Final Independent External Peer Review Report

Integrated Feasibility Study and Environmental Impact Statement for the LCA-Small Diversion at Convent/Blind River (St. James Parish, Louisiana)

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Ecosystem Restoration Planning Center of Expertise
Rock Island District

Contract No. W911NF-07-D-0001
Task Control Number: 10096
Delivery Order: 0896

June 22, 2010
SHORT-TERM ANALYSIS SERVICE (STAS)

on

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by

Battelle
505 King Avenue
Columbus, OH  43201

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Scientific Services Program

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or decision, unless so designated by other documentation.
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EXECUTIVE SUMMARY

The Small Diversion at Convent/Blind River is a project proposed by the U.S. Army Corps of Engineers (USACE), New Orleans District, to construct a freshwater diversion project along the banks of the Mississippi River in the vicinity of Romeville, Louisiana. The diversion will provide fresh water, nutrients, and sediments to the southwest portion of the Maurepas Swamp to reverse the trend of deterioration in the Swamp and in the Blind River. The Blind River headwaters are located in St. James Parish, Louisiana, approximately 2 to 3 miles north of the east bank of the Mississippi River at Convent. The Blind River flows north then east through Ascension and St. John the Baptist Parishes before it empties into Lake Maurepas. The study area for this project is within the Upper Lake Pontchartrain Sub-basin, which includes Lake Maurepas, Maurepas Swamp, Blind River, and portions of the Amite River.

Without action, the swamp is predicted to continue to deteriorate at the same rate or at accelerated rates. The objectives of this study are as follows: (1) reverse the current decline of a portion of the southwest portion of the Maurepas Swamp, (2) prevent the transition of the swamp into saline marsh and open water, and (3) reintroduce fresh water, sediment, and nutrients to the Swamp to return the natural historic flooding cycle and rebuild wetlands. The third objective is intended to improve biological productivity, reverse the current trend of degradation, and restore the Swamp, which may provide some measure of flood damage protection.

USACE is simultaneously conducting five individual Independent External Peer Review (IEPRs) under one project (LCA 6 project) to review six elements of the Louisiana Coastal Area (LCA) Ecosystem Restoration Project. As part of the LCA 6 project, an IEPR was conducted for the Integrated Feasibility Study and Environmental Impact Statement for the Louisiana Coastal Area (LCA) – Small Diversion at Convent/Blind River (St. James Parish, Louisiana), hereinafter referred to as the Convent/Blind River report. Battelle, as a 501(c)(3) non-profit science and technology organization with experience in establishing and administering peer review panels for USACE, was engaged to coordinate the IEPR of the Convent/Blind River report. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2010), USACE (2007), and OMB (2004). This final report describes the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel (the Panel).

1 Two of the six elements were reviewed under one independent external peer review.
Five panel members were selected for the IEPR from more than 90 identified candidates for the five LCA 6 project IEPR panels. Based on the technical content of the Convent/Blind River report and the overall scope of the project, the final panel members were selected for their technical expertise in the following key areas: civil design/construction cost engineering, Civil Works planning, wetland ecology, hydrology and hydraulics engineering, and economics.

The Panel received electronic versions of the Convent/Blind River documents, along with a charge that solicited comments on specific sections of the documents to be reviewed. The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to the start of the review. Other than this teleconference, there was no direct communication between the Panel and USACE during the peer review process. The Panel produced approximately 375 individual comments in response to the 126 charge questions.

IEPR panel members reviewed the Convent/Blind River documents individually. The panel members then met via teleconference with Battelle to review key technical comments, discuss charge questions for which there were conflicting responses, 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, or low); and (4) recommendations on how to resolve the comment. Overall, 14 Final Panel Comments were identified and documented. Of these, eight were identified as having high significance, one had medium significance, and five had low significance.

Table ES-1 summarizes the Final Panel Comments by level of significance. Detailed information on each comment is contained in Appendix A of this report.

**Table ES-1. Overview of 14 Final Comments Identified by the Convent/Blind River IEPR Panel**

<table>
<thead>
<tr>
<th>Significance - High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>12</td>
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<tr>
<td>13</td>
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<tr>
<td>14</td>
</tr>
</tbody>
</table>

The IEPR panel members generally agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2010; p. D-4) in the Convent/Blind River report. In addition, the IEPR Panel agrees that the USACE PDT has presented rational and achievable structural alternatives which have been derived in accordance with USACE Planning Guidance in an effort to achieve the project objectives. The following statements provide an overview of the Panel’s findings, which are described in more detail in the Final Panel Comments (see Appendix A). The cumulative effect of the plan formulation process as described below is that the only project objective which can be reasonably expected to be met is the eastward movement of the saline waters through Lake Maurepas and perhaps out to Lake Pontchartrain. Sustaining the movement under future conditions, and considering sea level rise, is less certain.

**Engineering:** The identification and selection of management measures rely heavily on best professional judgment and accepted best management practices to compensate for the lack of data and the resultant challenges to proper model construction. The design level engineering associated with the management measures (such as structure details) is nonetheless well done, although it is not clear whether allowances have been made to compensate for infrastructure subsidence due to future sea level rise. Of great significance to the Panel was the question of flood avoidance and future flood control capacity. Having the diversion in place and the floor of the swamp increasing in elevation, while the surrounding populated areas continue to experience subsidence, creates a flood management situation worthy of intense investigation.
**Economics:** The cost estimating, which represents a significant portion of the work effort, was well done. It is the Panel’s opinion that the economic assessments were complete and thorough within the context of the other uncertainties. For example, should the engineering estimates of meeting flood control requirements be inaccurate or the ecological response within the swamp and lake be less than desired, then the assessment would need to be revised.

**Environmental:** The lowered salinity is likely to slow down or reverse the present-day trend towards conversion from forested swamp to salt marsh or open water, depending on the extent of future sea level rise. The level to which the remaining objectives might be met cannot be predicted. Predicting ecological responses, either in changes to swamp ecological structure or to resident species, requires a complete understanding of the physical and chemical changes wrought by the new water circulation. The ecological models, which rely on the engineering models, are, therefore, not likely to be accurate in their predictions.

**Plan Formulation:** The project was planned based on a mixture of complete, precise, and accurate data and on data which are incomplete, imprecise, and often biased. Some data as well as the analysis of that data, such as groundwater (including seepage into and out of rivers, canals, and swamps), potential for saltwater intrusion due to relative sea level rise (RSLR), or a watershed water balance, appear to be overlooked entirely or omitted from the report. As a result, there are plan elements or management measures which are appropriate but poorly implemented (e.g., evenly spaced and sized berm cuts). Others, such as the contribution of atmospheric deposition, litterfall, and root biomass, are not considered. Models used to analyze the environmental conditions and the hydrology are admittedly poor and not reliably predictive of either existing or future conditions.

There is a heavy and acceptable reliance on best professional judgment in the selection of management measures and, at the same time, an apparent oversight in not conducting syntheses of alternatives to arrive at a single plan using the best elements of individual alternatives. For example, combining Alternatives 2 and 6 by eliminating the Rome canal and retaining the northern distribution canal might have had benefits to the northeast swamp while eliminating the cost of the Rome diversion.

The Panel is in complete agreement that the method of adaptive management proposed in the Convent/Blind River report is the only rational path forward without suspending the project until more appropriate data are collected. The Panel also finds that the description of the adaptive management program and the post-construction data collection effort upon which it will rely are in need of added detail and mandated funding. The post-construction data collection (monitoring) must go beyond typical monitoring efforts and become a comprehensive, well-funded, and ongoing program.
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<tr>
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</tr>
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<td>Overview of 14 Final Panel Comments Identified by Convent/Blind River IEPR Panel</td>
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</tbody>
</table>
LIST OF ACRONYMS

AFB  Air Force Base
ATR  Agency Technical Review
CE/ICA Cost Effectiveness and Incremental Cost Analysis
CPRA Coastal Protection and Restoration Authority
DrChecks Design Review and Checking System
EFDC Environmental Fluid Dynamics Code
EIS Environmental Impact Statement
ERDC Engineer Research and Development Center
FS  Feasibility Study
HEC-HMS Hydrologic Engineering Center-Hydrologic Modeling System
HEC-RAS Hydrologic Engineering Center-River Analysis System
IEPR Independent External Peer Review
LCA Louisiana Coastal Area
NOAA National Oceanic and Atmospheric Administration
NTP Notice To Proceed
O&M Operations & Maintenance
OCPR Office of Coastal Protection and Restoration
OMB Office of Management and Budget
PDT Project Delivery Team
RSLR Relative Sea Level Rise
SCS Soil Conservation Service
SFWMD South Florida Water Management District
USACE United States Army Corps of Engineers
USEPA United States Environmental Protection Agency
USGS United States Geological Survey
WVA Wetland Value Assessment
1. INTRODUCTION

The Water Resources Development Act of 2007 authorized the Louisiana Coastal Area (LCA) program. Specifically, Section 7006(e)(3) requires the Secretary of the Army to submit one feasibility report to Congress on the following six elements of the project (hereinafter referred to as LCA 6 project):

1) Terrebonne Basin Barrier Shoreline Restoration,
2) Small Diversion at Convent/Blind River,
3) Amite River Diversion Canal Modification,
4) Medium Diversion at White Ditch,
5) Convey Atchafalaya River Water to Northern Terrebonne Marshes, and

The Congressional language further authorizes construction of these six elements contingent upon submittal of a favorable report of the Chief of Engineers no later than December 31, 2010. The U.S. Army Corps of Engineers (USACE) is the Federal sponsor for the projects, and the non-Federal sponsor is Louisiana’s Coastal Protection and Restoration Authority (CPRA).

Five individual Independent External Peer Reviews (IEPRs) are being conducted simultaneously under one project (LCA 6 project) to review the six elements of the LCA Ecosystem Restoration Project. As part of the LCA 6 project, an IEPR was conducted for the Small Diversion at Convent/Blind River project (hereinafter referred to as the Convent/Blind River project).

The Blind River headwaters are located in St. James Parish approximately 2 to 3 miles north of the east bank of the Mississippi River at Convent. The Blind River flows north then east through Ascension and St. John the Baptist Parishes before it empties into Lake Maurepas. The study area for this project is within the Upper Lake Pontchartrain Sub-basin, which includes Lake Maurepas, Maurepas Swamp, Blind River, and portions of the Amite River.

The USACE, New Orleans District, is proposing to construct a freshwater diversion project along the banks of the Mississippi River in the vicinity of Romeville, Louisiana, to provide fresh water, nutrients, and sediments to the southwest portion of the Maurepas Swamp to reverse the trend of deterioration in the swamp and in the Blind River. Without action, the swamp is predicted to continue to deteriorate at the same rate or at accelerated rates. The objectives of this study are as follows: (1) reverse the current decline of a portion of the southwest portion of the Maurepas Swamp; (2) prevent the transition of the swamp into saline marsh and open water; and (3) reintroduce freshwater, sediment, and nutrients to the swamp to return the natural historic flooding cycle and rebuild wetlands. The third objective is intended to improve biological productivity, reverse current trend of degradation, and restore the swamp, which may provide some measure of flood damage protection.

Two of the six elements were reviewed under one independent external peer review.
The objective of the work described here was to conduct an IEPR of the LCA Small Diversion at Convent/Blind River Integrated Feasibility Study and Environmental Impact Statement (herein after referred to as the Convent/Blind River report) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers Engineer Circular Civil Works Review Policy (EC No. 1165-2-209) (USACE, 2010), USACE CECW-CP memorandum Peer Review Process (USACE, 2007), and Office of Management and Budget (OMB) bulletin Final Information Quality Bulletin for Peer Review (OMB, 2004). Battelle, as a 501(c)(3) non-profit science and technology organization with experience in establishing and administering peer review panels, was engaged to coordinate the IEPR of the Convent/Blind River report. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses.

This final report details the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel on the existing environmental, economic, and engineering analyses contained in the Convent/Blind River report. Detailed information on the Final Panel Comments is provided in Appendix A.

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 (2010) and USACE (2007).

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 economic, engineering, and environmental analysis 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 Convent/Blind River report was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization under Section 501(c)(3) of the U.S. Internal Revenue Code with experience conducting IEPRs for USACE.

3. METHODS

This section describes the methods followed in selecting the members for the IEPR Panel (the Panel) and in planning and conducting the IEPR. The IEPR was conducted following procedures described by USACE (2010) and in accordance with USACE (2007) and OMB (2004) guidance. Supplemental guidance on evaluation for conflicts of interest 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).
3.1 Planning and Schedule

After receiving the notice to proceed (NTP), Battelle held a kick-off meeting on the entire LCA 6 project with USACE to review the preliminary/suggested schedule for each of the five reviews, 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.

Table 1 outlines the tasks conducted under this project and defines the schedule followed in executing the Convent/Blind River IEPR. Tasks 1 through 4 were conducted concurrently for all five IEPRs being conducted under the LCA 6 project. For instance, one work plan applicable to all five reviews was prepared and submitted. Due dates for milestones and deliverables listed in Table 1 are based on receipt of approval from the USACE Contracting Officer to begin initial work on the project (i.e., Pre-award funding approval) on March 12, 2010. The actual meeting dates and receipt of the Convent/Blind River report are specific for this review. Note that the work items listed in Task 8 occur after the submission of this report. Battelle will enter the 14 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.

