had no COIs, but Battelle made the final selection of the four-person Panel.

The Panel received an electronic version of the Blanchard River review documents (968 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2012) and OMB (2014), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process. The Panel produced individual comments in response to the charge questions.

IEPR panel members reviewed the Blanchard River documents individually. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of: (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, four Final Panel Comments were identified and documented. Of these, three were identified as having a medium significance and one had medium/low significance.

Battelle received a summary of public comments from USACE along with a copy of the 40 specific public comments on the Blanchard River (89 total pages) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the Blanchard River review documents. After completing its review, the Panel confirmed that no issues or concerns were identified other than those already covered in the Final Panel Comments.

Results of the Independent External Peer Review

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2012; p. D-4) in the Blanchard River review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel's findings.

The documentation in the FR/EIS and supporting appendices and background information provide considerable analysis and effectively summarize the work conducted for the project. However, the Panel did identify elements of the project that require further cost consideration and documentation.

Environmental: The Panel noted that for the biological and environmental issues where data were available, the documentation presents a thorough analysis. A good assessment of the challenges that could occur during this project was conducted, and solutions have been identified to be addressed during pre-construction engineering and design (e.g., on-site surveys to analyze the presence of wetlands, endangered species, and archaeology).

The Panel suggests that additional studies should be conducted on the fish species present in the project area and their associated habitat. Mussels were noted as a species of concern in the documentation and were sufficiently studied. However, similar studies were not conducted for fish species. The mussels use fish as hosts during the parasitic larval stage; therefore, the fish resources in this system may prove more important than they would appear at first glance.

Engineering: Both the FR/EIS and the Hydrology and Hydraulic (H&H) Engineering Appendix are detailed and comprehensive. The information is easy to find and the documents are easy to read. The Panel believes that USACE has built in the necessary flexibility in the engineering design given the lack of actual site information currently available. However, the Panel noted two engineering issues that could affect cost estimates. The first is the design of the inverted siphon planned for the Aurand Run. The Panel believes that more information should be included on the inverted siphon as this feature can be complicated to model and design, which could affect project cost estimates. Inverted siphons can also be a barrier for fish. The second issue is the estimated cost of low permeable core material for the Lye cutoff levee. The Panel believes that an off-site borrow material cost should be included in the cost estimate for the low-permeable core material since geotechnical surveys have not been conducted and data supporting the availability of the necessary amount of material on site are unavailable. The Panel, and several public comments, noted the document should clarify whether the flood mitigation considered storage areas, ponds, or shallow impoundments to address flooding on agricultural lands.

Economics and Planning: The agricultural losses, flood damages, and mitigation costs are all described well and the analytic methodologies are sound. The report is clear and easy to follow. In particular, the no action alternative is well-described.

Table ES-1. Overview of Four Final Panel Comments Identified by the Blanchard River IEPR Panel

No.	Final Panel Comment
Significance – Medium	
1	The description and assessment of the fish resources in the project area is not adequate to determine or document project impacts on the fish and other resources, such as freshwater mussels.
2	A description and associated cost estimate for the inverted siphon planned for the Aurand Run and other such stream crossings has not been included in the Draft EIS, Engineering Appendix, or the H&H Engineering Appendix.
3	Limited on-site availability of low permeable core material for the Lye cutoff levee may require the material to be obtained from an off-site source.
Significance – Medium/Low	
4	It is not clear whether flood mitigation considered storage areas, ponds, or shallow impoundments to address induced flooding on agricultural land affected by the project.

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LIST OF ACRONYMS

ADM	Agency Decision Meeting
ATR	Agency Technical Review
BCR	benefit-cost ratio
COI	Conflict of Interest
CWRB	Civil Works Review Board
FR/EIS	Feasibility Report/Environmental Impact Statement
DrChecks	Design Review and Checking System
EC	Engineer Circular
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
H&H	hydrology and hydraulics
IEPR	Independent External Peer Review
IWR	Institute of Water Resources
NEPA	National Environmental Policy Act
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
PDT	Project Delivery Team
SAR	Safety Assurance Report
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Services
USGS	United States Geological Survey
WRDA	Water Resources Development Act

1. INTRODUCTION

The Blanchard River Watershed, a portion of the Maumee River Watershed, is located within the counties of Putnam, Hancock, Seneca, Allen, Hardin, and Wyandote in northwest Ohio. The Blanchard River has flooded numerous times in its history causing significant damages in the City of Findlay and Village of Ottawa. Serious flooding in Findlay was reported in Findlay newspaper articles dating back to January 1846. According to the U.S. Geological Survey (USGS) stream gage data at Findlay, the Blanchard River has reached flood stage at least once in 15 of the last 20 years. More recently, between December 2006 and March 2008, Findlay experienced four flooding events that were considered larger than the 10 percent annual chance flood; two of the four floods were within the top five floods ever recorded in Findlay (Source: National Weather Service).

The purpose of the study was to investigate alternative measures and plans for providing flood risk management in the Blanchard River Watershed; to determine the economic, social, and environmental effects of alternative plans; to produce a Feasibility Study Report; and to recommend a project for authorization by the Congress. Measures investigated for flood risk management included upstream impoundments, levees, floodwalls, diversion channels, and channelization and non-structural flood proofing actions.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Blanchard River Watershed, Ohio, Feasibility Report/Environmental Impact Statement (FR/EIS)² (hereinafter: Blanchard River IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (USACE), Engineer Circular (EC) *Civil Works Review* (EC 1165-2-214) (USACE, 2012) and the Office of Management and Budget (OMB), *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, economic, environmental, and plan formulation analyses contained in the Blanchard River IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE on April 17, 2015. Appendix D presents the organizational conflict of interest form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the Blanchard River IEPR.

² The actual document reviewed was Blanchard River Watershed, Ohio, Draft Detailed Project Report/ Environmental Impact Statement (DPR/EIS). Per the Performance Work Statement, we referred to it as the Feasibility Report/Environmental Impact Statement.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2012).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the Blanchard River was conducted and managed using contract support from Battelle, an Outside Eligible Organization (OEO), as defined by EC 1165-2-214. Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. Table 1 presents the major milestones and deliverables of the Blanchard River IEPR. Due dates for milestones and deliverables are based on the award/effective date of September 15, 2014. Note that the work items listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on August 21, 2015. The actual date for contract end will depend on the date that all activities for this IEPR, including Agency Decision Meeting (ADM) and Civil Works Review Board (CWRB) preparation and participation, are completed.

Battelle identified, screened, and selected four panel members to participate in the IEPR based on their expertise in the following disciplines: civil/structural engineering, biological resources and environmental law compliance, hydrologic and hydraulic engineering, and economics/Civil Works planning. The Panel reviewed the Blanchard River document and produced four Final Panel Comments in response to 21 charge questions provided by USACE for the review. This charge included two overview questions and one public comment question added by Battelle. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-214, Appendix D), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

Table 1. Major Milestones and Deliverables of the Blanchard River IEPR

Task	Action	Due Date
1	Award/Effective Date	9/15/2014
	Review documents available	4/9/2015
2	Battelle submits list of selected panel members	10/28/2014
	USACE confirms the panel members have no COI	11/24/2014
3	Battelle convenes kick-off meeting with USACE	11/25/2014
	Battelle convenes kick-off meeting with USACE and panel members	4/15/2015
4	Panel members complete their individual reviews	5/11/2015
	Panel members provide draft Final Panel Comments to Battelle	5/28/2015
5	Battelle submits Final IEPR Report to USACE	6/18/2015
	USACE PCX provides decision on Final IEPR Report acceptance	6/25/2015
6 ^a	Battelle convenes Comment-Response Teleconference with panel members and USACE	7/30/2015
	Battelle submits pdf printout of DrChecks project file to USACE	8/21/2015
3	ADM (Estimated Date) ^b	8/2015
	CWRB Meeting (Estimated Date) ^b	12/2015
	Contract End/Delivery Date	1/8/2016

^a Task 6 occurs after the submission of this report.

