Comment Response Record for the Independent External Peer Review (IEPR) of the Integrated Draft Feasibility Study and Environmental Impact Statement, Pearl River Basin, Mississippi, Federal Flood Risk Management Project, Hinds and Rankin Counties, Mississippi

Final Evaluator Responses and BackChecks

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Final Panel Comment 1

The final alternative plans do not definitively demonstrate that the TSP is the NED plan.

Basis for Comment

Engineer Regulation (ER) 1105-2-100 (USACE, 2000; p. 2-7) states that "For all project purposes except ecosystem restoration, the alternative plan that reasonably maximizes net economic benefits consistent with protecting the Nation's environment, the NED plan, shall be selected." There is no minimum level of USACE participation in flood risk management (ER 1105-2-100, paragraph 3-3.b.(2(c)). For a flood risk management study, identification of the NED plan requires formulation and evaluation of alternatives that provide a range in the level of protection to show how net NED benefits incrementally increase with increasing levels of protection until net NED benefits and the level of protection no longer increase in tandem. Table 3-8 (Draft FS/EIS, p. 124) shows the net NED benefits for the final alternative plans and is used to identify the NED plan; however, only one of the final alternative plans has positive net NED benefits. There is no alternative that provides greater NED benefits than the TSP, but due to higher costs results in lower net NED benefits.

Significance – High

Without an evaluation of a range of alternatives that provide varying levels of protection (both lower than and greater than Alternative C), it is not possible to verify that the TSP provides the greatest net NED benefits.

Recommendations for Resolution

1. Formulate and evaluate additional alternative plans designed to provide levels of protection that are lower than and greater than Alternative C to verify that it provides the greatest net NED benefits.

PDT Final Evaluator Response (FPC #1)

X	**Concur**		**Non-Concur**

Explanation: Please see the explanation below.

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: In response to Comment 1, it should be understood from the document and plan formulation appendix that this study continues the efforts of previous studies. Specifically, data from multiple sources was used to update and review arrays of alternatives and recommended plans. The Final Draft will clarify how these previous studies have been utilized during the plan formulation. A more detailed summary of previous studies is included below. This information will be added to Appendix A: Plan Formulation to further illuminate the range of flood risk management alternatives considered.

After the Flood of record in 1979, The Pearl River Basin Intern Report on Flood Control and Environmental Impact Statement May 1984 was developed. This report references over 8 clearing plans and numerous other initial alternatives from raising levees, modifying the Ross Barnett Reservoir, building dry dams, and constructing additional reservoirs. Although the Dry Dam (Shoccoe) was selected as the recommended plan, the NED plan was a clearing plan (1G) for 23 miles which was a channel improvement and clearing plan that went from mile 279 to mile 302 (Ross Barnett Reservoir). At the time

PDT Final Evaluator Response (FPC #1)

Shocoe Dam would have provided 91% flood reduction with the clearing plan (NED) providing only 46% reduction (Volume 1 page 71). The planning objective at that time was to "provide effective protection against floods, including the larger floods". Shoccoe Dam would provide a high degree of protection and Plan 1G (NED) would provide a relatively low degree of protection. (Volume 1 page 70.) In addition to the plans discussed above, nonstructural analysis within this study provided information that the nonstructural plan would directly befit only a few families and business while doing relatively little to alleviate the flood problem in Jackson. (Volume 1 page 43). Authorization of the construction of Shoccoe Dam was contained in Section 401(e) of the Water Resources Development Act (WRDA) 0f 1986 but was subsequently determined to be "unimplementable" from a local interest standpoint.

In 1990, the U.S. Army Corps of Engineers completed a reconnaissance study at the request of Pearl River Basin Development District and the Hinds County Board of Supervisors to investigate alterative flood control measures since the 1984 plan described above was not implemented. The Flood Control, Pearl River Basin Jackson Metropolitan Area, Mississippi Draft January 1996 report recommended a more comprehensive levee plan after 6 levee plans and four clearing plans were reviewed and analyzed. Only one clearing plan was deemed justifiable, and only marginally justifiable at that. The recommended plan consisted of construction of 21.9 miles of new levee, 3,720 feet of floodwall, enlarging 10.5 miles of existing levee, clearing floodways, and relocating 30 commercial buildings that contained over 100 businesses. During this study, nonstructural measures proved to be impractical. Furthermore, property owners were not receptive to nonstructural measures, especially those required structures raising, relocations, acquisition/demolition, etc. (Page 6-43 Volume III).

Unable to identify a local sponsor to support the levee plan, the effort to provide flood risk management in the Jackson Metropolitan Area continued with the 2007 Feasibility Study and Draft & Environment Impact Statement, which looked at additional alternatives of the locally preferred Lefluer Lakes plan and a revised levee plan. At that time, WRDA 2007 modified the WRDA 1986 and 1996 authorization, giving the nonfederal sponsor the option of constructing **the NED, the Locally Preferred Plan, or a combination thereof** under Section 211. However, work on this draft report was suspended prior to Public Review.

After some initial inquiries of a locally preferred plan with a smaller footprint, the flood risk management effort continued in 2013 when the Rankin Hinds Flood Control District team began rescoping the project with input from the U.S. Army Corps of Engineers - Vicksburg District, input from additional agencies and the public, and a review of previous alternatives. Based on previous data and USACE input, it was determined to review previous alternatives to determine what, if any, changes from past studies may be deemed practical solutions along with any new alternatives. In the rescoping process, 16 initial arrays were reviewed to determine what changes from previously studies may be possible. In additional, new planning constraints, such as the new mitigation bank in the area upstream of the proposed project footprint, presented new factors to consider with respect to the footprint of previous alternatives. These new planning constraints helped shape the objectives. As similar to the 1984 study, the **Study Goal** was "*To provide a comprehensive solution to reduce flood risk in the Jackson metropolitan area caused by the Pearl".*

With so much available data, many alternatives were evaluated, or re-evaluated as the case may be, and in some cases, the plans were hydraulically modeled to insure the review was thorough and complete.

The USACE - Vicksburg District was involved with the initial rescoping charrette and review of the initial array of alternatives, which included a briefing at the Vicksburg District with vertical chain members.

PDT Final Evaluator Response (FPC #1)
Based on discussion with the Corps, it was determined and recommended that a nonstructural alternative had to be pushed forward to the final array of alternatives. Therefore, despite nonstructural measures being identified as not practical in the prior studies mentioned above, the buyout plan was moved forward as a nonstructural alternative because it was the only nonstructural plan that would provide the level of comprehensive flood risk management identified in the study goal. In summary, the four study efforts considering effective flood risk management for the Jackson Metropolitan area, spanning from 1984 to today, have screened over 50 alternatives of plans or combinations of plans. These plans included a wide variety of alternatives- from dry dams, clearing plans, watershed diversions, levees, pumps, reservoir modifications, bridge modifications, new reservoirs, channel improvements, non-structural, and no action alternatives. To date, no project improving flood risk management for the area has been constructed. In response to the comment, plans providing both more and less flood risk management were considered in the initial array of alternatives. However, Alternative C was moved forward as the plan meets the Study Goal of providing "a comprehensive solution to reduce flood risk" and meets the WRDA2007 criteria of being "the NED, the Locally Preferred Plan, or a combination thereof." A more detailed evaluation of the limits, both technically and economically, of these alternatives will be included in the report. Also, additional alternatives and variations investigated in the initial array which provided greater and less levels of protection than Alternative C will be expanded to ensure NED benefits are maximized.
Panel Final BackCheck Response (FPC #1)
X Concur **Non-Concur**
Explanation: The evaluation of additional alternatives that were considered in prior studies should include updating both benefits and costs of the alternatives and displaying the results in a tabular comparison with Alternative C.

Literature Cited

USACE (2000). Planning Guidance Notebook. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Regulation (ER) No. 1105-2-100. April 22, 2000.

Final Panel Comment 2

The report does not provide a rationale for how structural and nonstructural management measures were combined to form the initial array of alternative plans.

Basis for Comment

The initial array of 16 alternative plans (Draft FS/EIS, pp. 101 and 102) is presented in five structural management measure categories. There is no description of a comprehensive set of structural flood control management measures, techniques for screening management measures, or a process by which structural and nonstructural management measures were combined to form alternative plans. The initial array of alternatives includes very few combinations of management measure types. As a result, it is not possible to evaluate benefit and cost tradeoffs between the extent of levees/floodwalls and pumps and that of channel improvements. It is possible that if additional channelization was included in one or more of the Levees, Floodwalls, and Pumps alternatives described on p. 102 of the Draft FS/EIS, a plan that provides greater benefits with lower costs might exist. It is also possible that if nonstructural management measures (after screening) were included in one or more of the initial array of alternatives, benefits and costs might have been beneficially impacted. As a result, the initial array of alternatives that were considered may have not considered a plan that would be superior to the TSP.

Significance – High

The plan formulation methodology may have failed to identify another alternative that might provide the same or greater NED benefits at a reduced cost.

Recommendations for Resolution

1. Evaluate tradeoffs between management measures (i.e., evaluate increased channelization vs. reduced levees/floodwalls and pumps) to ensure that the alternatives perform efficiently by:
    a. Formulating an expanded initial array of alternative plans consisting of a mix of one or more structural and nonstructural management measures.
    b. Applying a quantitative or qualitative evaluation of the initial array of alternatives to identify the alternative plans to be evaluated in greater detail.
    c. Refining the final alternatives so the mix and relative extent of structural and nonstructural management measures provides the greatest benefits at the lowest cost.

PDT Final Evaluator Response (FPC #2)

X	**Concur**		**Non-Concur**

Recommendation 1:		**Adopt**	**X**	**Not Adopt**

Explanation: As mentioned in the response to FPC #1, additional variations have been evaluated. The report will be updated to clarify that qualitative analysis of numerous measures was evaluated. This updated discussion will also describe the quantitative analysis, such as hydraulic modeling, that was performed to evaluate the initial array of alternatives. It should be noted however that the TSP does include a mix of structural and nonstructural measures: channel improvements with levee setbacks and voluntary residential buy-outs.

PDT Final Evaluator Response (FPC #2)
In addition to including this information expanding upon previously evaluated plans, additional variations of the measures will be evaluated and added to the narrative of the report. The updated consideration of additional alternatives will also include the updated costs and benefits associated with the plans and variations discussed in the response to FPC #1.