Table 1. Convent/Blind River IEPR Schedule

<table>
<thead>
<tr>
<th>TASK</th>
<th>ACTION</th>
<th>DUE DATE</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-award funding approval&lt;sup&gt;a&lt;/sup&gt;</td>
<td>March 12, 2010</td>
</tr>
<tr>
<td></td>
<td>NTP/review documents available</td>
<td>March 24, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle prepares draft Work Plan&lt;sup&gt;b&lt;/sup&gt;</td>
<td>April 9, 2010</td>
</tr>
<tr>
<td></td>
<td>USACE provides comments on draft Work Plan</td>
<td>April 14, 2010</td>
</tr>
<tr>
<td>2</td>
<td>Battelle recruits and screens up to 30 potential panel members; prepares summary information&lt;sup&gt;a&lt;/sup&gt;</td>
<td>April 7, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle submits draft charge&lt;sup&gt;b&lt;/sup&gt;</td>
<td>April 9, 2010</td>
</tr>
<tr>
<td></td>
<td>USACE provides comments on draft charge</td>
<td>April 14, 2010</td>
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<tr>
<td></td>
<td>Battelle submits final Work Plan, including final charge&lt;sup&gt;b&lt;/sup&gt;</td>
<td>April 19, 2010</td>
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<tr>
<td></td>
<td>USACE approves final Work Plan, including final charge</td>
<td>April 20, 2010</td>
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<tr>
<td>3</td>
<td>Battelle selects no more than 25 panel members</td>
<td>April 7, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle submits list of selected panel members</td>
<td>April 7, 2010</td>
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<tr>
<td></td>
<td>USACE provides comments on list of panel members</td>
<td>April 9, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle completes subcontracts for panel members</td>
<td>April 27, 2010</td>
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<td>4</td>
<td>Kick-off meeting convened with USACE and Battelle</td>
<td>March 26, 2010</td>
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<td></td>
<td>Kick-off meeting convened with Battelle and IEPR Panel</td>
<td>April 26, 2010</td>
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<tr>
<td></td>
<td>Kick-off meeting convened with USACE, Battelle, and IEPR Panel</td>
<td>April 28, 2010</td>
</tr>
<tr>
<td>5</td>
<td>Battelle sends review documents and charge to IEPR Panel</td>
<td>April 26, 2010</td>
</tr>
</tbody>
</table>

<sup>a</sup> Due dates for milestones and deliverables listed in Table 1 are based on receipt of approval from the USACE Contracting Officer to begin initial work on the project (i.e., Pre-award funding approval) on March 12, 2010. The actual meeting dates and receipt of the Convent/Blind River report are specific for this review. Note that the work items listed in Task 8 occur after the submission of this report. Battelle will enter the 14 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.

<sup>b</sup> For instance, one work plan applicable to all five reviews was prepared and submitted. Due dates for milestones and deliverables listed in Table 1 are based on receipt of approval from the USACE Contracting Officer to begin initial work on the project (i.e., Pre-award funding approval) on March 12, 2010. The actual meeting dates and receipt of the Convent/Blind River report are specific for this review. Note that the work items listed in Task 8 occur after the submission of this report. Battelle will enter the 14 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.
### TASK ACTION DUE DATE

<table>
<thead>
<tr>
<th>TASK</th>
<th>IEPR Panel completes review and provides comments to Battelle</th>
<th>May 13, 2010</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Battelle consolidates comments from IEPR Panel</td>
<td>May 24, 2010</td>
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<tr>
<td>7</td>
<td>Consensus teleconference convened with IEPR Panel and Battelle</td>
<td>May 24, 2010</td>
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<tr>
<td></td>
<td>IEPR Panel provides draft Final Panel Comments to Battelle</td>
<td>June 2, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle submits final IEPR Report to USACE(^b)</td>
<td>June 23, 2010</td>
</tr>
<tr>
<td>8(^c)</td>
<td>Battelle inputs Final Panel Comments to DrChecks</td>
<td>June 25, 2010</td>
</tr>
<tr>
<td></td>
<td>USACE provides draft Evaluator Responses via e-mail (Word document)</td>
<td>July 6, 2010</td>
</tr>
<tr>
<td></td>
<td>Teleconference convened with USACE, Battelle, and IEPR Panel to discuss Final Panel Comments</td>
<td>July 16, 2010</td>
</tr>
<tr>
<td></td>
<td>USACE inputs final Evaluator Responses to Final Panel Comments in DrChecks</td>
<td>July 28, 2010</td>
</tr>
<tr>
<td></td>
<td>IEPR Panel responds to USACE Evaluator Responses (Backcheck Responses)</td>
<td>August 11, 2010</td>
</tr>
<tr>
<td></td>
<td>Battelle submits pdf of DrChecks file and closes out DrChecks(^b)</td>
<td>August 12, 2010</td>
</tr>
<tr>
<td></td>
<td>Project Closeout</td>
<td>October 21, 2010</td>
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</tbody>
</table>

\(^a\) Requested to start on recruitment to meet the aggressive schedule

\(^b\) Deliverable

\(^c\) Task occurs after the submission of this report.

#### 3.2 Identification and Selection of IEPR Panel Members

Each of the five LCA IEPRs required experts with identical areas of expertise corresponding to the technical content of the LCA projects: civil design/construction cost engineering, Civil Works planning, wetland ecology, hydrology and hydraulics engineering, and economics. Therefore, efforts were consolidated to identify and recruit experts.

Battelle initially identified 90 candidates for the five LCA 6 project IEPR panels, evaluated their technical expertise, and inquired about potential conflicts of interest. Of these, Battelle chose 29 of the most qualified candidates and confirmed their interest and availability. Of the 29 candidates, 25 were proposed for the final LCA panels (5 experts per panel) and 4 were proposed as backup panel members for individual areas of expertise (the civil design/construction cost engineering panel was presented without a backup). The backup panel members were the same for each of the five LCA IEPRs and would be able to serve on any panel that required their participation. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed conflicts of interest, or lack of the precise technical expertise required. The five primary and four backup panel members chosen for the Convent/Blind River IEPR are described in Section 4.0 of this report.
The candidates were screened for the following potential exclusion criteria or conflicts of interest.³ Participation in previous USACE technical peer review committees and other technical review panel experience was also considered.

- Involvement by you or your firm⁴ in any part of the LCA program, particularly the following six elements:
  - Multipurpose Operation of Houma Navigation Lock
  - Terrebonne Basin Barrier Shoreline Restoration
  - Small Diversion at Convent/Blind River
  - Amite River Diversion Canal Modification
  - Medium Diversion at White Ditch
  - Convey Atchafalaya River Water to Northern Terrebonne Marshes
- Involvement by you or your firm⁴ in any work related to the Louisiana CPRA.
- Involvement by you or your firm⁴ in ecosystem restoration, flood risk management, coastal storm damage reduction, or shoreline restoration projects in coastal Louisiana or Mississippi.
- Involvement by you or your firm⁴ in the conceptual or actual design, construction, or operations and maintenance (O&M) of any projects for the LCA program, particularly the six elements listed in #1 above.
- Current employment by USACE.
- Involvement with paid or unpaid expert testimony related to the LCA program, particularly the six elements listed in the LCA projects above.
- Current or previous employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups: Louisiana CPRA, Louisiana Office of Coastal Protection and Restoration (OCPR), National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Environmental Protection Agency (USEPA), Minerals Management Service, and U.S. Geological Survey (USGS) and currently working on LCA-related projects (for pay or pro bono).
- Past, current, pending, or future interests (financial or otherwise) by you, your spouse, or children related to the LCA program, particularly the six elements listed in #1 above, including interest in LCA-related contracts or awards from 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 Note: Includes any joint ventures in which your firm is involved.
• Current personal involvement with other USACE projects, including authoring any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the New Orleans District.

• Current firm involvement with other USACE projects, specifically those projects/contracts that are with the New Orleans District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role.

• Any previous employment by the USACE as a direct employee or contractor (either as an individual or through your firm) within the last 10 years, notably if those projects/contracts are with the New Orleans 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:
  o shoreline restoration projects
  o hydrologic diversion projects
  o lock operation projects,
and include the client/agency and duration of review (approximate dates).

• A significant portion (i.e., greater than 50%) of personal or firm revenues within the last 3 years came from USACE contracts.

• Participation in relevant prior Federal studies/programs relevant to this project, such as:
  o Coast 2050 Plan
  o LCA Ecosystem Restoration Study, 2004
  o Integrated Ecosystem Restoration and Hurricane Protection: Louisiana’s Comprehensive Master Plan for a Sustainable Coast, 2007
  o Louisiana Coastal Protection and Restoration Technical Report, 2009
  o LCA Near-term Restoration Plan, 2004

• Participation in relevant prior non-Federal studies/programs relevant to this project.

• Any publicly documented statement (including, for example, advocating for or discouraging against) related to the LCA program, particularly the six elements listed in LCA projects above.

• 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:

In selecting the final 29 members for the five panels from the list of candidates, Battelle chose experts who best fit the expertise areas and had no conflicts of interest. Then, to assign each selected panel member to a specific IEPR, Battelle evaluated his or her background and expertise in more detail for experience that may be most appropriate for the individual LCA projects. For
example, if a panel member had experience with coastal restoration, Battelle assigned him or her to the Terrebonne Basin Barrier Shoreline Restoration Project IEPR. In addition, Battelle made every effort to have at least one expert on each panel who had previously served on another IEPR panel managed by Battelle. This ensured that panel members unfamiliar with the process would have someone, in addition to Battelle, who had experience and could provide guidance.

Once the five panel members for the Convent/Blind River IEPR were chosen from the larger pool of candidates, Battelle established their subcontracts in which they indicated their willingness to participate and confirmed the absence of conflicts of interest through a signed Conflict of Interest form. Section 4.0 of this report provides names and biographical information of the Convent/Blind River IEPR panel members.

Prior to beginning their review and within 2 days of their subcontracts being finalized, all members of the Panel attended a kick-off meeting via teleconference that was planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication, and other pertinent information with the Panel.

3.3 Preparation of the Charge and Conduct of the IEPR

Battelle drafted a preliminary charge document for the Convent/Blind River IEPR to assist USACE with the development of the charge questions to guide the peer review, according to guidance provided in USACE (2010) and OMB (2004). The draft charge was submitted to the USACE for evaluation as part of the draft Work Plan. USACE provided comments and revisions to the draft charge, which were used to produce the final charge. The final charge was submitted to USACE for approval. In addition to a list of 126 charge questions/discussion points developed for the Convent/Blind River IEPR, the final charge included general guidance for the Panel on the conduct of the peer review (provided in Appendix B of this final report). After the charge was reviewed and approved by USACE, it was sent to the Panel to guide the review of the Convent/Blind River report.

To begin the review, Battelle planned and facilitated kick-off meetings via teleconference during which USACE presented project details to the Panel. Two teleconference meetings were conducted for each of the five IEPRs: the first allowed USACE to provide an overview of the LCA Ecosystem Restoration Project as a whole, and the second allowed USACE to brief the individual panels on the specific project that they would be reviewing. Before the meeting, the Convent/Blind River IEPR Panel received an electronic version of the Convent/Blind River documents and the final charge. A full list of the documents reviewed by the Panel is provided in Appendix B of this report. The Panel was instructed to address the charge questions/discussion points within a comment-response form provided by Battelle.

All IEPR activities conducted – from the review of the documents through the Final Panel Comment Backcheck process (described below) – were conducted solely by the Convent/Blind River IEPR panel members and not in conjunction with the other four panels participating under the LCA 6 project.
3.4 Review of Individual Comments

The Convent/Blind River Panel produced approximately 375 individual comments in response to the charge questions/discussion points. The individual comments were merged into a single table to facilitate the review of the five sets of comments received on the Convent/Blind River report. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. As a result of the review, Battelle was able to summarize the 375 comments into a preliminary list of 23 overall comments and discussion points. Each panel member’s individual comments were shared with the full Panel in a merged individual comments table.

3.5 IEPR Panel Teleconference

Battelle facilitated a 4-hour teleconference with the Panel so that the panel experts, many of whom are from diverse scientific backgrounds, 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 IEPR report and decide which panel member would 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 high-level importance to the findings, and merged any related individual comments. In addition, Battelle confirmed each Final Panel Comment’s level of significance to the Panel.

The Panel also discussed responses to nine specific charge questions where there appeared to be disagreement among panel members. The conflicting comments were resolved based on the professional judgment of the Panel, and all sets of comments were determined not to be conflicting. Each comment was either incorporated into a Final Panel Comment, determined to be consistent with other Final Panel Comments already developed, or determined to be a non-significant issue.

At the end of these discussions, the Panel identified 13 comments and discussion points that should be brought forward as Final Panel Comments.

