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FINAL REPORT

OF THE SCIENTIFIC PEER REVIEW PANEL ON THE DATA AND METHODOLOGIES IN

MFL Establishment for the Aucilla River, the Wacissa River, and Associated Springs

Prepared for

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
Live Oak, Florida 32060

Prepared under Contract 03/04-137
By

Water & Air Research, Inc. Peer Review Panel
Ivan Chou, M.E., P.E.
Louis Motz, Ph.D., P.E., D.WRE.
Jeffrey Hill, Ph.D.
E. Lynn Mosura-Bliss, M.A.

December 2015

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INTRODUCTION

The Minimum Flows and Levels (MFL) Program within the State of Florida is based on the requirements of Chapter 373.042 Florida Statutes. This statute requires that either a Water Management District (WMD) or the Department of Environmental Protection (DEP) establish minimum flows for surface watercourses and minimum levels for groundwaters and surface waters. The statutory description of a minimum flow is "the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area" (Ch. 373.042 (1)(a), F.S.).

The statute provides additional guidance to the WMDs and DEP on how to establish MFLs, including how they may be calculated, using the "best information available," to reflect "seasonal variations," when appropriate. Protection of non-consumptive uses also are to be considered as part of the process, but the decision on whether to provide for protection of non-consumptive uses is to be made by the Governing Board of the WMD or the DEP (Ch. 373.042 (1) (b), F.S.).

WMDs are to develop priority lists of water courses and water bodies for which to establish MFLs and the proposed schedules to do so. These lists are to be updated yearly and sent to DEP for review and approval. In developing these lists, the WMDs are to examine the importance of the watercourse or water body to the State or region and the potential for significant harm to the water resources or ecology. Beginning in 2003, each priority list and schedule must include all first magnitude springs and second magnitude springs meeting certain characteristics (Ch. 373.042 (2), F.S.). For such springs within the Suwannee River Water Management District (SRWMD), the District may choose not to establish MFLs on said springs provided the District submits a report to DEP containing evidence demonstrating that such springs are not currently experiencing adverse impacts from withdrawals and are not anticipated to experience adverse impacts during the next 20 years.

The District enlisted a team of technical consultants to develop proposed Aucilla and Wacissa River MFLs, pursuant to the direction and guidance provided within the Florida Statutes (summarized in the preceding paragraphs). After the report was prepared, the District chose to enlist a separate team of technical experts to undertake a voluntary peer review of the data and methodologies used in the determination of the MFLs for the Aucilla and Wacissa Rivers. The Peer Review Panel consists of Dr. Lou Motz, Dr. Jeff Hill, Ivan Chou, M.E., and Lynn Mosura-Bliss, M.S., (who led a team of Water & Air Research, Inc. reviewers). Resumes documenting qualifications of these technical experts are provided in Appendix A at the end of this Peer Review Report.

The District provided the Peer Review Panel with a set of general review constraints, a specific set of charges, and a specific set of limitations defining what the Peer Review Panel was to consider in its review, summarized as follows.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT

Task 1. Determine whether the method used for establishing the minimum flows is scientifically reasonable.

This section lists review panel comments that reflect uncertainties or concerns about issue that may materially affect the MFL.

a. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The panel shall assume the following:

1. The data and information used were properly collected;

2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and District hydrologic monitoring networks.

b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine whether:

1. The assumptions are clearly stated, reasonable and consistent with the best information available; and

2. Assumptions were eliminated to the extent possible, based on available information.

c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;

2. The procedures and analyses incorporate appropriate factors;

3. The procedures and analyses were correctly applied;

4. Limitations and imprecision in the information were reasonably handled;

5. The procedures and analyses are repeatable; and

6. Conclusions based on the procedures and analyses are supported by the data.

Task 2. If a proposed method is not scientifically reasonable, the CONTRACTOR shall:

a. Deficiencies: List and describe scientific deficiencies.

b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies.

c. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and the review panel shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the District's development of MFLs. CONTRACTOR shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the Scope of Work. These givens include:

1. the selection of water bodies for which minimum flow and/or levels are to initially be set;
2. the determination of the baseline from which "significant harm" is to be determined;
3. the definition of what constitutes "significant harm" to the water resources or ecology of the area; and
4. the determination of the specific water-resource values considered in development of the MFL.

Instructions:

1. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
2. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(4)(b), in the discipline noted above.
3. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

The above instructions and limitations were provided to the peer review team as part of a peer review form that the reviewers were instructed to use. The completed forms are included in Appendix B.

TIMETABLE

The Peer Review Panel received a draft document titled: "Minimum Flows and Levels for the Aucilla River, Wacissa River and Priority Springs" by HSW Engineering, Inc., on October 19, 2015. That report included six sections and 138 pages describing the approach used to recommend the proposed MFLs, and a comprehensive reference list.

The Peer Review Panel was given a deadline to have its Peer Review Report to the District completed by November 25, 2015. This was accomplished, with a Peer Review Report that provided SRWMD questions about the methods and procedures, suggestions for text and figure clarification, and an assessment of the extent to which the report being reviewed had succeeded in developing scientifically valid methods and procedures.

RESULTS OF PEER REVIEW

The technical report presents that data and analyses that provide technical support for establishing MFLs for the Aucilla River, Wacissa River, and priority springs. The stated goals of the MFLs are:

- To implement the intent and policy of the governing board (Board) of the Suwannee River Water Management District (District); and
- To satisfy the requirements of the state water law and policy.

The MFL report is divided into seven chapters:

1. Introduction and Relevant Water Resource Values
2. Hydrology
3. Biology
4. Approach to Setting MFLs MFL
5. Evaluation of Water Resources Values
6. Summary and Development of MFLs
7. References

Chapter 1. Introduction provides a brief introduction to the legal basis for establishing MFLs, an overview of the water bodies for which MFLs are being developed, and a discussion of the relevance of specific water resource values that may be considered when developing MFLs. Chapter 62-40.473 F.A.C lists ten water resource values that may be considered when developing MFLs. These include:

1. Recreation in and on the water
2. Fish and wildlife habitats and the passage of fish
3. Estuarine resources
4. Transfer of detrital material
5. Maintenance of freshwater storage and supply
6. Aesthetic and scenic attributes
7. Filtration and absorption of nutrients and other pollutants
8. Sediment loads
9. Water quality
10. Navigation

The authors use a qualitative preliminary screening method for ranking WRVs and selecting those WRVs that are relevant, important and for which data for evaluating are available. Based on this preliminary screening, selected WRVs are retained for further investigation to identify the limiting conditions for MFL development. These include:

• Recreation on and in the water
• Fish and wildlife habitats and the passage of fish
• Estuarine resources

As specified in the peer review instructions, the selection of WRVs for protection is a given and the selection process and rationale were not explicitly evaluated.

Chapter 2. Hydrology describes the rivers' hydrology and regional characteristics and gives the magnitude of data and the station locations for collection of meteorological

and hydrologic records. The river system is described and regional physiography is discussed. Stream flow gauging station locations and periods of record are discussed. Springs in the basin are discussed. Most of the springs are located on the Wacissa River, with Nutall Rise being the only major spring in the Aucilla River. Sources and details of rainfall and groundwater data collected in the basin are discussed, their history is given, and how the data were applied for the MFL development is presented. A strategy for dealing with missing hydrologic data is presented. Flow characteristics are discussed, and seasonal trends are related to rainfall history. The history of groundwater use in the region and its effects on water levels is reviewed.

Spring flow sources and locations are described. A spring flow rating scheme is presented. A conceptual model of the river system was developed through hydrologic analysis and is described in this chapter. Trends in long term hydrologic and meterologic data are characterized. The association between rainfall and flow is explored and modeled. The earlier HEC-RAS models developed by Taylor Engineering for this river system are described, as was the recent development of an updated HEC RAS model. Intended for use with SEFA models. Model refinements applied were described, and the relevance of these data and models to the MFL assessment was reviewed.

Chapter 3. Biology provides a history of the measures enacted by the state of Florida to designate this river system as waters of special significance deserving extra protection. The consequences of flow reduction on the regionally significant ecological communities in and adjacent to these rivers are listed. The Conceptual Ecological System model used to assess the fish and wildlife habitat and fish passage water resource value is described in this chapter. Regional ecosystems and species of interest deemed most sensitive to reductions in flows and levels are characterized. Instream and riparian habitats were described and their capacity for inhabitation by aquatic biota was characterized, and conditions of these habitats were related to the quality of opportunities for human recreation. Estuarine habitat resources were well characterized in this Chapter, and salinity regimes were discussed. A process to determine and validate the Aucilla watershed critical salinity regime was presented. Biota of special interest occurring in the basin that were deemed most sensitive to flow reduction were listed. Floodplain vegetation and soils were related to the extent of inundation duration and frequency necessary to maintain them, as was the way in which river levels relate to those regimes.

Chapter 4. Approach to Setting MFLs gives an overview of the process used to set the MFLs for these rivers. A weight of evidence approach was applied. Priority water resource values (WRVs) were selected. Hydrological and biological data analyses and various models were applied, then a systematic analysis of potential flow reductions that would still protect the river values that the WRVs represent was conducted. Response functions that relate flow metrics to response variables such as depth was presented. The criterion of an allowable 15 percent loss of useable habitat associated with a reduction in flow was applied during the MFL development process.

Chapter 5. Evaluation of Water Resources Values provides an in-depth overview of the three priority WRVs thought to be most relevant to this river system, including recreation in and on the water, fish passage and fish and wildlife habitat, and estuarine resources. Each of these priority WRVs was characterized and various models were applied for both the Aucilla and Wacissa rivers. Effects of flow reduction supported by tables and graphs were discussed in the context of the allowable 15 percent loss of useable habitat associated with a reduction in flow convention. Various specific important river habitats were modeled to determine how they might be affected by flow reduction. For the estuarine resources WRV, salinity was featured, with the expected salinity regime exceedences modeled for 5, 10, 15, and 30 percent flow reduction. The extent of upstream penetration of salinity was modeled under flow reduction schemes (compared to the baseline condition) and these results were presented as maps.

Chapter 6. Summary and Development of MFLs gives a general overview of the MFL development process for these two rivers and their priority springs. Due to the limits of available information for these rivers, the allowable 15 percent loss of useable habitat associated with a reduction in flow convention was applied to determine threshold flow reductions beyond which significant harm may occur to the WRVs . Specific flow volumes are discussed that are deemed the threshold flows for each priority WRV for each river , along with the rationale for those determinations. Proposed MFLs for each river are presented. For the Aucilla River three MFLs are presented based on flow levels, while two MFLs are given for the Wacissa River. These multiple MFLs are presented in recognition that rivers are more vulnerable to flow reduction due to large withdrawals during dry seasons or times of drought. It is stated that these MFLS would collectively be protective of the habitat and resources of the Aucilla River estuary.

REVIEW SUMMARY

Specific review comments regarding report issues are given in the Peer Review Forms from each reviewer (see Appendix B). As stipulated in the peer review scope, reviewers focused on data and data analysis procedures, and on whether or not comments would materially impact the MFLs. If the peer review panel was uncertain about the impact of a stated comment or concern, a “yes” was entered in the column reflecting that the comment may identify an issue that could materially affect the MFLs. A “no” generally means that the peer review panel is requesting/suggesting clarification on a subject that would not appear to affect the MFLs, correcting mundane report issues, or presenting an observation or comment that reflects the reviewers understanding of the subject.

The MFL method for the Aucilla and Wacissa Rivers and associated springs is summarized below.

Baseline condition for the Aucilla River was defined as the period of record for the USGS gaging station 02326500 at Lamont, where it was determined that there was no evidence of anthropogenic impacts on the stream flow. The USGS gaging station 0236526 at Wacissa was used to estimate the combined flow of the Wacissa River

springs upstream from that point, although the period of record for it was not sufficient to rule our anthropogenic impacts to the flows. Baseline flow duration curves were developed for each of these gages.

Three environmental water resource values (WRVs) were relevant to these rivers and springs and also had sufficient data available to relate the WRVs to the system hydrology. These included Recreation In and On the Water, Fish and Wildlife Habitats and the Passage of Fish, and Estuarine Resources. Various models were applied to evaluate salinity, boating access, and minimum levels for fish passage, and the results of these analyses were related back to the flow duration curves. Three MFLs were determined for the Aucilla River regime. A limit of 6.5 percent flow reduction during low to moderate flows would remain protective of the oligohaline salinity regime of the Aucilla River estuary. A limit of 13 percent flow reduction would remain protective of Aucilla River bank habitat for increasingly higher flows of up to 558 cfs. A flow reduction limit of up to 17 percent would remain protective of Aucilla River floodplain habitat for flows over 558 cfs. Two MFLs were determined for the Wacissa River regime. A limit of 5.1 percent reduction in flow during moderate to low flows less than 376 cfs would be protective of recreation activities associated with motor boating on the Wacissa River. A limit of 7.3 percent flow reduction of Wacissa River flows greater than 376 would remain protective of instream habitat. These MFLs were deemed protective of all of the WRVs of concern.

Task 1. Determine whether the method used for establishing minimum flows is scientifically reasonable.

This section lists review panel comments that reflect uncertainties or concerns about issue that may materially affect the MFL.

a. Supporting Data and Information

Overall, we found the report thorough in its data review and presentation of background information.

b. Technical Assumptions

No Comments.

c. Procedures and Analyses

LM Comment 37 - p. 45, lines 9-12: “The flow distributions used in the Taylor model represent the river as a losing stream with flow decreasing in the downstream direction beginning at river mile 36.98.” Where is river mile 36.98? Is this result consistent with the results in Table 6 (p.37)? Indicate where river mile 36.98 is located and compare the Taylor model results with the results in Table 6.

SPACE RESERVED FOR AUTHORS’ COMMENTS

LM Comment 38 - p. 45, line 23: “The model input/output tables [for the Wacissa HEC-RAS model] are included in Appendix A.” Appendix A contains the EFDC hydrodynamic model results for the Aucilla River; where is the description of the Wacissa River HEC-RAS model and the input and output tables? A description of the Wacissa HEC-RAS model with input and output tables needs to be included in the report.

SPACE RESERVED FOR AUTHORS’ COMMENTS

LM Comment 40 - Did HSW use the refined Aucilla HEC-RAS model to calculate new water-surface profiles for the Aucilla River that replaced the water-surface profiles that had been calculated previously using the Taylor Engineering model (shown in Figure 36, p. 45)? If new water-surface profiles were calculated using the refined Aucilla HEC-RAS model, the results should be included in the report and compared to the results from the Taylor Engineering HEC-RAS model (Figure 36).

Task 2 Scientific Deficiencies

a. Deficiencies

No major deficiencies were noted.

b. Remedy

None were required.

CONCLUSIONS

Overall, we found the report to be thorough in its data review and presentation of background information.

We recommend that the water resource values analyses should be revised to better justify, as appropriate, the selection of a limited suite of them. The process whereby some of the WRVs were deemed to be protective of other WRVs should be clarified and noted in the report where that is relevant. Endangered species, fish, and macroinvertebrate sections should be revised to include appropriate species that were not mentioned and assess any threats to them.

The hydrodynamic modeling procedures and methodology for Aucilla River was appropriate and reasonable. A 3-dimensional hydrodynamic model, EFDC, was used for the assessment. Model calibration was satisfactory and used the best available data. However, the calibration statistics for salinity used with the EFDC model should be more clearly presented.

The selection of the HEC-RAS model to simulate water-surface profiles for the Aucilla and Wacissa Rivers was appropriate, and the results appear to be reasonable and consistent. However, the results of the HEC-RAS model for the Aucilla River need to be compared to previous calculations made using the Taylor Engineering model, and a description of the HEC-RAS model for the Wacissa River with input and output tables needs to be included in the report.

APPENDIX A

RESUMES OF THE PEER REVIEW PANEL

IVAN B. CHOU, P.E.
Water Resource Engineer

IBC Consulting
4126 NW 66 Terrace
Gainesville, Florida 32606
(352) 256-1883
ivanbchou@gmail.com

Areas of Specialization

Hydraulics, Hydrology, Hydrodynamic Modeling, Water Quality Modeling, Stormwater Management, Harbor and Marina Assessment, Coastal and Oceanographic Engineering

Relevant Experience

Project Manager; Lake Monroe Minimum Flows and Levels (MFLs) Assessment, St. Johns River Water Management District (SJRWMD)—Conducted human use and water resource values (WRVs) assessment for Lake Monroe minimum levels considered by SJRWMD. Conducted hydrologic and frequency/duration analyses to determine if the MFLs for Lake Monroe would protect each of the 10 WRVs under consideration, according to Section 60-40.473, F.A.C. Performed statistical analyses of the Lower St. Johns River (LSJR) EFDC model simulation results for a 5-year period to quantify the salinity regime changes caused by various freshwater withdrawal scenarios and to evaluate the water use effects on the estuarine ecology.

Project Manager; Hydrodynamic and Water Quality Modeling of the Gemini Springs Run for MFLs Assessment, Intera/SJRWMD—Conducting modeling of Gemini Springs Run for SJRWMD using CE-QUAL-W2 model, to evaluate the effect of water withdrawals from Gemini Springs on water quality (e.g., water temperature, specific conductance, and color, etc.). The model will be calibrated by monthly water quality samples collected at 11 stations. Ten-year continuous simulations will be conducted for both the baseline and the MFLs conditions.

Project Manager; Independent Scientific Peer Review for the MFLs Program, SJRWMD—Provided independent scientific peer review for various documents related to MFLs development, hydrological analyses, and water resource values evaluation for many waterbodies, including Silver River and Silver Springs, Cowpen Lake, Lake Brooklyn, Lake Melrose, Lake Norris, Banana Lake, Lake Como, Little Lake Como, and Trone chain-of-lakes.

Project Manager; Development of Environmental Resource Constraints for the Upper Santa Fe River, New Fields Company/SJRWMD—Conducted hydrologic analysis and environmental resource assessment to evaluate the relation between reductions in stream flow/level and environmental harm to the Upper Santa Fe River. The evaluation was based on soil and vegetation coverage, frequency-duration analysis of the HEC-RAS model simulation results, and the identification of the most restrictive dominating water resources values, described in Rule 62-40.473, F.A.C., for the river reach. The study results may be used by SJRWMD to make permitting action decisions for future consumptive use permits.

Project Manager; Lower Suwannee River EFDC Model, Water Resource Associates/Suwannee River Water Management District (SRWMD)—Conducted hydrodynamic modeling of the Lower Suwannee River and Suwannee Sound using the 3-dimensional EFDC model. Conducted continuous modeling for a 4-year period to project salinity distribution in the estuary under various freshwater withdrawal scenarios. The model results were used to evaluate water use impacts on submerged aquatic vegetation, shellfish communities, fish habitats, and wetland vegetation; and to develop MFLs for the Suwannee River.

Project Manager; Cumulative Impact Analysis for Alternative Water Supply, SJRWMD—Evaluated the cumulative impact of surface water withdrawal from the St. Johns River as an alternative water supply on the salinity of the St. Johns River estuary. The cumulative impacts analysis also considered the effects of future deepening and expansion of Jacksonville Port, sea level rise, and removal/reuse of existing treated wastewater discharges. A 3-dimensional hydrodynamic model, EFDC, was used to quantify the salinity impacts of various scenarios.