Panel Final BackCheck Response (FPC #2)			
X	**Concur**		**Non-Concur**
Explanation: A qualitative comparison of the updated benefits and costs of a wide range of additional alternatives considered in prior studies will help demonstrate that a comprehensive range of alternatives was considered.			

Final Panel Comment 3

Alternative A, the Buyout Plan, is impractical, and its inclusion in the final array of alternative plans precludes an efficient evaluation of the alternatives that best meet the planning objectives.

Basis for Comment

The Draft FS/EIS (p. ix) and Appendix A (Section A.5.2.1) state that the buyout plan was included in the final array of alternatives to comply with a USACE requirement (Engineer Pamphlet [EP] No. 1165-2-314) that a stand-alone nonstructural alternative be considered through the entire planning process (USACE, 1995). However, EP 1165-2-314, *Flood Proofing*, establishes USACE flood-proofing regulations to specify the minimum building standards and requirements to "… safeguard life or limb, health, property, and public welfare …" (p. 2-1). Planning Bulletin (PB) 2016-01 (USACE, 2015), *Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures*, states (p. 2): "While a minimum of one primarily nonstructural plan (Section 73 of the Water Resources Development Act of 1974 (WRDA 1974)) must be considered, the combination of structural and nonstructural measures should be utilized to formulate complete plans." Under this guidance, a nonstructural plan that is not practical does not need to be considered among the final alternatives.

Because of the detailed and time-consuming evaluation required of the final alternative plans, inclusion of an impractical alternative prevents consideration of another, practical plan. In order to identify the TSP, a range of alternatives that provide both fewer and greater net NED benefits than the TSP must be identified.

Significance – High

By including an impractical alternative in the final evaluation, limited planning resources are wasted, and it is not possible to definitively identify the TSP.

Recommendations for Resolution

1. Screen the buyout plan based on the reason that it is considered to be impractical, and do not include it in the final alternatives.
2. Replace the buyout plan with another, promising alternative from the initial array of alternatives.

PDT Final Evaluator Response (FPC #3)

X	**Concur**		**Non-Concur**

Explanation: As stated previously, the USACE was involved in the initial rescoping of this project. The Vicksburg District concluded based on their interpretation of the guidance that a non-structural alternative was required to be in the final array of alternatives.

Recommendation 1:		**Adopt**	**X**	**Not Adopt**

Explanation: The nonstructural alternative was screened based on previous studies concluding nonstructural alternatives are impractical. However, it was moved forward based on guidance from the USACE.

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PDT Final Evaluator Response (FPC #3)				
Recommendation 2:	**X**	**Adopt**		**Not Adopt**
Explanation: As stated in the response to the above recommendation, the non-structural alternative was moved forward based on guidance from the USACE. Moving this plan forward did not keep another promising plan out of the final array of alternatives. Nevertheless, the additional alternatives and variations discussed in FPC #1 and #2 will also be thoroughly investigated and discussed within the narrative of the report. These alternatives will include structural and nonstructural measures. If determined that a plan needs to be added to the final array of alternatives, the alternative will be moved forward for further analysis.				
Panel Final BackCheck Response (FPC #3)				
	Concur	**X**	**Non-Concur**	
Explanation: Including a nonstructural alternative in the final set of plans is not a USACE requirement. Many USACE flood risk management feasibility reports do not include a nonstructural alternative in the final set of plans.				

Literature Cited

USACE (1995). Flood Proofing. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineer Pamphlet (EP) No. 1165-2-314. December 15, 1995.

USACE (2015). Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Planning Bulletin (PB) No. 2016-01. December 22, 2015.

WRDA (1974). Water Resources Development Act of 1974, Public Law 93-215, March 7, 1974.

Final Panel Comment 4

The lack of detail in the conceptual engineering design affects the evaluation of potential impacts and the cost estimates.

Basis for Comment

Appendix C (Engineering) provides limited engineering documentation to evaluate the possible impacts and costs of Alternatives B and C. The discussions refer to the previous levee and lake plans, the details of which are not presented. Appendix C does not include conceptual levee plans showing the extent/grades of the proposed improvements or the features.

Figure 3-5 in the Draft FS/EIS shows Alternative B. Figures 3-6, 5-1, 5-2, and 5-3 show the Channel Improvement Alternative Layout. Appendix C includes limited plan and profile information of weir and levee improvements for Alternative B. However, these schematic illustrations do not provide sufficient detail to evaluate the engineering aspects of the project alternatives.

Section 2.5.2.3 of the Draft FS/EIS, *Pearl River Tributaries and Interior Drainage*, refers to engineering analyses of interior drainage which resulted in the addition of several new pump stations for Alternative B but not for Alternative C. The models, assumptions, and results of these analyses are not provided in the report. Since pump station costs are a significant component of the Alternative B, this issue could affect the selection of the most cost-effective alternative.

Appendix C briefly discusses subsurface conditions and includes excerpts of boring location plans, profiles at various locations, and limited geotechnical calculations. However, the report does not provide a rationale for the development of geotechnical models or explain how the limited geotechnical calculations relate to the alternative designs. For the selected Alternative C, an assessment of the material types, moisture condition, and strength of the soil in the excavation may have a significant effect on the construction means and methods. This could affect project costs as well as impacts during construction.

For Alternative B, the Abbreviated Risk Analysis in the cost engineering section of Appendix C indicates that a contingency of 74% was applied to “Levees and Earthwork” and 71% to the “Pumping Plant” line items. These two items account for a significant portion of the total project cost.

The lack of detail in the engineering analysis may be exacerbating uncertainty to the extent that it could affect the selection of the TSP.

Significance – High

A better understanding of conceptual engineering analyses and detail is necessary to validate the selection of the TSP.

Recommendations for Resolution

1. Provide conceptual levee plans and cross-sections showing the extent of the proposed improvements, approximate grades, and location of key features.
2. Provide additional details in Appendix C (Engineering) regarding interior drainage engineering analyses.
3. Provide preliminary interpretative cross sections showing the variation subsurface conditions as they relate to the Alternatives B and C improvements.
4. Discuss how geotechnical conditions will impact design of levees, new cut and fill slopes, and placement and compaction of new mass fill.

Final Panel Comment 4

5. Explain the selection of contingency applied to various work features.

PDT Final Evaluator Response (FPC #4)

X	**Concur**		**Non-Concur**

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: Being added to the final report are cross sections which include top of levee grades and channel section features such as excavation and fill limits. In addition, bridge sections are also being added. Sections will present existing soil features where boring data is available from previous studies.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

Explanation: The interior analysis section will be expanded to include more details.

Recommendation 3:	**X**	**Adopt**		**Not Adopt**

Explanation: As stated in 1 above, cross sections are being included that have estimated subsurface information for Alternative C. Alternative B is already included within Appendix C of the document.

Recommendation 4:	**X**	**Adopt**		**Not Adopt**

Explanation: Appendix C: Engineering, Hydrologic and Hydraulic Analysis includes previously collected geotechnical data, including soil borings from within the project footprint. Addition discussion will be included about the geotechnical conditions for cut and fill slopes and placement of fill.

Recommendation 5:		**Adopt**	**X**	**Not Adopt**

Explanation: Contingency is covered in Appendix C: Engineering. The Abbreviated Risk Analysis contingency method used by the USACE was utilized and reviewed with the USACE Cost Engineering Center.

Panel Final BackCheck Response (FPC #4)

X	**Concur**		**Non-Concur**

Explanation: The panel did not include a Cost Engineering Expert and the basis of the contingencies was unclear. Given that the costs were reviewed by the USACE Cost Engineering Center, the panel concurs with the team's response.

Final Panel Comment 5

The three HTRW sites identified in the Draft FS/EIS are not sufficiently characterized to determine the adverse impacts on the Pearl River and on the overall project cost.

Basis for Comment

Section 2.5.14 of the Draft FS/EIS identifies three HTRW sites that present issues of concern. Alternative C is the only alternative which would have direct impacts on these sites. Although, the HTRW Environmental Evaluation Study (Appendix C) states that the potential costs for remedial actions for the sites is included in the Alternative C total cost, it is not clear that these costs are sufficient. The cost estimate has a section for “Landfill Removal” which has line items for landfill excavations and landfill lining.

For Alternative C, the most significant of the HTRW sites, is the former Gulf States Creosote Company site. The Environmental Evaluation Study indicates that portions of the channel excavation would occur within the area impacted by the former creosote company operations. Possible remedial measures have been identified “as capping in order to permanently cover and not disturb the sediments, or excavating and removing the impacted sediments prior to dredging the lake”. If a capping alternative is selected, sediments would be capped and left in place, and the limits of the new channel would be reduced. The hydraulic impact of a reduced channel width has not been addressed. Depending on the concentrations of heavy metals and polynuclear aromatic hydrocarbons in the sediment and groundwater, excavation and onsite reburial may not be permitted by the regulatory agencies. If offsite disposal at a properly licensed facility were required, the costs of excavation and disposal may be many times the current estimated costs.

A similar concern exists for the Former Gallatin Street Dump site. While this site appears to primarily contain municipal wastes, large portions (2/3) of the landfill will be excavated and relocated, possibly to the other remaining portion of the landfill, increasing the elevation. The Environmental Evaluation Study suggests that the elevated mound could provide public access for a park and recreational facilities, but that assumes that the waste characterization would prove the materials suitable for such a use and that the regulatory agencies would approve. The potential cost of disposal may be less that that associated with the Gulf States site, but substantially more than that assumed in the cost estimate.

For the LeFleurs Landing Site/Jefferson Street landfill area, the Environmental Evaluation Study indicated that during previous investigations of the underground storage tank (UST) area, one monitoring well was sampled in 2004 and the benzene concentration in groundwater was 3.8 ppm. The current regulatory standard for benzene is .005 ppm. The study also indicates that the landfill portion of the site was investigated, and that soil and groundwater samples were collected but there is no discussion of the results. Soil excavation has been conducted in the UST area of the site, however, there is no indication that the extent of the impacted groundwater has been defined.