^b The ADM and CWRB meetings were listed in the Performance Work Statement under Task 3 but were relocated in this schedule to reflect the chronological order of activities.

4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2012; p. D-4) in the Blanchard River IEPR review document. The following summarizes the Panel's findings.

The documentation in the FR/EIS and supporting appendices and background information provide considerable analysis and effectively summarize the work conducted for the project. However, the Panel did identify elements of the project that require further cost consideration and documentation.

Environmental: The Panel noted that for the biological and environmental issues where data were available, the documentation presents a thorough analysis. A good assessment of the challenges that could occur during this project was conducted, and solutions have been identified to be addressed during pre-construction engineering and design (e.g., on-site surveys to analyze the presence of wetlands, endangered species, and archaeology).

The Panel suggests that additional studies should be conducted on the fish species present in the project area and their associated habitat. Mussels were noted as a species of concern in the documentation and were sufficiently studied. However, similar studies were not conducted for fish species. The mussels use fish as hosts during the parasitic larval stage; therefore, the fish resources in this system may prove more important than they would appear at first glance.

Engineering: Both the FR/EIS and the Hydrology and Hydraulic (H&H) Engineering Appendix are detailed and comprehensive. The information is easy to find and the documents are easy to read. The Panel believes that USACE has built in the necessary flexibility in the engineering design given the lack of actual site information currently available. However, the Panel noted two engineering issues that could affect cost estimates. The first is the design of the inverted siphon planned for the Aurand Run. The Panel believes that more information should be included on the inverted siphon as this feature can be complicated to model and design, which could affect project cost estimates. Inverted siphons can also be a barrier for fish. The second issue is the estimated cost of low permeable core material for the Lye cutoff levee. The Panel believes that an off-site borrow material cost should be included in the cost estimate for the low-permeable core material since geotechnical surveys have not been conducted and data supporting the availability of the necessary amount of material on site are unavailable. The Panel, and several public comments, noted the document should clarify whether the flood mitigation considered storage areas, ponds, or shallow impoundments to address flooding on agricultural lands.

Economics and Planning: The agricultural losses, flood damages, and mitigation costs are all described well and the analytic methodologies are sound. The report is clear and easy to follow. In particular, the no action alternative is well-described.

[4.2 Final Panel Comments](#)

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

Final Panel Comment 1

The description and assessment of the fish resources in the project area is not adequate to determine or document project impacts on the fish and other resources, such as freshwater mussels.

Basis for Comment

Based on information presented in the FR/EIS and in the Environmental/NEPA Appendix (Chapters 1 and 2), it appears that USACE did not conduct a fish survey of the area where the recommended plan will be implemented. A significant effort was undertaken to document the presence of freshwater mussels, including the finding of some rare mussel species. Knowing which species of fish are present, whether or not they are mussel hosts, and what the fish species require as spawning habitat could provide specific guidance for avoiding negative impacts on the fish (and, potentially, the mussels) during the construction phase of this project. However, a similar survey of fish resources was not documented.

The fish resources in this system may prove more important than they would appear at first glance because they are the necessary hosts for the mussels' parasitic larval stage. The mussel surveys suggest there are healthy populations of freshwater mussels present in the system; therefore, there must be an adequate population of the right species of fish present in the aquatic ecosystem. Although best management practices for the mussels will be applied during the construction period, nothing is mentioned regarding best management practices for the fish resources.

Significance – Medium

Adverse impacts on the fish populations could have a secondary and, potentially, substantive impact on freshwater mussels.

Recommendation for Resolution

1. Include in the FR/EIS and/or the Environmental/NEPA Appendix, a brief summary of findings of fish species present, their spawning habitat requirements, whether or not they are mussel hosts, and an analysis of potential construction impacts on the fish as well as secondary impacts on the mussels.

Final Panel Comment 2

A description and associated cost estimate for the inverted siphon planned for the Aurand Run and other such stream crossings has not been included in the Draft EIS, Engineering Appendix, or the H&H Engineering Appendix.

Basis for Comment

During the IEPR mid-review teleconference on April 27, 2015 facilitated by Battelle between the Panel and USACE, a discussion occurred on the crossing of the diversion with Aurand Run. Figure 33 (FR/EIS, p. 45) clearly shows that the diversion will cross Aurand Run, but no technical discussion was supplied on how the stream would be crossed. During the teleconference discussion, USACE indicated that an inverted siphon was planned for this stream crossing. During its further review of the Draft EIS and the H&H Appendix, the Panel could not locate any discussion on the planned inverted siphon.

Inverted siphons can be complicated structures to model, design, and permit, and could impact project cost estimates. Diversion channel crossings can have environmental impacts on aquatic habitat because inverted siphons can be a barrier to fish. A discussion on the Aurand Run diversion crossing and any other diversion crossings should be included in the FR/EIS. The cost estimates, which are built into the benefit-cost ratios (BCRs) for the proposed diversion alternative, should also include the design, construction, and land acquisition for the proposed inverted siphon at Aurand Run and any other similar diversion structures.

The Aurand Run diversion crossing may be a significant structure and some level of planning is warranted. There may also be other existing drainage channels or streams that will also cross the diversion channel, but are not mentioned.

Significance – Medium

If a planning-level design of a crossing of the diversion channel has not been performed, the cost estimate may not be accurate, which may change the benefit-cost ratio for the selected alternative.

Recommendation for Resolution

1. Describe in the Draft EIS or H&H Engineering Appendix the proposed inverted siphon at Aurand Run and any other diversion structures similar to what was provided for the diversion channel structure.
2. Provide a figure or drawing of the proposed inverted siphon at Aurand Run and any other diversion structures in the Engineering Appendix similar to what was provided for the diversion channel structure.
3. Document the estimated costs for design, construction, and land acquisition for the proposed inverted siphon at Aurand Run and any other similar diversion structures.
4. Recalculate (if necessary) the BCR for the proposed diversion channel alternative with current design, construction, and land acquisition costs for the proposed inverted siphon at Aurand Run and any other similar diversion structures.
5. Document if there are any environmental impacts and mitigation associated with the proposed inverted siphons such as being a barrier to aquatic habitat.

Final Panel Comment 3

Limited on-site availability of low permeable core material for the Lye cutoff levee may require the material to be obtained from an off-site source.

Basis for Comment

The conceptual design of the Blanchard to Lye cutoff levee includes a 10-foot-wide core of impervious material (Cost Engineering Appendix, p.10). According to the Blanchard to Lye Cutoff 100 year Quantity and Cost Estimate April 2, 2015 table (Cost Engineering Appendix, Attachment 1, Construction and Real Estate Current Working Estimates), the cost estimate for this work includes only common fill from on-site borrow.

Given the acknowledged need for additional subsurface site investigation, it is possible that the impervious material may not exist on site in sufficient quantity, and would have to be obtained from an off-site borrow source at a higher cost than estimated. Approximately 31,000 cubic yards of low permeable material is required. Depending on the source and haul distance, this could result in \$4 to \$6 of additional cost per cubic yard for the low permeability material.

Significance – Medium

The accuracy of the estimate would be improved with an appropriate adjustment for the use of off-site borrow material.

Recommendation for Resolution

1. Revise the cost estimate for the Blanchard to Lye Creek cutoff levee to include the estimated quantity of impervious material with an appropriate unit price.

Final Panel Comment 4

It is not clear whether flood mitigation considered storage areas, ponds, or shallow impoundments to address induced flooding on agricultural land affected by the project.

Basis for Comment

The FR/EIS notes (p. 97) that the project will cause flooding in agricultural land because water levels will be higher under the future with-project condition than under the existing condition. It is not clear if an analysis was conducted to determine if the impacts associated with flooded agricultural land could be mitigated using storage areas, ponds, or shallow impoundments. Such areas may reduce or limit the need for flood easements on agricultural land. Including such ponds in the overall project may also assist with land acquisition for the project.