Project Manager; Environmental Assessment for MFLs Development in St. Johns River near Deland, SJRWMD—Conducted environmental assessment of the MFL regime recommended by SJRWMD for the St. Johns River between State Road 40 and Lake Monroe. Per requirement of Section 60-40.473, F.A.C., ECT determined whether the MFL regime would provide protection to water resources values, including recreation in and on the water, fish and wildlife habitats and the passage of fish, estuarine resources, transfer of detrital material, maintenance of freshwater storage and supply, aesthetic and scenic attributes, filtration and absorption of nutrients and other pollutants, sediment loads, water quality, and navigation.

Project Manager; LSJR Salinity Regime Assessment, SJRWMD—Conducted salinity regime analysis to determine the effects of stream flow reduction in the St. Johns River near Deland on the salinity distribution and ecological resources in the LSJR estuary. Analyzed the EFDC model simulation result in the LSJR for a period of 3 years to quantify the temporal and spatial changes in salinity at various locations in the river. The effects of freshwater withdrawal on *Vallisnaria americana* due to salinity changes was evaluated.

Project Manager; Scientific Peer Review of Ecologic Evaluation of Blue Spring Minimum Flow Regime, SJRWMD—Conducted independent scientific peer review of *Human Use and Ecological Evaluation of the Recommended Minimum Flow Regime for Blue Spring and Blue Spring Run, Volusia County, FL*, in accordance with Rule 373.042(4)(a), Florida Statutes. Rendered opinion and recommendation based on the result of the review.

Task Manager; LSJR TMDL Modeling Review, First Coast Manufacturer's Association (FCMA)—Served as a technical advisor on behalf of FCMA to review the modeling effort by U.S. Army Corps of Engineers (USACE) Waterways Experiment Station and SJRWMD for the LSJR TMDL development. Compiled and evaluated the existing hydraulic, hydrologic, and water quality data to identify any potential short fall of the database. Reviewed the EFDC model grid configuration, tidal boundary conditions, upstream flow conditions, meteorologic inputs, and evaluated the results of hydrodynamic calibration. Provided technical recommendations to the modeling approaches.

Task Manager; Savannah River Water Quality Modeling For TMDL Development, Georgia Ports Authority—Conducted water quality modeling for Savannah River using WQMAP, a 3-dimensional finite difference model with boundary-fitted curvilinear grid. The model was used to develop TMDLs for nutrients, dissolved oxygen, and chloride. Extensive field monitoring was conducted to calibrate the hydrodynamic and water quality model, including tide, currents, meteorological data, water quality data, and flow data. The model was also used to quantify the water quality impacts of the Savannah Harbor deepening.

Project Engineer; Charleston Harbor Water Quality Modeling For TMDL Development, South Carolina Department of Health and Environmental Control (SCDHEC)—Conducted hydrodynamic and water quality modeling for Charleston Harbor, Cooper River, Wando River, and Ashley River. A 3-dimensional finite difference model WQMAP with boundary-fitted curvilinear grid was used for the project. The model projections will be used to develop TMDL for the watershed. Conducted water quality simulations for model verification and assisted with workshop preparation and technology transfer.

Project Manager; Independent Peer Review of Magnolia Bay Marina, SRWMD—Conducted independent peer review of an environmental resource permit (ERP) application for a proposed 374-slip marina near Dekle Beach, Florida. Reviewed permit documents and evaluated water quality and hydrodynamic impacts of the proposed marina and the construction activities. Rendered opinion and recommendation based on the result of the review.

Project Manager; Independent Peer Review of Jason Jennings Ditch Relocation Project, SRWMD—Conducted independent engineering peer review of an ERP application for the relocation of a waterway. Reviewed permit documents and hydraulic modeling inputs/outputs. Evaluated potential flooding and hydraulic impacts of the channel relocation on the adjoining properties. Rendered opinion based on the result of the review.

Project Manager; Sampson River Hydraulic Structure Assessment, SRWMD—Conducted a hydrologic and hydraulic assessment to evaluate the potential effects of a proposed hydraulic structure modification in Sampson River near the outlet of Lake Sampson in Bradford County, Florida. The assessment included the consideration of flooding, ecology, and water quality impacts.

Project Manager; Steinhatchee River Basin Management Plan, SRWMD—Conducted hydrological studies for the Steinhatchee River Basin in Florida. GIS was used to quantify the land use and hydrographical changes taken place between 1950 and 1980. Hydrological model HSPF was used to determine the impacts of human activities such as forestry, timbering, ditching, road construction, etc. A basin management plan was recommended to alleviate the hydrologic impacts resulting from the watershed changes based on the model simulations.

Project Manager; 3-Dimensional Modeling of Pollutant Transport, JEA—Conducted hydrodynamic modeling of the LSJR, from Mayport to Buffalo Bluff, to determine potential water quality impacts of the Buckman Outfall, approximately 30 MGD, operated by JEA. A 3-dimensional model EFDC was used to simulate tidal hydrodynamics and pollutant plume dispersion. Two large-scale dye studies with 3 to 4 days' continuous injection were conducted to characterize the chemical mixing zones and to verify the model. The dye study data were used to verify the EFDC model. Two-year real-time flow and tide data were used as the boundary input data for the long-term simulation. Tecplot was used to visualize the plume animation. Statistical analyses were conducted for the model results.

Project Manager; Cannon Creek Basin Assessment, SRWMD—Conducted a hydrologic and water quality assessment for Cannon Creek Basin in Columbia County, Florida. Conducted extensive field investigation and data analysis to identify flooding and water quality problems in the watershed. Provided conceptual solutions for the identified problems. The recommended solutions included hydraulic structure improvement, stormwater detention and treatment, best management practices, maintenance, management of existing septic tanks, and establishment of basin-specific criteria.

Project Manager; Salinity Regime Assessment, CH2M Hill—Analyzed EFDC model results to quantify the effects of a proposed 5.5-MGD surface water withdrawal from the St. Johns River by Seminole County near Lake Monroe on the salinity regime of the LSJR. Assessed salinity impacts of various withdrawal scenarios. Testified as an expert witness in an administrative hearing.

Project Manager; Alligator Creek Entrance Channel Realignment and Dredging Feasibility Study, Charlotte County—Conducted a coastal engineering study to assess the engineering and permitting feasibility to realign the entrance channel of the Alligator Creek in Charlotte County, Florida. The study included bathymetric survey, benthic survey, sediment transport evaluation, conceptual dredged channel design, estimation of dredge quantity and project cost, and future maintenance dredging needs.

Task Manager; Storm Surge Modeling for Max Brewer Bridge Scouring Study, Metz & Associates/Florida Department of Transportation (FDOT)—Conducted hydrodynamic modeling, using CE-QUAL-W2, to determine the flow velocity in the Indian River under various storm surge conditions. The model results were used to compute the sediment scour depth at the bridge piers under the worst-case conditions as required by the bridge hydraulic report.

Project Manager; Beach Erosion Assessment and Shoreline Stabilization, Technical Consulting Group—Conducted field investigation and littoral transport assessment at Tocones Beach near Dorado, Puerto Rico. The purpose of the study was to determine the causes of beach erosion at the shorefront of Dorado Beach Cottages, and to determine the potential impacts of a recently constructed seawall. Prepared a beach erosion assessment report that provided various options to stabilize the shoreline. A conceptual design of the erosion control measures was also recommended.

Project Manager; Marina Engineering Investigation, Zhejiang Nine Dragons Development Company, Ltd./Applied Technology and Management—Conducted marina site investigation and engineering evaluation for a resort marina facility in Hangzhou Bay near Zhapu, Zhejiang Province, approximately 100 km southwest of Shanghai, China. The investigation included tide, current, storm surge, waves, bathymetry, sediments, and geotechnical issues. Assessed engineering feasibility of the proposed sites and recommended an alternate marina plan.

Task Manager; ERP and National Pollutant Discharge Elimination System (NPDES) Permit Applications, Southern Monitoring and Environmental, LLC—Conducting surface water assessment to evaluate the potential impact of the construction of a proposed bulk terminal for Keystone Properties in

Jacksonville, Florida. The proposed project includes the demolition of an existing bulkhead, deepening the existing berth to 41 ft-MLW, construction of a new bulkhead, and construction of a coal pile facility. An estimated 350,000 cubic yards of dredge spoil will be generated during the deepening of the channel. Preparing the application for an ERP and the modification of an existing NPDES permit.

Project Manager; Level II Water Quality Based Effluent Limitations (WQBEL) Study, Volkert & Associates—Prepared and implemented a plan of study to conduct a Level II WQBEL study for an NPDES outfall at the Main Street wastewater treatment plant (WWTP) operated by Escambia County Utility Authority in Pensacola, Florida. An outfall from a nearby Naval Air Station facility is also considered in the study. The purpose of the study is to determine the assimilative capacity of the Pensacola Bay, to quantify the water quality impact of the existing facility, and to evaluate effluent limitations. Conducted mixing zone analysis to assess the water quality impact of the outfall.

Project Manager; Diffuser Design and Mixing Zone Analysis for a WWTP Discharge, Jehle-Halstead, Inc.—Conducted mixing zone analysis, using CORMIX model, to determine the mixing zone sizes of various water quality parameters for an outfall in Pensacola Bay from the Main Street WWTP operated by the Escambia County Utility Authority. Designed diffuser to minimize the mixing zones.

Project Manager; Sediment and Water Quality Assessment for a JEA Cross-River Pipeline, Ocean Engineering Associates—Conducted water quality impact assessment for a proposed 2-mile water line crossing the St. Johns River near Jacksonville, Florida. State-of-the-art directional drilling technology will be used to install the majority of the pipeline to minimize environmental impacts. Conventional dredging method will be used to construct cofferdams in the river, where pipeline connections can be installed. A 3-dimensional hydrodynamic model, EFDC, is used to quantify the turbidity mixing zone during the construction. A sediment transport study will be conducted to evaluate the zone of sediment deposition near the dredging site.

Project Manager; Maximum Probable Flood (MPF) Analysis for Fortuna Reservoir, El Paso Corporation—Conducted hydrologic and hydraulic modeling to evaluate the existing design capacity of the Fortuna Reservoir and spillway at a hydroelectric power plant in northwest Panama. Evaluated the probable maximum precipitation (PMP), conducted MPF analysis, wind wave analysis, wind setup, and wave runup calculations.

Project Manager; Thermal Modeling for Cooling Reservoir, Cogentrix—Conducted thermal modeling to determine the feasibility of a 255-acre cooling water reservoir for the proposed Mercer Ranch Energy Project in Benton County, Washington. A two-dimensional model, CE-QUAL-W2, was used to evaluate the cooling efficiency of the reservoir. The model was also used to assist facility design and to locate the optimal intake and discharge structures.

Task Manager; Hydraulic Design for Hickory Mound Impoundment, Florida Fish and Wildlife Conservation Commission—Conducted hydraulic modeling and designs to stabilize the levee surrounding Hickory Mound Impoundment, a 1,800-acre wildlife management area in Taylor County, Florida. Provided hydraulic design to minimize erosion and to prevent levee damage during a 50-year storm surge event. Also provided erosion control designs to protect the levee from current scouring, wave impacts, and human foot traffic. EXTRAN model was used to predict the water level in the impoundment and the current speed at the proposed emergency spillway.

Project Manager; Stormwater Improvement Evaluation, City of Atlantic Beach, Florida—Conducted third-party review of the hydraulic design and stormwater modeling for the City of Atlantic Beach Stormwater Improvement Project. Identified potential hydraulic and water quality impacts of the proposed project and provided recommendations for alternative design to minimize environmental impact, salinity intrusion, and project cost. ECT's recommendations were accepted by City Engineer and were implemented in the final design.

Project Manager; Hydrodynamic Study of Shipyard Creek, Kinder Morgan Bulk Terminal—Conducted hydrodynamic study of the Shipyard Creek near North Charleston, South Carolina, to assess the navigational impacts and boating safety issues incurred by a proposed public boat ramp in the vicinity of marine terminal operations. The potential impacts of ship mooring procedures and tugboat propeller wash on recreation vessels were investigated. The study report was used as evidence of a civil litigation.

Project Manager; Pollutant Transport Study for Charleston Naval Complex (CNC) RCRA Facility Investigation, Ensafe—Conducted hydrodynamic evaluation of the Cooper River, Shipyard Creek, and Noisette Creek near CNC to assess the fate of potential pollutant sources from CNC. A hydrographical study of the Noisette Creek was conducted. Mixing zone modeling was also conducted to quantify the zone of water quality impacts of the stormwater outfall.

Project Manager; Buckman Dye Study, JEA—Two comprehensive dye dispersion studies were conducted in the LSJR to evaluate the water quality impacts of a 30-MGD discharge from the Buckman Water Reclamation Facility operated by the JEA at Jacksonville, Florida. In each of the study, large quantity of Rhodamine W2 fluorescent dye was continuously injected into the effluent for 3 to 4 days. Dye concentrations in St. Johns River were measured in an 18-mile river segment between Blount Island and Point La Vista for a period of 4 days. A thorough 1-day background fluorescence survey in the study area was conducted before the dye injection, and a background fluorescence vs. salinity relation was established to resolve the temporal and spatial variability of the background fluorescence. Three boats equipped with Turner Design Model 10-AU and Model 10-005 fluorometers were used to conduct near-field mixing zone mapping and far-field plume tracking. The measurements included synoptic snapshots, vertical profiles, horizontal transects, and time-series of the dye concentrations.

Project Manager; East Indian River County Stormwater Management Modeling, Calpine Eastern—Developed a comprehensive stormwater management model for a 50,000-acre watershed in Indian River Farms Water Control District (IRFWCD) with extensive irrigation and drainage canal system. Visual-SWMM model was used to simulate 1,080 nodes, 312 natural channels, 787 culverts, 34 detention ponds, and 14 flow control structures. A graphical users interface and GIS database was developed for the model. Data collected at six rain gauges, five water level recorders, and three USGS gauging stations were used to calibrate the model. The modeling task is to assist Indian River County in achieving the pollutant load reduction goal.

Project Manager; Water Quality Modeling of Freeport Harbour, Enron—Thermal and water quality modeling were conducted to evaluate the potential impacts of a cold water discharge into the Freeport Harbour, Grand Bahama Island from a proposed LNG terminal. CE-QUAL-W2 model was used to simulate the cold water plume dispersion in the tidal basin and to assess the potential impacts on the coral reef community outside of the harbor. Continuous simulation was conducted using 3 years real time data.

Project Manager; Alligator Lake Restoration, SRWMD—Prepared a conceptual design to rehabilitate Alligator Lake, a severely degraded water body in Columbia County, Florida. The objectives of the project were to restore aquatic and wetland habitat, improve water quality, provide outdoor recreation facilities, create environmental education opportunities, and to estimate the rehabilitation costs. Various restoration schemes were considered, including dike removal/alteration, wetland creation, fish habitat creation, stormwater retrofits, and lake water level management. ECT staff conducted field observation to identify potential problems and likely causes of lake degradation. Reviewed pertinent data, including bathymetry, historic photography, land use data, lake and groundwater level data, water quality data, sediment data, phytoplankton data, aquatic plant cover and species, and sinkhole history. Prepared a restoration plan and recreation plan that were presented to the Alligator Lake Technical Working Group and the Governing Board of SRWMD.

Task Manager; Contaminant Spill Forecast Modeling, Detroit Water and Sewerage Department—Conducted hydrodynamic circulation and dispersion modeling to simulate the transport and dispersion of potential pollutant spills in the St. Clair River-Lake St. Clair-Detroit River system. The arrival time and pollutant concentration at the water treatment plant intake were predicted. A 2-dimensional hydrodynamic model CAFE1 was used to simulate the current circulation pattern. The output of CAFE1 was then linked with a dispersion model DISPER1 to simulate the transport and dispersion of the pollutant plume. Three large scale dye studies were conducted in Lake St. Clair to calibrate the models. User friendly pre and post processors and graphical interface were provided for operation efficiency. Conducted training seminars to transfer the technology to DWSD staff. Also participated public meetings to provide information and demonstration of the emergency response system.

Principal Investigator; Environmental Assessment and Salinity Impacts of Savannah Harbor Expansion, Georgia Ports Authority—Conducted extensive studies regarding the proposed expansion of the Savannah Harbor up to the Mulberry Grove site in Georgia. Technical tasks included coordination with the USACE

regarding field studies, salinity intrusion modeling, sediment transport modeling, alternative site evaluations and spoil disposal area assessments, evaluation of project impacts on adjacent wildlife areas, and groundwater and geological impacts of the proposed dredging. Served as a member of the Savannah River Salinity Model Study Group to investigate the hydraulic and water quality impacts of Back River tide gate. Responsibilities included evaluation, improvement, and calibration of the LAEMSED model.

Project Manager; Water Quality and Salinity Study of Loxahatchee Estuary, Jupiter Inlet District—Prepared a basin management plan for the Loxahatchee River Estuary in Florida. Water quality modeling was conducted to determine the salinity impacts resulting from dredging activities. Prepared a water quality monitoring program to collect water quality and flow data for model calibration.

Task Manager; Circulation and Thermal Plume Modeling for Tampa Electric Company (Tampa Electric)—Conducted hydrodynamic and circulation analyses to assess the impacts of thermal discharge from the Big Bend Unit 4 of Tampa Electric. The finite element model CAFE1 was setup for the entire Tampa Bay area to establish the farfield circulation pattern using course grid segmentation. Subsequently, a finegrid model was set up for Hillsborough Bay to establish circulation with finer resolution near the outfall, using the results of the course-grid model as the boundary condition. The results of CAFE1 were linked with a finite element dispersion model, DISPER1, to calculate the size and temperature of the thermal plume caused by the cooling water from the power plant. Both CAFE1 and DISPER1 were modified in order to simulate the realtime tide condition and to simulate the heat transfer to the atmosphere. Continuous wind, tide, and current data and infrared images were used to calibrate the models.

Task Manager; Estuarine Hydrodynamic and Water Quality Modeling for Lower Maurice River, Atlantic City Electric (ACE)—Used SWMMII Model to evaluate freshwater consumptive use impact caused by proposed coal-fired power plant near Millville, New Jersey. Simulated farfield pollutant transport and nearfield mixing due to cooling tower blowdown. MIT's salinity intrusion model was used to predict salinity intrusion. Also developed a potential flow model to predict effects of the intake structure on fish larvae transport, entrainment, and impingement. Models PLUME and PDS were used to perform nearfield mixing and dispersion studies.

Project Manager; Hydraulic Impacts Assessment, Pensacola Naval Air Station (Homeport) Dredging Improvements, U.S. Navy—Studies were performed to evaluate the U.S. Navy's proposed ship channel and turning basin modifications within the Pensacola Bay system adjacent to the Pensacola Naval Air Station in Florida. Assessed potential impacts which may result from the proposed Pensacola Bay channel and turning basin improvement and evaluated dredged material disposal options. This tidal hydrodynamic prediction in Pensacola Bay was accomplished by using the 2-dimensional, finite element, circulation computer model CAFE1. Based on these simulation results, the dredging and disposal impacts were evaluated for various disposal alternatives, including upland disposal, offshore open water disposal, or inshore open water disposal.