The implementation of Alternative C will require comprehensive site characterization, and the engineering and implementation of remediation techniques to address potential impacts. It is not clear that all of these costs have been considered. The remediation techniques identified in the Environmental Evaluation Study include the installation of slurry cutoff wall, groundwater pump/treat systems, impermeable caps, or the use of in-situ bioremediation techniques, among others. Because the sites have not been fully characterized, these costs are unknown but are likely to far exceed the cost section for “Landfill Removal”.

Final Panel Comment 5

Significance – High

The potential costs of HTRW site remediation may be significantly understated in the cost estimates and risk analysis, potentially affecting the selection of the TSP.

Recommendations for Resolution

1. Conduct full site characterizations to assess the nature and extent of soil and groundwater contamination and to determine leachate and groundwater flow patterns.
2. Provide a more detailed evaluation of possible remedial measures/costs, including contaminated soil/landfill waste disposal and groundwater remediation.
3. Evaluate the potential impact of avoiding or reducing excavation limits in HTRW sites on river hydraulic analysis.

PDT Final Evaluator Response (FPC #5)

X	**Concur**		**Non-Concur**

Explanation: This comment addresses two main issues: the need for further study on the HTRW sites before final plans can be made for them, and the cost differences between the EIS' predicted outcome for the HTRW sites versus the outcomes in the event one of the commenter's hypothetical situations proves accurate. With respect to the first issue, we agree. More study on the HTRW sites, including full site characterizations, is necessary before final engineering plans and construction can take place. However, the EIS drafters have performed analysis of these sites sufficient for decision making at the current stage of the process. That is, a more complete study of the possibilities for remediating the HTRW sites will take place, but that activity is more appropriately placed within the Preconstruction, Engineering and Design phase that will follow the EIS.

On the second issue, we respectfully disagree. Again, sufficient analysis of all three HTRW sites has taken place such that the remediation plans described in the EIS, including their expected costs and environmental outcomes, are reasonably likely to be practicable once full site remediation design is complete. Further, the overall budget set forth for Alternative C includes sufficient built-in cost contingency within its various elements to allow for HTRW remediation to cost more, within reasonably expected levels, than the EIS estimates.

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: As stated above, full site remediation design will be performed on the HTRW sites as part of the Preconstruction, Engineering and Design phase for Alternative C. Such a process would be premature at this stage but final design and construction will not take place without a full remediation design. However, we will adopt this recommendation by providing additional documentation in Appendix C, more fully setting forth the assessment, remediation design, and estimated remediation cost information on which the EIS' narrative regarding the HTRW sites is based.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

PDT Final Evaluator Response (FPC #5)				
Explanation: We will take two actions in adopting this recommendation. First, as set forth above, we will provide additional documentation in Appendix C to ensure it contains a full explanation of the assessment information on which the HTRW analysis is based. Second, we will amend the narrative in the body of the EIS to more fully evaluate potential remedial measures and costs as laid out in the recommendation.				
Recommendation 3:	**X**	**Adopt**		**Not Adopt**
Explanation: Again, this analysis will take place as part of the Preconstruction, Engineering and Design phase of Alternative C, but Appendix C will be amended to include more detailed documentation.				
Panel Final BackCheck Response (FPC #5)				
X	**Concur**		**Non-Concur**	

Final Panel Comment 6

There is minimal explicit connection between the modeling results, the dimensioning of the structures, and the associated cost estimates for the alternatives evaluated, including the TSP.

Basis for Comment

The results of the H&H analysis presented in Figures 3-5, 3-6, and 3-7 of Appendix C include the modeled water surface and top-of-levee elevations along the project area for Existing Conditions and With-Project. It is not clear, however, if the top-of-levee elevations shown in these figures for Alternatives B and C correspond to the proposed levee work. Furthermore, and more importantly, there are no summary tables connecting these modeling results with the plan and profile drawings for the different levee segments that are included in the same Appendix C, nor with the quantities and cost estimates subsequently presented in the Cost Engineering section of Appendix C. Providing such connection in a more explicit form will facilitate review of the proposed design and cost estimates.

Similarly, the Interior Analysis section of the H&H analysis presented in Appendix C discusses the modeling conducted to determine interior drainage needs, including pumping requirements, but there is no explicit connection with the typical plan view and typical cross section shown in the same Appendix C, nor with the quantities and cost estimates subsequently presented in the Cost Engineering section of Appendix C. Additionally, potential issues that should be included in the risk register of the project may not have been identified.

Significance – Medium/High

The economic feasibility of the TSP is uncertain due to the lack of connection between the modeling results, engineering analysis, design drawings, and cost estimates.

Recommendations for Resolution

1. Include a roadmap and summary tables that provide a clear link between the different sections of Appendix C dealing with modeling, engineering analysis, drawings, quantities, and cost estimates.

PDT Final Evaluator Response (FPC #6)			
X	**Concur**		**Non-Concur**
Recommendation 1:	**X**	**Adopt**	**Not Adopt**
Explanation: As stated in response to FPC #4, a more detailed presentation of cross sections that will include levee and fill grades and hydraulic flowlines. Summary tables will be added to insure connectivity to the modeling, quantities, and cost estimates within the final draft.			

Panel Final BackCheck Response (FPC #6)			
X	**Concur**		**Non-Concur**

Final Panel Comment 7

The HEC-RAS calibration of Existing Conditions against the 2007 Pearl River Watershed Feasibility Study results does not appear to be consistent with the decision to use the FEMA discharge estimates for this study.

Basis for Comment

Appendix C of the Draft FS/EIS presents the H&H analysis and the calibration of the hydraulic model (HEC-RAS). However, there appears to be contradictory information within the tables and text, raising questions about the applicability of the results and the potential impact on the determination of benefits for the with-project alternatives. For example.

1. The paragraph below Table 2-1 (Appendix C, Hydrologic and Hydraulic Analysis section, p. 3) of the H&H analysis states the following: "It was decided to utilize the FEMA discharge estimates for this study." However, Section 3.4.1 (Appendix C, Hydrologic and Hydraulic Analysis section, p. 7) states that "The existing conditions model was…calibrated for the 1% annual chance flood event to the respective estimated stage-discharge relations published in 2007 USACE Feasibility Study, while using the FEMA FIS as a check." Section 3.4.1 then states that the calibration criteria of a maximum 0.5-foot elevation differential is applied to the 2007 USACE Feasibility Study only.
2. In Table 3-1, the FEMA FIS water surface elevations are lower than those corresponding to the 2007 USACE Feasibility Study by as much as approximately 2.5 feet.
3. In Table 3.1, the difference in water surface elevations between the Existing Conditions modeled in this study and the FEMA FIS results is in the range of 1 to 2 feet, which does not meet the calibration criteria threshold of a 0.5-foot elevation differential.

If the calibration had been performed against the FEMA FIS results, the water surface elevations modeled for Existing Conditions would be lower, and potentially the benefits would be smaller because the flood level reduction attributable to the with-project alternatives would be consequently smaller.

Significance – Medium/High

Developing and applying models that are consistent with decisions pertaining to the design flow estimates to use will influence the evaluation of project impacts and the determination of benefits for Alternatives B and C.

Recommendations for Resolution

1. Describe the rationale for calibrating the hydraulic model for Existing Conditions against the 2007 Pearl River Watershed Feasibility Study instead of the FEMA FIS results.
2. Depending on the answer to the first recommendation:
   a. recalibrate the hydraulic model for Existing Conditions against the FEMA FIS results.
   b. rerun the hydraulic models for Alternatives B and C using the recalibrated model per 2(a).

PDT Final Evaluator Response (FPC #7)

	Concur	**X**	**Non-Concur**

Explanation: Please refer to the explanation below.

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PDT Final Evaluator Response (FPC #7)				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: Appendix C: Engineering, Hydrologic and Hydraulic analysis already includes some discussion on why the FEMA Profiles were not used but the flows were used. These decisions were made in review with the USACE and the USGS early in the study. Basically, review of the flows indicate they are appropriate estimates, but as stated in the FIS, errors appear to have occurred when the flows were converted into profiles. See the following excerpts from the report for clarification:

The FEMA Flood Insurance Study developed discharge-frequency relations for the Pearl River through the City of Jackson using information from USGS gaging stations based on 102 years of rainfall for the 10-, 2-, 1-, and 0.2-percent annual chance flows. The USGS City of Jackson gaging station, located just downstream of U.S. Highway 80 with a drainage area of approximately 3,171 square miles, was selected for this study reach. The USGS Water-Resources Investigations Report 91-4098, Annual Peak Stages and Discharges for Streamflow-Gaging Stations in Mississippi, was used to confirm the discharge values at the gage location listed within the FEMA FIS.

It should be noted that discrepancies were observed for the Pearl River in the FEMA Flood Insurance Study. These discrepancies include errors in the vertical elevations of the flood profiles for sheet numbers 206P through 207P. The flood profiles do not match during the transitions from one sheet to the next. Also, the drainage area published in the FIS at the downstream limit of study (River Mile 268.5) is 31.00 square miles; however, upstream at the City of Jackson gaging station, the drainage area is published as 3,171 square miles.

Mendrop Engineering discussed the differences and discrepancies stated above in a September 2013 Charette Meeting with various agency officials and in a January 2014 meeting with the USGS Mississippi Branch. It was decided to utilize the FEMA discharge estimates for this study.

Mendrop Engineering submitted a request to FEMA Library to obtain the Effective Model for the Pearl River through the study reach, and subsequently received an electronic HEC-2 model. It should be noted that the FEMA Library Results included a disclaimer stating the obtained HEC-2 model is “slightly off especially between cross section AA thru (sic)”. These cross sections are from the Pearl River and Eubanks Creek confluence upstream through the Ross Barnett Reservoir. This disclaimer is expected considering the flood profile discrepancies stated in Section 1.0. The obtained HEC-2 electronic file was then imported into HEC-RAS. The transition of the HEC-2 data file into HEC-RAS is not a seamless one, and corrections were made to the bridge widths within the model bridge routine to create a duplicate effective model.