3.6 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 Final Convent/Blind River IEPR report:

- **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 other IEPR panel members 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 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, low; see description below)
  4. Recommendations 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 problem with the project that could affect the recommendation or justification of the project
  2. Medium: Affects the completeness or understanding of the reports/project
  3. Low: Affects the technical quality of the reports but will not affect the recommendation of the project.

• Guidance for Developing the Recommendation: The recommendation was to include specific actions that the 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).

During the preparation of the Final Panel Comments, the Panel identified one additional Final Panel Comment. At the end of this process, a new total of 14 Final Panel Comments were prepared and assembled. 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. 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 Appendix A of this report.

4. PANEL DESCRIPTION

Candidates for the Panel were identified using Battelle’s Peer Reviewer Database, targeted Internet searches using key words (e.g., technical area, geographic region), searches of websites of universities or other compiled expert sites, and referrals. Battelle prepared a draft list of primary and backup candidate panel members (who were screened for availability, technical background, and conflicts of interest) and provided it to USACE. Battelle selected the final panel members.

Table 2 presents an overview of the credentials of the final five primary members of the Convent/Blind River IEPR 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 presented below and in the text that follows the table.

**Ralph Ellis, Jr., P.E.**  
**Role:** Civil Design/Construction Cost Engineering  
**Affiliation:** Independent Consultant and University of Florida

**Dr. Ralph Ellis, Jr., P.E.**, is currently an Associate Professor in the Department of Civil Engineering at the University of Florida specializing in the areas of engineering management, construction engineering, and the legal aspects of construction. He earned a Ph.D. in civil engineering from the University of Florida in 1989 and is a licensed professional engineer in Florida. Dr. Ellis has 30 years of construction engineering and management experience and has worked on large-scale civil engineering projects both regionally and internationally. He is experienced in cost-estimating practices and current procurement and contracting methods, including design-build and best value approaches. Dr. Ellis has published numerous technical papers on cost-risk analysis, risk mitigation planning, cost-growth analysis, and planning as related to construction project cost. As the Director of Projects for the FMI-Hammer Joint Venture, Dr. Ellis was responsible for supervising cost-estimating activities and managing large Civil Works projects for USA CE, U.S. Navy, and the Panama Canal Company. Many of these projects were located in South Florida and Central America and involved the construction of large-scale earthworks, some directly associated with flood control projects. He is familiar with all aspects required for the construction of pump station structures, which typically required setting up complex dewatering operations. He has also directed the construction of temporary and permanent sheet pile walls for flood control purposes. Dr. Ellis is familiar with construction practices commonly required for Everglades Restoration projects in South Florida, as well as those utilized on the Gulf Coast projects. He is experienced with incorporating environmental protection planning into project operations and is familiar with new construction methods for building drainage retention areas. Dr. Ellis has performed over 48 research projects focusing on construction management and construction technical issues. He has served as a construction cost engineering expert for the IEPR of the Tamiami Trail Limited Re-evaluation Report and is currently serving on the Board of Directors for the Florida Construction Users Roundtable. Additionally, Dr. Ellis has served on the Industry Advisory Panel for the U.S. State Department, Bureau of Overseas Building Operations, and is currently a member of the Critical Infrastructure Committee of the American Society of Civil Engineers.
Table 2. Small Diversion at Convent/Blind River: IEPR Panel: Technical Criteria and Areas of Expertise

<table>
<thead>
<tr>
<th>Civil Design/Construction Cost Engineering (one expert needed)</th>
<th>Ellis</th>
<th>Cuba</th>
<th>Proffitt</th>
<th>Maristany</th>
<th>Mazzotta</th>
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</thead>
<tbody>
<tr>
<td>Minimum of 10 years demonstrated experience</td>
<td>X</td>
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<tr>
<td>Familiar with large, complex Civil Works projects with high public and interagency interests</td>
<td>X</td>
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<tr>
<td>Degree(s) in Civil Engineering</td>
<td>X</td>
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<tr>
<td>Demonstrated experience in performing cost engineering/construction management for all phases of ecosystem restoration, flood risk management, or related projects</td>
<td>X</td>
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<tr>
<td>Familiar with similar projects across the United States and related cost engineering. Experience in associated contracting procedures, total cost growth analysis, and related cost risk analysis desired</td>
<td>X</td>
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<tr>
<td>Familiar with construction industry and practices used in wetland restoration, flood damage/coastal storm damage reduction in the Gulf of Mexico coast</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>Civil Works Planning (one expert needed)</th>
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<tr>
<td>At least 10 years of demonstrated experience in Civil Works planning</td>
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<tr>
<td>Familiar with large, complex Civil Works projects with high public and interagency interests</td>
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<tr>
<td>Degree in planning or related field</td>
<td>Waiver requested</td>
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<tr>
<td>Experience with the plan formulation process</td>
<td>X</td>
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<tr>
<td>Familiar with evaluation of alternative plans for ecosystem restoration projects</td>
<td>X</td>
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<tr>
<td>Familiar with USACE standards and procedures</td>
<td>X</td>
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<tr>
<td>Wetland Ecology (one expert needed)</td>
<td>Ellis</td>
<td>Cuba</td>
<td>Proffitt</td>
<td>Maristany</td>
<td>Mazzotta</td>
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<tr>
<td>At least 10 years of demonstrated experience in wetland ecology</td>
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<td>X</td>
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<tr>
<td>Familiar with the ecology of coastal wetlands and estuarine environments and restoration of coastal wetland and estuarine environments in the Gulf of Mexico</td>
<td></td>
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<td>X</td>
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<tr>
<td>Master’s degree in ecology or biology</td>
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<tr>
<th>Hydrology and Hydraulics Engineering (one expert needed)</th>
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<tbody>
<tr>
<td>Minimum 10 years experience with engineering analyses related to wetland restoration in coastal areas</td>
<td></td>
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<tr>
<td>Minimum 10 years experience with engineering analyses related to flood/coastal storm damage reduction</td>
<td></td>
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<td>X</td>
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<tr>
<td>Familiar with standard USACE hydrologic and hydraulic computer models</td>
<td></td>
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<td>X</td>
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<tr>
<td>Familiar with large, complex Civil Works projects with high public and interagency interests</td>
<td></td>
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<td>X</td>
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<tr>
<td>Registered professional engineer</td>
<td></td>
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<td>X</td>
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<tr>
<td>Minimum of an M.S. degree in civil engineering or hydrology and hydraulics</td>
<td></td>
<td></td>
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<thead>
<tr>
<th>Economics (one expert needed)</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Minimum 10 years experience evaluating the appropriateness of cost effectiveness and incremental cost analysis (CE/ICA), as applied to dollar costs and ecosystem restoration benefits</td>
<td></td>
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<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Familiar with USACE CE/ICA tool: Institute for Water Resources (IWR)-Planning Suite (per 3/26 kickoff, this is not required expertise for this IEPR)</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Experience with cost effectiveness and cost-benefit analysis in general⁹</td>
<td></td>
<td></td>
<td>X</td>
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</tr>
<tr>
<td>Familiar with large, complex Civil Works projects with high public and interagency interests</td>
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a. The SOW requests a degree in planning or related field; Dr. Cuba has a Ph.D. in marine science and his degree focused on the research and application of the dynamics of successional ecology (i.e., planning). Dr. Cuba has planning and alternatives analysis experience, has served as a project manager and chief scientist on several restoration projects during his 27-year career, and has experience with plan formulation within the context of the USACE six-step planning process. Battelle’s opinion is that Dr. Cuba’s Ph.D., years of experience, and valuable contributions on recent USACE IERP panels (served as planner on C-111, Clear Creek, and Tamiami Trail) are equivalent to a degree in a related field. Battelle is confident that his skill set is more than adequate to serve as an expert on this Panel.

b. As clarified during the March 26, 2010, kickoff teleconference, if a panel member does not have specific experience with IWR-Planning Suite.
**Tom Cuba**
**Role:** Civil Works Planner  
**Affiliation:** Delta-Seven, Inc.

Dr. Tom Cuba earned a B.S. in zoology from Texas A&M University and a Ph.D. in marine ecology from the University of South Florida. He is currently the chief scientist at the consulting firm of Delta Seven, Inc., and serves as a research scientist for the Stillwater Research Group, a not-for-profit ecological research group. He has developed management plans for a variety of Florida watersheds and aquatic preserves, worked on waterfront and coastal infrastructure feasibility plans, and designed and implemented wetland, pond, and seagrass, mangrove, marsh, and dune restoration plans. His restoration project experience includes components of construction elements as well. He has managed, regulated, and conducted research in every type of coastal habitat on the Gulf Coast. Dr. Cuba has written a prioritization report for management, recovery, and restoration planning in Pinellas County, Florida, and after creating the conceptual plans for the recovery of the Fort DeSoto Aquatic Management Area, he supervised the implementation of those plans as well as for the restoration of several Florida swamps and ponds. For Allen’s Creek watershed, he directed the development of a holistic watershed plan for a stream having characteristics ranging from tidal influence (at the mouth) to being fed by small ponds and lakes (in its upper reaches). The watershed covers 4,600 acres in central Pinellas County, the most densely populated county in Florida. His team began with a year-long water monitoring and habitat study (which included cypress-maple wooded swamp, a small marsh, the ponds and small lakes, and the streams themselves). An integrated version of SWMM 4/5 was used with a receiving water model to load and unload the stream, including additions of stormwater, septic, and street underdrain loadings, with Dr. Cuba’s team eventually mapping the entire stormwater system for the first time. This entire process was repeated for the Lake Seminole, Lake Tarpon, and Alligator Creek watersheds. Dr. Cuba has participated in three other peer reviews, including ones for large Civil Works projects, and is familiar with the plan formulation process and USACE’s six-step planning process.

**Ed Proffitt**
**Role:** Wetland Ecologist  
**Affiliation:** Florida Atlantic University

Dr. Ed Proffitt is currently an Associate Professor in the Department of Biological Sciences, Florida Atlantic University, stationed at Harbor Branch Oceanographic Institution, Fort Pierce, Florida, with research interests in mangrove and marsh biology and ecology, estuarine ecology, plant-animal interactions, population and community biology, ecological genetics, and remediation and restoration ecology. He earned his Ph.D. in biology from the University of South Florida in 1983. He has over 35 years of experience in the field of estuarine and coastal ecology and is familiar with methods for evaluating ecological benefits in coastal wetland and estuarine environments in the Gulf Coast region. Dr. Proffitt’s involvement with large Civil Works projects includes his position as the Chief of the Wetlands Ecology Branch National Wetlands Research Center for the USGS in Lafayette, Louisiana, and service on national teams to develop plans for specific new research. He also oversaw all biological research for the Hurricane Mitch program in Central America and the USGS coastal marsh dieback program. Key restoration studies have included analysis of mangroves in southwest Florida and
examination of salt marshes in Louisiana and Florida, focusing on the vegetation ecology. He has been author/co-author on over 50 technical reports, book chapters, and publications on wetland and ecological-related topics for *Journal of Ecology*, *Restoration Ecology*, *Estuaries* and *Coasts*, and other publications, and is the Associate Editor of the journal *Wetlands*. Dr. Proffitt has received several Star Awards for outstanding performance while with the USGS, 1998-2005, and a recipient of the National Association of Counties Achievement Award for Estuarine and Coastal Research and Management Projects Initiated in Collier County. He has served as a board member of the Coastal and Estuarine Research Federation and President of the Gulf Estuarine Research Society.

**Agustin Maristany, P.E.**

**Role:** Hydrology and Hydraulics Engineer  
**Affiliation:** King Engineering Associates, Inc.

Mr. Agustin Maristany, P.E., is currently the vice president of King Engineering Associates, Inc. in Florida. He earned his M.S. in civil engineering/water resources from the University of Texas, Austin, in 1979 and is a registered professional engineer in Florida. Mr. Maristany has over 30 years of experience practicing civil/water resources engineering, including the hydrologic and hydraulic evaluation of coastal and freshwater wetland systems. Sample projects have included evaluation of the Homestead, Florida, Air Force Base (AFB) coastal wetland rehydration; planning, design, and construction support services (including seepage and sheet (2D) flow modeling) for the South Florida Water Management District’s (SFWMD) artificial wetland Stormwater Treatment Areas 3/4 and 5/6, which are key components of the Comprehensive Everglades Restoration Plan; the North Canal Design project in Homestead, Florida, which involved embankment restoration improvements; and the 370-acre Lake Maggiore environmental assessment and restoration study. Mr. Maristany has completed numerous stormwater and watershed master plans dealing with flood control, hydrologic and hydraulic modeling, floodplain delineation, damage assessment, evaluation/ranking of flood control alternatives, design, and permitting. He has developed coastal flood control plans for the SFWMD, Miami-Dade County, Central Broward Water Control District, the cities of Fort Lauderdale and Cape Coral, Broward County, and the Homestead AFB. Mr. Maristany is experienced with the following hydrologic/hydraulic modeling software: HEC-1, HEC-2, SID, EAD, HEC-RAS, SWMM, XP-SWMM, SEEP2D, adCIRC, FESWMS-2D, and the Georgia Tech Watershed Model. He has practical working knowledge of MODFLOW, MIKE SHE, and MIKE 11 models. In addition, he has developed and applied hydrologic, hydraulic, and water quality models to fit specific project needs, including the development of an integrated surface and groundwater stochastic model that simulated the impacts of wellfield operations on the Everglades National Park. Mr. Maristany has extensive experience with the planning, modeling, design, permitting, and construction management of large public multi-disciplinary civil/water resources projects for SFWMD, the Northwest Florida Water Management District, Central Broward Water Control District, Broward County, Miami-Dade County, and Leon County.
Marisa Mazzotta
Role: Economist
Affiliation: Independent Consultant

Dr. Marisa Mazzotta is currently the principal at EcoBenefits Research, an independent environmental economic consulting firm. She earned her Ph.D. in environmental and natural resource economics from the University of Rhode Island in 1996. She has 20 years of experience, including 13 years as an assistant research professor at the URI. She has extensive experience working on ecosystem restoration-related economics projects, including serving as the Principal Investigator for a research grant with the National Science Foundation, USEPA, and the U.S. Department of Agriculture: Combining Economic and Ecological Indicators to Prioritize Wetlands Restoration Projects Within a Spatial GIS Framework. While at the University of Rhode Island, Dr. Mazzotta researched natural resource restoration as compensation for natural resource injuries and she has co-authored several restoration-related publications. She currently serves as an economist on the wetlands team of the USEPA’s Ecosystem Services Research Program. Dr. Mazzotta’s experience with large, complex Civil Works projects includes conducting a benefits analysis of USEPA’s 316(b) regulations of power plant cooling water intake structures. She has extensive experience with benefit-cost analysis and natural resource damage assessment analysis, including estimating use and non-use values for commercial and recreational fisheries and threatened and endangered species. Her experience with cost effectiveness/incremental cost analysis (CE/ICA) types of projects includes using restoration scaling approaches, conducting break-even analyses, and researching cost effectiveness of restoration actions as compensation for damages. She has reviewed various economic analysis methods, including cost effectiveness and restoration scaling.