Project Manager; Water Quality Modeling, Norfolk Harbor—Model simulations were conducted to assess the sediment and water quality impacts of tributyltin anti-fouling paint being leached from the ship hulls. Hydrodynamic model DYNHYD3 was used to simulate the tidal current and water surface elevation in the Norfolk Harbor, Hampton Road, Elizabeth River, and James River in Virginia. Water quality model TOXIWASP was used to predict the dissolved TBT concentration in the water column and the quantity absorbed by the sediments. The impacts from the recreational, commercial and military vessels were evaluated. The study results were used by EPA to develop policy to regulate trbutyltin usage.

Task Manager; Hydrodynamic and Water Quality Modeling for Pungo River and the Canal System, Peat Methanol Associates—The study area included Pungo River, Pungo River Canal, Intracoastal Waterway, and Alligator River in North Carolina. The RECEIVII model was calibrated by four tide gauges, two current meters, a dye study, and two seasonal water quality sampling surveys. The effects of wind, tide, and proposed methanol plant discharge on the estuary salinity, metal ion, and BOD/DO were investigated. The preferred methanol plant discharge site was recommended. The SWMMIII model was also used to perform continuous realtime modeling to determine the effects of peat harvesting on the surface runoff characteristics, and to evaluate the salinity changes in the Pungo River caused by harvesting activities. Qualified as an expert witness.

Project Manager; Hydrological Modeling of a Phosphate Mining Site, Occidental Chemical—Hydrological modeling of a phosphate mining site near White Springs, Florida, for Occidental Chemical

Agricultural Products, Inc., to evaluate the hydrological impact of the mining activities. Hydrological model HSPF was used to perform continuous realtime simulation and compare the Suwannee River hydrology under premining conditions, existing conditions, and reclaimed conditions. Twenty years precipitation and evaporation data with 1-hour intervals was used for simulation.

Project Manager; Thermal Plume Modeling for Florida Power & Light Company's (FPL's) Fort Myers Power Plant, Golder & Associates—Conducted comprehensive hydrodynamic and thermal modeling in Caloosahatchee Estuary and Orange River to quantify the thermal plume created by the repowering of FPL's Fort Myers Power Plant. CE-QUAL-W2 was used to simulate the longitudinal distribution and vertical thermal stratification in the study area. A dye study and intensive monitoring of temperature and salinity was conducted to calibrate the model. The modeling tasks included (1) thermal plumes for the existing and repowered conditions, (2) determining the most effective option to protect manatee during brief plant downtime in the winter, and (3) effects of S-79 lock operation schedule on the thermal plume.

Project Manager; Northwest Florida Beaches International Airport Master Drainage Plan Review; Vezina, Lawrence & Piscitelli, P.A.—Reviewed the stormwater master plan for the International Airport in Panama City, Florida, and assessed potential causes of the flooding issues during construction. Served as an expert witness.

Project Manager; Riverview Substation Stormwater Design, Seminole Electric Cooperative, Inc. (SECI)—Designed stormwater management facility for the expansion of a substation in Putnam County, Florida.

Project Manager; Water Budget Study for Seminole Generating Station, SECI—Conducted hydrologic and water budget study for the flue gas desulfurization (FGD) landfill area. Components of the water budget included rainfall, runoff, evaporation, evapotranspiration, seepage, retention pond inflow/ outflow, groundwater flow, and pump operations.

Project Manager; Bridge Hydraulic Report and Scouring Analysis, WBQ Design & Engineering, Inc/FDOT—Conducted a technical review of a 2-dimensional model (RMA2) of Escambia River, Blackwater River, and Yellow River to assess the hydraulic impacts of a US90A bridge crossing over the Escambia River near Pensacola, Florida. The bridge scouring under 100-year and 500-year storm surge conditions were completed. A review of the bridge hydraulic report was also completed.

Project Engineer; Cape Fear River Dye Study, City of Wilmington—Two comprehensive dye dispersion studies were conducted in the Cape Fear River and Northeast Branch Cape Fear River to evaluate the water quality impacts of the outfalls from two domestic waste treatment plants in Wilmington, North Carolina. A total of 1,000 pounds of Rhodamine W2 fluorescent dye was continuously injected into the effluent for a 6-hour period, and dye concentration was monitored for 4 days. The primary objectives of the study were to determine the upstream excursion limit of the discharge plume, and to use the data to calibrate a 3-dimensional EFDC computer model.

Project Manager; Water Quality Assessment for a Power Barge, Enron—Conducted mixing zone modeling to determine potential thermal and water quality impacts of the 36 MGD discharge from a power barge in Puerto Quetzal, Guatemala. CORMIX model was used to evaluate various discharge options, including offshore ocean outfall, onshore surface discharge, and discharge in the harbor. The potential for thermal recirculation between the intake and discharge was investigated.

Task Manager; Cooling Reservoir Assessment, SECI—Conducted thermal assessment to evaluate the potential impacts of Hardee Unit 3 design modification on the existing cooling reservoir at Hardee Power Station and to ensure that the reservoir would have sufficient cooling capacity for the revised project.

Task Manager; Hydrologic Modeling for Blue Heron Energy Center, Calpine Eastern—Conducted surface water modeling to assess the potential impacts from a proposed power plant in the IRFWCD, including water use impact, stormwater impact, and water quality impact. Stormwater model Visual SWMM was used for runoff and flood routing simulations.

Task Manager; Thermal Mixing Zone Analysis, Coastal Power Company—Conducted thermal mixing zone analyses to determine the most cost-effective design of a submerged heated water discharge pipe from a power plant mounted on a floating barge in El Realejo Estuary near Corinto, Nicaragua. Prepared diffuser pipe design and estimated the potential of recirculation of the cooling water.

Project Manager; Environmental and Engineering Evaluation of Carlos Waterway, Jack M. Berry, Inc.—Evaluated a flood control waterway near Fort Myers, Florida, proposed by the East County Water Control District. The assessment included environmental impacts, costs, and safety and design alternatives. Served as an expert witness in an Order of Taking hearing and presented the study findings in the courtroom.

Project Manager; Water Quality Assessment for NPDES Permit Renewal, SECI—Conducted water quality assessment for a FGD system modification which would create a chloride bleed stream at SECI's Palatka facility. Projected water quality of the internal and external NPDES outfalls and determined the size of the chemical and thermal mixing zones in the St. Johns River under various blowdown options. The results were used to support the renewal of an NPDES permit.

Task Manager; NPDES Permit Modification, Tampa Electric—Conducted water quality assessment to support an NPDES permit modification for the outfalls at the Big Bend Station in Tampa, Florida. The modification involved the addition of a chloride bleed stream from the FGD system.

Project Manager; Circulation Study for Lake Minniola, Modica & Associates—Conducted circulation study for Lake Minniola to assess the potential impacts of a proposed city marina in central Florida. A drogue study was conducted to quantify the circulation pattern near the project site.

Task Manager, Water Quality Assessment and Mixing Zone Analysis, Calpine Corporation—Conducted water resources assessment for the 700-MW natural gas-fired Magic Valley Generating Station in Hidalgo, Texas. Effluent from the City of Edinburg WWTP was used as cooling tower makeup water source. Mixing zone modeling was conducted to determine the water quality and hydrological impact of the cooling tower blowdown into the North Main Drain, a receiving water.

Project Engineer; Mixing Zone Analysis for a Proposed Power Plant in Thailand, Edison Mission Energy—Conducted mixing zone assessment to determine the water quality impacts in the Mae Klong River in Thailand from a proposed power plant.

Project Engineer; Turbidity Study, MacFarlane, Ferguson, McMullen—Conducted a turbidity study to determine the potential turbidity impacts of the operation of the Sun Cruz casino boat in Crystal River, Florida. Turbidity measurement was taken along the course of the boat navigation before, during, and after the boat passage. The turbidity impact during docking/undocking operation was also investigated.

Project Engineer; Water Quality and Thermal Mixing Zone Analysis, Coastal Power Company—Conducted thermal mixing zone analyses for the 50-MW diesel engine power plant in Tipitapa, Nicaragua.

Project Engineer; Hydrological Study, TECO Power Services Corporation (TPS)—Conducted hydrological assessment for the proposed 60-MW Pavana Power Plant in San Lorenzo, Honduras.

Project Engineer; Environmental Impact Assessment (EIA) for 120-MW San José Power Plant, Central Generadora Electrica San José, Ltd.—Responsible for conducting thermal and water quality modeling of discharges from coal-fired power plant in Puerto Quetzal, Guatemala. Modeling results were used to demonstrate compliance with applicable World Bank environmental guidelines. Also evaluated the dredging impact due to the construction of a ship channel and coal loading piers. Conducted environmental assessment at an alternate site near Campo Nuevo, including thermal mixing zone analysis and flood analyses for a bridge elevation design.

Principal Investigator; Thermal Mixing Zone Analysis, Brooklyn Navy Yard Cogeneration Partners—Conducted thermal analysis and circulation study to determine the thermal mixing zone of the cooling water discharge from a proposed cogeneration facility in Brooklyn Navy Yard Basin, New York. Assessed the potential for recirculation of the heated discharge. Also conducted water quality assessment to evaluate the impacts of the dredging activity associated with the construction of the discharge pipeline.

Principal Investigator; Floodplain Forest Modeling for Rodman Reservoir Restoration, SJRWMD—Use bottomland forest floodplain model, FORFLO, to simulate the growth and succession of hardwood species on the floodplain of Florida's Lower Ocklawaha River for various hydrologic conditions and restoration schemes (a total of 267 scenarios). The model was modified so that it could be applicable for all hydrologic and ecologic conditions. Tree species surveys were conducted to calibrate the FORFLO model. The results of the model were used to assist SJRWMD in making restoration recommendations.

Principal Investigator; Mixing Zone Study, Amoco Oil Company—Conducted mixing zone study for two NPDES stormwater outfalls at Amoco's Tampa Terminal in Florida. Established and implemented monitoring program to characterize the ambient tidal current and water quality in the Sparkman Channel. Used mixing zone models CORMIX1 and CORMIX2 to optimize the discharge configuration and determined the mixing zone size for copper, iron, lead, and pH.

Project Manager; Coastal Engineering and Water Quality Assessment for Paradise Island Resort, Sun International—Conducted thermal balance and water quality assessment to evaluate environmental conditions in fish display pools and lagoons at Paradise Island Resort, Bahamas. Conducted tidal hydraulic analysis to determine lagoon flushing and circulation. Designed dune restoration to mitigate the construction impacts on sand dunes. Conducted coastal engineering analysis to improve and stabilize the north inlet of the Paradise Lagoon, and designed terminal groin to control sediment transport. Also implemented a stabilization plan to prevent erosion of a manmade beach in the lagoon.

Task Manager; Oxbow Restoration Feasibility Study, Wayne County, Michigan—Conducted an environmental study to evaluate the feasibility and cost/benefit to restore a detached oxbow near Henry Ford Museum at Lower River Rouge, Michigan. Conducted site assessment, vegetation survey, and topographic survey to determine existing hydrologic and ecologic conditions compared with the historic conditions. Evaluated the feasibility of restoring wetlands, fish habitats, and navigation potential in the oxbow. Identified major environmental and engineering issues related to oxbow restoration, i.e., dredge/disposal, sediment quality, hydroperiods, flood hazard, sedimentation/erosion, and stormwater retrofitting.

Project Engineer; Water Quality Assessment for Rodman Reservoir Restoration, SJRWMD—Conducted water quality modeling, using QUAL2E model, to predict the water quality of the restored Lower Ocklawaha River in Florida between Eureka Dam and Rodman Dam under various restoration schemes. The water quality impacts of restoration schemes for the riverine zone, lacustrine zone, and the transition zone were evaluated.

Project Manager; Marina Permitting, Andell Harbor—Conducted water quality analysis and modeling to determine the potential environmental impacts of a 400-slip lock harbor on Seabrook Island, South Carolina. Fecal coliform and biochemical modeling was conducted to project the water quality in the marine. The receiving water impacts in the Bohicket Creek was also assessed. Conducted substantial water quality data collection at Queen's Harbour, a similar lock harbor in Jacksonville, Florida, to support the Andell Harbor study. Conducted salinity measurements in Queen's Harbour navigation lock and the adjacent creek to compute the exchange coefficient for the lock. Conducted wind wave forecast and boat wake analysis to assess the bank erosion impacts from boat traffic. Testified in the administrative hearing as an expert witness.

Task Manager; Storm Surge and Wave Force Calculation for Transmission Line Design, POWER Engineers, Incorporated—Conducted coastal engineering analysis to determine the design wave heights in Pine Island Sound for Lee County Electric Cooperative's transmission line design spanning Captiva Island and Pine Island, Florida. Computed the total wave forces and maximum bending moments on transmission line supporting structures. The scour depth at the structure foundation by wave forces was also conducted.

Task Manager; Mixing Zone Modeling for Ocean Outfall, Fertinal Group—Conducted mixing zone modeling, using CORMIX, to evaluate the effectiveness of several alternative designs to replace an existing outfall pipeline in the nearshore zone of the Pacific Ocean from a fertilizer plant near Lazaro Cardenas, Michoacan, Mexico. Current velocity, temperature, and water quality samples were collected to characterize the ambient condition.

Task Manager; NPDES Permitting for Stormwater Discharges, Tampa Electric—Prepared the Part I and Part II NPDES permit application for the stormwater discharges at the selected Tampa Electric power stations.

The group application included five facilities: Big Bend, Gannon, and Hookers Point Power Stations in Tampa, and Phillips and Dinner Lake power stations in Sebring, Florida. Stormwater sampling was conducted to characterize the stormwater quality at the outfall.

Task Manager; Drainage Canal Design at Alborada Power Plant, Tampa Centro Americana de Electricidad, Ltda—Conducted field investigation and hydraulic design to prevent potential flooding at the Alborada Power Plant in Escuintla, Guatemala. Directed topographic survey to gather information required for the design of a perimeter canal. Completed hydraulic design and plan and specification for the canal.

Task Manager; Thermal and Chemical Mixing Zone Analysis, Delmarva Power & Light Company—Conducted hydraulic and water quality impact assessment for the cooling tower blowdown to the Nanticoke River near Vienna, Maryland. CORMIX1 model was used to determine the size of the nearfield mixing zone to conform with Maryland's water quality regulations. ECT investigated three candidate sites to determine the most favorable site location. In addition to the nearfield mixing zone, the farfield water quality impacts for each candidate site was also assessed. Conducted ship wave and screw race analyses to assess the bank erosion and sediment re-suspension due to the propeller and vessel motion of the coal transport barges.

Project Manager; Circulation and Dispersion Study in Little Lake Harris, Lake County Water Authority—Conducted dispersion study to assess the water quality impacts of a proposed public boat launching, mooring, and recreation facilities at Little Lake Harris. Dispersion modeling was conducted to quantify the impacts of boat discharges. Two dye studies were conducted to verify the dispersion characteristics and the zone of water quality impacts due to potential pollutant discharges. Historical hydrologic data were analyzed to evaluate the extent of far-field and long-term water quality impacts in the lake. Made design changes for the dock layout to minimize the hydraulic and water quality impacts.

Task Manager; Bridge Scouring Analysis, FDOT—Conducted hydraulic analysis to evaluate the scour depth of the Ortiz Bridge over Billy Creek in Lee County, Florida. Hydraulic model HEC-RAS was used for the analysis. Assisted with the preparation of a bridge hydraulic report.

Task Manager; Bridge Hydraulic Analysis, FDOT—Conducted hydraulic analysis to determine the flood stage and scour depth at a bridge over Eau Gallie River in Brevard County, Florida. Hydraulic model HEC-RAS and pier scour procedure HEC-18 were used for the analysis.

Discipline Manager; Surface Water Assessment for Polk Power Station, Tampa Electric—Conducted water resources investigations in preparation of site certification application for the Polk Power Station in Polk County, Florida. Prepared and implemented a 6-month surface water monitoring plan to characterize the baseline condition at the project area, including continuous water level recording, flow measurements, and water quality analysis. Responsibility also included thermal analysis and water budget analysis for the cooling pond, prepared stormwater management plan, conducted hydraulic and hydrologic impact assessment, and conducted water quality assessment to determine cooling pond water quality and receiving water quality. Computer models, HEC-1 and QUAL2E, were used to simulate the surface runoff hydrograph and the water quality in the cooling pond. Testified in an administrative hearing as an expert witness.

Project Engineer; Stormwater Management Plan, Caribe General Electric Products, Inc.—Conducted a water quality compliance survey at a plastic molding facility at Palmer, Puerto Rico. Prepared and implemented a stormwater management plan to remove process water and potentially contaminated runoff from offsite stormwater discharge. Implemented a stormwater monitoring program to monitor rainfall, runoff quantity, and runoff quality at three stations where flow measurement devices were installed. Prepared operation and maintenance manual for stormwater monitoring; also prepared monthly monitoring reports for permit compliance.

Project Manager; Nutrient Budget Assessment for Big Bend Station, Tampa Electric—Tampa Electric proposed to install a selective catalytic reduction system to reduce nitrogen oxides emissions from the Big Bend Station in Hillsborough County, Florida. ECT conducted nutrient budget analysis to evaluate the reduction of nitrogen deposition from the atmosphere to Tampa Bay/Hillsborough Bay, evaluate the potential increase of nitrogen load from the FGD blowdown, and to assess the total nitrogen balance and net nitrogen loads to Hillsborough Bay.

Task Manager; Berm Failure Analysis for Cooling Water Reservoir, Tampa Electric—Conducted hydraulic modeling to assess the flooding impact in an event of a catastrophic failure of the cooling water reservoir berm at Polk Power Station. An emergency response plan was also prepared.

Project Manager; Thermal Plume Modeling for FPL—Conducted hydraulic and thermal impact studies for the FPL repower project in Fort Lauderdale, Florida. RECEIVII model was modified to simulate the heat transfer and dispersion of the thermal plume in the cooling pond and receiving waters. Extensive field monitoring and a dye study were conducted to calibrate the model. The modified model also simulated the potential recirculation of the cooling water intake and discharge system. The salinity impacts of the plant repowering were evaluated. Expert witness at administrative hearing.

Task Manager; Hydrologic and Hydraulic Analysis for Payne Creek, SECI—Conducted storm runoff and routing analysis for Payne Creek in Hardee County, Florida. Also simulated the discharges from the cooling pond and the adjacent watershed to determine the effects of runoff dilution under a 10-year, 24-hour storm. HEC1 model was used for the analysis.

Project Manager; Hydraulic and Water Quality Assessment for Savannah Harbour Development, LJ Hooker Developments—Conducted environmental impact assessment for a proposed harbor and canal system at Hutchinson Island, Savannah, Georgia, which connects the Savannah River with the Back River. Hydraulic calculations, sedimentation assessment, and water quality analysis were performed to determine the impacts of the proposed project; which includes marina facilities, cruise ship terminal, and an aquarium.