Mendrop Engineering also obtained the 2010 USACE Levee Certification Report HEC-RAS model. The Levee Certification Model contains more current geometry data than the obtained FEMA Effective Model, and consequently, was used as the base model for the existing conditions. The obtained cross-sections and stream reach were geo-referenced using ArcGIS, Version 9.3.1. The study area begins at Byram, MS, and continues upstream to Ross Barnett Reservoir. The basin cross-sections were spaced approximately one mile apart within the model.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

Explanation: As explained in FPC#7 Recommendation #1, recalibrating the hydraulic model to FEMA FIS profiles at this time would not improve the Existing Conditions Model. As stated in the response to the proceeding recommendation, the cited problems with the FEMA FIS profiles make calibration to those

PDT Final Evaluator Response (FPC #7)
models ineffective. However, the hydraulic models are in the process of being reviewed and reevaluated with the FEMA flows. The model calibrations will be revised if the review indicates revision is necessary.

Panel Final BackCheck Response (FPC #7)			
X	**Concur**		**Non-Concur**
Explanation: We appreciate the additional explanation about the issues with the water surface profiles of the FEMA FIS model, and believe the adoption of the two recommendations and follow-up on the likely action items will help determine if there are inconsistencies between the model calibration and the calculation of benefits.			

Final Panel Comment 8

The impacts of construction involving 25 million cubic yards of excavation are not addressed.

Basis for Comment

The Draft FS/EIS does not address the potential construction means and methods associated with excavation and placement of a large quantity of soil. As a result, the lack of detail associated with construction makes it difficult to evaluate air quality, water quality, noise impacts, and cost implications.

Use of excavators and haul trucks, as compared to various dredging methods, will affect the mix and duration of equipment used. Equipment type and duration of use will affect air quality and create noise during construction. In addition, different excavation methods will involve varying dewatering and storm water control measures, which could affect the assessment of water quality impacts during construction. In addition, construction impacts associated with work occurring over multiple construction seasons are not evaluated. Such work may include interim dewatering and erosion control in addition to long-term measures for the completed work. Finally, discussion of potential construction means and methods can be used to validate the unit cost assumed in the cost estimates.

Significance – Medium

Potential environmental impacts during construction cannot be fully evaluated without a better understanding of the possible range of construction means and methods.

Recommendations for Resolution

1. Describe potential construction means and methods, including use of excavators, haul trucks, and dredging.
2. Evaluate measures to mitigate water quality impacts from excavation and fill site dewatering during construction and long-term, including consideration of construction occurring over multiple construction seasons.
3. Discuss the possible mix of equipment for various alternatives, methods, and approximate durations.
4. Confirm that unit costs assumed in the cost estimates are consistent with the proposed range of means and methods.

PDT Final Evaluator Response (FPC #8)

X	**Concur**		**Non-Concur**

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: It is anticipated that excavators, haul trucks, and dredging operations will be utilized in the construction. Final determination of the construction means will be governed by the location and type of soils encountered. For example, the levee setbacks will utilize typical construction methods for levee sections and borrow material. The conceptual project plan does anticipate being able to utilize the some portion of the dredged material in disposal areas. The final draft will be updated to expand the discussion about potential construction means and methods.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

PDT Final Evaluator Response (FPC #8)				
Explanation: Current expectations are that the project will be constructed in segments and that as much as possible of the construction work will be done off-line of the main river. Construction will be managed such that riverine flow shall be maintained throughout the process. Best management practices, including storm water controls, will be followed during all implementation phases of this project, thereby limiting and reducing water quality impacts from the construction process. Clarification of the anticipated potential impacts to water quality during construction will be added to the final report.				
Recommendation 3:	**X**	**Adopt**		**Not Adopt**
Explanation: As stated above, a more detailed discussion will be added to the document.				
Recommendation 4:	**X**	**Adopt**		**Not Adopt**
Explanation: Additional breakdown of cost estimates will be included in the final draft. This will include estimates of types of methods for excavation.				

Panel Final BackCheck Response (FPC #8)			
X	**Concur**		**Non-Concur**

Final Panel Comment 9

The Draft FS/EIS does not clearly state whether the mitigation techniques presented are consistent with the current TSP or explain how mitigation would be implemented.

Basis for Comment

The Draft FS/EIS Habitat Evaluation Procedure (HEP) analysis uses a 2006 aquatic evaluation previously developed for a previously considered project, the Pearl River Watershed Feasibility Study Two Lakes Flood Control Plan. It is not stated in the draft FS/EIS that the same mitigation approach for aquatic resources described in the 2006 aquatic evaluation is also being utilized for the TSP. The 2006 aquatic evaluation recommends a mitigation approach of a 1:1 ratio for obligate riverine species, and states that tradeoffs among guilds and opportunities for in-kind mitigation will be important considerations in the final mitigation plan.

The 2006 aquatic evaluation determined that obligate and facultative riverine guilds would be adversely impacted, and that obligate riverine species (which represent approximately 20% of the fish assemblage) would become rare or be extirpated from the project area after construction was completed. The lake habitat suitability index for facultative riverine species was more than 50% lower than for existing conditions.

However, the 2006 aquatic evaluation stated that in-kind mitigation for loss of obligate riverine fish habitat would be limited, and four potential mitigation techniques were proposed: (1) reconnecting secondary channels, (2) reconnecting or managing water levels of backwaters, (3) protecting/creating gravel bars, and (4) constructing in-lake weirs. The HEP analysis in the Draft FS/EIS does not clearly state whether these proposed mitigation techniques are consistent with the current TSP, and, if so, how successful the opportunities for in-kind mitigation would be.

Significance – Medium

Potential adverse impacts to obligate and facultative riverine guilds due to project construction may not be successfully mitigated if the mitigation techniques recommended in the 2006 aquatic evaluation are not consistent with the TSP.

Recommendations for Resolution

1. Clarify that mitigation for aquatic resources under the current TSP will provide suitable habitat for riverine fish species and will include in-kind mitigation for loss of obligate riverine fish habitat.

PDT Final Evaluator Response (FPC #9)

X	**Concur**		**Non-Concur**

Explanation: At the same time the IEPR review was being completed we were conducting the coordination activities with the USFWS. As a part of the USFWS coordination process discussions relative to the potential impacts of the aquatic and fisheries resources were conducted and a consensus on the potential adverse impacts and the needed mitigation was reached. As a result, revisions have been made to the FSEIS in Section 4.5.5 regarding the TSP impacts and Section 5.3 regarding the proposed mitigation. Based upon the coordination with the USFWS it was determined that approximately 1.0 mile of the river in the southern portion of the TSP and approximately 2.0 miles of the river in the northern portion of the TSP offers portions of the historic riverine habitat in the Project Area. The

PDT Final Evaluator Response (FPC #9)				
remaining and majority of the river channel through the TSP Project Area has been dredged, realigned and channelized in the past which resulted in the loss of the historic riverine habitat and significantly diminished the quality of the existing riverine habitat. Regarding riverine mitigation, USFWS concurred that a 1:1 mitigation ratio would be required for the approximate 3-miles of river within the TSP that has not been previously impacted and that suitable mitigation would be protected at a 1:1 ratio to offset the functions associated with the riverine habitat. Further, the USFWS has stated that the TSP itself would offset the loss of riverine habitat in the TSP area that has been previously impacted by past dredging, and channelization. Revisions to the Mitigation Plan documentation in Section 5.3 of the FSEIS provide the additional clarification for the aquatic and fisheries mitigation requirements. We would like to point out that the basis for comment appears to be referring to the 2006 project proposed at that time. The TSP will function differently than 2006 project from a hydrologic perspective. Flow would continue through the widened and deepened channel as proposed. Low flow gates on the proposed relocated weir would ensure flow during drought conditions. This said, obligate riverine species would not become rare or be extirpated from the project area after construction is completed.				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: As noted, revisions have been made to the proposed Mitigation Plan following the IEPR and USFWS review activities to provide suitable habitat for the aquatic and riverine species and in-kind mitigation for the obligate riverine fish species. These mitigation measures will be implemented jointly for the obligate fish species and the Ringed sawback (map) turtle within the Pearl River drainage basin as outlined in Section 5.3 in the FSEIS.				
Panel Final BackCheck Response (FPC #9)				
X	**Concur**		**Non-Concur**	
Explanation: For clarification, and as stated in the Basis for Comment, the Panel's basis for comment was indeed referring to the 2006 project because that was the only aquatic evaluation that was provided for review in the Draft FS/EIS.				

Final Panel Comment 10

The evaluation of the project is focused on the area where flood risk reduction will be provided, but impacts on the river morphology can occur farther downstream, impacting costs under the TSP.

Basis for Comment

One of the main recommendations of the preliminary sediment impact assessment presented in Appendix C is that additional analysis or investigations will be required during the feasibility assessment. In this regard, channel erosion, sedimentation, or changes to the river planform downstream of the project area could be triggered by the substantial modification of the river channel between RM 284 and RM 293.5. The potential for these impacts should be evaluated, including estimation of the associated mitigation costs that might be required, because these potential impacts would affect the overall evaluation of the TSP feasibility and cost. Information in the preliminary sediment impact assessment presented in Appendix C can serve as input for this evaluation.

Significance – Medium

Impacts on the river morphology downstream of the project area may need to be addressed through mitigation measures, and the cost and timing of such measures may affect overall implementation of the TSP.

Recommendations for Resolution

1. Evaluate the potential for channel erosion, sedimentation, or changes to the river planform downstream of RM 284.
2. Estimate mitigation costs associated with these impacts for the TSP.

PDT Final Evaluator Response (FPC #10)

X Concur **Non-Concur**

Explanation: While the sediment loads from the Ross Barnett Reservoir are thought to be low compared to pre-dam quantities, analysis of the downstream reaches do indicate they have been relatively stable since the reservoir's construction. Furthermore, the Ross Barnett Reservoir is an impoundment which always regulates the amount of flow through the gates. The Tentatively Selected Plan does not include a dam. Rather, the project proposes to relocate a weir, constructed as such an elevation that it is submerged even during the 100% and 50% annual chance exceedance flood events. These more frequent flood events tend to be the channel forming flows during which the majority of geomorphic changes are taking place.