If such analyses were completed, the Panel could not identify where the results are described. The FR/EIS does identify mitigation of these impacts as a constraint specific to the study area (p. 27):

- “Any plan for flood risk reduction should avoid, minimize, or provide mitigation for induced flooding in the study area.
- Minimize the use of agricultural lands where applicable for the implementation of any project.
- Minimize impacts to agricultural lands with respect to impacts to crops and other uses.”

However, the Panel could not find where the mitigation for the induced flooding is analyzed, or whether it involves storage areas, ponds, or shallow impoundments. As part of a National Environmental Policy Act (NEPA) document, issues that have been raised during scoping need to be addressed in the EIS, even if the lead agency action does not directly respond to the issue.

The Real Estate Appendix suggests (p. 7) that approximately 1,579 acres may be affected. The same paragraph acknowledges that induced flooding on these lands may be from one inch to four feet, which is potentially a significant flood event. If this type of analysis has been completed for the induced flooding, the Panel believes mitigation was also considered, since it was identified as a constraint at the outset of the project. The results of this should be included in the discussion.

Because the agricultural analysis has not yet been completed ([Economics Appendix, p. 45), it is not clear whether these induced flooding impacts on agricultural lands (or, costs to agriculture) are potentially outweighed by the benefits due to project-related reductions in agricultural damage from flooding. Whether one is outweighed by the other does not really matter, but the Panel believes that efforts to reduce induced flooding have not been clearly described in Chapter 6, Plan Formulation, of the FR/EIS.

During review of the public comments, the Panel noted similar concerns in the majority of letters from the public regarding this issue.

Significance – Medium/Low

The lack of specificity regarding the potential to mitigate the induced flooding does not agree with the identified constraints.

Recommendation for Resolution

1. Describe the efforts to mitigate induced flooding if these were included in the plan selection

process.

2. If mitigation for induced flooding has not yet been completed because the analysis of the induced flooding has not been completed, but both will be in the future, include an assessment of the potential flood reduction from ponds, storage areas, or shallow impoundments. This can be done in the feasibility stage or pre-construction engineering design.
3. Provide an analysis of the induced flooding, and compare that with the reduced flooding for agricultural lands.

5. REFERENCES

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2012). Water Resources Policies and Authorities: Civil Works Review. Engineer Circular (EC) 1165-2-214. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. December 15.

APPENDIX A

IEPR Process for the Blanchard River Project

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A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the schedule followed in executing the Blanchard River Watershed, Ohio, Draft Feasibility Report/Environmental Impact Statement Independent External Peer Review (hereinafter: Blanchard River IEPR). Due dates for milestones and deliverables are based on the award/effective date of September 15, 2014. Review documents were provided by the U.S. Army Corps of Engineers (USACE) on April 9, 2015. Note that the work items listed under Task 6 occur after the submission of this report.

Battelle will enter the four Final Panel Comments developed by the Panel into USACE's Design Review and Checking System (DrChecks), a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

Table A-1. Blanchard River Complete IEPR Schedule

Task	Action	Due Date
1	Award/Effective Date	9/15/2014
	Review documents available	4/9/2015
	Battelle submits draft Work Plan ^a	9/30/2014
	USACE provides comments on draft Work Plan	11/4/2014
	Battelle submits final Work Plan ^a	4/17/2015
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	9/22/2014
	USACE provides comments on COI questionnaire	9/29/2014
	Battelle submits list of selected panel members ^a	10/28/2014
	USACE confirms the panel members have no COI	11/24/2014
	Battelle completes subcontracts for panel members	3/27/2015
3	Battelle convenes kick-off meeting with USACE	11/25/2014
	Battelle sends review documents to panel members	4/13/2015
	Battelle convenes kick-off meeting with panel members	4/15/2015
	Battelle convenes kick-off meeting with USACE and panel members	4/15/2015
	Battelle convenes Mid-Review Teleconference for panel members to ask clarifying questions of USACE	4/28/2015
4	Panel members complete their individual reviews	5/11/2015
	Battelle provides panel members with talking points for Panel Review Teleconference	5/13/2015
	Battelle convenes Panel Review Teleconference	5/15/2015

Table A-1. Blanchard River Complete IEPR Schedule (continued)

Task	Action	Due Date
4	Battelle provides Final Panel Comment templates and instructions to panel members	5/15/2015
	Panel members provide draft Final Panel Comments to Battelle	5/28/2015
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	5/29/2015-6/7/2015
	Panel finalizes Final Panel Comments	6/8/2015
	Battelle receives the public comments from USACE	5/29/2015
	Battelle sends public comments to Panel	5/29/2015
	Panel completes their review of the public comments	6/4/2015
	Battelle and Panel review Panel's responses to public comments	6/5/2015
	Panel drafts Final Panel Comment, if necessary	6/8/2015
	Panel finalizes Final Panel Comment regarding public comments	6/10/2015
5	Battelle provides Final IEPR Report to panel members for review	6/12/2015
	Panel members provide comments on Final IEPR Report	6/16/2015
	Battelle submits Final IEPR Report to USACE ^a	6/18/2015
	USACE PCX Provides Decision on Final IEPR Report Acceptance	6/25/2015
6 ^b	Battelle inputs Final Panel Comments to DrChecks and provides Final Panel Comment response template to USACE	6/29/2015
	Battelle convenes teleconference with USACE to review the Post-Final Panel Comment Response Process	6/29/2015
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process	6/29/2015
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE Planning Center of Expertise (PCX) for review	7/14/2015
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	7/20/2015
	USACE PCX provides draft PDT Evaluator Responses to Battelle	7/21/2015
	Battelle provides the panel members the draft PDT Evaluator Responses	7/23/2015
	Panel members provide Battelle with draft BackCheck Responses	7/28/2015
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	7/29/2015
Battelle convenes Comment-Response Teleconference with panel members and USACE	7/30/2015	

Table A-1. Blanchard River Complete IEPR Schedule (continued)

Task	Action	Due Date
6 ^b	USACE inputs final PDT Evaluator Responses to DrChecks	8/6/2015
	Battelle provides final PDT Evaluator Responses to panel members	8/10/2015
	Panel members provide Battelle with final BackCheck Responses	8/13/2015
	Battelle inputs the Panel's final BackCheck Responses in DrChecks	8/20/2015
	Battelle submits pdf printout of DrChecks project file ^a	8/21/2015
	Agency Decision Meeting (Estimated Date) ^c	8/2015
	CWRB Meeting (Estimated Date) ^c	12/2015
	Contract End/Delivery Date	1/8/2016

a Deliverable.

b Task 6 occurs after the submission of this report

c The CWRB meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.

At the beginning of the Period of Performance for the Blanchard River IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan. The final charge consisted of 21 charge questions provided by USACE, two overview questions and one public comment question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

At the start of the review, all the members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received the Blanchard River review documents and reference materials listed below. The documents and files in bold font were provided for review; the other documents were provided for reference or supplemental information only.

- **Main Report (200 pages)**
- **Hydrology and Hydraulic Engineering (Appendix A; 71 pages)**
- **Economic Appendix (Appendix B; 132 pages)**
- **Real Estate (Appendix C; 19 pages)**
- **Geotechnical, Structural and Civil Engineering (Appendix D; 48 pages)**
- **Environmental/NEPA (Appendix E; 314 pages)**
- **Cost Estimating Appendix (Appendix F; 26 pages)**
- **Abbreviated Risk Analysis (Appendix G; 12 pages)**
- **Mitigation and Monitoring Plan (Appendix H; 61 pages)**

- **Public Review Comments (85 pages)**
- Risk Register
- Decision Log
- USACE guidance, *Civil Works Review* (EC 1165-2-214), December 15, 2012
- Office of Management and Budget, *Final Information Quality Bulletin for Peer Review*, December 16, 2004.

About halfway through the review of the Blanchard River IEPR documents, a teleconference was held with USACE, the Panel, and Battelle so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted five panel member questions to USACE. USACE was able to provide responses to all of the questions during the teleconference and followed up with written response later that day via email.