Project Engineer; Water Resources Studies for Jacksonville Port Authority Spoil Site Evaluation—Evaluated the hydrodynamics and water quality impacts of maintenance dredging, channel deepening, and dredged material disposal in St. Johns River near Jacksonville, Florida. A disposal corridor for maintenance dredging was established based on water quality, hydraulics, ecology, archeology, and socioeconomic impacts. The favorable sites for dredged material disposal were recommended based on the ranking matrix.

Project Engineer; Design and Planning of a Harbor/Airport Complex at Kasae Island, Trust Territory of Pacific Islands—Conducted harbor planning and design, reef runway design, drainage design, causeway and highway design, and structural design of breakwater and harbor facilities for a harbor/airport complex in Kasae Island, TTPI.

Project Engineer; Marine Construction/Permitting, Southern Monitoring and Environmental, LLC—Responsible for all modeling and marine permitting for dredging of Keystone Properties' 44 ft-MLLW basin, and construction of a seawall at a bulk materials unloading terminal on the St. Johns River in Jacksonville, Florida. Designed a 12-acre confined dredge material disposal facility.

Principal Investigator; Water Quality Modeling, Willbrook Plantation, Waccamaw River—RECEIVII model was used to assess the water quality impact of the proposed docking facilities and the dredged canals in a proposed waterfront resort development at Waccamaw River, South Carolina. The model was used as a design tool to optimize the channel configuration and to maximize the tidal flushing efficiency. Conducted water quality monitoring for model calibration. Testified at the administrative hearing as expert witness.

Project Manager; Salinity Intrusion Modeling, ACE—MIT Salinity Intrusion Model (SIM) was used to assess the consumptive use impact of proposed coal-fired power plant on the Maurice River in New Jersey. The model simulated the potential salinity intrusion caused by the cooling water withdrawal from the river and cooling tower blowdown to the river.

Task Manager; Fate of Dredged Material Disposal, The Landings Marina—Conducted sedimentation analysis to assess the water quality impacts from the dredging activities in an existing marina on Skidaway Island, Georgia. A 3-dimensional finite difference model (MIT Transient Plume Model) was used to determine the mixing zone and dispersion of the disposed material. Provided recommendations to minimize future shoaling in the marina.

Task Manager; Water Quality Modeling, Kiawah Island Marina Development—Evaluated water quality impacts of a lock harbor system in Kiawah River, South Carolina. Water quality model QUALII was used to

simulate algae growth in the marina. Transient Plume Model was used to simulate the farfield dispersion impacts in Kiawah River.

Task Manager; Dredged Material Disposal Modeling, Harbortown Marina—Model DMFJ was used to predict transport, dispersion, and fate of dredged material discharged into open water through a pipeline near Hilton Head Island, South Carolina.

Task Manager; Thermal Impact Study for a Liquid Natural Gas Plant, Southern Natural Gas—Conducted model simulation to assess the impacts of a cold water discharge into Savannah River, Georgia, from a LNG facility. Circulation and dispersion model DIFF2 was used to assess the water quality impacts.

Project Manager; Wetland Modeling of the Cabbage Head Swamp, Occidental Chemical—Conducted hydrological modeling for Four Mile Branch and its headwater area, Cabbage Head, to evaluate the hydrological impacts and wetland hydroperiod changes resulting from the proposed dredging and filling activities in Suwannee County, Florida. The hydrological model HSPF was used for the simulations. In order to adequately represent the watershed characteristics for the wetlands, an in-depth experimentation and sensitivity analysis of the model parameters in the PERLND module was conducted.

Project Manager; Mixing Zone Analysis and Dye Study for Suntree Marina—Conducted a dye study at the proposed marina site in Indian River, Florida, using continuous injection method. Subsurface drouges were also used to verify the current velocity and flow path. Developed a 2-dimensional numeric model to simulate the dispersion of the pollutants from boat discharges. The dye study data was used to calibrate the model.

Project Manager; Dye Study for Mixing Zone Analyses, Port St. Joe Waste Treatment Plant—Conducted two dye studies to determine the mixing zone of the plant discharge. Rhodamine dye was continuously injected into the Gulf County Canal for 24 hours. Continuous measurement of the dye concentration was conducted for 4 days in the Gulf County Canal and St. Joseph Bay in Florida. Studies were conducted for both spring tide and neap tide conditions. Performed data analysis to determine the mixing zone.

Project Manager; Hydrological Study, City of Sanford—Evaluated a proposed wastewater effluent disposal site near Yankee Lake and Lake Monroe, Florida. The proposed land application system included a rapid infiltration network, exfiltration trench, and overland flow through low hammock and wetlands. The nutrient removal rate of the wetland was evaluated. The hydrological and water quality impacts on the receiving wetlands was assessed.

Task Manager; Floodplain Analysis for AMAX Chemical Company—Performed flood frequency analysis and delineated the floodplain of Big Slough and Horse Creek near AMAX Chemical Company's proposed phosphate mine site in DeSoto County, Florida. Model E431 was used to perform floodplain analysis.

Project Manager; St. Lucie Estuary Hydrodynamic Modeling—Provided consulting services to South Florida Water Management District (SFWMD) for the setup of a Dynamic Estuary Model on St. Lucie Estuary, Florida. Assisted SFWMD with calibrating the model and produced bathymetric map of the estuary using hydrographic survey data and SURFACEII mapping software.

Task Manager; Hydrodynamic Modeling, Baptist Medical Center—Used finite element model CAFE1 to assess the St. Johns River circulation impacts due to the proposed hospital construction in Jacksonville, Florida. Effects of the hospital caisson structure on sediment transport and tidal flushing characteristics were also evaluated.

Project Manager; McCoys Creek Stormwater Improvement, Jacksonville Downtown Development Authority—Prepared study to determine feasibility of rechannelizing McCoys Creek to (1) improve water quality of the Creek, (2) improve stormwater runoff conditions of the area, and (3) improve the aesthetic qualities of the Creek. A stormwater model was used to evaluate the existing drainage system and make recommendations for improvements to stormwater handling capacity and water quality. A flushing study was also conducted using the RECEIVII model to determine the residence time of the existing Creek and the proposed dredging requirements. Based on the results of the stormwater and flushing studies, recommendations were developed to modify the hydraulic system to allow boat navigation, improve water circulation, decrease hydraulic residence time, and enhance flushing.

Project Manager; Stormwater Management System Design—Stormwater management system design for the development of a 12 square-mile citrus farm near Gannet Slough in Highland County, Florida. Designed a master drainage plan, including drainage canals, irrigation reservoir, retention pond, and pump stations.

Project Manager; Hydrographical, Hydrological, and Stormwater Studies near Sulphur Point—Conducted dye study at a proposed marina site in St. Andrew Bay, Florida, to determine the flushing and dispersion characteristics of the project site. Nearfield and farfield water quality impacts were assessed. A stormwater management system was designed to retain the runoff from the upland development.

Project Manager; Comprehensive Shorefront Management Plan for Horry and Georgetown County, South Carolina Coastal Council—Conducted beach erosion assessment for 27 miles of shoreline in Horry and Georgetown Counties, South Carolina. The study program included beach data survey and analysis, sediment analysis, long term and short term erosion trends, future beach nourishment needs, and development of shorefront management plan. Participated in public hearings.

Principal Investigator; Beach Nourishment Project Design and Engineering for Captiva Erosion Prevention District—Conducted a coastal engineering evaluation for the design of a 5-mile beach restoration project in Captiva, Florida. Performed technical engineering evaluations in support of USACE requirements including analyses of physical coastal data, engineering and design of a rock revetment, submerged breakwater, and terminal groin structure. Prepared the final engineering and design for the beach restoration project based on a technical and economic evaluation of alternative project design level. Conducted wave refraction model to assess the impacts of dredging.

Principal Investigator; Coastal Engineering Analysis and Management of 15 years of Beach Profile data along 26 miles of North Carolina Beaches for USACE, Coastal Engineering Research Center—The data was used to compute the sediment volumetric rate of change, sediment transport rate, shoreline excursion rate, and to set up a wave refraction model for the study area. The wave refraction model was used to predict wave shoaling and compute longshore energy flux. Historical beach fills and storm events were investigated to evaluate beach fill performance.

Project Manager; Revetment Design and Beach Erosion Assessment of Forrest Beach, Sea Crest Motel—Assessed the long- and short-term, and storm-induced beach erosion near Sea Crest Motel, Hilton Head Island, South Carolina. Evaluated the potential erosion/accretion impacts of the proposed erosion control structure. Provided design of a composite concrete revetment. Expert witness for public hearing.

Principal Investigator; Shoreline Stabilization Design, Ft. George Island Development—Investigation of the shoreline planeform changes and erosion pattern near a proposed marina on Ft. George Island, Florida. The cause of the erosion and the sedimentation near the project site was determined and a shoreline stabilization plan was recommended. Provided engineering design of a revetment.

Project Manager; Southern Isle of Palms Coastal Construction Baseline Determination, The Beach Company, Isle of Palms—Conducted shoreline study to establish the coastal construction baseline and setback line for the Southern Isle of Palms from Breach Inlet to 10th Avenue, in accordance with the South Carolina Coastal Council Beach Bill. The study included historic aerial photo analysis, shoreline movement, storm impacts, and beach profile surveys. The revised baseline and setback lines were field verified and were successfully approved by the South Carolina Coastal Council. Expert witness at public hearing.

Task Manager; Beach Nourishment Planning and Design, Town of Longboat Key—Designed terminal groin as an element of the comprehensive beach nourishment plan for the Town of Longboat Key, Florida. The groin was designed to minimize the spreading and dispersion loss of sand from the project area.

Task Manager; Marina Design, Leeward Limited, Providenciales, B.W.I.—Conducted hydrographic and geotechnical investigation at Leeward GoingThrough. Prepared alternative structural design for the proposed marina.

Project Manager; Bulkhead and Marina Design, HarbourGate Marina—Designed an 86-slip marina on North Myrtle Beach, South Carolina, with 1,250-ft timber bulkhead and a fuel dock. Performed structural

design of the wooden bulkhead and the adjacent walkway. Alternative concrete and steel designs were also conducted. Prepared bid documents for marina and bulkhead construction.

Project Manager; Channel Stability and Sediment Transport Analysis, Rose Hill Plantation—Assessed channel stability and sediment transport of an existing channel at Colleton River. Conducted hydrographic field investigation to assess the feasibility, engineering alternatives, maintenance dredging requirements, and environmental impacts for a proposed channel stabilization project in Hilton Head, South Carolina.

Project Engineer; Beach Nourishment Study of North Shore Park, St. Petersburg, Florida—Performed sediment transport analysis to evaluate the fate of beach fill material and assess the environmental impact on the grass bed caused by beach fill operation and the littoral processes. A preferred borrow site for beach fill material was recommended.

Project Manager; Beach Erosion and Shoreline Protection Study, Pelican Watch Villas—Identified long and short-term erosion trends and recommended immediate and long-term shoreline protection method. Provided stabilization protection method. Provided stabilization alternatives along an existing wooden seawall and beach dunes on Seabrook Island, South Carolina.

Project Manager; Marina Planning, Design, and Permitting, Patriots Point Marina—Conducted the design and environmental assessment for a proposed 616-slip marina in Charleston Harbor, Mt. Pleasant, South Carolina. Work included hydrological analysis, dredge/disposal plan, water quality analysis, and coastal marina report. Performed engineering analyses for a proposed floating breakwater. Conducted comprehensive wind analysis, wave forecasts, and established the design criteria for the breakwater. Provided construction services such as bid document preparation and site inspection. Participated in public hearings.

Task Manager; Sediment Transport Study for Daufuskie Island/Webb Tract Marina, International Paper Realty Corp.—Conducted water quality, sedimentation, and sediment transport studies for the proposed 420-slip lock harbor on Cooper River on Hilton Head Island, South Carolina. Vertical current profiles, suspended solid profiles, and bottom sediment samples were taken and analyzed to predict sedimentation and future maintenance requirement. Conducted dye study to assess the pollutant dispersion and mixing.

Task Manager; Marina Assessment for Queen's Harbour, The Bullard Group—Prepared engineering studies to evaluate a lock harbor marina associated with a waterfront development in Jacksonville, Florida. Studies included stormwater drainage plan, water quality impact assessment, dredge/disposal plan, and long-term maintenance requirement.

Principal Investigator; Dye Study and Environmental Assessment, Moss Creek Marina, Moss Creek Plantation—Performed dye study to evaluate the longitudinal mixing, dispersion, and tidal flushing in the vicinity of a proposed marina expansion in Hilton Head, South Carolina. Potential pollutant impacts was evaluated based on anticipated marina use and occupancy. Study results were used to assess the compliance with the shellfish harvesting water quality criteria, and the shellfish buffer zone needed to protect public health. Boat wake impacts were assessed.

Project Manager, Water Quality and Stormwater Assessment, Kiawah Island, Center Island—Responsible for water quality impact assessment of 50 individual dock facilities and a community boat launching facility along the Kiawah River at Kiawah Island, South Carolina. Provided dock design guidelines to project planners and architects, assessment of impacts of the project on surrounding water quality, and recommendations on methods for minimization or avoidance of significant impacts. Studied the feasibility of stormwater design to retain all stormwater in the project area up to and including the 100-year 24-hour storm.

Project Manager; Environmental Impact Assessment, Porter, Inc.—Assessed the impacts of a proposed boat manufacturing facility on the Colleton River, South Carolina. The boat wake impacts and the water quality impacts from antifouling paint were determined. Developed a dispersion and entrainment model to assess the impacts from a hypothetical fuel spill. Testified as an expert witness in an administrative hearing.

Task Manager; Power Plant Feasibility Study, Wärtsilä NSD North America, Inc.—Conducted surface water resources assessment for the siting and feasibility study of a 55-MW power-plant-on-barge facility near

Manzanillo, Dominican Republic. Investigation included freshwater sources, water quality, navigation, currents, exposure to wind-waves, storm surge, and mixing zone evaluation.

Principal Investigator; Marina Assessment, Cape Charles Marina—Planning, design, and flushing analysis for a 600-slip marina in Cape Charles, Virginia. RECEIVII model was used to determine the flushing time and the water quality in the marina basin.

Principal Investigator; Environmental Assessment—Wind/wave analysis was conducted to determine the wave impacts on a proposed marina in Narragansett Bay, Rhode Island. Diffraction analysis was conducted to assess the proposed breakwater efficiency. The hydraulic impacts of the breakwater construction were also analyzed.

Project Manager; Shoreline Erosion Evaluations—Performed analyses of extensive beach/offshore profile data to evaluate the sediment transport and shoreline erosion impacts resulting from the construction of the Little River Inlet jetties in Waites Island, South Carolina, in support of USACE - Section 111 proposal.

Project Manager; Wave Refraction Modeling, Redfish Pass—Studied effect of dredging on wave propagation and coastal processes on Captiva Island, Florida. Wave refraction model was used to perform the analysis.

Project Manager; InletBay-Waterway Modeling—Developed nonlinear model for inletbay-waterway system to evaluate the estuary flushing capability.

Project Hydrologist; Stormwater Management System Design and Permitting for 790-MW Integrated Gasification Combined-Cycle (IGCC) Power Plant at Polk Power Station, Tampa Electric—Conducted stormwater runoff modeling, designed stormwater management system, and prepared permit application for IGCC Unit 6 at Polk Power Station in Polk County, Florida.

Task Manager; Power Plant Feasibility Study, Wärtsilä NSD North America, Inc.—Conducted surface water resources assessment for the siting and feasibility study of a 55-MW power-plant-on-barge facility near Manzanillo, Dominican Republic. Investigation included freshwater sources, water quality, navigation, currents, exposure to wind-waves, storm surge, and mixing zone evaluation.

Project Manager; Environmental Assessment, Park West Development—Performed an environmental assessment of residential docks and an access bridge for a residential development in Park Island near Mt. Pleasant, South Carolina. Served as an expert witness.

Project Manager; pH Mixing Zone Study, SECI and TPS—Conducted pH mixing zone study in Payne Creek for the intermittent discharge from a cooling water reservoir operated by Hardee Power Station (TPS) and Payne Creek Generating Station (SECI). Conducted statistical analysis of reservoir discharge and river flow. Developed flow correlation and stage discharge relation in Payne Creek. Mixing zone models CORMIX and pH kinetics model PHMIX2 were used to determine the size of the pH mixing zone.

Project Manager; Mixing Zone Analysis for Hillabee Energy Center, Calpine—Conducted thermal mixing zone analysis for a proposed power plant near Alexander City, Alabama. Computed 7Q10 critical flow at the receiving water, the Oaktasasi Creek. Provided diffuser design to minimize the thermal mixing zone.

Project Manager; Mixing Zone Analysis for Lone Oak Energy Center, Calpine—Conducted thermal and chemical mixing zone analysis for a 0.7 MGD discharge from the proposed Lone Oak Energy Center near Columbus, Mississippi. CORMIX model was used for the analysis.

Task Manager; Diffuser Design Panda Energy International (PEI)—Conducted mixing zone analysis and diffuser design for the proposed 1,190-MW Tallmadge Generating Station at Grand River near Grand Rapids, Michigan. Mixing zone model V-Plume was used to determine the size of the mixing zone.

Task Manager; NPDES Permitting and Mixing Zone Analysis for Stormwater and Power Plant Discharges, U.S. Generating Company—Conducted water quality assessment for the preparation of NPDES permit for wastewater and stormwater discharges from the Indiantown Station in Martin County, Florida.

Determined the discharge water quality during extreme storm event and determined the size of the chemical mixing zone.

Project Engineer; Stormwater Management, PEI—Coordinated the stormwater management and pollutant prevention activities at Union Power Station's construction site in El Dorado, Arkansas. Conducted site assessment to devise and implement emergency remediation actions to control runoff quantity and quality during extreme storm events. Managed the water quality monitoring program and conducted periodic site inspections to ensure the best management practices onsite. As a result of the successful water management actions, the water quality in the receiving river and Lake Anthony was dramatically improved and complied with state standards.

Project Manager; Stormwater Assessment and Stormwater Pollution Prevention Plan (SWPPP), PCR, Inc.—Conducted stormwater assessment for a chemical manufacturing facility in Gainesville, Florida. Prepared a SWPPP to support an NPDES stormwater multi-sector general permit application.

Task Manager; Cooling Reservoir Assessment, SECI—Conducted thermal assessment to evaluate the potential impacts of Hardee Unit 3 design modification on the existing cooling reservoir at SECI's Hardee Power Station.

Project Engineer; Dye Dispersion Study, SJRWMD—Conducted a comprehensive dye dispersion study to assess the mixing zone characteristics of the Buckman Outfall from JEA's domestic WWTP. Rodamine WT fluorescent dye was continuously injected into the outfall as tracer for 3 days. Longitudinal, lateral, and vertical profiles of salinity and fluorescence were measured, analyzed, and interpreted.