Alluvial channels adjust their geometries in response to flows and their ability to transport sediment through the system. Channel-forming, or dominant, discharges can be defined as "a theoretical discharge that if maintained indefinitely would produce the same channel geometry as the natural long-term hydrograph.[1]" Copeland, Biedenharn, and Fischenich (2000) maintain that a representative channel-forming/dominant discharge is "the foundation of 'regime' and 'hydraulic geometry' theories for determining morphological characteristics of alluvial channels." Three methods are commonly used to estimate the dominant discharge: (1) the bank-full discharge which, in addition to other concerns, can be difficult to identify[1,2], and is not necessarily a constant value within even the same basin[2]; (2) a specified

PDT Final Evaluator Response (FPC #10)
annual chance exceedance (ACE) flood event discharge, typically between the mean annual chance exceedance event and the 20% ACE flood event[1]; and (3) effective discharge, defined as the discharge transporting the largest fraction of the annual sediment load over time. However, Knighton (1984) points out that some flood flows transporting large sediment loads do not occur with enough frequency to have a significant cumulative impact. Copeland et al., (2000) concludes that use of a channel-forming discharge value can be used to appropriately determine preliminary design dimensions, and that the selection of the appropriate method used to determine this discharge is based on many criteria, including data availability and physical characteristics of the site. Knighton (1984) states: "A link is thus established between dominant discharge, most effective discharge and bankfull discharge with an approximate recurrence interval of 1-2 years." This flow corresponds to the 100% - 50% ACE flood events. In the case of the Pearl River, the bank full discharge ranges between the 100% - 50% ACE event flows. As the relocated weir is submerged during these events, the weir is not anticipated to inhibit the downstream flow of sediment through the reach. This conclusion is further validated by the existing weir. The existing weir was built in 1920 and if it was a major inhibitor of the downstream flow of sediments, a loss of depth due to the deposition of sediment would be seen at the existing weir's location and this has not occurred. Furthermore, with the weir submerged during the channel-forming/dominant discharges, it should not impact the downstream dynamics of the system. With respect to downstream cross sections, discharge out of the project reach will be maintained, and therefore, geomorphic changes should be negligible as the channel-forming/dominant discharge will not be impacted. As mentioned above, the design team has begun updating and expanding the existing sediment transport modeling to further quantify the amount of sediment traveling through the reach. However, the Pearl River is an alluvial sinuous riverine system and will therefore continue to undergo planform changes over time. [1] Copeland, R.R., D.S. Biedenharn, and J.C. Fischenich. 2000. "Channel-Forming Discharge." Vicksburg, MS: US Army Corps of Engineers, Engineer Research and Development Center, Coastal and Hydraulic Laboratory Technical Notes, VIII-5. [2] Knighton, D. 1984. Fluvial Forms and Processes. London: Edward Arnold.
Recommendation 1: **X** **Adopt** **Not Adopt**
Explanation: Updated information will be added to clarify the sediment impact study. As stated in the report, this area was channelized by the USACE during the 1960s. The TSP includes the relocation of an existing weir, as opposed to adding a new weir to the river system, and is not expected to have an adverse impact on the channel morphology or planform downstream of the project. The report will be clarified to stress that this project will continue to act as a riverine system. At all times, water will have changes in velocity and changes in depth. In other words, the variability of flow through the proposed project reach will continue as it does now in the reach under the existing conditions. This is not a storage project. The channel forming discharges, or the discharges that typically have the most impact on channel morphology, are the lower flows such as the 100% and the 50% ACE flood events. These more frequent flows over time have the most impact on channel morphology. The relocated weir will be completely submerged at all events greater than the 50% ACE flood event; therefore, sediment can still be transported through the system. Also, flows that come into the project will leave the project with no flow duration changes.

PDT Final Evaluator Response (FPC #10)				
Recommendation 2:		**Adopt**	**X**	**Not Adopt**
Explanation: Mitigation cost for sediment impacts are not expected.				

Panel Final BackCheck Response (FPC #10)			
X	**Concur**		**Non-Concur**
Explanation: The panel appreciates the additional explanation, including the discussion of relevant references. Having said this, we also believe worthwhile mentioning that using the channel forming discharge is a standard that allows a more straightforward and simplified analysis of sediment transport in a riverine system, but this does not mean that such channel forming discharge is the one that has the most impacts on channel morphology. Other relevant literature and cases of study suggest that it is the larger, less frequent events that determine the channel morphology. However, we acknowledge that in practical terms, the project proposed does not change the current configuration of the riverine system, therefore it is reasonable to assume that impacts (if any) downstream of the project site will be similar to existing conditions.			

Final Panel Comment 11

It is not clear whether stormwater ponded behind the levees/floodwalls under Alternative B will induce flooding.

Basis for Comment

The H&H analysis presented in Appendix C discusses potential needs for interior drainage, including pumping requirements, but it is not clear if the discussion in the Interior Analysis section is comprehensive for Alternative B. Although the cost estimate includes nearly $200 million for pumping, there are several indications in the Draft FS/EIS that an engineering analysis has not been completed for Alternative B.

- "Alternative B is expected to result in indirect short-term impacts to existing hydrology with respect to areas behind levees where an additional amount of water will pond. This ponded water will have the potential to back up into adjacent areas and be stored until the water elevation subsides as a result of levee gate opening, pumping, and/or evaporation." (p. 133)
- "…some areas will have direct adverse impacts due to the potential for impounding drainage in the sump areas" with Alternative B. (p. 143)
- "This alternative [B] will have minimal beneficial direct and indirect impacts on the community's ability to further develop its business and industrial activities. Some areas will have moderate adverse direct and indirect impacts on thee resources due to possible impoundment drainage in sump areas." (p. 145)

Significance – Medium

Not accounting for the potential to induce flooding or for additional interior drainage requirements will have an impact on the economic feasibility of the alternatives evaluated.

Recommendations for Resolution

1. Present the engineering analysis for interior drainage of Alternative B.
2. Explicitly list the pumping requirements that will support the cost estimates of Alternative B.

PDT Final Evaluator Response (FPC #11)

X	**Concur**		**Non-Concur**

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: More information about the interior analysis and pumping station requirements needed will be added to the report.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

Explanation: More information about the interior analysis and pumping station requirements needed will be added to the report.

Panel Final BackCheck Response (FPC #11)

X	**Concur**		**Non-Concur**

Final Panel Comment 12

The discussion of climate change addresses the significant uncertainty of climate change forecasts but does not evaluate potential impacts under the no action plan or the alternatives.

Basis for Comment

USACE policy requires consideration of climate change in all current and future studies to reduce vulnerabilities and enhance the resiliency of the U.S. water resource infrastructure. USACE Engineering and Construction Bulletin No. 2016-25 (USACE, 2016) provides USACE with initial guidance for incorporating climate change information in hydrologic analyses in accordance with USACE's overarching climate change adaptation policy. Section 3.6 of the Draft FS/EIS states that, "… changes to the climate were considered …" However, the only discussion relates to the uncertainty of climate change forecasts and no description is provided of potential impacts of climate change on the no action plan or the final alternatives.

Significance – Medium/Low

Without an assessment of potential climate change impacts, it is not possible to evaluate how project benefits might be impacted.

Recommendations for Resolution

1. Provide a qualitative analysis that considers both past (observed) impacts and potential future (projected) impacts to relevant hydrologic inputs based on applicable USACE guidance, including how the performance of the no action plan and the alternatives might be impacted.

PDT Final Evaluator Response (FPC #12)

X Concur **Non-Concur**

Explanation: As noted in the Basis for Comment, Engineering & Construction Bulletin No. 2016-25 provides guidance for incorporating climate change impacts to inland hydrology in civil works projects. The ECB states it is applicable to "all hydrologic analyses supporting planning and engineering decisions having and extended decision time frame (i.e., not for short-term water management decisions)." However, the "objective" seems to limit the ECB to "new and existing USACE projects:" "The objective of this ECB is to enhance USACE climate preparedness and resilience by incorporating relevant information about climate change impacts in hydrologic analyses *for new and existing USACE projects*. The required qualitative analysis includes any *completed projects where Federal funds are being used to rehabilitate a project*." The Rankin-Hinds project may therefore not be covered based on that language. Nevertheless, in the interest of completeness and as set forth below, we will perform a qualitative analysis under the ECB.

The ECB itself notes the problem that "projections of specific climate changes and their associated impacts to local-scale project hydrology that may occur in the future can be highly uncertain, requiring guidance on their interpretation and use." It further notes that at this time "there is no consensus on how extreme storms will evolve in the future" and accordingly the ECB does not require addressing that issue at all. With these qualifications, the ECB lays out a qualitative analysis required for projects to which it

PDT Final Evaluator Response (FPC #12)				
applies, which is intended to explore both observed changes possibly related to the climate and projected future climate-related changes relating to the construction site. Attachment C to the ECB spells out the process for performing the required qualitative analysis. It breaks the process into two phases. Phase I addresses the current climate and evidence of past climate change in the area, and Phase II addresses projected changes to the watershed hydrology and an assessment of its vulnerability to climate change. The attachment also provides case studies as guides; the ECB states a full analysis should take no more than a few days. The District will follow the procedures laid out in Attachment C to the ECB in performing the analysis.				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: Please see above discussion.				

Panel Final BackCheck Response (FPC #12)			
X	**Concur**		**Non-Concur**

Literature Cited

USACE (2016). Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Engineering and Construction Bulletin No. 2016-25. September 16, 2016.

Final Panel Comment 13

The location and type of the hydraulic model's downstream boundary condition could be affecting the model results.

Basis for Comment

The hydraulic model results for the with-project condition are presented in Table 3-2 (for Alternative B) and Table 3-3 (for Alternative C) of the H&H analysis section in Appendix C. A review of the results suggests that the location of the model downstream boundary condition may be "artificially" fixing the water surface elevations along the downstream segment of the model domain, particularly for Alternative C in the reach between RM 279 and RM 284. Given the expected hydrograph attenuation of the Pearl River downstream of RM 284 (due to the massive channel excavation and widening upstream), it does not seem intuitive that the water surface profile will be the same for Existing Conditions and With-Project downstream of this location. An alternative explanation could be given by the type of downstream boundary condition set in the model, or the possible use of an "internal" boundary condition at the weir location in RM 284, yet the result is not intuitive and may be a model artifact.

Furthermore, the location of the model's downstream boundary condition may influence model results in the case of a relatively low gradient riverine system like the Pearl River, but the Draft FS/EIS does not discuss the reasons for selecting RM 279 as an appropriate location for such boundary condition.