5. SUMMARY OF FINAL PANEL COMMENTS

The IEPR panel members generally agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USA CE, 2010; p. D-4) in the Convent/Blind River report. In addition, the IEPR Panel agrees that the USA CE Project Delivery Team (PDT) has presented rational and achievable structural alternatives which have been derived in accordance with USA CE Planning Guidance in an effort to achieve the project objectives. The following statements provide an overview of the Panel’s findings, which are described in more detail in the Final Panel Comments (see Appendix A.) The cumulative effect of the plan formulation process as described below is that the only project objective which can be reasonably expected to be met is the eastward movement of the saline waters through Lake Maurepas and perhaps out to Lake Pontchartrain. Sustaining the movement under future conditions, and considering sea level rise, is less certain.

Engineering: The identification and selection of management measures rely heavily on best professional judgment and accepted best management practices to compensate for the lack of data and the resultant challenges to proper model construction. The design level engineering associated with the management measures (such as structure details) is nonetheless well done, although it is not clear whether allowances have been made to compensate for infrastructure subsidence due to future sea level rise. Of great significance to the Panel was the question of flood avoidance and future flood control capacity. Having the diversion in place and the floor of
the swamp increasing in elevation, while the surrounding populated areas continue to experience subsidence, creates a flood management situation worthy of intense investigation.

**Economics:** The cost estimating, which represents a significant portion of the work effort, was well done. It is the Panel’s opinion that the economic assessments were complete and thorough within the context of the other uncertainties. For example, should the engineering estimates of meeting flood control requirements be inaccurate or the ecological response within the swamp and lake be less than desired, then the assessment would need to be revised.

**Environmental:** The lowered salinity is likely to slow down or reverse the present-day trend towards conversion from forested swamp to salt marsh or open water, depending on the extent of future sea level rise. The level to which the remaining objectives might be met cannot be predicted. Predicting ecological responses, either in changes to swamp ecological structure or to resident species, requires a complete understanding of the physical and chemical changes wrought by the new water circulation. The ecological models, which rely on the engineering models, are, therefore, not likely to be accurate in their predictions.

**Plan Formulation:** The project was planned based on a mixture of complete, precise, and accurate data and on data which are incomplete, imprecise, and often biased. Some data as well as the analysis of that data, such as groundwater (including seepage into and out of rivers, canals, and swamps), potential for saltwater intrusion due to relative sea level rise (RSLR), or a watershed water balance, appear to be overlooked entirely or omitted from the report. As a result, there are plan elements or management measures which are appropriate but poorly implemented (e.g., evenly spaced and sized berm cuts). Others, such as the contribution of atmospheric deposition, litterfall, and root biomass, are not considered. Models used to analyze the environmental conditions and the hydrology are admittedly poor and not reliably predictive of either existing or future conditions.

There is a heavy and acceptable reliance on best professional judgment in the selection of management measures and, at the same time, an apparent oversight in not conducting syntheses of alternatives to arrive at a single plan using the best elements of individual alternatives. For example, combining Alternatives 2 and 6 by eliminating the Rome canal and retaining the northern distribution canal might have had benefits to the northeast swamp while eliminating the cost of the Rome diversion.

The Panel is in complete agreement that the method of adaptive management proposed in the Conven/Blind River report is the only rational path forward without suspending the project until more appropriate data are collected. The Panel also finds that the description of the adaptive management program and the post-construction data collection effort upon which it will rely are in need of added detail and mandated funding. The post-construction data collection (monitoring) must go beyond typical monitoring efforts and become a comprehensive, well-funded, and ongoing program.

Table 3 lists the 14 Final Panel Comment statements by level of significance.
### Table 3. Overview of 14 Final Panel Comments Identified by Convent/Blind River IEPR Panel

<table>
<thead>
<tr>
<th>Panel</th>
<th>Significance – High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The proposed structural actions are well engineered but are based on data which lack resolution, accuracy, precision, and spatial distribution, thereby compromising the logic in the derivation of management measures.</td>
</tr>
<tr>
<td>2</td>
<td>The hydrodynamic model (Environmental Fluid Dynamics Code [EFDC]) was not well documented and was improperly validated; key hydrologic components were not considered; and berm cuts were not modeled correctly.</td>
</tr>
<tr>
<td>3</td>
<td>The engineering calculations do not provide accurate results, and the model validation process was not appropriate.</td>
</tr>
<tr>
<td>4</td>
<td>The flood control impacts of the proposed improvements are not properly documented or addressed.</td>
</tr>
<tr>
<td>5</td>
<td>The operation and management plan should be expanded to include actions designed to meet ecological goals, specifically pulsed and extended dry periods.</td>
</tr>
<tr>
<td>6</td>
<td>Equally spaced/sized berm cuts and culvert locations/sizes are not tailored to the specific topographical, hydraulic, and ecological features of the receiving habitat areas, or to the specific diversion alternatives.</td>
</tr>
<tr>
<td>7</td>
<td>The extent of seepage and the potential impact that seepage may have on the project has not been considered and could be significant, affecting the hydrology and hydraulics of the study area.</td>
</tr>
<tr>
<td>8</td>
<td>Because of the many uncertainties associated with predicting the project’s benefits, a sensitivity analysis for the Wetland Value Assessment (WVA) analysis should be conducted to demonstrate that the project will successfully provide benefits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel</th>
<th>Significance – Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>The lack of data on sediment accretion rates and productivity in the forest system will prevent achieving the Project Objective of relating “swamp building” to river diversion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel</th>
<th>Significance – Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>The discussions on endangered and protected species and their habitats contain inconsistencies and inaccuracies which need to be corrected.</td>
</tr>
<tr>
<td>11</td>
<td>The needs of the railroads, which have only been informally discussed with them, may impact right-of-way acquisition and project design.</td>
</tr>
<tr>
<td>12</td>
<td>The report should differentiate between saline and freshwater marshes.</td>
</tr>
<tr>
<td>13</td>
<td>The readability of the report would be significantly improved by providing references to the appropriate appendix in the narrative of the main report.</td>
</tr>
<tr>
<td>14</td>
<td>There are typographical errors in the cost effectiveness/incremental cost analysis (CE/ICA) sections that need to be corrected so that results are accurately reported.</td>
</tr>
</tbody>
</table>
6. REFERENCES


APPENDIX A

Final Panel Comments

on the

Integrated Feasibility Study and Environmental Impact Statement for the LCA-Small Diversion at Convent/Blind River (St. James Parish, Louisiana)
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### Final Panel Comment 1:

The proposed structural actions are well engineered but are based on data which lack resolution, accuracy, precision, and spatial distribution, thereby compromising the logic in the derivation of management measures.

### Basis for Comment:

The engineering in the management measures is clearly based on best management practices and best professional judgment and meets normal engineering standards of practice. The conceptual design approach for the civil design elements is technically sound and cost-effective.

The obstacle to success of the Recommended Plan is the high and pervasive levels of uncertainty associated with the data upon which the engineering is based. Uncertainty in subsidence, sea level rise, and accretion obviate the ability to predict a balance among the three, resulting in a range of possible results spanning 7.62 feet. The poor topographic data within the swamp basins themselves affect not only the range but also the distribution of sediments, nutrients, and autochthonous production (litterfall and roots).

It is commendable that the Project Delivery Team (PDT) acknowledges these limitations (e.g., Appendix L, p. L-47: “Fundamentally, then, in the absence of data with which to confirm HEC-HMS hydrologic predictions . . .” and Appendix L, p. L-16: “Because of a lack of hydrologic data throughout the swamp and Blind River system, the HEC-HMS and HEC-RAS models could not be truly calibrated to historical data.”) However, acknowledgment of the effects of the problem on the project reliability is not sufficient.

Good data within the channels and creek provide reliable information regarding salinity gradients. The uncertainties in data lead to uncertainties in the hydrologic model, which leads to uncertainties in the loads and affects of the water flow and pattern and in the resulting ecological response. The uncertain water distribution (and the nutrient and sediment loads it carries) within the swamp undermines ecological models and predictions, including Figure L2.10.5-1 as compared to Figure L2.10.5-4 (Appendix L, pp. L-196 and L-199). These models predict frequency, not duration, of desiccation, establishing uncertainty in the project results. Berm cut elevations which are higher than the normal pool of the swamp lead to uncertainties about desiccation. Despite the uncertainties, the projections are sometimes reported as if they were precise (such as the target of 1,000 grams per square meter of sediment deposited, presumably evenly, over the system). It is unclear how such a prediction could be accurate given the data and the model and given the uncertainty in water flow rates in the forest. Similarly, the project predicts no increased flood risk to developed properties, but fails to consider that the swamp floor is expected to rise while the developed areas are expected to continue to subside.

Similar to the uncertainty in the physical data, there are problems with the ecological data set as well. Data collection sites and observation stations (see Appendix A) are most often located on the river, road beds, rail beds, canal banks and other points with easy access. These data are most probably not representative of the interior of the swamp. The ecological data contain inconsistencies as well. For example, in Table 4-9 of the environmental impact statement (EIS), the entry under Raptors is “Not Historically Present” for Blind River Mapping Unit. On the contrary, Appendix A, p. A1-38 et seq. lists four hawks and two owls.
Upon examining the map of observation posts for the avifauna survey in Figure 2, Bird Survey Location Points (Terrestrial) Small Diversion at Convent/Blind River (see figure on PDF p. 81 of the Biological Assessment, Appendix A) and the location of the sighting in Appendix A, p. A1-38, it is clear that the observers were working from berms, dirt roads, rails, and river courses, and not really penetrating the swamp itself. Vegetative observation stations are also at “edge” sites (see unlabeled figure on PDF p. 112 of Appendix A), as are the geological borings: the latter are less affected by the station bias than the biological data.

These uncertainties give rise to significant risk to the success of the project. Risk in the report is defined in terms of parameters, not in terms of overall project, hydrologic, or ecological performance. The high risk associated with the uncertainties mandates proper monitoring, adaptive programs, and funding.

The existing monitoring plan as described will not meet the data needs required to make corrective judgments. The plan needs to go beyond the baseline work. The variables discussed in the plan, however, do allow for the development of definitive measures and metrics of the effect of the plan. Project success hinges on a very strong reliance on post-implementation monitoring, assessment, and adaptation.

In summary, the Convent/Blind River report indicates that the objectives of sedimentation, marsh buildup, backflow prevention, and protection of the marsh against saltwater intrusion protection will probably not be met over the life of the project without acquiring and utilizing additional data and the ongoing refinement of the plan, the models, the engineering, and the operations. The project as proposed is a valid short-term, first-response solution that may not be effective without substantial future changes. The adaptive management plan as presented is generic and procedural in nature. The actions required by "adaptive management" may require radical changes.

**Significance - High:**
Incomplete, imprecise, baseline data coupled with a poor monitoring plan and ill-defined response plan present an unacceptable risk to the long-term success of the project.

**Recommendation(s) for Resolution:**
To resolve these concerns, the report would need to be expanded as follows:
1. Develop and implement a spatially, temporally, and topically comprehensive post-implementation data collection and analysis (monitoring) plan.
2. Develop and implement a fast response mechanism for managers to adjust operational aspects of the project.
3. Develop and implement a steady, long-term program of frequent data analysis associated with structural components of the project (i.e., those not alterable by operational adjustments), with a periodic assessment of re-engineering and reconstruction which may be required or beneficial.
4. Incorporate the above elements into a well-defined, funded, mandated, and auditable (by effort, cost, and result) adaptive management plan.
Final Panel Comment 2:

The hydrodynamic model (Environmental Fluid Dynamics Code [EFDC]) was not well documented and was improperly validated; key hydrologic components were not considered; and berm cuts were not modeled correctly.