A.2 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response table provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments in a preliminary list of eight overall comments and discussion points. Each panel member's individual comments were shared with the full Panel in a merged individual comments table.

A.3 IEPR Panel Teleconference

Battelle facilitated a 2-hour teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member should serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

At the end of these discussions, the Panel identified four comments and discussion points that should be brought forward as Final Panel Comments.

A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle prepared a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the Blanchard River IEPR:

- **Lead Responsibility:** For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and

submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed the merged individual comments table, a summary detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.

- Directive to the Lead: Each lead was encouraged to communicate directly with the other panel member as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.
- Format for Final Panel Comments: Each Final Panel Comment was presented as part of a four-part structure:
 1. Comment Statement (succinct summary statement of concern)
 2. Basis for Comment (details regarding the concern)
 3. Significance (high, medium/high, medium, medium/low, and low; see description below)
 4. Recommendation(s) for Resolution (see description below).
- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:
 1. **High:** Describes a fundamental issue with the project that affects the current recommendation or justification of the project, and which will affect its future success, if the project moves forward without the issue being addressed. Comments rated as high indicate that the Panel determined that the current methods, models, and/or analyses contain a “showstopper” issue.
 2. **Medium/High:** Describes a potential fundamental issue with the project, which has not been evaluated at a level appropriate to this stage in the SMART Planning process. Comments rated as medium/high indicate that the Panel analyzed or assessed the methods, models, and/or analyses available at this stage in the SMART Planning process and has determined that if the issue is not addressed, it could lead to a “showstopper” issue.
 3. **Medium:** Describes an issue with the project, which does not align with the currently assessed level of risk assigned at this stage in the SMART Planning process. Comments rated as medium indicate that, based on the information provided, the Panel identified an issue that would raise the risk level if the issue is not appropriately addressed.
 4. **Medium/Low:** Affects the completeness of the report at this time in describing the project, but will not affect the recommendation or justification of the project. Comments rated as medium/low indicate that the Panel does not currently have sufficient information to analyze or assess the methods, models, or analyses.
 5. **Low:** Affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Comments rated as low indicate

that the Panel identified information that was mislabeled or incorrect or that certain data or report section(s) were not clearly described or presented.

- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, four Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Final Panel Comments are presented in the main report.

A.5 Conduct of the Public Comment Review

Battelle received a PDF file containing 85 pages of public comments on the Blanchard River (40 written comments) from USACE on May 29, 2015. Battelle then sent the public comments to the panel members on May 29, 2015 in addition to the following charge question:

- 1. Does information or concerns raised in the public comments raise any additional discipline-specific technical concerns with regard to the overall report?**

The Panel produced individual comments in response to the charge question. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. Upon review, Battelle determined and the Panel confirmed that no issues or concerns were identified other than those already covered in the Final Panel Comments.

APPENDIX B

Identification and Selection of IEPR Panel Members
for the Blanchard River Project

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B.1 Panel Identification

The candidates for the Blanchard River Watershed, Ohio, Feasibility Report/Environmental Impact Statement (hereinafter: Blanchard River IEPR) Panel were evaluated based on their technical expertise in the following key areas: civil/structural engineering, biological resources and environmental law compliance, hydrologic and hydraulic engineering, and economics/Civil Works planning. These areas correspond to the technical content of the Blanchard River IEPR review documents and overall scope of the Blanchard River project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected four experts for the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

The candidates were screened for the following potential exclusion criteria or COIs.³ These COI questions serve as a means of disclosure and to better characterize a candidate's employment history and background. Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

- Previous and/or current involvement by you or your firm⁴ in the Blanchard River Watershed, Ohio, Feasibility Report and Environmental Impact Statement (FR/EIS) and technical appendices.
- Previous and/or current involvement by you or your firm⁴ in flood risk management studies in northwest Ohio.
- Previous and/or current involvement by you or your firm⁴ in Blanchard River Watershed, Ohio FR/EIS-related projects.
- Previous and/or current involvement by you or your firm⁴ in the conceptual or actual design, construction, or operation and maintenance (O&M) of any Blanchard River Watershed, Ohio FR/EIS-related projects.
- Current employment by the U.S. Army Corps of Engineers (USACE).

³ Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. See OMB (2004, p. 18), "...when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

⁴ Includes any joint ventures in which a panel member's firm is involved and if the firm serves as a prime or as a subcontractor to a prime.

- Previous and/or current involvement with paid or unpaid expert testimony related to Blanchard River Watershed, Ohio FR/EIS-related projects.
- Previous and/or current employment or affiliation with the non-Federal sponsor (Hancock County, OH) or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups: National Resource Conservation Service (NRCS), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), Ohio Department of Natural Resources (ODNR), Ohio Environmental Protection Agency (OEPA), Ohio State Historic Preservation Office (OSHP), Putnam County (OH), City of Findlay (OH), and Village of Ottawa (OH) (for pay or pro bono).
- Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to northwest Ohio, particularly the City of Findlay, OH and/or Village of Ottawa, OH.
- Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Buffalo District.
- Previous or current involvement with the development or testing of models or methods that will be used for, or in support of, the Blanchard River Watershed, Ohio FR/EIS, including HEC-FDA, Habitat Suitability Index (HSI) models, Habitat Evaluation Procedures (HEP), Amphibian Index of Biotic Integrity (IBI), Qualitative Habitat Evaluation Index (QHEI), Headwater Habitat Evaluation Index (HHEI), Ohio Rapid Assessment Method for Wetlands (ORAM), Vegetative Index of Biotic Integrity (VIBI), Ohio Floristic Quality Assessment Index (FAQI), HEC-RAS, HEC-HMS, and/or HEC-GeoHMS.
- Current firm⁴ involvement with other USACE projects, specifically those projects/contracts that are with the Buffalo District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the Buffalo District. Please explain.
- Any previous employment by USACE as a direct employee, notably if employment was with the Buffalo District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by USACE as a contractor (either as an individual or through your firm²) within the last 10 years, notably if those projects/contracts are with the Buffalo District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning flood risk management, and include the client/agency and duration of review (approximate dates).
- Pending, current, or future financial interests in Blanchard River Watershed, Ohio FR/EIS-related contracts/awards from USACE.
- A significant portion (i.e., greater than 50%) of personal or firm⁴ revenues within the last 3 years came from USACE contracts.

- A significant portion (i.e., greater than 50%) of personal or firm⁴ revenues within the last 3 years from contracts with the non-federal sponsor (Hancock County, Ohio).
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to the Blanchard River Watershed, Ohio FR/EIS.
- Participation in relevant prior and/or current Federal studies relevant to the Blanchard River Watershed, Ohio FR/EIS.
- Previous and/or current participation in prior non-Federal studies relevant to relevant to the Blanchard River Watershed, Ohio FR/EIS.
- Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

Other considerations:

- Participation in previous USACE technical review panels
- Other technical review panel experience.

B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Three of the four final reviewers is affiliated with a consulting company; the other is an independent consultant. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

Table B-1 presents an overview of the credentials of the final four members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information regarding each panel member and his or her area of technical expertise is given in Section B.3.