Significance – Medium/Low

If the hydraulic model results are biased due to the type and location of the model's downstream boundary, the project design and evaluation of impacts could be affected.

Recommendations for Resolution

1. Describe the type of boundary condition (from a hydraulics viewpoint—e.g., rating curve for Existing Conditions) used at the model's downstream boundary condition, and discuss its effect on the modeled water surface elevations along the downstream segment of the model domain.
2. Indicate what type of hydraulics representation has been given for the weir (in RM 284) included in Alternative C, and discuss its impact on the water surface elevations downstream of the weir.
3. Conduct a sensitivity analysis of the location of the model's downstream boundary condition on the water surface elevations modeled in the project area, including upstream of RM 284 for Alternative C.

PDT Final Evaluator Response (FPC #13)				
X	**Concur**		**Non-Concur**	
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: The discussion of the hydraulic modeling will be expanded in the final draft to include discussion of factors such as the boundary condition utilized.				
Recommendation 2:	**X**	**Adopt**		**Not Adopt**

PDT Final Evaluator Response (FPC #13)				
Explanation: Although the weir design will be refined and modified as the TSP moves towards preliminary design, the hydraulics discussion within the documents will be expanded to further discuss the incorporation of the relocated weir into the hydraulic modeling.				
Recommendation 3:	**X**	**Adopt**		**Not Adopt**
Explanation: The downstream boundary condition will be reviewed.				

Panel Final BackCheck Response (FPC #13)			
X	**Concur**		**Non-Concur**

Final Panel Comment 14

The process for screening nonstructural management measures is not clearly described, was applied inconsistently, and does not comply with USACE guidance.

Basis for Comment

Explanations for why some nonstructural management measures were dropped while others were carried forward are not consistent or are not clear (Draft FS/EIS, p. 100; Section A.5.1 of Appendix A). For example, Flood Warnings, Flood Insurance, and Flood Plain Ordinances are all currently in place and are included in the future without-project condition, but only flood insurance and flood plain ordinances are carried forward.

Many USACE flood risk management studies do not consider management measures in alternative plan formulation if they are included in the future without-project condition. Flood proofing was dropped from consideration because "…it is not recognized by the National Flood Insurance Program (NFIP) for any flood insurance premium rate reduction…" (Draft FS/EIS, p. 100). Planning Bulletin 2016-1 (USACE, 2015), *Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures*, states: "Local flood ordinances and National Flood Insurance Program (NFIP) regulations alone are not sufficient criteria for screening nonstructural measures" (p. 2). Furthermore, the nonstructural management measures that were retained for further consideration were not used in any alternatives. No explanation for this is provided in the Draft FS/EIS; therefore, it is unclear why nonstructural management measures were not included in the initial array of alternatives.

Significance – Medium/Low

Without a clear explanation, and rigorous application, of the screening process for nonstructural measures, the analysis of alternatives cannot be considered complete.

Recommendations for Resolution

1. Develop screening criteria based on the planning objectives and apply them in a consistent manner to the full set of nonstructural management measures.
2. Include the nonstructural management measures that remain after screening in the initial array of alternative plans.

PDT Final Evaluator Response (FPC #14)

X	**Concur**		**Non-Concur**

Explanation: As previously discussed with prior comments, the nonstructural alternatives were deemed impractical in many cases in the prior studies examining the options for flood risk management in the Jackson Metropolitan Area. However, the nonstructural analysis will be reviewed and revised for clarification in the final document.

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: Screening of nonstructural measures will be more clearly discussed in the final document.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

PDT Final Evaluator Response (FPC #14)			
Explanation: The nonstructural management measures included in the report after the screening, such as the voluntary buy-outs included in the TSP, will be clarified and highlighted in the final document.			
Panel Final BackCheck Response (FPC #14)			
X	**Concur**		**Non-Concur**

Literature Cited

USACE (2015). Clarification of Existing Policy for USACE Participation in Nonstructural Flood Risk Management and Coastal Storm Damage Reduction Measures. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. Planning Bulletin (PB) No. 2016-01. December 22, 2015.

Final Panel Comment 15

The description of Alternative A, the Buyout Plan, is not complete.

Basis for Comment

A comprehensive description of Alternative A is required for preparing a cost estimate and for assessing the impacts of the alternative relative to the other final alternatives. The following issues are not addressed in the report.

- The Draft FS/EIS states (p. 111) that "… no risk management improvement would be realized at the $300 million [wastewater treatment] plant …" under the buyout plan. It does not explain why the wastewater treatment plant (WWTP) would not be relocated as part of the plan.
- There is no discussion of whether the WWTP would still be needed if the structures in the study area serviced by the WWTP were relocated.
- Section 3.7 of the Draft FS/EIS (p. 123) states that the NED benefits of the buyout plan would be negligible and that environmental quality (EQ) would not improve. Buyout of the existing structures in the floodplain would result in flood damage reduction benefits relative to the without-project condition, resulting in NED benefits that could be comparable to the TSP. It is not clear why removal of the existing structures in the floodplain would not increase available fish and wildlife habitat, thereby improving EQ.
- The Draft FS/EIS does not explain why the WWTP would not be provided with a ring levee under the buyout plan, as it is with the TSP.
- Table 3-8 of the Draft FS/EIS (p. 125) does not include interest during construction for the buyout plan. Although there would be no construction under the plan, it would take many years to implement the buyout plan, so the cost of money associated with the implementation timeframe should be accounted for in the total project cost.
- Table 3-8 does not include costs for interest/amortization/initial investment or for operation and maintenance, repair, replacement and rehabilitation. Both of these costs should be documented, in addition to average annual benefits, net annual benefits, and benefit-cost ratio.
- The Draft FS/EIS does not state whether the buyout plan would include physical removal of the structures or explain how the area would be maintained after implementation.

Significance – Medium/Low

Without a clear description of the buyout plan, its costs, benefits, and impacts cannot be fully evaluated.

Recommendations for Resolution

1. Provide a comprehensive description of the buyout plan: what it would consist of, how it would be implemented, and what maintenance would be required.
2. Verify that the documented benefits and costs are accurate based on the comprehensive description of the plan.

PDT Final Evaluator Response (FPC #15)

X	**Concur**		**Non-Concur**

Explanation: The discussion of the buyout plan (Alternative A) will be updated and expanded to include the implementation elements and a comprehensive breakdown of the estimated cost.

PDT Final Evaluator Response (FPC #15)				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: Please see the explanation above.				
Recommendation 2:	**X**	**Adopt**		**Not Adopt**
Explanation: Please see the explanation above.				

Panel Final BackCheck Response (FPC #15)			
X	**Concur**		**Non-Concur**

Final Panel Comment 16

The Draft FS/EIS does not fully describe the direct impacts of the TSP on the ringed sawback (map) turtle, a Federally listed species.

Basis for Comment

Review of the USFWS 5-Year Review: Summary and Evaluation for the ringed sawback (map) turtle (*Graptemys oculifera*) (2010) indicates that:

> "An impoundment for flood control of the Pearl River within ringed map turtle habitat at Jackson, Mississippi, south of the existing Ross Barnett Reservoir, has been considered…If the proposed reservoir is completed, it would likely result in the extirpation of the known ringed map turtle population at this location. The population at this location represents the best-known population on the Pearl River south of the Ross Barnett Reservoir".

The Draft FS/EIS describes the direct impacts to the species from implementation of the TSP as minor in intensity and long-term in duration. The Draft FS/EIS also acknowledges that ringed sawback turtle survey efforts have been limited and that the exact extent of the turtle population within the project area is not known at this time. Although the Mississippi Department of Wildlife Fisheries and Parks (MDWFP) and USFWS believe that ringed sawback turtles are present and utilize the stretch of the river within the TSP, their survey and monitoring efforts have not included most of the stretch of the Pearl River encompassing the TSP project area.

The first criterion listed in the USFWS 5-Year Review for the ringed sawback turtle's recovery plan calls for protection of a total of 150 miles of the turtle's habitat in two reaches of the Pearl River located on opposite ends of the Ross Barnett Reservoir at Jackson. No areas have been formally protected south of the Ross Barnett Reservoir. The first Recommendation for Future Actions in the USFWS 5-Year Review is "Conduct an analysis of potential effects to the ringed map turtle from a proposed impoundment of the Pearl River at Jackson, Mississippi." As stated in the FS/EIS, the extent of the ringed sawback (map) turtle population within the project area is not known at this time; therefore, the extent of potential impacts cannot be determined.

The FS/EIS suggests that due to the limited amount of survey efforts and significant data available for the ringed sawback (map) turtle in the project area, an adaptive management approach could provide the optimal opportunity to monitor the potential utilization of the project area by the species. There is no explanation of how potential adaptive management options could be included in the final design to avoid impacts to the species.

Significance – Medium/Low

An understanding of the potential impacts to the ringed sawback (map) turtle is not provided, which could affect selection or implementation of the recommended plan.

Recommendations for Resolution

1. Conduct a ringed sawback (map) turtle population and habitat survey in the TSP project area to determine potential effects.
2. Provide clarification on how "ongoing monitoring of these adaptive management measures" described in the Draft FS/EIS will ensure protection of the species and its habitat prior to project implementation.