Project Engineer; Hydrologic Evaluation for Wetland Mitigation Banking, City Management, Inc.—Conducted hydrologic study to evaluate the feasibility of creating wetland for the purpose of mitigation banking in Wayne County, Michigan. Determined the surface runoff pattern in the project area and established hydraulic design scheme to maintain the hydroperiod in the wetlands.

Task Manager; Water Quality Evaluation for Slag/Sluice Conversion at Gannon Station, Tampa Electric—Conducted water balance and water quality studies to evaluate the project design to convert an existing saltwater slag tank into a recycling freshwater slag tank at the F.J. Gannon Station, Tampa Florida. Plant water use was modified to maximize wastewater recycle, reduce groundwater quality impacts, and to improve the treatment efficiency of a reverse osmosis system.

Task Manager; Water Quality Evaluation for Slag Pond Conversion at Big Bend Station, Tampa Electric—Conducted water balance, heat balance, and water quality studies to evaluate the project design to convert an existing once-through saltwater slag pond into a recycling freshwater slag pond in Tampa, Florida. Plant water use was modified to maximize wastewater reuse. The water quality at the converted slag pond was computed.

Task Manager; Hydraulic Modeling, Williams Farm—Conducted hydrologic and hydraulic modeling to determine the effects of canal maintenance, or lack of it, on the flood event at Williams Farm during Hurricane Wilma. Hydraulic model ICPR was used to simulate flood hydrographs. Testified as expert witness during a trial.

Project Engineer; ERP Application Reviews, Northwest Florida Water Management District (NWFWMD)—Conducted permit reviews on behalf of NWFWMD for various ERP applications associated with stormwater management design for commercial, residential, and institutional development. Conducted site investigations and prepared review reports.

Project Manager; Stormwater Pollution Prevention Plan for T. Eston Marchant Headquarters Complex, South Carolina Army National Guard (SCARNG)—Prepared a stormwater pollution prevention plan and best management practices for the T. Eston Marchant Headquarters Complex in Columbia, South Carolina, according to the requirement of the SCDHEC NPDES General Permit for stormwater discharges associated with industrial activity. Conducted field investigation to verify drainage pattern and to identify non-stormwater discharges.

Project Engineer; Mixing Zone Analysis, Tampa Electric—Conducted nearfield chemical mixing analysis to re-evaluate the size of the iron and copper mixing zones according to recent regulation changes regarding water quality standard. The mixing zones for the outfalls at the Big Bend and Gannon stations in Tampa, Florida, were evaluated.

Project Engineer; Water Quality Assessment for Proposed Residential Docks in Kiawah River, Kiawah Resort Associates—Conducted hydraulic and water quality assessment to determine the potential environmental impacts of private residential docks in Kiawah River and the adjacent unnamed tributary on Kiawah Island, South Carolina. The long-term effects of potential boat discharges on water quality were evaluated. Expert witness at the administrative hearing.

Project Manager; Drainage Plan, Leesburg Training Site, SCARNG—Prepared a master drainage plan for a military tank parking area. Conducted soil percolation test to support a non-discharge design. Prepared grading plan, ditching plan, and paving plan for the motor pool.

Project Manager; SWPPP, SCARNG—Prepared SWPPP for 14 South Carolina National Guard OMS facilities. Conducted field reconnaissance to determine drainage pattern, identify potential source of stormwater pollution, and non-stormwater discharges. Prepared best management plan for each facility.

Principal Investigator; Mixing Zone Analysis for SECI—Conducted a thermal mixing zone analysis for the cooling water discharge from two coalfired steam electric generating units on the St. Johns River near Palatka, Florida. Initial mixing models PLUME and OUTPLM were used to determine the extent of the thermal mixing zone.

Task Manager; Stormwater Management for Kathleen Mine, Lane Construction—Conducted stormwater management and hydrologic/hydraulic modeling, using ICPR to assess the potential hydrologic impact of a limestone mine in Polk County, Florida. Assisted in the preparation of an ERP application.

Project Engineer; Water Resources Study for a 3,200-MW Coal-Fired Power Plant, Florida Power Corporation (FPC)—Conducted flow and tidal study in St. Joseph Bay and Lake Wimico in Gulf County, Florida. Performed spectrum and harmonic analysis for tide data recorded at five gauges to establish the tidal and flow pattern in the receiving water system. Applied RECEIVII model to assess the water quality impacts of the plant discharge.

Project Engineer; Structural Investigation of Old Shands Bridge—Inspected the remnant of the Old Shands Bridge in St. Johns County, Florida, to determine its structural integrity. Feasibility study was conducted to evaluate the design alternatives of repairing or rebuilding the existing structure into a fishing pier. Conducted preliminary design, cost analysis, and environmental permit for the demolition and refurbishing of the old structure.

Project Engineer; Navigation Channel and Basin Improvement for Vilano Boat Basin, City of St. Augustine, Florida—Designed dredging plan for the Vilano boat basin and the entrance channel improvement. Designed terminal groin at the channel entrance to prevent siltation and sediment accumulation in the basin. Also designed the dredged material disposal plan.

Project Engineer; Carrabelle Wharf, City of Carrabelle—Prepared conceptual design and marina slip layout for the Carrabelle Wharf in the Florida Panhandle. Also conducted conceptual design of a boat ramp and parking area at the project site. Conducted water quality assessment to evaluate turbidity impact of the dredging activity, using DREDGE model. Assisted in the preparation of an ERP application.

Task Manager; Thermal Plume Study for a Coal-Fired Power Plant, FPC—Conducted thermal plume study to assess the nearfield mixing zone and farfield thermal dispersion resulting from the cooling tower blowdown from Crystal River Unit 4 and 5 plants. Three dimensional model PDS and Transient Plume Model was used to determine the farfield impacts. PLUME and OUTPLUM models was used to assess the nearfield and initial mixing.

Project Manager; Flushing Study for Proposed River Bay Waterfront Development, Sarasota, Florida—Water quality model RECEIVII was used to simulate basin flushing under various design conditions.

Task Manager; Canal Flushing Assessment, Placido Bayou—SWMMII model was used to predict flushing time of a proposed boat basin and the canals system in a residential development in St. Petersburg, Florida.

Project Manager; Hydraulic Analysis, Seminole Expressway—Conducted hydraulic and hydrological analysis to assess the impacts of a proposed cross lake expressway over Lake Jessup in Seminole County, Florida. The analyses included current modification, flooding, sediment transport, and wind induced mixing.

Task Manager; Wetland Nutrient Uptake Study for Poinciana New Township—Collected the water quality data in Florida's Reedy Creek Swamp and Lake Russell to determine the nutrient assimilation capacity of the swamp and to evaluate the feasibility of utilizing the swamp for secondarily treated wastewater disposal.

Project Manager; Master Drainage Plan Design, Nassau County—Designed the master drainage plan for Annie Pines, a single-family residential community near Callahan, Florida. This development included two large manmade lakes which serve as an amenity as well as stormwater retention ponds. The drainage system (road, lakes, outfall structures) was designed for 25-year, 24-hour storm in compliance with SJRWMD requirements. Lakes were designed to provide detention with filtration to satisfy stormwater quality provisions of FDEP 6225 stormwater rules. Designed the outfall channel with significant tailwater constraints to drain into Big Funk Creek swamp. Performed drainage calculation and channel sizing necessary for preparation for the dredge and field permit.

Principal Investigator; Environmental Assessment for Marina Expansion, Golden Isle Marina—Conducted water quality impact assessment for the expansion of Golden Isle Marina in Brunswick, Georgia. Water quality and oyster sampling was conducted to assess the potential impact to shellfish resources. Erosion and sedimentation impacts were also determined.

Principal Investigator; Permitting and Construction Services, Naples City Dock—Design and permitting for the expansion of the City Marina, including the electric upgrade, replacement of underground fuel tanks, and addition of slips in Naples, Florida. Prepared bid documents and provided field services.

Principal Investigator; Planning and Permitting, Armada Marina—Planning, design, and permitting for a proposed marina at Bob Sikes Cut, Apalachicola Bay, Florida.

Task Manager; Myrtle Beach Farms Marina—Conducted preliminary feasibility study for marina along the Intracoastal Waterway in Myrtle Beach, South Carolina. Study included evaluation of water quality and flushing of the marina; preliminary design and planning studies were completed following the feasibility study.

Project Manager; Water Quality Assessment, Christenbury Marina—Conducted hydrological, water quality, and coastal engineering assessment for a proposed marina in Little River, Myrtle Beach, South Carolina.

Project Manager; Sediment Transport Analysis, Belle Isle Marina—Conducted sediment transport analysis for Bell Isle Marina in Winyah Bay, South Carolina, which has severe silting problem. Structural alternatives were recommended to prevent future shoaling.

Principal Investigator; Bay Creek Village Marina, Edens and Avant Inc.—Conducted engineering and environmental studies for development of a coastal marina on the South Edisto River, South Carolina.

Project Manager; Lowrie's Canal Hydraulic and Flushing Analysis, St. Johns River—Conducted hydraulic analysis to assess the water quality and flushing of a proposed canal at a residential community in Astor, Florida The effects of surface runoff, current, and wind-induced circulation were considered.

Project Manager; Marina Permitting for Lighthouse Harbor, Pringle Development—Conducted marina planning, design, and environmental permitting services for a 60-slip commercial docking facility on Little Lake Harris in Lake County, Florida. Conducted an environmental assessment to address potential water quality impacts, endangered species, archaeological resources, wetland impacts, and mitigation. A hydrographical and dispersion study was conducted to evaluate water quality impacts. An ERP application was prepared.

Project Manager; Thermal Mixing Zone Study, Nebraska Public Power District—Conducted thermal mixing zone study for the Canaday Station on Tri-County Canal near Lexington, Nebraska. CORMIX-GT was used to simulate the thermal mixing. Water temperature profile data collected in 2 years were used to calibrate the model.

Task Manager; Hydraulic Assessment, FPL Energy—Conducted hydraulic analysis to determine the potential hydraulic and flooding impacts of a 1.2-MGD cooling tower blowdown from Lamar Energy Center near Paris, Texas, on a small receiving stream.

Project Manager; Quality Assurance/Quality Control (QA/QC) of Flow Measurement Data at Hydraulic Structures, SFWMD—Responsible for preparation of QA/QC plan to ensure the quality of flow measurement data (QMEAS) collected at hydraulic structures. Prepared standard operating procedures to evaluate the flow data quality, identify invalid data, and correct data entry errors. Implemented the QA plan and evaluated 2,326 data records in QMEAS collected at 219 locations including spillways, culverts, and pump stations within the District. The quality of the QMEAS data is instrumental to the integrity of the District's corporate database, DBHYDRO. Responsible for the mentoring of an ECT employee providing QA/QC of flow measurement data while assigned to the SFMWD offices located in West Palm Beach, Florida.

Task Manager; Drainage Assessment, Navasota Energy—Conducted site investigation and hydraulic evaluation to provide solution to the flooding problem at the Colorado Bend Energy Center at Wharton, Texas. Evaluated the existing drainage design and recommended potential solutions.

Task Manager; Evaporation Pond Analysis, Navasota Energy—Conducted hydrologic and thermal balance analysis to evaluate the design of an evaporation pond at the Odessa Power Plant in Odessa, Texas. Used CE-QUAL-W2 model to conduct evaporation and thermal balance analysis.

Research Assistant; Flow Field and Turbulence Analysis—Performed model studies for ocean thermal energy conversion plant to investigate the flow field and turbulence characteristics near the OTEC plant. Conducted experimental studies for internal waves and stratified flow, and field investigation for a tidal inlet. Operated and calibrated constant temperature hot-film anemometry and various electronic instruments.

Research Assistant; Floating Power Plant Wave Analysis, Coastal and Oceanographic Engineering Research Laboratory—Performed physical model studies for the response of an offshore floating nuclear power plant to long waves. The added mass of the floating platform and the resonant mechanism in the breakwater structure were investigated.

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Education

M.E.	Coastal and Oceanographic Engineering University of Florida	1975
B.S.	River and Harbor Engineering National Taiwan Ocean University	1971

Registrations/Certifications

Professional Engineer, Florida, Civil, No. PE0030688
Professional Engineer, Florida, Structural, No. PE0030688
Professional Engineer, South Carolina, Civil, No. 9979
Professional Engineer, Georgia, Civil, No. 14794
Professional Engineer, North Carolina, Civil, No. 16897
Professional Engineer, Texas, No. 98830
Professional Engineer, Virginia, No. 0402 045296

Affiliations

American Society of Civil Engineers
Member of Stormwater Management Model User's Group

Publications

Chou, I.B. 1975. An experimental investigation to the interfacial waves generated by lower frequency internal waves. M.E. thesis, University of Florida.

Chou, I.B. 1975. Interfacial waves generated by finite amplitude internal waves. Transaction, American Geophysical Union, 56(12):1005.

Chou, I.B. 1976. Flow field near an ocean thermal energy conversion plant. Coastal Engineering Conference, 4:3068.

Chou, I.B. 1976. Flow field near an OTEC plant. Report 76/006, Coastal and Oceanographic Engineering Archives, University of Florida.

Chou, I.B. 1977. The instability of internal gravity waves. Technical Report No. 32, Coastal and Oceanographic Engineering Archives, University of Florida.

Chou, I.B. 1981. Calibration of the RECEIV model for a well mixed tidal estuary using equilibrium procedure. Proc. Stormwater and Water Quality Management Modeling Group Meeting, Niagara Falls, Canada.

Winton, T.C., Chou, I.B., Powell, G.M., and Crane. J.D. 1981 Analysis of coastal sediment transport processes from Wrightsville Beach to Fort Fisher, North Carolina. Miscellaneous Rep. No. 81-6, Coastal Engineering Research Center.

Chou, I.B., Powell, G.M., and Winton, T.C. 1983. Assessment of beach fill performance by excursion analysis. Proc. of the Third Symposium on Coastal and Ocean Management, ASCE, San Diego, California.

Chou, I.B. and Danek, L.J. 1985. Hydrodynamics and Water Quality Modeling in An Estuary with Multiple Boundaries. Proc. Stormwater Management Models Users Group Meeting, Gainesville, Florida, 1985.

Dickinson, R.E., Chou, I.B., and Ramsey, F.V. 1986. A RECEIV-II expert system in Turbo Pascal. Proceedings of Stormwater and Water Quality Model Users Group Meeting.

Curriculum Vitae (Brief)

Jeffrey E. Hill
Tropical Aquaculture Laboratory, University of Florida
Ruskin, FL 33570

Education:

2003	PhD	UF Department of Fisheries and Aquatic Sciences
1998	MS	UF Department of Fisheries and Aquatic Sciences
1991	BS	Department of Biology, University of North Alabama

Years of Experience: UF: 10 Other Firms: 5

Dr. Hill will conduct fish collections, identification, and photography. He has extensive experience with fish sampling and boat electrofishing. Since 1996, he has regularly sampled south Florida canals with boat electrofishing. Dr. Hill has considerable expertise in fish identification and identifies on average 30-45 fish lots (one or more individual fish) for state and federal agencies, county extension faculty, and Sea Grant faculty each year. Dr. Hill has taken over 4,000 digital photographs of native and non-native fishes, aquatic habitats, and fish sampling in the last 6 years.

Professional Experience:

2012-present	Associate Professor and Extension Specialist, SFRC Program in Fisheries and Aquatic Sciences, University of Florida
2006-2012	Assistant Professor and Extension Specialist, SFRC Program in Fisheries and Aquatic Sciences, University of Florida

Professional Services Provided

Biological Monitoring and Assessments

- Fish surveys

Selected Publications (of 63 publications):

Hardin S, JE Hill. 2012. Risk analysis of barramundi aquaculture in Florida. North American Journal of Fisheries Management 32:577-585.

Lawson LL Jr, JE **Hill**, L Vilizzi, S Hardin, GH Copp. 2012. Revisions of the Fish Invasiveness Scoring Kit (FISK) for its application in warmer climatic zones, with particular reference to peninsular Florida. Risk Analysis DOI: 10.1111/j.1539-6924.2012.01896.x

Thompson KA, JE Hill, LG Nico. 2012. Eastern mosquitofish resists invasion by nonindigenous poeciliids through agonistic behaviors. Biological Invasions 14:1515-1529.

Hill JE 2011. Emerging non-native species issues for aquaculture. USDA-Southern Regional Aquaculture Center, Stoneville, Mississippi.

Hill JE, AR Kapuscinski, T Pavlowich. 2011. Fluorescent transgenic zebra danio more vulnerable to predators than wild-type. Transactions of the American Fisheries Society 140:1001-1005.

Hill JE 2009. Risk analysis for non-native species in aquaculture. USDA-Southern Regional Aquaculture Center, Stoneville, Mississippi.

Hill JE 2008. Non-native species in aquaculture: terminology, potential impacts, and the invasion process. USDA-Southern Regional Aquaculture Center, Stoneville, Mississippi.

Hill JE, P Zajicek. 2007. National aquatic species risk analysis: a call for improved implementation. Fisheries 32:530-538.

Select Professional Service:

President, Introduced Fish Section of the American Fisheries Society (2009-2012)
Member, Governing Board, American Fisheries Society (2009-2012)
Associate Editor, Biological Invasions
Associate Science Editor, Fisheries

Louis H. Motz, PhD, PE, D.WRE UNIVERSITY OF FLORIDA

ASSOCIATE PROFESSOR, DEPARTMENT OF CIVIL AND COASTAL ENGINEERING

Education

PhD	1970	Water Resources Engineering	Vanderbilt University
MS	1969	Water Resources Engineering	Vanderbilt University
BE	1966	Civil Engineering	Vanderbilt University

Registration: Professional Engineer in Florida
Certification: Diplomate, Water Resources Engineer (D.WRE), American Academy of Water Resources Engineers (American Society of Civil Engineers)

Specialization:

Analytical and Numerical Modeling of Groundwater Systems, including Variable-Density Groundwater Flow and Transport and Saltwater Intrusion in Coastal Aquifers

Professional Services Provided:

Environmental Monitoring and Assessments

- Groundwater (levels and quality)
- Hydrogeologic Characterizations (geophysical logging, aquifer testing, formation interpretation)

Technical Analysis (MFLs, Water Reservations, etc.)
Assessment of Ecosystem Responses to Hydrologic and Nutrient Inputs Using Empirical Data and Mechanistic Modeling
Statistical Analysis and Water Use Permitting Database Assistance for the Completion of the Annual Estimated Water Use Report
Statistical Modeling
Expert Witness and Independent Peer Review
Public Notification, Public Meetings and Presentations to the Governing Board

Selected Project Experience:

Florida as a Laboratory for Global Urbanization, Sea Level Rise, and Future Health Risks of Drinking Water Sources. 2012-2013. Using SEAWAT to develop a variable-density groundwater model as a planning tool in Broward County to evaluate changes in chloride, TDS, and bromide concentrations due to projected sea-level rise, pumping increases, and changes in aquifer recharge resulting from urbanization and climate change.