Table B-1. Blanchard River IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Ellis	Newling	Comerio	Greene
Civil/Structural Engineering				
Minimum 10 years of experience in civil or construction engineering	X			
Experience in cost estimating for flood risk management projects	X			
Experience in:				
upstream impoundments	X			
levees	X			
floodwalls	X			
diversion channels	X			
channelization	X			
nonstructural flood proofing actions	X			
Ability to address the USACE Safety Assurance Review (SAR) aspects of all projects.	X			
Registered Professional Engineer	X			
Biological Resources and Environmental Law Compliance				
Minimum 10 years of experience directly related to directly related to water resource environmental evaluation or review and National Environmental Policy Act (NEPA) compliance		X		
Extensive knowledge of the Great Lakes ecosystem and environment		X		
Specific knowledge of:				
Environmental Species Act (ESA) for the area		X		
wetlands		X		
riparian habitats		X		
riverine systems		X		
mitigation and impacts to farmland		X		
Familiarity with environmental laws as well as tribal cultures within the study area, tribal laws and rights, and cultural and archeological resources		X		
M.S. degree or higher in a related field		X		
Hydrologic and Hydraulic Engineering				
Minimum 10 years of experience in hydraulic engineering with an emphasis on large public works projects			X	
Experience in the application of risk and uncertainty in defining project performance and assurance			X	
Familiarity with standard USACE hydrologic and hydraulic computer models including:				
Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS)			X	
Hydrologic Engineering Center's River Analysis System (HEC-RAS)			X	
Hydrologic Engineering Center's Geospatial Hydrologic Modeling System (HEC-			X	

Technical Criterion	Ellis	Newling	Comerio	Greene
GeoHMS)				
Thorough understanding of:				
open channel dynamics			X	
enclosed channel systems			X	
application of detention/retention basins			X	
levees and floodwalls			X	
nonstructural solutions such as flood warning systems			X	
flood proofing			X	
Active participation in related professional societies			X	
M.S. degree or higher in engineering			X ¹	
Registered Professional Engineer			X	
Economics/Civil Works Planning				
Minimum 15 years of experience in economics				X
Minimum of 15 years expertise in flood risk management analysis and benefit calculations, including some experience evaluating both structural and nonstructural measures				X
Familiarity with the use of standard USACE computer programs, including Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA).				X
Familiarity with the Institute for Water Resources (IWR) planning suite				X
Familiarity with USACE plan formulation process, procedures, and standards as it relates to flood risk management				X
Minimum of 5 years of experience directly dealing with the USACE six-step planning process, which is governed by ER 1105-2-100, Planning Guidance Notebook				X
Active participation in related professional societies				X
B.S. degree or higher in economics				X

¹ USACE accepted a waiver of this panel member's educational requirements as part of the Task 2 deliverable.

B.3 Panel Member Qualifications

Ralph Ellis, P.E., Ph.D.

Role: Civil/structural engineering expert.

Affiliation: Independent Consultant

Dr. Ellis is an independent consultant and an associate professor in the Department of Civil Engineering at the University of Florida specializing in civil engineering and construction engineering. He earned his Ph.D. in civil engineering from the University of Florida in 1989 and is a registered professional engineer in Florida. During his 40-year career in industry and academia, he has gained more than 35 years of experience with large-scale civil engineering projects, including flood risk management projects. Currently, Dr. Ellis teaches the fundamentals of project design and delivery and is up-to-date with current standards of flood risk management practice.

Dr. Ellis's work on large-scale civil engineering projects has involved both regional and international experience in industry (1973-1989), including the design and construction of levees, pumping stations, piping, and other structures related to water control, construction of temporary and permanent sheet pile walls, and dewatering operations. Many of the projects involved floodwalls, retaining walls, gate well structures, utility penetrations and relocations, interior drainage systems and structures, and the application of stoplog, sandbag, and other nonstructural measures. Before joining the University of Florida, Dr. Ellis was president of the Hammer Corporation construction firm and director of projects for the FMI - Hammer Joint Venture, where he was directly responsible for engineering and delivering all construction projects, including numerous projects for USACE, U.S. Navy, and the Panama Canal Company, and additional water management projects in South Florida. Many of these projects involved the construction of large-scale earthworks directly associated with flood control projects, including large-scale control structures. Dr. Ellis was responsible for construction management, cost estimating, cost and schedule risk analysis, and the design of permanent and temporary structures within the construction scope of work.

Dr. Ellis has experience in performing cost engineering/construction management for all phases of flood risk management projects. During his time in industry experience, he was directly responsible for cost engineering (including the preparation of construction cost estimates) and for project management. He also was directly responsible for contracting issues on many USACE projects. As an experienced IEPR panel member, he has reviewed many project cost estimates at all levels and is completely familiar with USACE cost estimating procedures and standards.

In his position at the University of Florida, he has kept up-to-date on current practice in project management and cost engineering as applied to all phases of flood risk management projects. He is experienced in the development of schedule and cost risk analysis, and uses current risk analysis software applications. In addition, he teaches advanced construction engineering studies, including project management and cost engineering. He has maintained current knowledge of professional practice including the USACE application of risk and uncertainty analyses. As an experienced IEPR member, Dr. Ellis has thorough knowledge and understanding of the USACE application of risk and uncertainty analyses.

Dr. Ellis has also kept up-to-date on Safety Assurance Review (SAR) aspects of USACE projects. As a result, he was selected to participate in several Louisiana coastal storm damage reduction and

ecosystem restoration project IEPRs for USACE, assessing analyses associated with cost engineering and construction management. He also has participated in an IEPR for a SAR of an impoundment project in Palm Beach County, Florida.

Dr. Ellis is an active member of the American Society of Civil Engineers (ASCE). He was a member of the ASCE Committee on Critical Infrastructure (2009-2012), providing input on national infrastructure renewal issues, and was a director of the ASCE Education and Research Directorate (2003-2007).

Charles Newling, PWS

Role: Biological resources and environmental law compliance expert.

Affiliation: Wetland Science Applications, Inc.

Mr. Newling is the senior wetland regulatory scientist and senior vice-president of Wetlands Science Applications, Inc. (WSA) and the Wetland Training Institute (WTI), Inc. He earned his M.S. in zoology with a focus in wildlife ecology from Southern Illinois University Carbondale in 1975. He holds certifications as a Professional Wetland Scientist, Certified Wildlife Biologist, and a Certified Wetland Delineator. His 39-year career has focused on environmental evaluation of water resources (primarily wetlands) in both the public and private sectors for compliance with the Clean Water Act and the National Environmental Policy Act (NEPA). He has a strong knowledge of ecological wetlands, wet prairies, streams, and interconnected habitat, having conducted functional analyses of these environments since 1975, much of this in the Great Lakes ecosystem.

Mr. Newling worked for USACE from 1975 to 1989, as both an environmental resources specialist at the New England Division and as a wildlife biologist with the Wetlands Research Team at the Waterways Experiment Station. He served as the national in-house consultant on matters of wetland delineation (including, when necessary, provision of expert testimony), wetland development and restoration, and as coordinator for USACE's wetland training program. Mr. Newling participated in the preparation of the 1987 "Corps of Engineers Wetland Delineation Manual" and served as chief technical advisor to the three-member team representing USACE in the negotiations that produced the 1989 "Federal Manual for Identifying and Delineating Jurisdictional Wetlands." Since leaving USACE, Mr. Newling has served as co-founder and senior vice-president of both WTI and WSA. Through WTI, he has organized and conducted training sessions primarily for private industry as well as numerous sessions under contract to Federal and state agencies and, since 1989, has been personally involved in providing direct instruction on wetlands topics to over 3,000 students. The WTI training sessions, conducted nationwide, have included Wetland Delineation, Wetland Soils and Hydrology, Wetland Construction and Restoration, Plant Identification, Wetland Delineation in Disturbed and Problem Areas, Wetland Evaluation Techniques, and Federal Wetland Regulation. As a senior wetland regulatory scientist at WSA, he has served as a consultant to private industry and government on wetland delineation, wetland construction and restoration, wetland functions and values, mitigation monitoring, and wetland mitigation banking.

He served as a senior technical reviewer for the 1997 State of Washington Wetland Delineation Method developed by the Washington Department of Ecology and served as a member of the Statewide Technical Committee providing guidance for the 1999 Methods for Assessing Wetland Functions developed by the Washington Department of Ecology. His expertise in wetlands includes integral experience with riparian habitats and riverine systems, including recent peer review work (as the

environmental panel member) for major river-related projects, including Upper Des Plaines River and Tributaries Feasibility Study and the Upper Turkey Creek Johnson County and Wyandotte County, Cedar River—Cedar Rapids, Iowa, Flood Risk Management Feasibility Study, Cache la Poudre at Greeley, Colorado, General Investigation Feasibility Study, and Truckee Meadows Flood Control Project, Nevada, General Reevaluation Report. Mr. Newling has specific knowledge of mitigation and impacts on farmland. Much of the farmland in the Great Lakes region is on drained or partially drained wetlands, with some of it having been designated as "farmed wetland" which can be restored to wetlands for proposed mitigation and is still regulated under the Clean Water Act (CWA). He commonly works with such issues in these habitats.