PDT Final Evaluator Response (FPC #16)				
X	**Concur**		**Non-Concur**	
Explanation: It is important to address the Basis for Comment before responding to the Recommendations for Resolution. The basis quotes a paragraph from the USFWS 5-Year Review: Summary and Evaluation for the ringed sawback (map) turtle which was approved in July 2010. The quoted paragraph is in reference to the previous Two Lakes proposal and not the current TSP. The TSP Project Area is much smaller than the previously proposed Two Lakes Plan which did in fact include impacts to the portion of the Pearl River channel north of State Highway 25 that includes the highest density population of the Ringed sawback (map) turtle in the Jackson, MS, area. Regarding past surveys, as stated in Selman, Smith, 2017 (Diamonds in the Rough; Status of Two Imperiled *Graptemys* Species (*Graptemys oculifera* and *G. pearlensis*) in the Pearl River in Jackson, MS), prior to 2017 data has only been collected for the species north of Lakeland Drive. The above referenced technical report was published in 2017 by Will Selman, Ph.D and Haley Smith. This technical report included surveys along the Pearl River in Jackson, MS. Two (2) of the reaches surveyed fall 100% within the TSP and approximately 75% of a third reach surveyed falls within the TSP. Based on the findings of this technical report, the species is found in the TSP, albeit at lower densities due to past channelization, desnagging, and lack of riparian buffer. The preponderance of the Pearl River channel included in the TSP Project Area has not supported significant populations since much of the river channel had been previously dredged and channelized. However, the FSEIS was further revised following coordination with the USFWS to clarify the presence of the Ringed sawback (map) turtle within the TSP Project Area. The FSEIS and the Biological Assessment (BA) were both also modified to reflect the Ringed sawback (map) turtle surveys specific to the referenced technical report with funding from Millsaps for both 2017 and 2018. The FSEIS and BA were both further revised to clarify and specify the Mitigation Plan documentation to reflect the proposed Ringed sawback (map) turtle mitigation actions consistent with the criteria included in the Species Recovery Plan. In addition, the specifics of the Mitigation Plan in Section 5.3 of the FSEIS and the BA documentation further clarity the mitigation proposal to offset the adverse impacts and the adaptive management planning process will be utilized for further potential modifications and actions in the future following the monitoring and coordination processes with the USFWS following the Mitigation Plan details implementation. Based on all reviewed surveys to date, the proposed project would not contribute to the decline or continued existence of the species.				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: The FSEIS and BA documentation has been revised following coordination with the USFWS to acknowledge the 2017 and 2018 monitoring activities specific to the TSP Project Area. The Mitigation Plan documentation included in Section 5.3 of the FSEIS and the BA have been revised to include the mitigation activities that will be included in the TSP consistent with the Species Recovery Plan criteria.				
Recommendation 2:	**X**	**Adopt**		**Not Adopt**
Explanation: As noted, Sections 4.5.7 and Section 5.3 of the FSEIS and the BA documentation have been revised following coordination with the USFWS to further clarify the Mitigation Plan details and the potential utilization of adaptive management planning guidelines through time.				

Panel Final BackCheck Response (FPC #16)			
X	**Concur**		**Non-Concur**
Explanation: The Panel appreciates the opportunity to review the referenced November 2017 study, which fills in population and habitat data gaps for G. *oculifera* in the TSP area. The study finds that in stretches S3 and S4 (TSP), the mean densities of G. *oculifera* observed are not insignificant, that in fact G. *oculifera* are present in sometimes relatively high densities, that they are reproducing in this area, and that implementation of the TSP could potentially impact between 1,033 and 1,895 G. *oculifera.* The Panel has not had the opportunity to review the revised FSEIS, BA documentation or revised mitigation plan. The Panel assumes that the USFWS has not yet completed a Biological Opinion, and that the PDT is continuing coordination with USFWS for protection of this listed species.			

Literature Cited

USFWS (2010). Ringed map turtle (*Graptemys oculifera*). 5-Year Review: Summary and Evaluation. Department of the Interior, U.S. Fish and Wildlife Service, Southeast Region, Mississippi Ecological Services Field Office, Jackson, Mississippi.

Final Panel Comment 17

Section 6.0 of the Draft FS/EIS is not consistent in explaining the applicability of the listed environmental laws and compliance requirements to the TSP.

Basis for Comment

Applicable Federal statutes and executive orders are listed in Section 6.0. In some cases, there is an explanation of how this requirement relates to the TSP (for example, Federal Aviation Administration Hazardous Wildlife Attractants On or Near Airports). In most cases, however, no explanation is provided, so how the TSP is compliant with these environmental laws is unclear. For example:

1. For the Coastal Zone Management Program, the project area is not located within the Coastal Zone of Mississippi; therefore, the TSP is in compliance, but Section 6.0 of the Draft FS/EIS does not explicitly state so.
2. Endangered Species Act consultations will continue with the United States Fish and Wildlife Service (USFWS), but Section 6.0 of the Draft FS/EIS does not explicitly state so.
3. Bald and Golden Eagle Act coordination is not described in Section 6.0 of the Draft FS/EIS.
4. Magnuson-Stevens Fisheries Act coordination is not described in Section 6.0 of the Draft FS/EIS.
5. For the National Historic Preservation Act, coordination with the Mississippi Department of Archives and History (MDAH) will continue, but Section 6.0 of the Draft FS/EIS does not explicitly state that.
6. Resource Conservation and Recovery Act issues have been addressed in the Environmental Evaluation of HTRW Site (Appendix C), but a Phase I Environmental Site Assessment was not conducted.
7. For Tribal Consultation, Section 6.0 of the Draft FS/EIS does not state that the USACE Vicksburg District will assist with tribal coordination upon completion of the MDAH review.
8. For EO 11988, the Draft FS/EIS does not address the impacts to floodplains, nor does it state that the 8-step floodplain decision-making process will be implemented. Section 6.0 does not describe how the TSP is compliant with EO 11988.

Significance – Low

An explanation of the status of environmental compliance is necessary for completeness of the document.

Recommendations for Resolution

1. In the Draft FS/EIS, explain how compliance with each executive order/compliance requirement has been or will be achieved.

PDT Final Evaluator Response (FPC #17)			
X	Concur		Non-Concur

NOTICE TO READER – this document contains deliberative discussions between Rankin Hinds Pearl River Flood and Drainage Control District (FCD) and Battelle. Substantive edits to the referenced documents have been made after this report was produced. The reader should not rely on this report as a final position of the FCD.

PDT Final Evaluator Response (FPC #17)
Explanation: The document will be revised to clarify these issues including the FAA question and as stated below: 1. Will revise document to reflect comment. 2. Will revise document to reflect comment. 3. Will revise document to reflect comment. 4. Although this is not applicable, the document will be revised document to reflect comment. 5. Will revised document to reflect comment. 6. Although it's unclear if the comment is suggesting that the Phase I ESA is necessary to complete remaining RCRA issues (which would not be correct as RCRA does not address Phase I's) or if it should be conducted to satisfy CERCLA. Regardless, Phase I ESA's will be completed if the project is approved and funding is obtained. Furthermore, ASTM E1527-13, Section 4.6 provides that a Phase I ESA will only be considered viable if it was completed less than 180 days. Therefore, any Phase I ESA's completed at this stage would need to be redone. Although Phase I ESA's were not conducted, a comprehensive review of all waste issues was completed for the project area. 7. Will revise document to reflect comment. 8. For the purposes of this response it is assumed that the comment is referring to the 8-step process outlined in Guidelines for Implementing Executive 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, Oct 8, 2015. As the 8-step process matches the NEPA process, most of the steps have been addressed through the NEPA process, including alternative analysis and potential impacts. Regarding the specific floodplain development questions and related issues, the project will actually allow for a remapping of the floodplain (as confirmed by FEMA) and does not propose any new development within the 1% ACE flood event floodplain. Additionally, the TSP removes many structures out of the 1% ACE flood event floodplain. To better inform the public the document will be revised to clarify compliance with E.O. 11988.
Recommendation 1: **X** **Adopt** **X** **Not Adopt**
Explanation: As stated above the document will be revised. For those recommendations not adopted, the document will be revised to further clarify the law, the work completed and future work expected.

Panel Final BackCheck Response (FPC #17)
X **Concur** **Non-Concur**
Explanation: To clarify,(6.) reference to the fact that a Phase I ESA was not completed is based on Section 6.0 Environmental Laws and Compliance of the Draft FS/EIS which states "A Phase I Environmental Site Assessment is required for all USACE Civil Works Projects to facilitate early identification and appropriate consideration of potential HTRW problems". The Panel appreciates clarification that Phase I ESAs will be completed if the project is approved and funded, and suggests that such wording be included in the FS/EIS.

NOTICE TO READER – this document contains deliberative discussions between Rankin Hinds Pearl River Flood and Drainage Control District (FCD) and Battelle. Substantive edits to the referenced documents have been made after this report was produced. The reader should not rely on this report as a final position of the FCD.

Final Panel Comment 18

The data and conclusions presented in Appendix E (Environmental Justice) are not provided in the text of the Draft FS/EIS.

Basis for Comment

The Environmental Justice section in the Draft FS/EIS is missing key data points. For example:

1. Table 2-7 does not include any information concerning income and does not specify which areas have a high-percentage minority population.
2. In Section 2.4.8.2, the text does not explain where "Northeast Jackson" fits into the table. The text mentions "three areas with recognized environmental justice concerns," but the discussion does not explain which three areas in Table 2-7 have been so identified, or how they were identified using the data presented in the table.
3. In Section 2.4.8.2, the only flooding risk discussed is limited to economic damages.
4. Section 4.4.8 includes a discussion about meaningful involvement of all people in the decision-making process, as required by Executive Order (EO) 12898, but does not include a discussion that the involvement has occurred or will occur.

Significance – Low

A comprehensive summary of environmental justice impacts in the Draft FS/EIS that reflects the results of the analysis in Appendix E (Environmental Justice) would improve the understanding of the report.

Recommendations for Resolution

1. Provide a more complete summary of the environmental justice analysis in the Draft FS/EIS.
2. Revise Table 2-7 to include income data and define the three areas with recognized environmental justice concerns.
3. Correct the name of Alternative C (River Channelization) in Appendix E (Environmental Justice) to be consistent with the name of Alternative C (Channel Improvements Plan) in the Draft FS/EIS.
4. Include a discussion of the meaningful public involvement which has occurred and will occur.

PDT Final Evaluator Response (FPC #18)				
X	**Concur**		**Non-Concur**	
Explanation: Revisions will be made to the FS/EIS to address FPC#18 as described below.				
Recommendation 1:	**X**	**Adopt**		**Not Adopt**
Explanation: Section 2.4.8 is being revised to explain the information sources utilized for the determination of areas with populations with environmental justice concerns of low income (poverty status) and minority.				
Recommendation 2:	**X**	**Adopt**		**Not Adopt**

PDT Final Evaluator Response (FPC #18)				
Explanation: Section 2.4.8.1 is being revised to explain the location in Table 2-7 which includes the three areas with recognized environmental justice concerns. In addition, Table 2-8 is being inserted to present annual income of the areas listed in Table 2.7.				
Recommendation 3:		**Adopt**	**X**	**Not Adopt**
Explanation: This suggested revision was previously made.				
Recommendation 4:	**X**	**Adopt**		**Not Adopt**
Explanation: Section 4.4.8 is being revised to include specifics with respect meaningful public involvement opportunities that have already occurred and that will occur in the future.				