Basis for Comment:

Four different models were utilized to jointly simulate the hydrologic and hydraulic characteristics of the study area. They are discussed in three different Final Panel Comments (2, 3, and 4). Because of the interconnected nature of the models, selected model concerns were repeated within each Final Panel Comment for completeness.

The hydrodynamic model was the primary high-resolution tool used to evaluate the effectiveness of the proposed alternatives by quantifying flow distribution, water depths, sediment deposition/erosion, water quality, and hydraulic residence time. Based on the limited documentation provided, it appears that the model is not yet performing at a level that credibly supports and validates the evaluation, selection, and effectiveness of alternatives, as follows:

Missing Key Components of Hydrology/Hydraulics of Study Area – The existing and future hydrology of the study area is poorly understood and conceptualized in the Convent/Blind River report and the EFDC model. Several key aspects of hydrology were omitted:

- Influence of groundwater and seepage - The Mississippi River is generally at a much higher stage than the rest of the study area, especially during the spring, creating a persistently high head gradient (2 to 28 feet of head) with the potential to deliver large volumes of seepage that would be captured by the canals in the study area. The inclusion of seepage is particularly critical to continuous simulations.

- Relative sea level rise (RSLR) impacts on flood control - RSLR will generally cause the existing developed properties to subside relative to sea level and the surrounding landscape (especially if this project is effective at raising the overall ground level of the wetlands). At a minimum, this effect will generally reduce the capacity of future diversions to avoid flooding existing properties. At worst, the diversions would have to be eliminated to prevent flooding impacts to these properties. Longer term, a combination of drainage pump stations and levees will be required to protect these properties. It is not clear how the current project fits into the long-term hydrology and hydraulics requirements of this area; therefore, it gives the impression of a “quick-fix” with limited long-term vision.

- Atmospheric deposition not considered - The documentation did not mention atmospheric deposition (wet and dry), which could be a large component of the nutrient input to the wetlands.

Hydrodynamic Model Input – The Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) and HEC-River Analysis System (HEC-RAS) provide inflows and boundary conditions. To the extent that those models are yielding poor or biased results, the hydrodynamic model results are equally compromised.
Missing Watershed Water Balance - A key element of any modeling effort is to get the volumes right prior to attempting to model flows, especially when limited data are available to calibrate/validate the model. A long-term water balance is essential to provide proper perspective on the magnitude of key components of the hydrologic cycle and their impact on the study area. Limited data presented in the report point to apparent major discrepancies in the water balance. For example, the report indicates that rainfall averages 60 inches per year and evaporation approximately 60 inches per year, neutralizing each other. Yet the report estimated runoff at 36 inches annually in 2003, or 60% of rainfall. Assuming that the 36 inches reflect the total runoff outflow from the basin (which is not clear), there must be an unidentified but significant source of water to satisfy evaporation demand.

Equally Spaced and Sized Berm Cuts - It appears that the use of equally spaced and sized berm gaps is causing short circuiting of water (as reflected by higher flows through the gaps closer to the channels draining into the Blind River) and is not promoting sheet flow along the higher portions of the swamp as desired. This is evident in Figures L2.10.1-3, L2.10.1-5, L2.10.1-6, and L2.10.1-7 in Appendix L.

**Significance - High:**
The evaluation of alternatives and the selection, operation, and success of the Recommended Plan are affected by the model results.

**Recommendation(s) for Resolution:**

To resolve these concerns, the report would need to be expanded as follows:

1. Revisit the range of recommended alternatives and consider the long-term hydrologic and hydraulic infrastructure requirements of the study area. If RSLR will inevitably lead to levees and pump stations to maintain flood control in the developed areas, the report should describe how the diversion project fits into the phased implementation of that future infrastructure required to maintain flood control. A combination of saltwater control structures, levees, and diversions may be key components of the final solution.

2. Incorporate impacts of RSLR on current and future flood control as developed properties subside relative to sea level and adjacent wetlands. A sensitivity analysis of this condition is essential to the long-term viability of the recommended alternative.

3. Evaluate seepage induced by higher Mississippi River stages into the study area and incorporate the resulting data into the models as appropriate. A simple vertical cross-section model of the area should be created to model the flows and groundwater levels induced by the river and its impact on the study area and proposed project. A SEEP2D model could be used for this purpose. Given uncertainties associated with the lithology of the study area, a sensitivity analysis of model parameters should be conducted.

4. Conduct a long-term water balance of the watershed study area that accounts for all elements of the water balance, even if some elements are estimated for lack of data.

5. Refine model boundary conditions and flows.

6. Address the issue of atmospheric deposition on the wetlands. Dry and wet deposition of nutrients and other parameters should be incorporated into the model and compared to the expected impacts of the proposed project as a means to judge the project’s effectiveness. Further, a simple nutrient budget balance of the wetlands for pre- and post-project would be helpful at gauging the project’s effectiveness.
7. Establish the location and size of berm cuts for each alternative to maximize the intended benefits and minimize short-circuiting. This process should be completed prior to assessing the benefits and cost of each alternative.

8. Provide more detailed documentation of model results, including flow and stage histories, summary statistics, and duration curves at key locations.
Final Panel Comment 3:

The engineering calculations do not provide accurate results, and the model validation process was not appropriate.

Basis for Comment:

Four different models were utilized to jointly simulate the hydrologic and hydraulic characteristics of the study area. They are discussed in three different Final Panel Comments (2, 3, and 4). Because of the interconnected nature of the models, selected model concerns were repeated within each Final Panel Comment for completeness.

The “engineering calculations” were used to create a water balance for the period 1989-2004, calculate average water levels, estimate the frequency of dry-out periods, compute annual sediment loads into the swamp, and develop a time series of diversion flows to be used as input to HEC-RAS.

The approach of utilizing engineering calculations was appropriate, but some of the methodologies used will produce low accuracy in the predictions, particularly in light of the fact that there are insufficient data for model validation. When data for model validation are scarce, it is more prudent to utilize deterministically based equations that are expected to yield more robust and credible results. Following are specific comments on the engineering calculations:

- The hydrology of the wetlands appears (not clear from review of the report) to have been represented by a simple one-way runoff equation that does not account for backflow conditions. This methodology will yield large errors, particularly if the model is not calibrated properly.
- The inability of the model to account for backflow from Lake Maurepas into the wetlands (especially with the introduction of berm gaps) will tend to reduce storage in the model (wetlands) and creates a bias toward lower wetland levels than actually exist.
- The model operates to avoid backflow from the lake; however, there is no discussion on the frequency or occurrences of backflow or whether the diversions were sufficient to prevent backflow.
- The engineering flow calculations were force-fitted using simplified techniques to fit the HEC-HMS flows and HEC-RAS, which were not calibrated and have their own limitations.
- The model does not account for seepage inflows from the Mississippi River, which can affect the hydrology and hydraulics of the study area.

The engineering calculations model validation process was not appropriate and creates the false impression that the model is producing accurate results because of the following:

- Comparison of HEC-HMS results with the engineering calculations is not valid because the engineering calculations of runoff were initially calibrated to match HEC-HMS data.
- Comparison of the transposed river gage data from a nearby watershed is not appropriate nor expected to yield accurate results because the geographical variation in rainfall alone will create large discrepancies in flows. This is evident in Figure L2.3.6-16 on p. L-57.
• Comparisons of HEC-RAS results and the engineering calculations for 2003 show that the engineering calculations consistently underestimated stages, partly because there is no accounting for backflow. Further, comparing one uncalibrated model to another is not an appropriate basis for validating a model.

• No water balance calculations were provided. However, sufficient data are available to prepare an estimate so that model results can be confirmed to be within acceptable ranges.

The general poor performance of the engineering calculations model is clearly depicted on Figure L2.3.6-14 where the model consistently underestimates stages in Area 100. Therefore, reliance on the results of this model is not recommended when testing the long-term effectiveness of alternatives. It is expected to overestimate both dry-out periods as well as diversion volumes. Page L-55 states that once diversions are introduced into the engineering calculations, the differences between the two models are substantially reduced. This does not validate the model and is explained by the fact that diversion flows will be automatically increased by the model until wetland and lake levels match in order to prevent backflow, a condition that will bring model stages closer to those of the lake. Because lake stages dominate stages in the study area, the model falsely appears to be more accurate when diversions are included, but the fact is that diversions serve as a calibration factor, force-fitting the model to match lake levels.

In summary, review of the available documentation raises significant questions and a general lack of confidence in the model results, yet the report gives the incorrect impression that the model results are adequate and relies on its results to measure the benefits of the alternatives.

**Significance - High:**
The model results directly impact the screening and selection of the Recommended Plan.

**Recommendation(s) for Resolution:**
To resolve these concerns, the report would need to be expanded as follows:

1. Document the results of the model to allow a more appropriate evaluation: present long-term average results of water budget components, present time series of stages, flows, summary statistics, duration curves, etc.
2. Restructure the model to incorporate more accurate routing methodologies such as storage routing through the wetlands, weir flow equation through the berm gaps, and hydraulic routing using rating curves generated by HEC-RAS for the canals.
3. Incorporate the ability to account for backflow. Model should track backflow events and estimate the ability of diversions to prevent backflows, especially in the future due to the effects of RSLR.
4. Incorporate the effects of seepage inflows from the Mississippi River.
5. Incorporate into the model as appropriate the expectation of the impacts of RSLR on current and future flood control as developed properties subside relative to sea level and adjacent wetlands. A sensitivity analysis of this condition is essential to the long-term viability of the recommended alternative.
6. Refine model boundaries and flows.
7. Perform sensitivity analysis of key model parameters to assess model accuracy and estimate model range of error
Final Panel Comment 4:

The flood control impacts of the proposed improvements are not properly documented or addressed.

Basis for Comment:
Four different models were utilized to jointly simulate the hydrologic and hydraulic characteristics of the study area. They are discussed in three different Final Panel Comments (2, 3, and 4). Because of the interconnected nature of the models, selected model concerns were repeated within each Final Panel Comment for completeness.

The HEC-HMS and HEC-RAS models were used to model several design storm events and establish baseline flood stages and flows for current conditions. These models were used as the basis for assessing the flood control properties of the proposed projects. Following is a summary of key issues related to flood control:

Documentation Limitations. The Convent/Blind River report shows estimated stages for various design storm events. However, the specific location of the stages is not shown. Further, the report does not include critical flood design levels of service (i.e., 100-year design stage, road crown elevations, etc.), critical elevations (stages at which flooding occurs), and related locations to serve as the basis for ensuring that existing properties are not negatively impacted by the proposed projects. Generally, peak stages and durations should be evaluated against existing ground elevations at strategic locations.

RSLR Impacts on Flood Control Not Considered – RSLR rise will generally cause the existing developed properties to subside relative to sea level and the surrounding landscape, especially if wetland accretion is successful. HEC-RAS model results show that the ability of the project to reduce backflow events is reduced significantly due to RSLR, even with increased diversions which may not be possible due to potential flooding impacts. For example, Table L2.3.5-2 shows average marsh stages increasing significantly due to sea level rise. In addition, Table L2.3.5-4 shows large increases in backflow volumes into the marsh due to RSLR, with some magnitudes in the same range as throughput near the 50-year projection. At a minimum, this effect will generally reduce the capacity of future diversions to avoid flooding existing properties. At worst, the diversions would have to be eliminated to prevent flooding impacts to these properties. Longer term, perhaps within the life of the proposed project, a combination of drainage pump stations, control structures, and levees will be required to protect properties from flooding and control saltwater intrusion impacts to the marshes.

HEC-HMS Model Contains Significant Flow Estimation Errors – HEC-HMS model was used to generate storm events flows and a continuous record of flow for the year 2003 simulations that served as the flow input data to both the HEC-RAS and hydrodynamic model (EFDC). The following limitations were identified:

- The HEC-HMS model was validated by comparing design storm peak flows estimated using U.S. Geological Survey (USGS) regression equations. The report acknowledges (p. L-35) that the regression equations are not applicable to the entire Blind River Basin because of the large storage in the basin. Table L-2.3.4-3 shows that the peak flows
generated by HEC-HMS compare favorably with the regression equations. These results suggest that the HEC-HMS peak flows may be overestimated. While this comparison is helpful, it does not constitute validation of the model, but gives the impression to the casual reader of a validated model.