Mr. Newling has specialized knowledge of a broad array of environmental laws, with a strong focus on the requirements of the CWA, NEPA, and the Endangered Species Act (ESA). Most of his work in the Great Lakes area has involved environmental evaluation of compliance with the CWA, NEPA, and the ESA. He is familiar with cultural resource review requirements, which have applied to virtually all of the permits on which he has worked, and is aware of the need to comply with applicable regulations.

Mr. Newling has more than 13 years of experience working for the USACE New England Division Regulatory Branch and the USACE Waterways Experiment Station Environmental Laboratory. His USACE work involved evaluation and long-term monitoring of habitat development projects. From 1981 to 1989, he was the technical coordinator for USACE wetland training, including evaluation of wetland functions and values, and he has organized, conducted, and served as primary instructor in wetland-related training courses. He has also provided rapid response assistance to USACE District offices nationwide on technical matters of wetland delineation and restoration.

Mr. Newling is a member of The Wildlife Society, Association of State Wetland Managers, Society of Ecological Restoration, and Wisconsin Wetlands Association and has served on the Board of Directors for the Society of Wetland Scientists (SWS) as Liaison to its National Certification Program and as the President of the SWS South Central Chapter.

Anthony Comerio, P.E., CFM, NCEES

Role: Hydrologic and hydraulic engineering expert.

Affiliation: Hanson Professional Services, Inc.

Mr. Comerio is the chief water resources engineer at Hanson Professional Services, Inc. He received a B.S. in agricultural engineering from the University of Illinois at Urbana-Champaign and is a registered professional engineer in Alaska, Missouri, Louisiana, Iowa, and Illinois. He is also a certified floodplain manager in Illinois and is licensed by the National Council of Engineering Examiners (NCEES). Mr. Comerio has 18 years of experience in hydraulic engineering with an emphasis on large public works, including designing levees, floodwalls, water control structures, and stormwater management systems. Until 2006, Mr. Comerio worked with the Illinois Department of Natural Resources' Office of Water Resources (IDNR-OWR), where he gained valuable experience in the analysis, design, coordination and permitting of numerous water resource projects and in the application of risk and uncertainty in defining project performance and assurance. For example, at IDNR-OWR he was responsible for providing detailed economic assessments for public flood control projects, which included quantifying risk and

uncertainty into the flood damage reduction models that were used to estimate average annual flood damage reduction benefits.

Mr. Comerio has extensive experience with standard USACE hydrologic and hydraulic computer models, including HEC-RAS and HEC-HMS and their integration with GIS for model building and flood hazard mapping. He has worked with HEC-HMS since 1999, using version 2.0 (current version 4.0) and HEC-HMS's predecessor, HEC-1. Mr. Comerio has used HEC-HMS for projects ranging from large basin detailed watershed studies for public flood control projects to small basin models for rural railroad bridges. Mr. Comerio was the lead technical advisor for a dam breach model of Lake Springfield, Illinois that required an HEC-HMS model of the entire Sangamon River basin, which has a drainage area greater than 5,000 square miles. He has worked with HEC-RAS since 1998 (and used HEC-RAS's predecessor, HEC-2) to model bridges, dams, levees, pump stations, and detention basins (unsteady). Mr. Comerio has extensive modeling experience with both small- and large-scale bridge projects including the Alaska Railroad Corporation's Tanana River Bridge near Salch, Alaska, which was recently completed to become the largest bridge in Alaska at 3,300 feet. The Tanana River is known for its sediment transport capabilities, as well as the presence of large woody debris and ice flows. This project included the evaluation and analysis of debris-induced pier and abutment scour. The process involved the development and evaluation of HEC-RAS and 2-dimensional hydraulic models, as well as the use of a physical model of the bridge piers at the Ven Te Chow Hydrosystems Laboratory at the University of Illinois Urbana-Champaign. He has worked with HEC-GeoHMS since 2001 when USACE staff from the Hydrologic Engineering Center provided a week-long class on HEC-GeoHMS and HEC-GeoRAS to the Illinois Department of Natural Resources-Office of Water Resources. Mr. Comerio has used HEC-GeoHMS, ArcHydro, and GIS to develop watershed modeling parameters on nearly every watershed modeling project he has worked on since.

Mr. Comerio has a thorough understanding of open channel dynamics, enclosed channel systems, the application of detention/retention basins, levees, and floodwalls, nonstructural solutions such as flood warning systems, and flood proofing. He led the hydraulic design and permitting for a water supply project at Ameren's Coffeen Power Plant in Montgomery County, Illinois from 2006 to 2008. The project included modeling an open-channel hinged-crest gate structure to impound additional water for pumping to the plant's reservoir during seasonal lows, hydraulic modeling of a potential failure of the main reservoir dam in unsteady flow HEC-RAS, and generating dam breach inundation maps for hazard classification. Mr. Comerio was the lead modeler for Levee 50 on the Des Plaines River for USACE Chicago District. This project required citing the proposed levee to reduce impacts on the river and ultimately permitting the levee with the IDNR-OWR. This project included modeling enclosed systems, including interior drainage systems, and required extensive modeling of existing storm systems, which normally would drain to the river but were blocked by the proposed levee and involved the construction of an interior detention pond and pump station to capture, detain, and pump through the levee during flooding. Other projects with detention and retention ponds included stormwater systems for industrial sites, linear roadway projects, intermodal facilities, and airports.

Mr. Comerio was also the water resources lead for the Komatsu levee raise project along the Illinois River in Peoria, Illinois; the levee was not considered sufficient to provide 100-year flood protection. The project involved field inspection of the levee, performance of soil borings, development of proposed flood protection elevation, preparation of subsurface profile, performance of seepage and stability analyses, evaluation of embankment protection, preparation of proposed earthen levee and floodwall concept typical sections, evaluation of internal drainage and existing floodgate structure, recommendations and

preliminary plans illustrating floodwall location, internal drainage improvements, and floodgate improvements, and lastly, permit preparation. Mr. Comerio has worked on several Class I high hazard dams to develop Emergency Action Plans and Operation and Maintenance Manuals. This included the development of dam breach models and associated inundation maps. The maps that were developed for Lake Springfield (2009-2013) and Lake Bloomington (2014) include the identification of affected residential building and bridge structures on major evacuation routes. The maps also included estimates of time-to-peak and estimated flood depth on key bridge structures along the evacuation routes to assist with emergency response. He is currently working on a large flood control project for the Cedar River in Cedar Rapids, Iowa where he will be modeling and designing a floodwall for the west side of the river. The west side protection system will have non-structural flood proofing components including a warning system. He also worked on several sites while at IDNR-OWR where repetitive loss structures were either elevated above the 100-year flood or removed from the floodplain. Once such area along the Des Plaines River in Cook County, Illinois required hazard mitigation of a historic Methodist campground that had been damaged numerous times by flooding. Mr. Comerio has worked on several projects where the feasibility of a large flood control project did not provide adequate benefit-cost ratios and ultimately flood proofing of individual residential structures was recommended. For example, flood proofing in the form of small ring levees, specified grading, and short retaining walls was recommended on the Farmer's Prairie Creek project in Cook County, Illinois.

Mr. Comerio is an active member in the American Society of Civil Engineers, the Illinois Association for Floodplain and Stormwater Management, the American Council of Engineering Companies, and the Association of State Floodplain Managers.

Gretchen Greene, Ph.D.

Role: Economics/Civil Works planning expert.