Panel Final BackCheck Response (FPC #18)			
X	**Concur**		**Non-Concur**

Final Panel Comment 19

It is unclear why the planning objectives are limited to reducing flood impacts only for transportation routes with more than 10,000 Average Daily Traffic (ADT) counts.

Basis for Comment

No explanation is provided for how many traffic routes with fewer than 10,000 ADT counts would be impacted and what the economic impacts would be. If there are a very large number of traffic routes with fewer than 10,000 ADT counts that are impacted by flooding, the economic impact could be comparable to the impacts to routes with more than 10,000 ADT counts.

Significance –Low

Without a complete assessment of flood impacts, the analysis of transportation-related economic impacts may be incomplete.

Recommendations for Resolution

1. Explain why 10,000 ADT counts were used as a threshold for the economic analysis.

PDT Final Evaluator Response (FPC #19)

X	**Concur**		**Non-Concur**

Explanation: In previous floods, the major routes were heavily impacted on the interstate highways as well as the state highway roads. Loss of these routes cut off access to critical facilities such as hospitals and access for emergency personnel. While all roads were used for indication and damage calculations, the larger traffic roads were utilized when considering rerouting and other impacts for the economic analysis. This discussion can be expanded and clarified in the final draft of Appendix B: Economics.

Recommendation 1:	X	**Adopt**		**Not Adopt**

Explanation: An ADT count of 10,000 was used as a threshold to narrow down the traffic routes considered to those roadways that were more heavily trafficked, where impacts disrupting those routes would affect the greatest number of people. They also are the routes frequently utilized by emergency personnel to access emergency facilities, such as the numerous hospitals in the Study Area.

Panel Final BackCheck Response (FPC #19)

X	**Concur**		**Non-Concur**

Final Panel Comment 20

The basis for the designs flows is not fully described in Appendix C of the Draft FS/EIS.

Basis for Comment

Table 2-1 of the H&H analysis in Appendix C summarizes estimated peak discharges at the City of Jackson gage, and the paragraph below Table 2.1 sets forth the decision made about the model source used for this study. This is a key decision for project design and evaluation of impacts, because the flows estimated by different model sources can vary by several thousand cubic feet per second. Therefore, the reasons for arriving at this decision require supporting documentation. Expanding on the reasons discussed during the September 2013 Charrette Meeting with various agency officials and the January 2014 meeting with the United States Geological Survey (USGS) Mississippi Branch would provide a more rigorous basis for the decision-making process.

Significance –Low

Because estimated flows can vary substantially, depending on the model source, project design and evaluation of impacts can be affected.

Recommendations for Resolution

1. Attach the meeting notes of the September 2013 Charrette Meeting with various agency officials and the January 2014 meeting with the USGS Mississippi Branch to Appendix C.

PDT Final Evaluator Response (FPC #20)			
X	**Concur**		**Non-Concur**
Explanation: Appendix C will be updated to more thoroughly discuss the design flows. These clarifications will reference the discussions from the 2013 Charrette and 2014 USGS meetings.			
Recommendation 1:	**X**	**Adopt**	**Not Adopt**

Panel Final BackCheck Response (FPC #20)			
X	**Concur**		**Non-Concur**

Final Panel Comment 21

There is no discussion of energy requirements and conservation potential of various alternatives and mitigation measures, as specified in Council on Environmental Quality (CEQ) regulations.

Basis for Comment

CEQ regulations (40 CFR § 1500-1508) state that the Environmental Consequences section of NEPA documents should discuss the energy requirements and conservation potential of various alternatives and mitigation measures (40 CFR § 1502.16e; CEQ, 2005). Currently, the Draft FS/EIS does not discuss these items.

Significance –Low

Consideration of energy requirements and conservation potential is required for NEPA consistency.

Recommendations for Resolution

1. Analyze the energy requirements and conservation potential of the various alternatives and mitigation measures.

PDT Final Evaluator Response (FPC #21)

X	**Concur**		**Non-Concur**

Explanation: The cited regulations do, at 40 CFR § 1502.16(e), state that the environmental consequences section should include a discussion of energy requirements and conservation potential of the various alternatives. However, for the tentatively-selected plan, the issue of energy requirements is not relevant. While the TSP may have some energy requirements during the construction phase, once complete, the plan would have no significant such requirements. As for conservation, while the EIS contains several references to conservation potential in the context of wetlands, habitat, and other resources, we agree the issue is not discussed in the environmental consequences section.

With respect to energy requirements of other alternatives, once again we acknowledge the report does not formally address the question in the environmental consequences section as set forth in the CEQ regulation. However, at Section 4.2.1 (within the environmental consequences section) and elsewhere, the EIS notes that Alternative B would require the long-term use of energy-demanding pumps to address ponding issues caused by extended levees. Section 4.2.1 also addresses the fact that Alternative A, the non-structural alternative, would involve the buyout and/or relocation of approximately 3,100 structures – a process that would necessarily require significant energy usage.

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: Despite our above-stated belief that the EIS adequately addresses those energy and conservation issues that are relevant to the presented alternatives, we must acknowledge that the regulation requires that the environmental consequences section include a discussion of "energy requirements and conservation potential of various alternatives and mitigation measures." Accordingly, Section 4 of the EIS will be edited to include an additional subsection reflecting that requirement and explaining the limited applicability of those issues.

Panel Final BackCheck Response (FPC #21)			
X	Concur		Non-Concur

Literature Cited

CEQ (2005). Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. Council on Environmental Quality, Executive Office of the President, 40 CFR § 1500-1508.

Final Panel Comment 22

The direct adverse impacts to aquatic resources are not clearly defined in the Draft FS/EIS.

Basis for Comment

The Draft FS/EIS (p. 186) states that for Alternative C "Some aquatic and fisheries habitats within the proposed fill area would be impacted. However, the project design associated with fill areas will avoid and limit impacts, and a significant "net loss" in aquatic habitat is not anticipated. Given these design considerations, the limited direct impacts would be evident but are not specifically measurable at this time." The aquatic and fisheries habitats within the fill area would be impacted by fill, but unless the approximate acreage of fill is calculated and presented in the report, total impacts under the TSP cannot be assessed and classified according to the impacts terminology defined on p. 128 of the Draft FS/EIS. Additionally, the report states (p. 187) that "Accordingly the construction of Alternative C would not lead to any significant direct impact to these resources within the project area. Given this, the direct, adverse impacts associated with the implementation of Alternative C would be moderate in intensity and long-term in duration." These two statements seem contradictory; therefore, it is unclear whether aquatic resources will be adversely impacted under the TSP.

Significance –Low

Consistent definition of direct adverse impacts to aquatic resources would improve the understanding of the report.

Recommendations for Resolution

1. Define the impacts on aquatic and fisheries habitats within the proposed fill area.

PDT Final Evaluator Response (FPC #22)

X	**Concur**		**Non-Concur**

Explanation: As noted previously, the Sections 4.5.5 and 5.3 of the FSEIS have been revised following further coordination with the USFWS relative to the impacts and mitigation requirements for the aquatic and fisheries resources. It should be noted that the reference to the filling activities associated with the TSP will primarily take place outside of the TSP excavation areas and therefore, outside of the existing Pearl River channel. Some limited amounts of habitats would be impacted by the filling activities outside of the channel but most of these areas will be avoided relative to the placement of fill. It should also be once again noted that the preponderance of the Pearl River channel within the TSP Project Area was previously dredged and channelized. The revised documentation within Sections 4.5.5 and 5.3 of the FSEIS will be reviewed and revised accordingly to ensure that the potential adverse impacts are fully explained and documented.

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: Revisions have already been made to the pertinent sections of the FSEIS but further review and revisions will be completed to insure that the recommendation is followed and that the issues are further documented.

Panel Final BackCheck Response (FPC #22)			
X	Concur		Non-Concur

Final Panel Comment 23

It is unclear whether the cost estimates for Alternative C consider the future use of the filled land or account for unspecified (but anticipated) costs associated with fill placement requirements.

Basis for Comment

The Draft FS/EIS states that portions of the newly filled land will be used for construction of new recreation facilities, including roads, parking lots, campgrounds, and other public access improvements. The report does not specify whether the fill will be placed in a manner suitable to support future development or will be placed as an uncompacted mass fill similar to a dredge disposal site.

The cost estimate for Alternative C includes a line item for "Unclassified Excavation." Unclassified excavation typically includes excavating haul roads; clearing and grubbing; or draining the borrow source, removing unsuitable material, excavating the borrow material, and hauling and delivering the material to the fill site. However, it is unclear if subgrade preparation, dewatering of the fill site, moisture conditioning, or compaction of the fill are included in the unit cost for this item. Excavation of clayey soil from the floodplain will result in soils that are wet of optimum and may require extensive effort to dry and compact.

Significance –Low

Fill placement requirements and moisture condition of the excavated soil may impact the cost of fill placement.

Recommendations for Resolution

1. Clarify the anticipated fill placement requirements for the proposed future use.
2. Provide unit costs consistent with anticipated efforts to meet project fill requirements.

PDT Final Evaluator Response (FPC #23)

X	**Concur**		**Non-Concur**

Recommendation 1:	**X**	**Adopt**		**Not Adopt**

Explanation: More detailed cross sections and profiles will be included in the final draft. These sections will include existing soil information at all locations where data is available. Where levees are relocated or typical levee sections needed, the soil fill utilized will be in compliance with USACE standards. In areas where fill is placed, consideration will be taken of the final project design, e.g. in areas designated for recreation or for parking, soil will be incorporated to meet the appropriate building standards.

Recommendation 2:	**X**	**Adopt**		**Not Adopt**

Explanation: The cost engineering analysis will be revised for the final draft to incorporate any updated cost estimates, including those associated with the different methods of soil placement and compaction.

Panel Final BackCheck Response (FPC #23)

X	**Concur**		**Non-Concur**