- The HEC-HMS model was the basis for generating a continuous record of flows used by HEC-RAS. The Soil Conservation Service (SCS) methodology utilized to estimate flows was developed for extreme storm events; therefore, very large errors can be expected from the application of the model to generate continuous flows.
- The model does not account for seepage inflows from the Mississippi River, which could limit the canal capacity available for flood control and diversions. The inclusion of seepage flows is particularly critical to continuous simulations.
- Page L-58 compares flows in an adjacent basin and flows estimated by the model. The runoff yield from the comparative basin for which data were available is estimated at 55% of the blind river, indicating that the runoff in the Blind River is higher by a factor of two.
- A long-term water balance of the study area was not performed, yet it is important to obtain accurate volumes before attempting to model flows. Limited data presented in the report point to apparent major discrepancies in the water balance. For example, the report indicates that rainfall averages 60 inches per year and evaporation approximately 60 inches per year, neutralizing each other. Yet the report estimated runoff at 36 inches annually in 2003, or 60% of rainfall, raising questions about conservation of mass.

HEC-RAS Model Simulations Contain Significant Errors – The HEC-RAS model was used to simulate design storm events and to provide a continuous simulation of flows and stages for the year 2003. Following is a summary of model shortcomings:

- Flow diversion history in HEC-RAS was provided by the “engineering calculations” model, which was found to contain significant errors.
- Runoff flow input data to the HEC-RAS model were provided by HEC-HMS, which was found to contain significant errors.
- Proposed control structures were simulated as fixed weirs during the 2003 simulations. It is unclear how the elevations were established or whether a sensitivity analysis was conducted to find the appropriate elevations, nor is it clear whether (and how) these elevations were adjusted when simulating future conditions of RSLR. Further, it is unclear why the structures were not operated in accordance with an operation schedule to achieve greater benefits to the marshes.
- HEC-RAS simulations assume that flow diversions can be increased over time to counter the effects of RSLR. However, there is no consideration for the impacts of increased diversion on flood control.
- Utilization of equally spaced and sized berm gaps creates short-circuiting of water through the wetlands.
Significance – High:

Maintaining current levels of flood control for existing developed areas is a key constraint of the project. To the extent that the recommended projects increase flooding impacts, they could significantly change the type and extent of the required infrastructure, project operations, and project effectiveness at meeting the desired objectives.

Recommendation(s) for Resolution:

To resolve these concerns, the report would need to be expanded as follows:

1. Document location of peak stages for existing conditions and current flood levels of service; identify sensitive low-lying areas subject to flooding and show critical elevations; and compare post-project peak stages and durations of flooding with existing baseline conditions, including the impacts of RSLR.

2. Incorporate into the model as appropriate the expectation of the impacts of RSLR on current and future flood control as developed properties subside relative to sea level and adjacent wetlands. Evaluate the impacts of increased diversions on flood control. A sensitivity analysis of this condition is essential to the long-term viability of the recommended alternative.

3. Revisit the range of alternatives and consider the long-term hydrologic and hydraulic infrastructure requirements of the study area. Assuming that RSLR will inevitably lead to levees, control structures, and pump stations to maintain flood control in the developed areas and avoid saltwater intrusion damage to the marshes, it is critical to design the “total” project with the long-term future in mind, and then consider the phased implementation of selected infrastructure which will fit with the most likely future scenario. Otherwise, the future fix (adaptive management) could far exceed the cost of the proposed project.

4. Prepare a long-term water balance of the watershed study area that accounts for all elements of the water balance for existing conditions, future conditions without project, and future conditions with project.

5. Evaluate seepage induced by higher Mississippi River stages into the study area and incorporate the resulting data into the models as appropriate.

6. Use a more accurate modeling procedure than the SCS methodology to generate continuous flows for the 2003 simulations.

7. Use a more accurate methodology to estimate the history of diversions. If HEC-RAS does not have that capability, consider utilizing other models with more sophisticated operational logic for control structures. A revised “engineering calculations” model may work so long as the weaknesses in the current model are addressed.

8. Expand documentation of how the control structures were located and the fixed weir elevations established. Consider a more sophisticated structure operations protocol to maximize the benefits of the project.

9. Establish the location and size of berm cuts for each alternative to maximize the intended benefits and minimize short-circuiting. This process should be completed prior to assessing the benefits and cost of each alternative.
## Final Panel Comment 5:
The operation and management plan should be expanded to include actions designed to meet ecological goals, specifically pulsed and extended dry periods.

### Basis for Comment:
According to Section L12.2.1 of the Convent/Blind River report, the diversion is to operate when Lake Maurepas is higher than the swamp. This action will force the river water into the swamp and drive the salinity gradient to the east. When the lake level is lower than the swamp, the diversion will cease, allowing the swamp to drain. Page R153 of Appendix L states that the Pass Manchac has tidally-influenced water levels of an average 0.4 foot (ft) (std = 0.2 ft). Table L.2.9.1-2 includes seasonal breakouts of the tidally-influenced water levels. While the report states that extensive dry periods will occur, the data in the tables indicate that the diversion would operate and shut down frequently because the triggers in the operational plan lie within the tidal range of the lake, which is the controlling factor.

It is also apparent from the invert of the berm cuts that the draining of the swamp waters at low stands would be to the east, not back into the canals. The time to drain (lag time) is not included in the dry-period discussions.

The operational criteria and triggers would serve to create water levels within the swamp which would be closely tied to tidal tail waters, not rainy season/dry season periodicity as would be expected in natural systems. The occurrence of an extended dry period would appear to be limited to periods of full or new moons with no rain during the dry season. The maximum duration which could be expected under such circumstances would be less than 2 weeks.

Swamps also benefit from high water pulses of short duration. The opening of the gates in anticipation of 1-inch rainfalls will serve to eliminate these pulsed events.

### Significance - High:
Predictable and regular water levels and discharges brought about by hard triggers will limit habitat and biological diversity within the system and lessen the overall benefit of the Recommended Plan.

### Recommendation(s) for Resolution:
To resolve these concerns, the report would need to be expanded to include the following:

1. An operational schedule which incorporates elements of fuzzy logic which could be used to create pulses of high water and unpredictable stands of low water or no water.
2. Less rigid triggers, incorporating fuzzy logic, when the water levels are between upper and lower limits to provide internal variability in swamp habitat.
**Final Panel Comment 6:**

**Equally spaced/sized berm cuts and culvert locations/sizes are not tailored to the specific topographical, hydraulic, and ecological features of the receiving habitat areas, or to the specific diversion alternatives.**

**Basis for Comment:**

It appears that the prescribed location and size of berm gaps and culverts are causing short-circuiting of water, as reflected by higher flows through the gaps closer to the channels draining into the Blind River, and are not promoting an equal distribution of sheet flow across the swamp as desired. This is evident in Figures L2.10.1-3, L2.10.1-5, L2.10.1-6, and L2.10.1-7. Therefore, wetland water distribution is not correct, the potential benefits of each alternative are not accurate, and alternative selection may be unduly biased by the seemingly arbitrary siting and sizing of these critical elements. Locating berm cuts without heed to existing and relict internal flow paths will not maximize restored flow and may lead to further internal ponding and stagnation. Further, the simulations of three models are affected by this issue: EFDC, HEC-RAS, and the “engineering calculations.”

A similar comment may apply to the location and operation of the proposed control structures but insufficient documentation was available to make that determination.

**Significance – High:**

The location and size of the project’s berm gaps and culverts impact flow distribution, water depth, sediment deposition/erosion, water quality, and hydraulic residence time and, therefore, affect the evaluation, selection, operation, and success of the Recommended Plan.

**Recommendation(s) for Resolution:**

To resolve these concerns, the report would need to be expanded to include the following:

1. Berm gaps and culverts should be located and sized individually for each alternative to promote the diversion of water into the upper reaches of the wetlands and away from existing channels to promote a more even distribution of flow and maximize the benefits of the diversions. In some instances, completely eliminating the gaps in some channel sections should improve flow distribution significantly. This process should be completed prior to assessing the benefits and cost of each alternative.
**Final Panel Comment 7:**
The extent of seepage and the potential impact that seepage may have on the project has not been considered and could be significant, affecting the hydrology and hydraulics of the study area.

**Basis for Comment:**
The interaction between surface and ground waters has not been properly addressed in the Convent/Blind River report and can significantly affect the hydrology and hydraulics of the area, as follows:

- Influence of groundwater and seepage – the Mississippi River is generally at a much higher stage than the rest of the study area, especially during the spring, creating a persistently high head gradient (2 to 28 feet of head) with the potential to deliver large volumes of seepage that would be captured by the canals in the study area. To the extent that seepage could be constantly flowing into the Blind River basin, a portion of the capacity of the canals will be used up by seepage, limiting the canal capacity available for flood control and diversions, and affecting canal and marsh stages. The inclusion of seepage is particularly critical to continuous simulations.

- Seepage impacts to adjacent properties – the diversion canal will generally carry flow at stages exceeding the ground elevations of the adjacent developed properties. The potential exists for seepage to increase ground water table elevations in properties adjacent to the transmission canal, causing negative flooding impacts.

**Significance - High:**
Seepage, if deemed significant, can affect the results of all the models used in support of the selection and design of alternatives.

**Recommendation(s) for Resolution:**
To resolve these concerns, the report would need to be expanded to include:

1. Seepage induced by higher Mississippi River stages into the study area should be evaluated and incorporated into the models as appropriate. A simple vertical cross-section model of the area should be created to model the flows and groundwater levels induced by the river and its impact on the study area and proposed project. A SEEP2D model could be used for this purpose. Given uncertainties associated with the lithology of the study area, a sensitivity analysis of model parameters should be conducted.

2. Similarly, the potentially negative impacts of seepage to properties adjacent to the transmission canal should be quantified using a similar methodology as outlined for the river.
**Final Panel Comment 8:**

Because of the many uncertainties associated with predicting the project’s benefits, a sensitivity analysis for the Wetland Value Assessment (WVA) analysis should be conducted to demonstrate that the project will successfully provide benefits.

**Basis for Comment:**
The Convent/Blind River report discusses numerous uncertainties associated with modeling and predicting outcomes. These uncertainties mean that benefits from the project could be significantly lower than those presented in the report. Presenting the possible range of anticipated benefits, based on a sensitivity analysis for the WVA, would clarify the risks associated with achieving the desired benefits from the project. A sensitivity analysis of benefits estimated in the WVA would demonstrate whether benefits will still be realized, even if some aspects of the project do not perform as anticipated. Also, a sensitivity analysis could show which variables are most crucial to the success of the project.

**Significance - High**
Without a sensitivity analysis of benefits, it is not possible to determine the level of risk associated with the project (i.e., whether the project will result in a measurable level of benefits).

**Recommendation(s) for Resolution:**
To resolve these concerns, the report would need to be expanded as follows:

1. Add a sensitivity analysis to the WVA that addresses the fact that the benefits presented depend on a large number of highly uncertain factors.
Final Panel Comment 9:

The lack of data on sediment accretion rates and productivity in the forest system will prevent achieving the Project Objective of relating “swamp building” to river diversion.

Basis for Comment:

One stated aim of the project is to increase sediment rates in order to keep the swamp from subsiding and converting to another system type. However, the link between sediments delivered by the diversion and resulting soil elevation in different parts of the swamp is not made because of the uncertain nature of sediment delivery and movement in the system. In addition, the importance of biological production, especially below-ground root material, has not been quantified and factored into the overall elevation change rate.

- (Main Report p 143) “Plan 2... would accomplish the planning objectives and goals; ...; and would contribute to reversing the trend of deterioration in the southeast part of the Maurepas Swamp.” Also, see the discussions of objectives on pp 62-67. The quote and other discussion text clearly indicate that swamp building is a major goal, and links swamp building to sediment inputs. However, it is not entirely clear if “swamp building” means increases in elevation over time, or increases in swamp area over time, or both. While the Panel believes that the term “swamp building” was referring to maintaining elevation, this needs to be clarified.

- Increases in swamp elevation should occur via direct input of sediments and biological productivity, particularly that of below-ground root material. The report cites works by Day and Schaeffer, but there is no mention of contrary findings, such as the paper by Geho, Campbell, and Keddy (2007) that found no effects of sediment added to an intermediate marsh in the same region. Rather, competition and herbivory were the main controlling factors. Their results may or may not apply in swamp forests, but that should at least be discussed for completeness.

- In other wetland systems studied, elevation gain has been shown to be more a function of below-ground biomass production than direct input of new sediment (see, for instance, Turner et al. [2002]). It seems likely that this productivity will be stimulated by nutrients in the water, but that the change in hydroperiod, which has not been well documented or modeled by the U.S. Army Corps of Engineers (USACE), may have an unknown, and possibly adverse, effect on production. For example, extended flooding can inhibit the growth of some wetland plant species.

- Furthermore, the input of sediments from the river diversion will be non-uniform, with most being near the discharge site and much less being transported throughout the swamp. It is highly possible that at least in the short- to mid-term, there may be adverse impacts from the high sediments and water in areas of the swamp near the discharge, and few or no effects from sediments (although possibly plenty from water and nutrients) over much of the swamp.

- If the sediments will be dispersed non-uniformly, then data on forest production and elevations need to be gathered before the diversion, in order to have a chance of success of this objective after the diversion. Otherwise, it will be difficult to attribute future “plant success” to a particular action, which will hinder future diversion project planning.
Significance - Medium:
The serious lack of understanding of sediment delivery and dispersion, and the effects of biological production on elevation, make the report incomplete and will reduce the ability of managers and engineers to evaluate any changes seen during project and take adaptive management actions.