Pilot Study of Groundwater-Level Monitoring Network Design for the Upper Floridan Aquifer. 2012. South Florida Water Management District, West Palm Beach, FL. Designed a groundwater-level monitoring network for the Upper Floridan aquifer within the boundaries of the South Florida Water Management District that recommends the number and locations of monitoring wells that will provide equivalent or better quality data compared to the existing monitoring network.

Groundwater Flow Model for Flagler and Parts of Adjacent Counties. 2010. Palm Coast Utilities, Palm Coast, FL. Developed a groundwater flow model for Flagler County and adjacent counties using MODFLOW-2000, utilizing Groundwater Vistas to prepare input and output files and to run MODFLOW. The model, which represents seven aquifer and confining units in the study area, was calibrated for average 1995 conditions and used to simulate pre-development conditions and to predict the impacts of pumping in four regulatory scenarios requested by the St. Johns River Water Management District.

Lake Wimauma: A Hydrologic Evaluation to Investigate the Minimum Lake Level. 2008-2009. Water & Air Research, Inc., Gainesville, FL. As part of investigation of Lakes Wimauma and Carlton in Hillsborough County conducted for the Southwest Florida Water Management District, Brooksville, Florida, compiled long-term lake-level, groundwater, rainfall, and potential evapotranspiration data and developed polynomial approximations for lake-surface area and volume versus stage relations. Also determined monthly water-budget components for changes in lake storage and inflows and outflows as part of water-budget calculations performed for both lakes.

Drawdown Impacts Due to Proposed Pumping at Well TP-1 at the Tampa Bay Water Regional Surface Water Treatment Plant. 2009. Tampa Bay Water, Clearwater, FL. Investigated the mitigating effect that the Tampa Bypass Canal will have on drawdowns in the Upper Floridan aquifer adjacent to the Hillsborough River Groundwater Basin due to proposed pumping at the Tampa Bay Water Regional Surface Water Treatment Plant. The investigation included simulating the hydraulic connection between the Tampa Bypass Canal and the underlying Upper Floridan aquifer by an increased vertical hydraulic conductivity in the confining unit between the canal and the aquifer and using analytical and numerical modeling techniques to estimate drawdowns for four pumping scenarios.

Screening Level Evaluation of the Potential Influence of Proposed Surface-Water Withdrawals on Groundwater Discharge, 2008. St. Johns River Water Management District, Palatka, FL. Calculated changes in groundwater discharge and chloride flux that will occur into the St. Johns River (SJR) and Lower Ocklawaha River (LOR) due to proposed surface-water withdrawals. Simulations were performed using existing MODFLOW groundwater flow models to calculate net groundwater discharge and chloride flux that will occur from the Upper Florida aquifer into relevant segments of the SJR and LOR including both diffuse upward leakage and point discharges into major springs and also to estimate base-flow reductions that have occurred due to groundwater pumping in the study area.

E. Lynn Mosura-Bliss, MA, PWS

SENIOR SCIENTIST

EDUCATION

MA, Zoology, University of South Florida
BA, Zoology, University of South Florida

CREDENTIALS/ORGANIZATIONS

- Professional Wetland Scientist, Society of Wetland Scientists
- American Planning Association
- Wetland Assessment Procedure (WAP)
- FDEP Qualified Stormwater Management Inspector

YEARS OF EXPERIENCE With Water & Air: 31 With Other Firms: 5

CAREER SUMMARY

Ms. Mosura-Bliss is an ecologist with experience conducting biological assessments and wildlife habitat characterizations throughout the Southeast. She has conducted over 250 initial and secondary assessments of vegetation communities and wildlife conditions on sites from Nassau County to Dade County, Florida. She is skilled in upland and wetland mapping and endangered and threatened species surveys. She has assisted with the ecological inventory and development of nature-based parks in north and central Florida. She has performed monitoring of State of Florida conservation lands, prepared master plans for city and county parks, developed interpretative materials for nature trails, and conducted numerous gopher tortoise surveys and relocations.

PROFESSIONAL SERVICES PROVIDED

Environmental Monitoring and Assessments

- Surface Water (levels, discharge, and quality)
- Collection and/or Analysis of Hydrologic, Piezometer, or Other Types of Data

Biological Monitoring and Assessments

- Fish, Avian, and Herpetofauna Surveys
- Habitat Mapping and Assessments
- Specific Species Surveys
- Jurisdictional Delineations
- Submersed, Emergent, Wetland and Riparian Vegetation Surveys

Soils Assessment
Cultural Resource Assessments
Development of Effective Water Quality Monitoring Plans
Univariate and Multivariate Statistical Analysis and Modeling
Environmental Permitting Support
Expert Witness and Independent Peer Review
Public Notification, Public Meetings and Presentations to the Governing Board
Project Management and Quality Assurance/Control

SELECTED PROJECT EXPERIENCE

Ecological Monitoring of Potable Water Wellfields, Hillsborough, Pasco, Pinellas Counties, FL, Tampa Bay Water. Project Biologist responsibilities included establishing monitoring stations, performing wetland monitoring, analyzing wildlife data, and preparing annual reports.

Wetland Assessment Procedures (WAP) Transect Setup, Pasco and Hillsborough County, FL, SWFWMD. Project Biologist responsibilities included establishing elevation controls for vegetation transects, documenting site specific conditions, conducting wetland monitoring and preparing reports.

Minimum Flows and Levels and Benthic Macroinvertebrate Spatial Distribution Evaluation of the Crystal River and Kings Bay, FL, Citrus County, FL, SWFWMD. Project Biologist responsibilities included conducting literature search and synthesis, performing data analysis and report preparation.

Minimum Flows and Levels and Benthic Macroinvertebrate Spatial Distribution Evaluation for the Pithlachascotee River, SWFWMD. Project Biologist responsibilities include conducting literature search and synthesis, performing data analysis and report preparation.

Management Plan for Lake Frances Preserve, Hillsborough County, FL, Hillsborough County Parks, Recreation and Conservation Services. Project Manager and Planner responsibilities included field site inspection, coordination and communications with staff, and plan preparation for a 1,664-acre preserve in northwest Hillsborough County.

Lake Dan Preserve Land Management Plan, Location: Hillsborough County, FL, Hillsborough County Parks, Parks, Recreation and Conservation Department. Project Manager/Biologist responsibilities included client communication and coordination, field survey work, data analysis and report preparation.

Restoration and Landscape Plan Implementation for Circle B-Bar Reserve, Polk County, FL, Polk County Natural Resources Division. Project Manager responsibilities included client communication; subcontract administration and oversight of contractors providing plants, mulch, aerial herbicide application, and mechanical planters. Ms. Mosura-Bliss also organized planting teams, provided on-site supervision of field crews, planned for field logistics , prepared a safety and contingency plans.

Endangered and Threatened Species Survey for North Belle Terre Park, Flagler County, FL, Bellomo-Herbert & Company, Inc. Project Manager responsibilities included conducting reconnaissance and gopher tortoise burrow survey, mapping gopher tortoise burrow locations with GPS, and report preparation.

David L. Evans, PhD, PWS

Senior Scientist

Education

PhD, Environmental Engineering Sciences, University of Florida
MS, Biology (Fisheries Management), Tennessee Tech. University
BS, Biology, Earlham College

Credentials/Organizations

- Professional Wetland Scientist, Society of Wetland Scientists
- FDEP-certified in SCI, LCI, and Bioreconnaissance (Biorecon)
- OSHA Health and Safety Training
- Florida Lakes Management Society
- N. American Lakes Management Society
- North American Benthological Society
- Founder, Past President, Past Executive Committee Member, Florida Association of Benthologists
- Florida Entomological Society

Years of Experience

With Water & Air: 32 With Other Firms: 5

Career Summary

Dr. Evans has experience in the field of aquatic and wetland ecology. His areas of expertise include water quality compliance monitoring and documentation, fish and macroinvertebrate surveys, mapping and quantitative characterization of aquatic macrophyte communities, wetland mitigation design and evaluation, natural resource audits, contamination audits, and biological inventories. He has also participated in developing biological aspects of environmental documentation for numerous Environmental Assessments, Environmental Impact Statements, Planned Unit Developments, and Developments of Regional Impact. Dr. Evans has presented numerous technical workshops and scientific papers related to wetland permitting and biological monitoring in aquatic and wetland systems. He has authored or co-authored over 100 technical reports, articles, and scientific papers.

Professional Services Provided

Environmental Monitoring and Assessments

- Surface Water (levels, discharge, and quality)
- Collection and/or Analysis of Hydrologic, Piezometer, or Other Types of Data

Biological Monitoring and Assessments

- Fish, Avian, Herpetofauna, and Macroinvertebrate Surveys
- Habitat Mapping and Assessments
- Specific Species Surveys
- Submersed, Emergent, Wetland and Riparian Vegetation Surveys

Development of Effective Water Quality Monitoring Plans
Univariate and Multivariate Statistical Analysis and Modeling
Environmental Permitting Support
Expert Witness and Independent Peer Review
Public Notification, Public Meetings and presentations to the Governing Board

Project Management and Quality Assurance/Control

SELECTED PROJECT EXPERIENCE

Ecological Monitoring of Potable Water Wellfields, Hillsborough, Pasco, Pinellas Counties, FL, Tampa Bay Water. Project Biologist responsibilities included performing fieldwork, analyzing hydrobiological data, and preparing reports.

Environmental Water Sampling and Analysis, 11-County North Florida Area, SRWMD. Benthic Invertebrate Identification Expert responsibilities included benthic invertebrate enumeration for samples collected within the project area.

Minimum Flows and Levels and Benthic Macroinvertebrate Spatial Distribution Evaluation of the Crystal River and Kings Bay, FL, Citrus County, FL, SWFWMD. Project Manager responsibilities included client communication, project coordination, data analysis, and report preparation.

Minimum Flows and Levels and Benthic Macroinvertebrate Spatial Distribution Evaluation for the Pithlachascotee River, Pasco County, FL, SWFWMD. Project Manager responsibilities included client communication, project coordination, data analysis, and report preparation.

Minimum Flows and Levels and Mollusc Survey for the Homosassa River, FL, Citrus County, FL, SWFWMD. Project Manager responsibilities included client communication, project coordination, data analysis, and report preparation.

Biological Assessment for Determining Minimum Flows and Levels, Shell Creek, Charlotte County, FL, Mote Marine Laboratory. Project Manager responsibilities included supervision of core and sweep sample identification and enumeration and taxonomic QA/QC, client communication, project coordination, data review, and report preparation.

Minimum Flow Determination of the Alafia River, Hillsborough County, FL, Mote Marine Laboratory. Project Manager responsibilities included invertebrate counts and identifications, QA checks, data analysis and interpretation, client communication, project coordination, and report preparation.

Determination of Submerged Aquatic Vegetation Light Requirements in the Lower St. Johns River, Various Locations in East Florida, SJRWMD. Project Manager responsibilities included planning and design, use of Li-Cor instruments to measure light attenuation, overall management of data collection, analysis evaluation, client communication, project coordination, and reporting.

Kirk M. Stage, BS, PWS

SENIOR SCIENTIST

EDUCATION

BS, Botany, University of Florida

CREDENTIALS/ORGANIZATIONS

- Professional Wetland Scientist
- Certified Wetland Delineator
- FWC Gopher Tortoise Authorized Agent
- Stormwater Management Inspector-FDEP
- Wetland Assessment Procedure Training (WAP)

YEARS OF EXPERIENCE

Years with Water & Air: 32 Years with Other Firms: 4

CAREER SUMMARY

Since 1978 Mr. Stage has worked as a biologist in Florida and the southeastern United States environments. While fieldwork is a significant portion of his professional work, he also has served as manager on numerous projects. He has performed biological site evaluations on small and large tracts of land. His field experience, aerial photographic interpretation skills, and land-use mapping capabilities provide an excellent foundation for biological projects. He has also performed site-specific surveys for protected plant and animal species; designed and implemented cost-effective environmental monitoring programs for permit compliance; and managed numerous Environmental Assessments and Environmental Impact Statements for compliance with the National Environmental Policy Act (NEPA).

PROFESSIONAL SERVICES PROVIDED

Environmental Monitoring and Assessments

- Surface Water (levels, discharge, and quality)
- Collection and/or Analysis of Hydrologic, Piezometer, or Other Types of Data

Biological Monitoring and Assessments

- Fish, Avian, Herpetofauna and Phytoplankton Surveys
- Habitat Mapping and Assessments
- Specific Species Surveys
- Jurisdictional Delineations
- Submersed and Emergent Wetland and Riparian Vegetation Surveys

Soils Assessment
Development of Effective Water Quality Monitoring Plans
Environmental Permitting Support
Expert Witness and Independent Peer Review
Public Notification, Public Meetings and Presentations to the Governing Board
Project Management and Quality Assurance/Control

SELECTED PROJECT EXPERIENCE

Ecological Monitoring of Potable Water Wellfields, Tampa Bay Water, Hillsborough, Pasco, Pinellas Counties, FL. Project Manager responsibilities included managing the project, performing wetland vegetation surveys, analyzing hydrologic data, preparing reports, habitat mapping, expert witness for administrative hearings and supported the client in permit applications.

Consumptive Use Permit Renewal for Brooker Creek Preserve Environmental Augmentation, Tampa Bay Water, Hillsborough and Pinellas Counties, FL. Project Manager responsibilities included preparing CUP permit preparation, South Florida Water Management District correspondence and meetings, and public meeting participation.

Wetland Assessment Procedure (WAP) Transect Setup, Southwest Florida Water Management District (SWFWMD), Pasco and Hillsborough Counties, FL. Project Manager/Field Biologist responsibilities included wetland survey, agency meetings, data analysis, quality assurance, and report preparation.

Aquatic Habitat Survey for Jacksonville Harbor, USACE- Jacksonville District, Jacksonville FL. Project Manager responsibilities involved mapping submersed, emergent, and riparian habitats in the 595-acre study area, jurisdictional delineations, environmental permitting support through calculating mitigation acreages for proposed impacts using GIS analysis of field data.

NEPA Environmental Impact Statement for the Continued Use of the Pinecastle Range (Ocala National Forest) as a Live-Fire Bombing Range, US Navy Southern Division, Marion and Lake Counties, FL. Project Manager and Biologist responsibilities included project management, data compilation and analysis, report writing, public notification, public meetings, and agency meetings.

District-wide Mitigation Services Contract, Florida Department of Transportation (FDOT) District V, throughout Florida. Project Biologist responsibilities included wetland vegetation surveys, data analysis, permit support, maintenance recommendations, and report preparation.

Wetland Evaluation for Mitigation Determination and Support Services, St. Johns River State College, St. Johns County, FL. Project Biologist responsibilities included field work, habitat mapping and assessments, permit support, UMAM evaluations, agency meetings, and planting plan preparation.

Ecological Site Characterization of Smith and Little Ranch for NRCS, Jones Edmunds & Associates, Inc., Okeechobee County, FL. Field Biologist responsibilities included field work and report and map preparation. The large-scale habitat mapping and assessment information was collected to assist in the development of a restoration plan to restore degraded wetlands.

Douglas G. Strom, BS

SENIOR SCIENTIST

EDUCATION

BS, Applied Biology, Georgia Institute of Technology

CREDENTIALS/ORGANIZATIONS

- Society of Wetland Scientists
- FDEP-certified for Plecoptera, Megaloptera, Neuroptera, and Trichoptera identification
- FDEP Riparian Habitat Certification
- FDEP-certified for SCI, LCI, and Bioreconnaissance (Biorecon)
- First Aid, CPR, and Bloodborne Pathogen Training/Certification
- OSHA Health and Safety Act Training "Hazwoper" training
- OSHA RCRA Hazardous Waste training
- Florida Wetlands: Successful Creation, Restoration & Enhancement Training Course

YEARS OF EXPERIENCE With Water & Air: 13 With Other Firms: 23

CAREER SUMMARY

Mr. Strom is an aquatic ecologist specializing in estuarine benthic macroinvertebrate taxonomy. He is skilled in performing data analysis, including statistical analysis, and writing reports including articles for submission to peer-reviewed literature; biological and water quality sampling, and sample processing. He has experience in environmental monitoring, research and assessment, involving aquatic biological monitoring using macroinvertebrates, fish, plants, and other organisms in relation to physico-chemical, biological, and water quality conditions. He has participated in planning and implementing multi-disciplinary water quality studies involving integrated biological and water quality sampling, and supervised technician teams working on these projects. He is also experienced in regulatory enforcement and permitting, especially as it relates to water quality, water quality regulations, and biological monitoring.

PROFESSIONAL SERVICES PROVIDED

Environmental Monitoring and Assessments

- Surface Water (levels, discharge, and quality)

Biological Monitoring and Assessments

- Fish, Avian, Herpetofauna, Phytoplankton, and Macroinvertebrate Surveys
- Habitat Mapping and Assessments
- Specific Species Surveys

Development of Effective Water Quality Monitoring Plans
Univariate and Multivariate Statistical Analysis and Modeling
Environmental Permitting Support
Public Notification, Public Meetings and Presentations to the Governing Board
Project Management and Quality Assurance/Control

SELECTED PROJECT EXPERIENCE

Ecological Monitoring of Potable Water Wellfields, Hillsborough, Pasco, Pinellas Counties, FL, Tampa Bay Water. Project Environmental Scientist responsibilities included statistical analysis of wildlife observation data.

Environmental Water Sampling and Analysis, 11-County North Florida Area, SRWMD. Project Biologist responsibilities included data entry and automated statistical index calculation for benthic invertebrate data from samples collected within the project area.

Benthic Macroinvertebrate Spatial Distribution and Minimum Flows and Levels Evaluation of the Crystal River and Kings Bay, Citrus County, FL, SWFWMD. Project Scientist responsibilities included macroinvertebrate identification, QA, data management, statistical analysis, including univariate and multivariate procedures, data interpretation, and report writing.

Benthic Macroinvertebrate Spatial Distribution and Minimum Flows and Levels Evaluation of the Pithlachascotee River, Pasco County, FL, SWFWMD. Project Scientist responsibilities included macroinvertebrate identification, QA, data management, statistical analysis, including univariate and multivariate procedures, data interpretation, and report writing.

Mollusc Survey for Establishing and Maintaining Minimum Flows and Levels in the Homosassa River, Citrus County, FL, SWFWMD. Project Taxonomist responsibilities included macroinvertebrate identification, QA, and data management.

Minimum Flows and Levels Evaluation of the Chassahowitzka, Manatee, and Braden Rivers, Citrus and Manatee Counties, FL, Mote Marine Laboratory. Project Biologist responsibilities included performing benthic invertebrate identifications and QA/QC checks.

Biological Assessment for Determining Minimum Flows and Levels, Shell Creek, Charlotte County, FL, Mote Marine Laboratory. Project Biologist responsibilities included taxonomic identification and QA/QC.

Assessment of the Impact of Lead Pellets Upon Benthos in a Saline Environment, St. Augustine, FL, St. Augustine Rod and Gun Club (Sid Ansbacher). Project Biologist/Field Team Leader responsibilities included project planning, leading fieldwork, macroinvertebrate identification, data analysis, and report preparation.