Affiliation: Ramboll Environ⁵

Dr. Greene is a senior manager at Ramboll Environ and has 20 years of diverse economics experience in natural resource, agricultural, and community economics, including expertise in natural resource damage assessment (NRDA) and flood damages. She earned her Ph.D. in food and resource economics from the University of Florida in 1998. Dr. Greene has Civil Works planning experience on numerous projects related to water resources, including dam feasibility, levee alterations, flood protection, port development, conservation, and ecosystem service payments.

She led a project entitled Dredged Material Management Study: Risk-Based Analysis of the Lewiston Levee, which was part of the Dredged Material Management Environmental Impact Statement (EIS) for the Snake River system in Walla Walla, Washington. For this project, she estimated flood damage reduction benefits of the Lewiston levee system using the HEC-FDA model consistent with USACE Engineering Manual 1110-2-1619, Risk-Based Analysis for Flood Damage Reduction Studies. She oversaw the development of a socioeconomic analysis of the region, including projections and a regional economic impact analysis. In addition, she has reviewed HEC-FDA model results for a number of projects, and she is currently authoring a paper comparing and contrasting alternative flood damage

⁵ ENVIRON International Corporation was purchased by Ramboll during conduct of this IEPR.

estimation tools. Her experience in non-structural flood risk management analysis includes the Floodplain Ecosystem Services Valuation for Carson River Valley. For this project, Dr. Greene estimated the value of floodplain ecosystem services provided by farmlands that flood during winter. The valuation considered the costs that might be avoided by maintaining the floodplain. The project used several HEC-RAS flood event simulations to quantify the magnitude of flood impacts between the natural floodplain and the same floodplain with development (encroachment). Results demonstrated changes in peak flow speed, volume, and warning time under the two scenarios.

She has used the USACE plan formulation process as a contractor to USACE, and has studied and debated the process and its merits and shortcomings in a litigation context. The process forms the basis for benefit-cost analysis that she uses every day as an economist. Her familiarity with USACE structural flood risk management projects includes her experience as an independent external peer reviewer for USACE's Fargo Moorhead Flood Risk Management project, as a peer reviewer for flood retention projects on the Chehalis River in Washington, and her work on the Lewiston Levee system. She is familiar with the IWR Planning Suite and has over five years of experience using the USACE six-step planning process (following ER 1105-2-100). She has applied the process in a number of projects, including the Lewiston Levee project, a Water Supply Reallocation Report for the Savannah District, in the analysis of recreational benefits of a Proposed Water Storage Facility on the Fort Apache Indian Reservation in Arizona, as well as a reviewer for Fargo Moorhead, the Alton to Gale Organized Levee Districts, and the Savannah Harbor General Reevaluation Report and EIS. Most of these projects also included an element of National Economic Development benefits calculation and review.

Dr. Greene is an active member of the Population Association of America, American Water Resources Association, the American Agricultural Economic Association, and the Society for Benefit Cost Analysis.

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APPENDIX C

Final Charge to the IEPR Submitted
to USACE on April 17, 2015 for the
Blanchard River Project

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CHARGE QUESTIONS AND GUIDANCE TO THE PANEL MEMBERS FOR THE IEPR OF THE BLANCHARD RIVER WATERSHED, OHIO, FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT

BACKGROUND

The Blanchard River Watershed, a portion of the Maumee River Watershed, is located within the counties of Putnam, Hancock, Seneca, Allen, Hardin, and Wyandote in northwest, Ohio. The Blanchard River has flooded numerous times in its history causing significant damages in the City of Findlay and Village of Ottawa. Serious flooding in Findlay was reported in Findlay newspaper articles dating back to January 1846. According to the U.S. Geological Survey (USGS) stream gage data at Findlay, the Blanchard River has reached flood stage at least once in 15 of the last 20 years. More recently, from December 2006 to March 2008, Findlay experienced four flooding events that were considered larger than the 10 percent annual chance flood; two of the four floods were within the top five floods ever recorded in Findlay (Source: National Weather Service).

Measures investigated for flood risk management included upstream impoundments, levees, floodwalls, diversion channels, and channelization and non-structural flood proofing actions.

The purpose of the study was to investigate alternative measures and plans for providing flood risk management in the Blanchard River Watershed; to determine the economic, social, and environmental effects of alternative plans; to produce a Feasibility Study Report; and, to recommend a project for authorization by the Congress.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Blanchard River Watershed, Ohio, Feasibility Report and Environmental Impact Statement (EIS) (hereinafter: Blanchard River IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Civil Works Review* (Engineer Circular [EC] 1165-2-214, dated December 15, 2012), and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004).

Peer review is one of the important procedures used to ensure that the quality of 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 purpose of the IEPR is to assess the “adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (EC 1165-2-214; p. D-4) for the Blanchard River documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) with extensive experience in civil/structural engineering, biological resources and environmental law compliance, hydrologic and

hydraulic engineering, and economics/Civil Works planning issues relevant to the project. They will also have experience applying their subject matter expertise to flood risk management.

The Panel will be “charged” with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-214, Appendix D, review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review.

Documents for Review

The following documents are to be reviewed by designated discipline:

Title	Actual No. of Pages	Required Disciplines
Main Report	200	All Disciplines
Economic Appendix	132	Economics/Civil Works Planning
Cost Estimating Appendix (Appendix F)	26	Economics/Civil Works Planning
Abbreviated Risk Analysis (Appendix G)	12	Economics/Civil Works Planning
Geotechnical, Structural and Civil Engineering (Appendix D)	48	Civil/Structural Engineer, H&H Engineer, Economics/Civil Works Planning
Hydrology and Hydraulic Engineering (Appendix A)	71	H&H Engineer
Real Estate (Appendix C)	19	Economics/Civil Works Planning
Environmental/NEPA (Appendix E; 2 files)	314	Biological Resources & Environmental Law Compliance, Economics/Civil Works Planning
Mitigation and Monitoring Plan (Appendix H)	61	Biological Resources & Environmental Law Compliance, Economics/Civil Works Planning
Public Review Comments	Estimated 50	All Disciplines
Total Page Count	933	

Supporting Information

- Risk Register (12 pages)
- Decision Log (4 pages)

Documents for Reference

- USACE guidance, *Civil Works Review*, (EC 1165-2-214, December 15, 2012)
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (December 16, 2004).
- USACE ER 1110-1-8159, Engineering and Design, DrChecks, May 10, 2001.

SCHEDULE

This final schedule is based on the April 9, 2015 receipt of the final review documents. Note that dates presented in the schedule below could change due to panel member and USACE availability.

Task	Action	Due Date
Conduct Peer Review	Battelle sends review documents to panel members	4/13/2015
	Battelle convenes kick-off meeting with panel members	4/15/2015
	Battelle convenes kick-off meeting with USACE and panel members	4/15/2015
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	4/28/2015
	Panel members complete their individual reviews	5/11/2015
Prepare Final Panel Comments and Final IEPR Report	Battelle provides panel members with talking points for Panel Review Teleconference	5/13/2015
	Battelle convenes Panel Review Teleconference	5/15/2015
	Battelle provides Final Panel Comment templates and instructions to panel members	5/15/2015
	Panel members provide draft Final Panel Comments to Battelle	5/28/2015
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments; panel reviews public comments and develops Final Panel Comments, if applicable	5/29/2015 - 6/07/2015
	Panel finalizes Final Panel Comments	6/8/2015
	Battelle receives the public comments from USACE	5/29/2015
	Battelle sends public comments to Panel	6/1/2015
	Panel completes their review of the public comments	6/4/2015
	Battelle and Panel review Panel's responses to public comments	6/5/2015
	Panel drafts Final Panel Comment, if necessary	6/8/2015
	Panel finalizes Final Panel Comment regarding public comments	6/10/2015