Recommendation(s) for Resolution:
To resolve these concerns, the report would need to be expanded to include:
1. Plans for spatially and temporally extensive monitoring of pre- and post-diversion productivity and sediment elevation change at many sites throughout the swamp area.
2. A clear and concise discussion of the problem, as presented above, to justify the additional studies.

Literature Cited

**Final Panel Comment 10:**

The discussions on endangered and protected species and their habitats contain inconsistencies and inaccuracies which need to be corrected.

**Basis for Comment:**

- The pallid sturgeon is potentially at risk and apparently could benefit from the diversion. There are inconsistencies in the descriptions regarding pallid sturgeon. For example, pp. 4-87 and 5-80 of the Convent/Blind River report state that the pallid sturgeon is likely to be at risk from the diversion; p. 5-17 (Table 5-1) states that there will be no impacts to the pallid sturgeon; p. 5-80 also mentions possible positive effects on pallid sturgeon.

- The manatee was included (in Table 4-10 and in the discussion of threatened and endangered species on p. 4-84), but should not be considered because its occurrence in the region is exceptionally rare. The Maurepas system is not suitable habitat for the manatee.

- The bald eagle was not listed in the discussion regarding protected species (the species is protected under the Golden and Bald Eagle Protection Act), but, on p. 4-81 it says “[m]uch of the southeastern Maurepas Swamp is considered important habitat for nesting Bald Eagles and other migratory birds.”

**Significance - Low:**

The technical credibility of the report will be improved by correcting these issues.

**Recommendation(s) for Resolution:**

To resolve these concerns, the report would need to be expanded to include:

1. Provide correct information on and resolve inconsistencies about threatened and endangered and other protected species.
**Final Panel Comment 11:**

The needs of the railroads, which have only been informally discussed with them, may impact right-of-way acquisition and project design.

**Basis for Comment:**

The current plan anticipates KCS Railroad and the Canadian National Railroad involvement. As discussed in Appendix I (pgs. 243 and 274), construction of four new culvert crossings under Highway 61 and the KCS Railroad will require permitting and temporary rail crossings of the KCS Railroad to provide contractor access. The new diversion culvert is to be constructed under the existing Canadian National Railroad. The plan assumes a temporary relocation of the Canadian National Railroad to a shoofly constructed on a temporary right-of-way easement. According to Appendix I (p. 268), informal discussions with the railroads have occurred and the specific railroad requirements have been requested but not yet received.

The cost and schedule risk analysis included in Appendix L, Annex L-1 has identified railroad involvement as the leading project risk factor, contributing 19% of the statistical cost variation and a corresponding major portion of the project cost contingency.

The occurrence of unexpected railroad requirements later in the design phase could delay both design and real estate acquisition progress. Resolving specific railroad needs early in the project development process will facilitate progress in design, real estate acquisition, and construction planning.

**Significance - Low:**

This absence of substantive information concerning railroad requirements weakens the technical quality of the report.

**Recommendation(s) for Resolution:**

To resolve these concerns, the report would need to be expanded to include:

1. An assessment of railroad accommodation requirements based upon direct discussions with the railroads.

2. A confirmation that the design assumptions and real estate requirements are consistent with the railroad requirements.
**Final Panel Comment 12:**

The report should differentiate between saline and freshwater marshes.

**Basis for Comment:**
A marsh, by definition, is a wetland populated by herbaceous material, not trees and woody shrubs. These can occur in both freshwaters and brackish or saline waters. In the report, the former is referred to as “fresh marsh,” which is acceptable.

The first sections, including the statement of need for the project, pose the threat of the conversion of forested freshwater wetlands (Cypress and Tupelo) to “marsh” or “open water.” Because the system is a freshwater one, the initial interpretation is that the threat is of a conversion to a freshwater marsh system. Informed readers know that a marsh and open water systems require different hydroperiods, and this creates an ambiguity in the statement of need. The exact nature of the perceived threat is unclear until very late in the report when the introduction of the salinity intrusion clarifies the threat.

**Significance - Low:**
The ambiguous references to “marsh” in the first segments of the report are confusing and affect the technical quality of the report.

**Recommendation(s) for Resolution:**
To resolve these concerns, the report would need to be expanded as follows:

1. Replace the generic reference to marsh with “salt marsh” as appropriate.
2. Link the conversion to “salt marsh” to salinity intrusion early in the report to clarify the threat.
**Final Panel Comment 13:**

The readability of the report would be significantly improved by providing references to the appropriate appendix in the narrative of the main report.

**Basis for Comment:**

Much of the technical detail and supporting information to the Convent/Blind River main report has been appropriately assigned to the report appendices. The main report contains approximately 523 pages. There are 14 appendices containing approximately 1,013 pages. When discussing the findings and conclusions in the report narrative, it would be helpful to include references to the key supporting sections in the appendices. This would permit the reader to quickly locate supporting information of particular interest.

The following is an example of a supporting reference that was included in the narrative text of the Convent/Blind Report:

3.7.7 Monitoring Plan and Adaptive Management

A feasibility level monitoring and adaptive management (AM) plan have been developed for the Louisiana Coastal Areas (LCA) Small Diversion at Convent/Blind River project (Appendix I). (Main report p. 160)

The following is an example of a supporting reference that would provide more clarity when added to the narrative of the report:

3.5.2 Cost-effectiveness/Incremental Cost Analysis

Cost effectiveness analysis begins with a comparison of the costs and outputs of alternative plans to identify the least cost plan for every possible level of output considered. The resulting least cost alternative plans are then compared to identify those that would produce greater levels of output at the same cost, or at a lesser cost, as other alternative plans. Details of the project cost development are provided in Appendix L, Annex L-1. (Main report p. 138)

**Significance - Low:**

The inclusion of references to key appendix sections in the main report would help the reader locate important information.

**Recommendation(s) for Resolution:**

To resolve these concerns, the report would need to be expanded to include:

1. Appropriate references to key appendix material supporting the narrative in the main report.
Final Panel Comment 14:

There are typographical errors in the cost effectiveness/incremental cost analysis (CE/ICA) sections that need to be corrected so that results are accurately reported.

Basis for Comment:

In Appendix K, p. K-4, the text says alternative 6 is cost-effective, but the table says it is not. On p. K-5, alternative 2 is reported as having a per-unit cost of $880,000. If the total annual cost is $5.6 million, and the total habitat units = 6421, $5.6 million/6421 = $879 per unit, not $880,000. The information in the corresponding table is correct. These errors are carried over to the main report, Section 3.5, p. 3-78, where it says the cost/hu is $880,000, when it should say $880 (Table 3-6 gives the correct value).

Significance – Low:

The technical quality of the report is affected by inaccurate and potentially confusing information.

Recommendation(s) for Resolution:

To resolve these concerns, the report would need to be corrected as follows:

1. Correct the incorrect information and resolve inconsistencies.
APPENDIX B

Final Charge to the Independent External Peer Review Panel

on the

Integrated Feasibility Study and Environmental Impact Statement for the
LCA-Small Diversion at Convent/Blind River (St. James Parish, Louisiana)

as

Submitted to USACE on April 23, 2010
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BACKGROUND

The Water Resources Development Act of 2007 authorized the Louisiana Coastal Area (LCA) program. Specifically, Section 7006(e)(3) requires the Secretary of the Army to submit one feasibility report to Congress on six elements by December 31, 2010. The six elements are:

1) Terrebonne Basin Barrier Shoreline Restoration,
2) Small Diversion at Convent/Blind River,
3) Amite River Diversion Canal Modification,
4) Medium Diversion at Whites Ditch,
5) Convey Atchafalaya River Water to Northern Terrebonne Marshes, and

The Congressional language further authorizes construction of these six elements contingent upon submittal of a favorable report of the Chief of Engineers no later than December 31, 2010. The U.S. Army Corps of Engineers (USACE) is the Federal sponsor for the projects and the non-Federal sponsor is Louisiana’s Coastal Protection and Restoration Authority (CPRA).

This Independent External Peer Review (IEPR) will review the Small Diversion at Convent/Blind River project.

The Blind River headwaters are located in St. James Parish approximately 2-3 miles north of the east bank of the Mississippi River at Convent. The Blind River flows north then east through Ascension and St. John the Baptist Parishes before it empties into Lake Maurepas. The study area for this project is within the Upper Lake Pontchartrain Sub-basin, which includes Lake Maurepas, Maurepas Swamp, Blind River, and portions of the Amite River.

The USACE, New Orleans District is proposing to construct a freshwater diversion project along the banks of the Mississippi River in the vicinity of Romeville, Louisiana to provide freshwater, nutrients, and sediments to the southwest portion of the Maurepas Swamp to reverse the trend of deterioration in the Swamp and in the Blind River. Without action, the Swamp is predicted to continue to deteriorate at the same or accelerated rates. The objectives of this study are as follows: (1) reverse the current decline of a portion of the southwest portion of the Maurepas Swamp, (2) prevent the transition of the Swamp into marsh and open water and (3) reintroduce freshwater, sediment, and nutrients to the Swamp to return the natural historic flooding cycle and rebuild wetlands. The third objective is intended to improve biological productivity, reverse current trend of degradation, and restore the Swamp, and may provide some measure of flood damage protection.
OBJECTIVES


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.

This purpose of the IEPR is to assess the adequacy and acceptability of economic, engineering, and environmental methods, models, and analyses used for the Convent/Blind River Integrated FS/EIS. 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 engineering, economics, and environmental issues relevant to the project. They should also have experience applying their subject matter expertise to ecosystem restoration.

The panel members will be “charged” with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-209, Appendix D, reviews 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 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 and reference materials that will be provided for the review. The documents and files presented in bold font are those which are to be reviewed. All other documents are provided for reference.

- Integrated Feasibility Study and Environmental Impact Statement for the LCA - Small Diversion at Convent/Blind River (St. James Parish, Louisiana)
  - Appendix A: Biological Assessment and Aesthetic Resources
  - Appendix B: U.S. Fish and Wildlife Service Coordination Letter and Report
  - Appendix C: NOAA Fisheries Service Coordination Letter
  - Appendix D: 404(b)(1) Water Quality Report
  - Appendix E: Louisiana Coastal Resources Program Consistency Determination
  - Appendix F: State Historic Preservation Officer Coordination Letter
• USACE guidance Civil Works Review Policy (EC 1165-2-209) dated January 31, 2010
• CECW-CP Memorandum dated March 31, 2007
• Evaluation of Environmental Investments Procedures Manual Interim: Cost Effectiveness and Incremental Cost Analysis
• IWR Planning Suite, the cost effectiveness-incremental cost analyses software used by USACE on ecosystem restoration projects and mitigation of ecosystem impacts (accessible from http://www.pmcl.com/iwrplan/)

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1 Provided to Economics Panel Member Only
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CHARGE FOR PEER REVIEW

Members of this peer review panel are asked to determine whether the technical approach and scientific rationale presented in the Convent/Blind River Integrated FS/EIS are credible and whether the conclusions are valid. The reviewers are asked to determine whether the technical work is adequate, competently performed, 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 reviewers are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the panel members (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 Convent/Blind River Integrated FS/EIS. Please focus on your areas 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 1165-2-209; 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 evaluation of 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.

- 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 USA CE Independent Technical Review.

- Please contact the Battelle deputy project manager (Betsy Barrows, BarrowsE@battelle.org) or project manager (Karen Johnson-Young, johnson-youngk@battelle.org) for requests or additional information.

- In case of media contact, notify the Battelle project manager immediately.

- Your name will appear as one of the panelists 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 Betsy Barrows, BarrowsE@battelle.org no later than May 13, 2010, 10 pm EDT.**
Independent External Peer Review
LCA Small Diversion at Convent/Blind River Integrated Feasibility Study and Supplemental Environmental Impact Statement

Final Charge Questions

General Questions

1. To what extent has it been shown that the project is technically sound, environmentally acceptable and economically justified?

2. Are the assumptions that underlie the economic, engineering, and environmental analyses sound?

3. Are the economic, engineering, and environmental methods, models, and analyses used adequate and acceptable?

4. In general terms, are the planning methods sound?

5. Are the interpretations of analysis and conclusions based on the analysis reasonable?

6. Will the proposed restoration (with O&M described in report) produce significant measurable benefits or are additional O&M or are additional restoration activities required for production of significant measurable benefits over the period of analysis? Consider the same question for production of significant measurable benefits beyond the period of analysis.

7. Please address validity of assumptions related to the potential for induced shoaling related to the diversion. Are the proposed operation and maintenance activities and costs associated with shoaling appropriate?

8. Does the report address how the diversions will be operated (pulsing versus consistent flows)? Are the benefits and costs of different operation plans adequately considered?

Section 1.0 Study Information

1.1 Study Authority

No questions

1.2 Purpose and Scope

No questions
1.3 Study Area
No questions

1.4 History of Investigation
No questions

1.5 Prior Reports and Existing Projects
9. Have all critically important prior studies performed relative to the study area been described?

1.6 Planning Process and Report Organization
No questions

1.7 USACE Campaign Plan
No questions

SECTION 2.0 - Need for and Objectives of Action

2.1 National Objectives
10. Comment on whether the Medium Diversion at Convent/Blind River Project as proposed will contribute to national ecosystem restoration (NER) output.