Aquatic Species Diversity List for Seminole Tribe of Florida, Broward and Glades County, FL, Seminole Tribe of Florida. Project Manager responsibilities included leading field work, aquatic species identification, data analyses, and report preparation.

Biological Assessment of a Citrus Concentrate Plant Wastewater Discharge, St. Joseph Sound, Panama City, FL, Grove Scientific. Project Biologist responsibilities included macroinvertebrate identification, quality assurance, and data management.

Charles R. Fellows, MS

QAO/Environmental Chemist

Education

MS, Water Chemistry, University of Florida
BS, Biology, Eckerd College

Credentials/Organizations

- Health and Safety Training: OSHA (29 CFR 1910.120) Supervisor Training
- Ecological and Human Health Risk Assessment Course (U.S. Army Corps of Engineers--DOTS)
- Member, Society of Environmental Toxicology and Chemistry

Years of Experience With Water & Air: 33 With Other Firms: 2

Career Summary

Mr. Fellows is an environmental chemist with experience in chemical analytical laboratory supervision and coordination; contamination assessments; surface and groundwater quality assessments; monitoring plan design; data review and interpretation for waters, sediments, soils, wastes, and biological tissues; collection of water, soils, sediments, and biological samples for chemical, physical, and bioassay testing; project management, and report preparation. He is the corporate Quality Assurance Officer (QAO) for Water & Air and has served as a project QAO under contracts for other firms.

Professional Services Provided

Environmental Monitoring and Assessments

- Groundwater (levels and quality)
- Surface water (levels, discharge, and quality)
- Collection and/or analysis of hydrologic, piezometer, or other types of data
- Laboratory analysis (sediment)

Soils Assessment
Development of Effective Water Quality Monitoring Plans
Environmental Permitting Support
Expert Witness and Independent Peer Review
Public Notification, Public Meetings and Presentations to the Government
Evaluation of historic, current and future water budgeting
Project Management and Quality Assurance/Control

Selected Project Experience

Lake Wimauma Hydrologic Evaluation for Minimum Lake Level Determination, Hillsborough County, FL, SWFWMD. Project Manager responsibilities included fieldwork, data analysis, and report preparation.

Ecological Monitoring of Potable Water Wellfields, Hillsborough, Pasco, Pinellas Counties, FL, Tampa Bay Water. Project Environmental Chemist responsibilities included performing QA/QC, and preparing reports.

Environmental Water Sampling and Analysis, 11-County North Florida Area, SRWMD. Quality Assurance Officer responsibilities included review and evaluation of in-situ and chemical data.

Determination of Submerged Aquatic Vegetation Light Requirements in the Lower St. Johns River, Various Locations in East Florida, SJRWMD, Quality Assurance Officer. Project responsibilities include experimental design and quality control/assurance review of the data.

Predredging Sediment Evaluation of Tampa Harbor, Tampa, FL, USACE. Project Manager responsibilities included field work, data analysis, subcontractor coordination and report preparation.

Hydrographic, Bathymetric, and Limn logical Investigation at Lake Harris, Florida, for Proposed Dock, Leesburg, FL, Atlanta Housing Partnership, LLP. Project Manager responsibilities included developing work scope after discussion with regulatory personnel; designing and constructing drogues; collecting field data collection and water samples; interpreting dye monitoring and water quality measurement data; and writing final report.

Florida Statewide Stream Condition Index Evaluation and Water Quality Monitoring, Florida Peninsula, FDEP, Assistant Project Manager/Quality Assurance Officer. Project responsibilities included leading field teams, review and auditing of procedures by Water & Air field personnel, and instrument maintenance.

Key West Background Turbidity Monitoring, City of Key West, FL. Project Manager and Field Team Leader responsibilities included mobilizing the multiple field teams; coordinating with Naval Base security, Coast Guard, and the City of Key West; constructing, servicing, and removing monitoring stations and instrumentation; reducing, evaluating, and transmitting collected data; maintaining all field documentation; providing the client with interim reports and photographs from the field; measuring water current speed and direction; overseeing preparation of the graphical presentation of data; and writing the final report.

Predredging Sediment Evaluation for Alafia River, Tampa, FL, PPB Environmental Laboratories, Inc. Project Manager responsibilities field work, data analysis, subcontractor coordination and report preparation.

Florida Statewide Stream Condition Index Evaluation and Water Quality Monitoring, Florida Peninsula, FDEP. Assistant Project Manager/Quality Assurance Officer responsibilities included leading field teams, review and auditing of procedures by Water & Air field personnel, and instrument maintenance.

APPENDIX B

PEER REVIEW COMMENTS

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Name and Affiliation of Reviewer: Ivan B. Chou, IBC Consulting

Discipline specialty covered by this review: Water Resources and Coastal Engineering

This document is for the use of project peer reviewers retained by the Suwannee River Water Management District (District) for the purpose of providing a technical peer review of a District report, including manuscripts prepared by District staff and consultants.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT:

Task 1. **Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

A. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:

1. The data and information used were properly collected;
2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and SRWMD hydrologic monitoring networks.

B. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:

1. If the assumptions are clearly stated, reasonable and consistent with the best information available; and
2. Assumptions were eliminated to the extent possible, based on available information.

C. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;
2. The procedures and analyses incorporate appropriate factors;
3. The procedures and analyses were correctly applied;
4. Limitations and imprecision in the information were reasonably handled;
5. The procedures and analyses are repeatable;
6. Conclusions based on the procedures and analyses are supported by the data.

Task 2. **If a proposed method used in the MFL report is not scientifically reasonable, the CONTRACTOR shall:**

A. Deficiencies: List and describe scientific deficiencies;
B. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
C. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of time and effort required to develop and implement; and
D. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and Peer Reviewers shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the DISTRICT's development of MFLs. CONTRACTOR and Peer Reviewers shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the scope of work. These givens include:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The determination of the baseline from which "significant harm" is to be determined;
3. The definition of what constitutes "significant harm" to the water resources or ecology of the area

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Instructions:

1. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
2. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(5), in the discipline noted above.
3. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer:	Date of Peer Review:
Jon B. Chan	11/17/2015

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc./Steve Peene, ATM	
Signature of Responder:	**Date of Response:** January 8, 2016

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
1	p.90, 1st line	No	References about EFDC and ADCIRC models should be provided.	Please provide references.	References will be added
2	p.90, 4th par, 2nd line	No	Aucilla ADVM was not defined.	Please define Aucilla ADVM.	ADVM will be defined
3	p.90, 4th par	No	The locations of Aucilla ADVM and Lamont were not presented.	Please show these two locations on a map.	Figure 6 will edited to include Aucilla ADVM and Lamont
4	p.90, Equation (6)	No	How well was the correlation?	Please consider showing a correlation graph.	New Appendix with model output and correlation graphs will be added
5	p.90, 5th par	No	Figure 57 seems to indicate that the FDCs for these two time periods were actually dissimilar, especially at the lower percent exceedance range. Visual comparison in the high percent exceedance range is not possible because of the plot scale.	Please verify. Please consider providing a comparison table for quantitative presentation.	Text will be added to indicate that the extremes are not used in MFL analysis and that the most representative 2 year period was used.
6	p.92, 1st sentence	No	This sentence may not be grammatically correct.	Please consider rewording.	Sentence will be revised

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
7	p.92, 2nd par, 6th line	No	IFIM was not defined.	Please define.	IFIM definition will be added
8	p.92, Section 4.3	No	The report used the "MFL" and "MFLs" interchangeably.	Please use a consistent term.	"MFLs" will be used consistently
9	p.92, Section 4.3	No	Various MFLs assessment methods were described in this section. However, it did not state which method was used for AWSS.	Please present the method used specifically for AWSS MFLs.	The last paragraph in section 4.3 explains the method used for AWSS MFLs
10	Appendix A, p.1-1, 2nd par, 3rd line	No	What is "apex of tidal prism"? There ought to be a better and more descriptive phrase to describe the phenomenon.	Please consider rewording.	Will change "apex" to "magnitude"
11	Appendix A, p.1-1, 2nd par, 5th line	No	Where is Nutall Rise?	Please mark the location of Nutall Rise on a map. Perhaps also briefly describe the physical nature of the rise.	Will identify Nutall Rise and some of the other key locations on Figures 1-1a and 1-1b.
12	Appendix A, p.1-2, 2nd line	No	A reference should be provided for GCSM model.	Please provide the reference(s).	Will provide reference

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
13	Appendix A, 2nd par, 3rd line	No	A reference should be provided for the EFDC model.	Please provide the reference(s).	Will provide references
14	Appendix A, p.1-3, Figure 1-1a	No	The location of Nutall Rise should be depicted.	Please mark Nutall Rise location on the map.	See response on Comment 11.
15	Appendix A, p.2-1, 2nd sentence	Yes	Were the floodplains in the upper reach of the study area included in the model as storage areas?	Please clarify.	Floodplains in portions of the upper reach were included as shown on Figure 2-2 of the grid. Sufficient "storage areas" which represent the impacts of the flooplain areas, were included so as to accurately simulate the tidal prism moving into the system.
16	Appendix A, p.2-1, 2nd par, 4th line	No	John Hamrick's publication(s) on EFDC model should be referenced.	Please provide the reference(s).	Will provide the references.

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
17	Appendix A, p.2-1, last par, 2nd line	No	A reference should be provided for the Blumberg-Mellor model.	Please provide the reference(s).	Will provide the references
18	Appendix A, p.2-2, Section 2.2	No	How many horizontal and vertical grid cells are there in the model? What were the maximum and minimum grid dimension? What are the maximum depths in the offshore grid and the river grid? What was the simulation timestep?	Please consider providing the basic information.	These specific information requests will be added to the text in the Appendix A report.
19	Appendix A, p.2-2, 2nd par, 9th line	No	Was the offshore area near the model boundary large enough to accurately simulate the interaction between the river flow and the nearshore/offshore tidal dynamics near the river mouth?	Please clarify.	The offshore area was developed to allow accurate simulation of the interaction between the river flow and the nearshore/offshore tidal dynamics at the mouth. The boundary matching at the mouth which showed good agreement

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
					between the model and the data for salinity reflects that this area was sufficient.
20	Appendix A, p.2-2, 2nd par, last line	No	Where are Ward Island and Little Ward Island?	Please mark them on a map.	These features will be marked on Figure 1-1a.
21	Appendix A, p.2-3 1st par	No	Figure 2-1 shows no storage area near the upstream limit of model domain. Is there any floodplain along the upper reach? If yes, would the model under-predict the salinity in the upper reach?	Please clarify.	There is floodplain area in the upper reach. The extent of the salinity intrusion in the system is limited to just above the upstream most station. This is primarily due to the relatively constant flow coming into the system even under baseflow low flow conditions and the existence of a sill type structure in the bottom just above that point.

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					Storage areas were input above this point using available DEM data of sufficient size to simulate the tidal prism passing the mid and upper stations and past the point of maximum salinity intrusion.
22	Appendix A, p.2-3, 1st par	Yes	Can the model simulate the wetting and drying of the wetland/floodplain? What would happen when the storage areas became completely dry?	Please clarify.	The model does simulate the wetting and drying anywhere in the model grid where cells would go dry based on the assigned bottom elevations. The storage areas have variable bathymetry in them which was matched to the DEM data and these flood and dry incrementally as the

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					water rises and falls. If the areas become completely dry they would then just refill when the water level came back up.
23	Appendix A, p.2-3, last par, 6th line	No	What is the relation between MLLW and NAVD88? The model is tide driven; a brief discussion about the tides in the area seems to be necessary.	Please specify. Please also specify the MSL, MHW, MLW, MHHW, and MLLW elevation in NAVD88.	A graphic will be added to the model report which shows the relationship locally (at a location where there is historic measured tides for a sufficiently long period). This will coincide with a write up describing the tidal conditions in the area per the comment.
24	Appendix A, p.2-7, 1st par	No	Were offshore water temperature and atmosphere temperature used as the	Please clarify.	Water temperature was not utilized. Generally it was found that temperature did not have

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			boundary conditions? If not, how would it affect the results?		a significant impact on the overall salinity intrusion (the parameter of interest) as its impact on density was limited in comparison to salinity. It is not believed that the inclusion would alter the results especially the relative comparisons of changes in salinity due to flow changes.
25	Appendix A, p.2-7, 2nd par, 2nd sentence	No	A primary reason of the need for spin-up is the lack of the initial conditions.	It may be helpful to explain.	Agreed, spin up is needed to allow the model to come into equilibrium. This will be explained better in the text.

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26	Appendix A, p.2-8, 1st par	No	A figure to compare the simulated water level at the river mouth and the measured water level at Station 02326570 will be helpful to assess the effectiveness of the boundary matching method and to show the difference in tidal phase between the two.	Please consider including the figure.	This graphic is already included in Section 3 as the top plot in Figures 3-2a through 3-2c. Text will be added to this section to refer the reader to these figures.
27	Appendix A, p-2-8, 2nd sentence	No	Why were no tidal amplitude adjustments made to the measured data? Because they match?	Please explain.	The matching was good without them.
28	Appendix A, p.2-8, last line	No	Do you use a ramp or other functions to connect data points from day to day (or from tidal cycle to tidal cycle)?	Please clarify.	The daily maximums were applied at each mid-day. The offshore boundary was moved out a sufficient distance to try and alleviate the tidal variations at this point and the value was to represent the salinity moving into the system during a flooding tide.

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					The choice of the maximum was based upon the assumption that that maximum represents the constant value out in the Gulf at the time. The boundary matching of the salinity then bore that assumption out as the comparisons were good.
29	Appendix A, p.2-9, 2nd bullet	No	How were the adjustment made? Using a constant multiplier for magnitude and some phase adjustment?	Please clarify.	Actually no adjustments were made to the daily maximum signal. The text will be reworded to reflect this.
30	Appendix A, p.2-9, 3rd par, 2nd sentence	No	This may not be a correct statement. Similar to the spin-up in time, the large offshore boundary region will adjust the salinity distribution by tidal dynamics. By the time the boundary salinity "propagates" to the river	Please consider rephrasing.	This is a good point. The text will be reworded.

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			mouth, the simulated vertical salinity distribution could match the measured salinity profile, if properly calibrated. It did not necessary prove that the offshore salinity profile was indeed uniform.		
31	Appendix A, p.2-9, 3rd par, 4th line	No	The offshore area did not provide GCSM input, but provided EFDC input using the GCSM output at the EFDC boundary. "MFL reduction" is not a correct or logical term.	Please considering rewording. Also, change "MFL reduction" to "flow reduction".	These statements will be reworded per the comment.
32	Appendix A, p.2-9, last sentence	No	"important area"? Do you mean only the results in this area were used for MFL assessment?	Please consider rewording.	This sentence will be reworded.
33	Appendix A, p.2-9, 3rd par	No	It appeared that two different methods (boundary matching and GCSM) were used to establish boundary condition for EFDC; one for calibration, one for assessment.	Please clearly differentiate the methods for different applications, and explain the need for using two different methods.	Two different methods were utilized. The text will be expanded to explain this better.

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34	Appendix A, p.2-9, Figure 2-5	No	It will be helpful to overlay the measured salinity at the river mouth on this figure.	Please consider including the measured salinity at the river mouth.	The measured versus simulated salinity at the mouth is presented in Section 3 in Figures 3-4a through 3-4c. Text will be added in this section to refer the reader to those figures.
35	Appendix A, p.2-10, 1st par	No	Was the freshwater contribution between the upstream model boundary and SRWMD 02326550 considered?	Please clarify.	Yes. The filtered flow measurements at SRWMD 02326550 provided the total flow passing this point and accounts for the freshwater contribution between the upstream model boundary and this location. This flow was simply added to the upstream boundary to assure the proper total flow was entering the

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					system. The additional amount of flow was not overly significant in relation to the total flow coming into the system.
36	Appendix A, p.3-4 2nd par, 1st sentence.	No	Figures 3-2a through 3-2c seemed to indicate that the model tended to over-predict the tidal amplitude when the tides propagated further upstream. It might suggest that the channel friction of the river was under-estimated. Was the bottom roughness appropriately assigned during the calibration process? In addition, these figures were not referenced in the report.	Please evaluate and introduce Figures 3-2a through 3-2c in the report.	Figures 3-2a through 3-2c were introduced at the beginning of Section 3.2. The comparison of the simulated and measured data at Nutall rise was qualified in the text due to the fact that the data actually were measured within an adjacent groundwater well and there may have been some damping in the signal. This is explained at the bottom of the first paragraph in Section 3.2. The friction

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					in the system was adjusted to balance the mean water level at Nutall Rise (which is represented well in the model) and the fluctuations at Nutall Rise to get the best calibration of water level. Given the uncertainty of the damping of the signal, the focus was more on the mean water level simulation.
37	Appendix A, p.3-7, Figures 3-3a through 3-4c	No	It is difficult to decipher these figures because of the scale. A correlation plot for each calibration parameter will be informative.	Please consider including correlation plots of simulated versus observed values for water level, flow, and salinity.	Correlation plots will be provided for the final report.

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38	Appendix A, p.3-7, 2nd par, 1st line	No	Table 3-1 was not a table of model statistics for flow calibration.	Please provide a table for flow calibration statistics.	The flow calibration statistics are presented as part of Table 3-1 with the parameter of flow identified in the table. The sentence will be reworded to state that the table includes the model statistics for the flow.
39	Appendix A, p.3-7, Figures 3-3a through 3-3f	No	The term "calculated" in the legend may mislead the reader to think those values were not real. The "calculated" values essentially were measured and required some calculation procedures as most instruments do.	Please consider rewording. Please define the calculated and the discrete flows.	The text will be reworded.
40	Appendix A, p.3-7, Figures 3-3a through 3-3f	No	Figure 3-3b and 3-3f seemed to indicate that the model-simulated flows systematically lagged behind the observed flows. Was it because of the inaccuracy of the boundary matching,	Please evaluate.	There is some lag in the flow data as observed, but calibration adjustments were not able to rectify this. The

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			or other reasons. A slight improvement of the phase could significantly improve the R^2 values.		results presented reflect the best calibration achieved. The phase lag is relatively small and the magnitudes are captured well.
41	Appendix A, p.3-10, line 7	No	Why did the maximum salinity intrusion occur during neap tide? Under the similar stream flow condition, the maximum salinity intrusion should occur during the spring tide when the tide range is largest and the flood current velocity is the strongest that pushes the salt further up the river.	Please re-examine the results, freshwater flows, and tide ranges to verify.	The data show that the maximum intrusion does occur during neap tide. This is a relatively common phenomena in systems that are strongly stratified. The mechanism is that during neap tide conditions the reduced velocities and therefore reduced turbulent mixing allows stronger stratification to occur and the "tongue" of saline water "slides"

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					further up the system driven by the stronger stratification. The author has measured this same phenomena in the Savannah River estuary and it has been found in other riverine estuaries also.
42	Appendix A, p.3-10, line 9	No	Was the sharp salinity front observed in the field or just speculation?	Please clarify.	The sharp salinity stratification was seen during vertical measurements at multiple times and locations throughout the system. The sharpness of the front can be surmised by the rapid rise and drop back to zero in salinity that occurs at the mid and for the limited time it gets

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					there at the upper station. Text will be added to the document to clarify this.
43	Appendix A, p.3-10, section 3.4	No	What are the calibration statistics for salinity?	Please provide a table for salinity calibration statistics. If the salinity error is greater than 15%, how confident are you about its ability to define the 15% reduction in habitats?	In the report text it is identified that the nature of the salinity (due to the sharpness of the front and the existence of significant periods of time where there is basically zero salinity value) did not lend itself to standard RMS type evaluations. More important is that the graphical comparisons demonstrate that the model is reasonably simulating the level of intrusion and the salinity values in the front. The

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					sharpness of the front, and the vertical and horizontal resolution that would have been required to absolutely capture the degree of sharpness would have been limiting in terms of model simulation run times and the need for extended 2-year simulation for the MFL analyses. The graphical comparisons sufficiently demonstrate that the model is able to capture the "changes" in salinity under the differing flow and tidal conditions.
44	Appendix A, p.4-1,	No	What is the grid size of the GCSM model in the vicinity of the Aucilla River mouth?	Please clarify.	The cells are on the order of 4 km per side at

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	last par, 1st sentence				the outside boundary conditions.
45	Appendix A, p-4-1, last sentence	No	For model calibration, a 90-day spin-up was used. Was a 15-day spin-up for MFL simulation sufficiently long to achieve equilibrium?	Please clarify.	For the model calibration the spin up time was 15 days not 90 days. The 90 days was the length of the period of the model calibration period, i.e. March to May.
46	Appendix A, p.4-1, Section 4.0	No	The report jumped from model scenarios to summary and conclusions, skipping the results. For a stand-alone report, the results should be presented.	Please include a result section.	Per instruction from the SRWMD the Modeling Report only contained a description of the MFL scenario runs with their input conditions and not the results. Any results and analyses presented were to be included in the primary MFL document.