	Battelle provides Final IEPR Report to panel members for review	6/12/2015
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Task	Action	Due Date
Prepare Final Panel Comments and Final IEPR Reports	Panel members provide comments on Final IEPR Report	6/16/2015
	Battelle submits Final IEPR Report to USACE*	6/18/2015
	USACE PCX Provides Decision on Final IEPR Report Acceptance	6/25/2015
Comment/Response Process	Battelle inputs Final Panel Comments to the Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	6/29/2015
	Battelle convenes teleconference with Panel to review the Post-Final Panel Comment Response Process	6/29/2015
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE Planning Center of Expertise (PCX) for review	6/29/2015
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	7/14/2015
	USACE PCX provides draft PDT Evaluator Responses to Battelle	7/20/2015
	Battelle provides the panel members the draft PDT Evaluator Responses	7/21/2015
	Panel members provide Battelle with draft BackCheck Responses	7/23/2015
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	7/28/2015
	Battelle convenes Comment-Response Teleconference with panel members and USACE	7/29/2015
	USACE inputs final PDT Evaluator Responses to DrChecks	7/30/2015
	Battelle provides final PDT Evaluator Responses to panel members	8/6/2015
	Panel members provide Battelle with final BackCheck Responses	8/10/2015
	Battelle inputs the panel members' final BackCheck Responses to DrChecks	8/13/2015
	Battelle submits pdf printout of DrChecks project file*	8/20/2015
	ADM	Agency Decision Milestone Meeting
Civil Works Review Board (CWRB)	Panel prepares and/or reviews slides for CWRB	TBD
	Civil Works Review Board	11/1/2015

* Deliverables

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the Blanchard River documents are credible and whether the conclusions are valid.

The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the Blanchard River documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note the following guidance. Note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-214; Appendix D).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.
2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.
3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.
4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.
5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.
6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).

2. Please contact the Battelle Project Manager (Lynn McLeod, mcleod@battelle.org) or Program Manager (Karen Johnson-Young (johnson-youngk@battelle.org)) for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Karen Johnson-Young (johnson-youngk@battelle.org) immediately.
4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report, but will remain anonymous.

Please submit your comments in electronic form to Lynn McLeod, mcleod@battelle.org, no later than May 11, 2015, 10 pm ET.

Independent External Peer Review
of the
Blanchard River Watershed, Ohio, Feasibility Report
and Environmental Impact Statement (EIS)

Charge Questions and Relevant Sections as Supplied by USACE

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 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 charge. The 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 charge.

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 panel may have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review.

Broad Evaluation Charge Questions

1. Is the need for and intent of the decision document clearly stated?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical information?
3. Given the need for and intent of the decision document, assess the adequacy and acceptability of the project evaluation data used in the study analyses.
4. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering assumptions that underlie the study analyses.
5. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering methodologies, analyses, and projections.
6. Given the need for and intent of the decision document, assess the adequacy and acceptability of the models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives.
7. Given the need for and intent of the decision document, assess the adequacy and acceptability of the methods for integrating risk and uncertainty.
8. Given the need for and intent of the decision document, assess the adequacy and acceptability of the formulation of alternative plans and the range of alternative plans considered.

9. Given the need for and intent of the decision document, assess the adequacy and acceptability of the quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans.
10. Given the need for and intent of the decision document, assess the adequacy and acceptability of the overall assessment of significant environmental impacts and any biological analyses.
11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
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.
13. For the tentatively selected plan, assess whether the models used to assess life safety hazards are appropriate.
14. For the tentatively selected plan, assess whether the assumptions made for the life safety hazards are appropriate.
15. For the tentatively selected plan, assess whether the quality and quantity of the surveys, investigations, and engineering are sufficient for a concept design considering the life safety hazards and to support the models and assumptions made for determining the hazards.
16. For the tentatively selected plan, assess whether the analysis adequately address the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.

Specific Technical and Scientific Charge Questions

17. Steady state hydraulic modeling was used to evaluate and compare alternative plans (including the No Action alternative).
 - a. Assess the adequacy and acceptability of the data, assumptions, and methods used in the hydraulic modeling.
 - b. Evaluate whether the interpretations of the hydraulic analysis and the conclusions based on the analysis are reasonable.
 - c. Evaluate whether the uncertainties associated with the hydraulic analysis were adequately considered and addressed to provide a reasonable basis for comparison of alternatives and selection of a recommended plan.
18. Due to challenges in obtaining rights of entry on private property, limited geotechnical information was available to support analysis.
 - a. Assess the adequacy and acceptability of the data, assumptions, and methods used in the geotechnical analysis and in particular the assumptions relative to the depth of bedrock.
 - b. Evaluate whether the interpretations of the geotechnical analysis and the conclusions based on the analysis are reasonable.
 - c. Evaluate whether the uncertainties associated with the geotechnical analysis were adequately considered and addressed to provide a reasonable basis for comparison of alternatives and selection of a recommended plan.

19. Similarly, due to the challenges in obtaining rights of entry, limited environmental field surveys were able to be conducted.
 - a. Assess the adequacy and acceptability of the data, assumptions, and methods used in the evaluation of wetland and endangered species resources and of potential alternative plan impacts.
 - b. Evaluate whether the interpretations of the analyses and the conclusions based on the analysis are reasonable.
 - c. Evaluate whether the uncertainties associated with the analysis were adequately considered and addressed to provide a reasonable basis for comparison of alternatives and selection of a recommended plan.
20. Regarding the residential and commercial structures:
 - a. Evaluate the data, assumptions, and methodologies used to evaluate residential and commercial structure inventories, including sampling methods where used.
 - b. Evaluate whether the interpretations of the economic analyses and the conclusions based on the analysis are reasonable.
 - c. Evaluate whether the uncertainties associated with the economic analysis were adequately considered and addressed to provide a reasonable basis for comparison of alternatives and selection of a recommended plan.
21. Assess the adequacy and reasonableness of the alternative plan cost estimates for use in comparing alternatives and as a basis for selecting a tentatively recommended plan.

Summary Questions:

22. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.
23. Please provide positive feedback on the project and/or review documents.

Public Comments

24. Does information or do concerns raised by the public raise any additional discipline-specific technical concerns with regard to the overall report?

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APPENDIX D

Conflict of Interest Form

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Conflicts of Interest Questionnaire
[Independent External Peer Review]
[Blanchard River Watershed]

The purpose of this document is to help the U.S. Army Corps of Engineers identify potential organizational conflicts of interest on a task order basis as early in the acquisition process as possible. Complete the questionnaire with background information and fully disclose relevant potential conflicts of interest. Substantial details are not necessary; USACE will examine additional information if appropriate. Affirmative answers will not disqualify your firm from this or future procurements.

NAME OF FIRM: **Battelle Memorial Institute**
REPRESENTATIVE'S NAME: **Gina M. Crabtree**
TELEPHONE: **614-424-5097**
ADDRESS: **505 King Avenue, Columbus, OH 43201**
EMAIL ADDRESS: crabtreeg@battelle.org

I. INDEPENDENCE FROM WORK PRODUCT. Has your firm been involved in any aspect of the preparation of the subject study report and associated analyses (field studies, report writing, supporting research etc.) No Yes (if yes, briefly describe):

II. INTEREST IN STUDY AREA OR OUTCOME. Does your firm have any interests or holdings in the study area, or any stake in the outcome or recommendations of the study, or any affiliation with the local sponsor? No Yes (if yes, briefly describe):

III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? No Yes (if no, briefly describe the difficulty in identifying outside reviewers):

IV. AFFILIATION WITH PARTIES THAT MAY BE INVOLVED WITH PROJECT IMPLEMENTATION. Do you anticipate that your firm will have any association with parties that may be involved with or benefit from future activities associated with this study, such as project construction? No Yes (if yes, briefly describe):

V. ADDITIONAL INFORMATION. Report relevant aspects of your firm's background or present circumstances not addressed above that might reasonably be construed by others as affecting your firm's judgment. Please include any information that may reasonably: impair your firm's objectivity; skew the competition in favor of your firm; or allow your firm unequal access to nonpublic information. No additional information to report.

Conia Chabree
YOUR SIGNATURE

8/20/16
DATE

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