2.2 Public Concerns
11. Have the public concerns been identified?

2.3 Problems, Needs, and Opportunities
12. Is the project need clearly stated?
13. Are the problems facing the Maurepas Swamp and Blind River area accurately described?
14. Are the study area opportunities to improve habitat conditions and address the problems accurately described?

2.4 Planning Objectives
15. Are the planning goal and objectives described clearly?
16. Comment on whether the Convent/Blind River Project as proposed will meet the planning objectives.

2.5 Planning Constraints

17. Should additional study-specific planning constraints be considered, based on your understanding of current conditions and the planning process?

SECTION 3.0 - Alternatives

3.1 Plan Formulation Rationale

18. Is the rationale for developing the plan clear and complete?

19. Are the criteria for developing the plan comprehensive?

3.2 Management Measures

20. Are the management measures thorough and accurate?

21. Assess the development and grouping of the management measures.

22. Is the methodology to develop the screening criteria appropriate?

23. Is the screening process of the management measures appropriate and adequate?

24. Is the elimination of some of the management measures from further study clearly described?

3.3 Screening/Evaluation of Alternative Plans

25. Assess the screening process of the potential alternative plans.

26. Was the elimination of some of the alternative plans from further study clearly described?

27. Is the description of the potential locations for the diversion structure accurate and sufficiently detailed?

28. Is the screening process used to eliminate some of the potential locations for the diversion structure adequate?

29. Is the incremental cost analysis/cost effectiveness assessment for the Convent/Blind River Project accurate and reliable?

3.4 Final Array of Alternatives (Alternative Studied in Detail)

30. Is each of the alternative plans clearly described?
31. Assess the screening process used to arrive at the final array of alternatives.

3.5 Comparison of Alternative Plans

32. Are the processes used to compare the Alternative Plans clear and reasonable?

33. Evaluate the cost estimates for the various habitat improvement measures.

34. To what extent have significant project design and construction costs been adequately identified and described?

3.6 The National Ecosystem Restoration (NER) Plan

35. Is the NER plan sufficiently detailed?

3.7 Plan Selection-Tentatively Selected Plan

36. Is the description of the components of the Tentatively Selected Plan sufficient?

37. Are the design, environmental, and construction considerations outlined for the Tentatively Selected Plan appropriate and adequate?

38. Does the preferred alternative give adequate consideration to ongoing or planned projects within the project area?

39. Have the impacts to existing infrastructure, such as state highways and oil and gas infrastructure, been adequately addressed?

40. Has adequate consideration been given to reduce flooding impacts to adjacent communities?

41. Does the plan address all real estate interests (private and public) and requirements resulting from the restoration project?

42. Have the operations and maintenance considerations of the Tentatively Selected Plan been addressed?

43. Was the decision to apply an adaptive management approach to the Convent/Blind River Project appropriate?

44. Is the discussion of fulfilling goals and objectives complete?

45. Are the compensatory mitigation measures appropriate?
3.8 Risk and Uncertainty

46. Are the descriptions of the risk and uncertainties associated with the development, selection, and construction of the Tentatively Selected Plan sufficiently comprehensive?

3.9 Implementation Requirements (Also consider information in Appendix I)

47. Have all assumptions, regulations, and stipulations regarding cost sharing, including in-kind work, been clearly described?

48. How complete is the action plan outlined in the financial requirements?

SECTION 4.0 - Affected Environment

4.1 Environmental Setting of the Study Area

49. Is the description of the climate in the study area sufficiently detailed and accurate?

50. Is the description of the geomorphological conditions in the study area sufficiently detailed and accurate?

4.2 Significant Resources

51. Is the description of sea level rise and estimated accretion rates in the study area complete and accurate?

52. Does the description of existing conditions provide sufficient understanding of the presence and distribution of soils and waterbottoms in the study area?

53. Is the description of the historical and existing flow and water level conditions in the study area adequate?

54. Is the description of the historical and existing water quality and salinity conditions in the study area adequate?

55. Is the description of vegetation resources in the project area complete and accurate?

56. Is the description of aquatic resources in the project area complete and accurate?

57. Is the description of the historical and existing wildlife and habitat resources in the study area complete and accurate?

58. Is the Essential Fish Habitat evaluation of the proposed study area comprehensive and adequate?

59. Is the description of threatened and endangered species resources in the study area complete and accurate? (Also consider information in Appendix A)
60. Is the description of the historical and existing cultural and historic resources in the study area complete and accurate? (Also consider information in Appendix F)

61. Is the description of the historical and existing aesthetic resources in the study area complete and accurate?

62. Is the description of the historical and existing recreational resources in the study area complete and accurate?

63. Is the description of the historical and existing socioeconomic resources in the study area complete and accurate?

64. Is the description of the hazardous, toxic, and radioactive waste in the study area complete and accurate?

SECTION 5.0 – Environmental Consequences

65. Are the scope and details of the potential adverse effects that may arise as a result of project implementation sufficiently described and comprehensive?

5.1 Soils and Water Bottoms

66. Are environmental effects of changes to soil and waterbottom resources from the alternatives reasonable and factually supported?

67. Are assumptions related to accretion and subsidence rates valid? Will with-project conditions slow degradation, stabilize, or result in marsh building?

5.2 Hydrology

68. Are the environmental consequences associated with increased diversion volumes reasonable and factually supported?

69. Are environmental effects of changes to sedimentation and erosion from the alternatives reasonable and factually supported?

70. Are environmental effects of changes to flow and water levels from the alternatives reasonable and factually supported?

71. Are environmental effects of changes to groundwater resources from the alternatives reasonable and factually supported?

5.3 Water Quality

72. Are environmental effects of changes to water quality from the alternatives reasonable and factually supported?

5.4 Air Quality
73. Are environmental effects of changes to air quality from the alternatives reasonable and factually supported?

5.5 Noise

74. Are the effects of changes to noise from the alternatives reasonable and factually supported?

5.6 Vegetative Resources

75. Are environmental effects of changes to riparian vegetation resources from the alternatives reasonable and factually supported?

76. Are environmental effects of changes to wetland vegetation resources from the alternatives reasonable and factually supported?

77. Are environmental effects of changes to submerged aquatic vegetation from the alternatives reasonable and factually supported?

78. Are environmental effects of changes to vegetative invasive species conditions from the alternatives reasonable and factually supported?

5.7 Wildlife and Habitat

79. Is the description of projected impacts to wildlife for each of the alternatives complete and accurate?

80. Are environmental effects of changes to wildlife habitat from the alternatives reasonable and factually supported?

5.8 Fisheries

81. Are environmental effects of changes to fishery resources from the alternatives reasonable and factually supported?

82. Are assumptions related to impacts to fisheries valid?

5.9 Aquatic Resources

83. Is the description of projected impacts to aquatic resources for each of the alternatives complete and accurate?

84. Are assumptions related to impacts to oysters valid?
5.10 Plankton

Are the predicted impacts of each alternative on the plankton in the project area reasonable and factually supported?

5.11 Essential Fish Habitat (EFH)

Are environmental effects of changes to Essential Fish Habitat from the alternatives reasonable and factually supported?

5.12 Threatened and Endangered Species

Are environmental effects of changes to threatened and endangered species from the alternatives reasonable and factually supported? (Also consider information in Appendix A)

5.13 Cultural and Historic Resources

To what extent have the potential impacts of the alternatives on cultural resources been addressed and supported? (Also consider information in Appendix F)

5.14 Aesthetics

Have the potential impacts to aesthetic resources from the alternatives been adequately considered?

5.15 Recreation

Have the potential impacts to recreation resources from the alternatives been adequately considered?

5.16 Socioeconomic and Human Resources

Have the potential impacts to socioeconomic and human resources from the alternatives been adequately considered?

5.17 Flood Control and Hurricane Protection

Have the potential impacts to flood control and hurricane protection from the alternatives been adequately considered?

5.18 Hazardous, Toxic, and Radioactive Waste

Are environmental effects of changes to hazardous, toxic, and radioactive waste from the alternatives reasonable and factually supported?
5.19 Unavoidable Adverse Effects

94. Is the description of unavoidable adverse effects resulting from the implementation of the alternatives adequate?

5.20 Relationship of Short-term Uses and Long-Term Productivity

95. Is the description of the relationship between short-term uses and long-term productivity adequate?

5.21 Irreversible and Irretrievable Commitment of Resources

96. Is the description of the irreversible and irretrievable commitments of resources adequate?

5.22 Mitigation

No questions

5.23 Environmental Consequences Summary

No questions

SECTION 6.0 – Public Involvement

97. Based on your experience with similar projects, has adequate public, stakeholder, and agency involvement occurred to determine all issues of interest and to ensure that the issues have been adequately addressed to the satisfaction of those interested parties? Should any additional public outreach and coordination activities be conducted?

SECTION 7.0 - Coordination and Compliance

No questions

SECTION 8.0 - Conclusions and Determinations

No questions

SECTION 9.0 - Distribution List and Other

No questions

Appendix A1: Biological Assessment

No questions
Appendix A2: Bird Survey Report

No questions

Appendix A3: Vegetation and Water Quality Survey Memorandum

No questions

Appendix B: U.S. Fish and Wildlife Service Coordination Letter and Report

No questions

Appendix C: NOAA Fisheries Service Coordination Letter

No questions

Appendix D: 404(b)(1) Water Quality Report

98. Are the general characteristics of the dredged and fill material accurately and adequately described?

99. Is the quantity of the dredged and fill material adequate and factually supported?

100. Is the description of the disposal method sufficiently detailed and comprehensive?

101. Are the suspended particulate/turbidity determinations appropriate?

102. Are the proposed disposal site determinations appropriate?

Appendix E: Louisiana Coastal Resources Program Consistency Determination

No questions

Appendix F: State Historic Preservation Officer Coordination Letter

No questions

Appendix G: Reserved for Future Use

No questions

Appendix H: Value Engineering Report

103. Are the value engineering process and recommendations outlined in the report adequate?
104. Were the three basic value engineering (VE) principles (project function, cost, and ways of constructing the project at the same or a reduced cost) considered during the VE process?

Appendix I: Adaptive Management/Monitoring Plan

105. Are the performance measures, desired outcomes, and monitoring designs for each of the project objectives adequate?

106. Are the proposed monitoring procedures appropriate?

107. Is the monitoring program assessment process sufficiently detailed and comprehensive?

108. Are the costs for administering a monitoring and assessment program appropriate?

Appendix J: Real Estate Plan

109. Is the methodology used to estimate the real estate costs presented in this plan appropriate and adequate?

110. Does the plan adequately address all real estate interests (public and private) and requirements allowing for appropriate comparisons across all alternatives?

111. Does the real estate plan address and plan for the potential concerns of landowners in the project area?

Appendix K: Benefit/Cost Incremental Cost Analysis

112. To what extent were significant project design and construction costs adequately identified and described?

113. Was the methodology used to conduct the incremental cost analysis adequate and valid?

Annex K-1 WVA Report

114. Are the WVA ecosystem output models reasonable and appropriate for evaluating project benefits/impacts?

115. Is the way in which the models were applied for evaluating project alternatives appropriate?
   a. If there are any modifications to the models, are they appropriate?
   b. Is weighting of variable or habitat types appropriate?
   c. If not, why?
116. Comment on the model reviewers' assessment of the technical quality, system quality, and usability of the WVA models.

117. Are the models used for the evaluation appropriate regarding:
   a. SI values assigned to variables
   b. The number of target years selected
   c. How A A HU s are calculated (i.e., estimating the sum rather than the arithmetic mean)
   d. How sea level change is incorporated into the models
   e. Whether policy or science is a more important driver for assigning an index value to model variables
   f. Whether calculations in the spreadsheets are correct and easy to use
   g. How risk and uncertainty is handled
   h. Whether the best data sources are used
   i. Justification for why the geometric mean or arithmetic mean is used to calculate HSIs.

Annex K-2 Response to Comments on WVA Certification

No questions

Appendix L: Engineering Appendix

118. How sound are the engineering calculations and modeling, as applicable and relevant to your area of expertise? Do calculations/models explain past events? How will engineering decisions be validated?

119. Are the technical assumptions used to recommend the Tentatively Selected Plan valid? What other assumptions should be included in the preliminary design discussion?

120. Have the engineering challenges associated with the Tentatively Selected Plan been adequately assessed?

121. Are the basic investigative techniques and interpretive methodologies used in the H&H engineering feasibility analysis appropriate? Are there alternative methods that should have been evaluated?

122. Are the assumptions used in the hydrologic modeling studies clearly identified?
123. Are the interpretations of analysis and conclusions based on the analysis valid?

124. Was the approach used to determine cost effectiveness and incremental costs and benefits sufficiently clear? To what extent are these results supported by and consistent with the detailed analyses presented in the appendices?

125. Based on your area of expertise, what additional factors should be considered when applying or designing construction management technologies that have not been identified for this project?

126. Are there any other objectives or constraints that should be considered as part of the project design and construction that will be important to reaching the project’s final goal?
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