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47	Appendix A, p.5-1, 4th par, line 2	No	It should be clarified that the boundary matching method was used only for model calibration and GCSM model was used to determine BCs for MFL simulation.	Please clarify.	The text will be modified to clarify this.
48	Appendix A, p.5-1, last par, 1st sentence	No	Statistical comparison of the simulated versus measured flow was not provided.	Please include a table in Section 3-3.	The statistical comparison of the measured versus simulated flow at the mid-station was included in Table 3-1.
49	Appendix A, p.5-2	No	Why was statistical comparison of the simulated versus measured salinity not provided?	Please included a table in Section 3-4.	See response to comment 43.
50	Appendix D, 1st line	No	What are the three Aucilla River MFLs.	Please state.	Language will be added to Appendix D
51	Appendix D, 1st par	No	Where are the USGS gages at Lamont, and Scanlon? Where is the Aucilla ADVM gage? Regression plots will be helpful.	Please mark the gage station locations on a map or refer to a station map in other part(s) of the MFL report. Please consider	Cross-references to the figures will be added. New appendix with

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				including the regression plots for flows at Lamont and Scanlon.	regression plots will be included.
52	Appendix D, 2nd and 3rd par, all bullet	No	It should be made clear that they are percent flow reductions, not just percent.	Please clarify.	Text will be revised
53	Appendix D, Table 1, 5th column	No	Please define "Range of Flow Available."	Please define.	Text will be added
54	Appendix E, line 4	No	What is this "projection of 5.1 inches"? Is it the sea level rise within certain time period?	Please clarify.	5.1 inches is year 2035 intermediate estimate. Text will be added for clarification
55	Appendix E, 2nd par, 1st line	No	What are these volume, bottom area and shoreline length? Are they habitat volume, etc. within certain salinity ranges?	Please clarify.	Descriptions will be added to the Appendix
56	Appendix E, 2nd par, line 2	No	5.1 inches rise from what date?	Please clarify.	20 year time period from 2015 to 2035. Text will

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					be added to Appendix E for clarification
57	Appendix E, 2nd par, all bullets	No	What were the criteria to determine the flow reduction? Was it based on 15% habitat reduction, or something else? Additionally, why was just the volume information provided? How about the bottom area and shoreline length?	Please clarify.	Text will be added for clarification. Bottom area and shoreline length information will be added to Appendix E
58	Appendix E, 2nd par, 2nd bullet	No	This statement is difficult to relate to Figure 1.	Please introduce Figure 1 and give an explanation of what it is.	Text will be added for clarification
59	Appendix E. 2nd par, 4th bullet	No	This statement is difficult to relate to Figure 2.	Please introduce Figure 2 and give an explanation of what it is.	Text will be added for clarification
60	Appendix E, Table 1 title	No	What are volume, bottom area, and shoreline lengths? Are they habitat volume with certain salinity range, or something else?	Please clarify.	Metrics will be defined in the Appendix
61	Appendix E, Table 1	No	The 1st row and 2nd row headings should be reversed for clarity. 1st	Please considering reversing 1st and 2nd rows. Please also	Table 1 will be modified

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			column should have a heading. Putting "% change from Baseline" on separate rows makes the table hard to decipher and not logically constructed.	consider reformatting Table 1 for easy interpretation. For example, place the salinity range (Habitats with 0-2 ppt Salinity, etc.) as the first row primary headings, and place baseline, sea level rise, and percent change on the second row as sub-headings, then place the volume, bottom area, and shoreline length on the left-hand column. There are other ways to do it for clearer presentation.	
62	Appendix E, Figure 1.	No	Is this for maximum or average volume?	Please clarify.	Figure 1 is 0-2 ppt salinity volume exceedance curve and shows percent of time the salinity volume is exceeded.
63	Appendix E, Figure 2.	No	Is this for maximum or average volume (according to the 3rd bullet)?	Please clarify.	Text will be added for clarification

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64	Appendix E, Figures 1 and 2	No	The exceedance curves for bottom area and shoreline length were not presented. Additionally, all the figures should be explained comprehensively, and/or refer to the proper section(s) of the MFL report(s).	Please consider including the exceedance curves for bottom area and shoreline length and provide explanation for clear interpretation.	Additional figures will be included in Appendix E
65	Appendix E, 3rd page	No	There should be a section header for references. The references listed were not in the standard format. Pagination is needed for this appendix.	Please reformat the references to be consistent with the standard convention used in other parts of the MFL report(s). Please provide pagination.	The references will be reformatted and page numbers will be added

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Name and Affiliation of Reviewer: Jeffrey E. Hill, PhD. University of Florida, School of Forest Resources and Conservation, Program in Fisheries and Aquatic Sciences

Discipline specialty covered by this review: Fish Ecology

This document is for the use of project peer reviewers retained by the Suwannee River Water Management District (District) for the purpose of providing a technical peer review of a District report, including manuscripts prepared by District staff and consultants.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT:

Task 1. **Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

A. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:

1. The data and information used were properly collected;
2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and SRWMD hydrologic monitoring networks.

B. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:

1. If the assumptions are clearly stated, reasonable and consistent with the best information available; and
2. Assumptions were eliminated to the extent possible, based on available information.

C. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;
2. The procedures and analyses incorporate appropriate factors;
3. The procedures and analyses were correctly applied;
4. Limitations and imprecision in the information were reasonably handled;
5. The procedures and analyses are repeatable;
6. Conclusions based on the procedures and analyses are supported by the data.

Task 3. **If a proposed method used in the MFL report is not scientifically reasonable, the CONTRACTOR shall:**

A. Deficiencies: List and describe scientific deficiencies;
B. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
C. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of time and effort required to develop and implement; and
D. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and Peer Reviewers shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the DISTRICT's development of MFLs. CONTRACTOR and Peer Reviewers shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the scope of work. These givens include:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The determination of the baseline from which "significant harm" is to be determined;
3. The definition of what constitutes "significant harm" to the water resources or ecology of the area

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Instructions:

4. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
5. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(5), in the discipline noted above.
6. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer:	**Date of Peer Review: 11/16/15**

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder:	**Date of Response:** January 8, 2016

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1	Fig 41, page 52; Sec. 3.1	No	Text and Fig 41 prominently feature "herbivorous fishes" within a highly simplified conceptual trophic relationship for the study area. Florida including the Aucilla-Wacissa River has few native herbivorous fishes (i.e., those that primarily consume phytoplankton, other algae, or macrophytes). Also, the detrital contribution to the trophic base is not clearly delineated.	Could be removed or an example of an herbivorous fish could be included. Several of the other are specific examples (e.g., coontail or alligator snapping turtle)	Herbivorous fish will be removed from Fig 41 and text will be revised accordingly.
2	Fig 41, page 52	No	"EPTs" are not explained. I assume that these refer to insects—Ephemeroptera, Plecoptera, and Trichoptera. Figures should be interpretable without reference to the text.	Define EPT in figure caption	Will define EPT
3	Sec 3.6.3, page 80	No	Suwannee Bass is correctly defined as an important recreational fisheries species in the system. There is speculation that Suwannee Bass is not native to the system because the first records for the species occur in the mid-1990s despite extensive	No specific action needed.	Acknowledged

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			surveys for the species in the early 1990s. Unlike many nonnative fishes in Florida, the Suwannee Bass is prized as a sport fish.		
4	Sec 3.6.3, page 80	No	Although true that no fish is currently listed as E, T, SSC, or S1, the Blackbanded Sunfish (*Enneacanthus chaetodon*) occurs in the Aucilla. This rare species is the subject of research (including current projects) concerning its population status in Florida.	Add sentence on the occurrence of this rare species in the Aucilla.	A sentence will be added with an appropriate reference
5	Sec 3.6.3, page 80	No	*Lepomis* should be italicized.	Suggest change be made	Noted; will italicize
6	Sec 3.6.3, page 80	No	The Chain Pickerel (*Esox niger*) would be the recreationally important pickerel.	Suggest changes be made	Will specify Chain Pickerel
7	Sec 3.6.3, page 80	No	Should be "brown darter or blackbanded darter." These seem to be the first use of the common names and therefore the scientific names should be included—	Suggest changes be made	Scientific names will be included

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			Etheostoma edwini and *Percina nigrofasciata*		
8	Sec 5.2.1, Page 99, last 2 sentences of 2nd paragraph	No	Should be clearer that the Neubauer et al. (2008) report is the "SJRWMD criterion" referenced in the next sentence.	Suggest changing the next to last sentence of the 2nd paragraph to "The SJRWMD developed a fish passage criterion of…" and use the Neubauer et al. paper as the citation.	Will revise accordingly
9	Sec 5.2.1, Page 99, 3rd paragraph	No	If a flow of 51 cfs at Lamont is equaled or exceeded 60% of the time, then fish passage should be unimpaired for that period. The next sentence states that fish passage is unimpaired only about 40% of the time. This should be impaired for 40% (39.8%) of time.	Suggest change be made	Will change unimpaired in next-to-last sentence to impaired
10	Sec 5.2.2.3, page	No	"High flows" should be "high water levels" when referring to marsh habitat.	Suggest change be made	Will replace flows with water levels

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	106, 2nd paragraph				
11	Sec 5.2.2.3, page 106, 2nd paragraph	No	No "a" needed for Hill and Cichra 2002 citation.	Suggest change be made	Noted; "a" will be deleted
12	Sec 5.2.2.3, page 106, 2nd paragraph	No	First use of fish common names should include scientific name. No need for "and" between golden topminnow and lined topminnow. Mosquitofish is one word. In the Aucilla the species would be Eastern Mosquitofish (*Gambusia holbrooki*).	Suggest changes be made	Suggested changes will be made

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Name and Affiliation of Reviewer: Louis H. Motz, Ph.D., P.E., D.WRE

Discipline specialty covered by this review: Hydrology and MFL Development

This document is for the use of project peer reviewers retained by the Suwannee River Water Management District (District) for the purpose of providing a technical peer review of a District report, including manuscripts prepared by District staff and consultants.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT:

Task 1. **Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

A. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:

1. The data and information used were properly collected;
2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and SRWMD hydrologic monitoring networks.

B. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:

1. If the assumptions are clearly stated, reasonable and consistent with the best information available; and
2. Assumptions were eliminated to the extent possible, based on available information.

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C. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;
2. The procedures and analyses incorporate appropriate factors;
3. The procedures and analyses were correctly applied;
4. Limitations and imprecision in the information were reasonably handled;
5. The procedures and analyses are repeatable;
6. Conclusions based on the procedures and analyses are supported by the data.

Task 4. **If a proposed method used in the MFL report is not scientifically reasonable, the CONTRACTOR shall:**

A. Deficiencies: List and describe scientific deficiencies;
B. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
C. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of time and effort required to develop and implement; and
D. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and Peer Reviewers shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the DISTRICT's development of MFLs. CONTRACTOR and Peer Reviewers shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the scope of work. These givens include:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The determination of the baseline from which "significant harm" is to be determined;
3. The definition of what constitutes "significant harm" to the water resources or ecology of the area

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Instructions:

7. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
8. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(5), in the discipline noted above.
9. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer: 	**Date of Peer Review: November 22, 2015**

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder: 	**Date of Response:** January 8, 2016

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1	Section 1.2	No	Re: p. 3, lines 2-3: "Based on a review of available information and data performed by HSW and Janicki Environmental in 2015…." Does this refer to the present investigation and current report or is there a separate report by HSW and Janicki Environmental?	Please clarify what is being referred to in this sentence.	The sentence will be reworded. The relevant portions of the literature review are included in Section 1.
2	Section 1.2	No	Re: p. 8. Lines 12-13: "[WRV 4 Transfer of Detrital Material]…should be adequately protected as a consequence of protecting the more relevant WRVs." Specifically, which are the more relevant WRVs relative to WRV 4?	Indicate which are the more relevant WRVs that provide protection for WRV 4.	The language will be modified to omit this language in this section of the report. Table 1 shows that WRVs 1, 2, and 3 received greater overall scores. Overall river protection will be demonstrated in the MFLs section and conclusions.

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3	Section 1.2	No	Re: p. 10, lines 5-7: "[WRV 9 Water Quality is]…sufficiently protected as a consequence of protecting the higher-scored WRVs". Specifically, which are the higher-scored WRVs relative to WRV 9?	Indicate which are the higher-scored WRVs that provide protection for WRV 9.	Table 1 shows that WRVs 1, 2, and 3 received greater overall scores. Overall river protection will be demonstrated in the MFLs section and conclusions.
4	Section 2	No	Re: p. 11, line 11: "The hydrology of the Aucilla River…" Does this refer to the Aucilla River *Watershed*? Should the Wacissa River be included in this section?	Include the Wacissa River in this introductory section.	Wacissa River will be included in the sentence.
5	Section 2.1	No	Some features called out in the text on pp. 12 and 14 (i.e., Half Mile Rise, Little River, Wacissa Springs County Park, and Goose Pasture) are not shown in Figure 5 (p. 15).	All river features called out in text on pp. 12 and 14 should be shown in Figure 5 (p. 15).	Figure 5 will be edited to include the features.
6	Section 2.2.1	No	Figure 7 is missing.	Insert missing Figure 7.	Figure 7 is in the report on page 14.

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7	Section 2.2.2	No	Twenty-two springs "have been reported" on the Wacissa River (p. 19, line 2), but only 16 springs are shown in Figure 8 and only 15 springs are identified in Table 3.	Resolve the inconsistencies in the number of springs in the text (p. 19), Figure 8, and Table 3.	Text will revised to resolve inconsistency in number of springs.
8	Section 2.2.2	No	One major spring (Nutall Rise) on the Aucilla River is indicated in the text on p. 19, but two springs (Nutall Rise and an unnamed spring) are identified in Table 3. Only Nutall Rise is shown in Figure 8. Can the unnamed spring be located?	Include the unnamed spring in the text on p. 19 and show its location in Figure 8.	The spring (unnamed) is on the Wacissa River. Table 3 will be edited accordingly.
9	Section 2.2.3	No	Re: pp. 20 and 21, Paragraph for Section 2.2.3: It is not clear what this paragraph is trying to say. Figure 9 is referred to, but it shows the locations of stream gages, not rain gages. Was rainfall calculated using data from the grids in Figure 9 that are outside the Aucilla River Basin? Is this how the rainfall shown in Figure 16 (section 2.4) was calculated? Also the reference PRISM 2014 (p. 20) is not in the list of references (Section 7).	Please clarify this paragraph.	Text will be edited for clarification and reference will be added. The paragraph is an explanation of how PRISM rainfall data are calculated. Language will be added to clarify how the data are used.

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10	Section 2.2.4	No	There is no discussion of the Floridan aquifer system in Section 2.2.4.	In this section or in another appropriate section such as Section 2.5, there needs to be a discussion about the hydrogeology of the Floridan aquifer system to provide a basis for the discussion of groundwater levels. Also, a potentiometric map of water levels in the Upper Floridan Aquifer in the vicinity of the Aucilla River Watershed needs to be included.	Florida aquifer is mentioned and discussed in several Sections – e.g., pg 11 and some detail in Section 2.7.1. Additional language will be added to section 2.2.4.

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11	Section 2.3.2	No	Re: The missing record for the Lamont gage was calculated "using *linear* regression equations…." (p. 24, line 3). Equation (1) (p. 24, line 8) contains a Q^2 term, which is *non-linear*.	Correct the text to accurately describe Equation (1).	The method of analysis is linear regression and the model is a polynomial equation – "equations" will be changed to "analysis."
12	Section 2.3.2	No	Re: p. 24. Lines 3-9: "Infilling missing streamflow data at Lamont was accomplished using linear regression equations developed for the association between Lamont and Scanlon...and Lamont and Econfina…." Were these equations developed in this investigation? Are plots of streamflow data for Lamont vs. Scanlon and Lamont vs. Econfina available? What are the statistics for Equations (1) and (2), i.e., how well do they predict the missing streamflow data?	Provide streamflow data plots and statistics for Equations 1 and 2.	A new Appendix will be added to include plots and statistical information.
13	Section 2.3.3	No	p. 24, Figure 11: what does LOESS refer to? What is the significance of the smoothing parameter = 0.3, i.e., is this a relatively low, medium, or high value?	Indicate what LOESS represents and the significance of the value chosen for the smoothing parameter.	LOESS information will be added to address the comment.

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14	Section 2.3.3	No	p. 25, Figure 12: The smallest value on the x-axis should not be shown as 0%. This value and all of the values shown on the x-axis shown be plotted as decimal fractions. For 0%, this should be 0.01, 0.001, or whatever the correct value is with the correct number of significant figures.	Plot the exceedance values on the x-axis with the correct number of significant figures. Also, this should be checked for all of the other flow duration curves in the report.	The existing plot is correct. The plot is not a probability plot rather a depiction of observations expressed as % exceeded.
15	Section 2.3.4	No	On p. 26, line 4, "Historical, daily flows are uni-modally distributed throughout the year… (Figure 14)." There are *two* peaks, not *one*, in Figure 14.	Correct apparent discrepancy between text (p. 26, line 4) and Figure 14 (p.27).	Text will be revised to "Flows are distributed seasonally with high flows during March and April…"
16	Section 2.4	No	p. 26, lines 11-14: "Average annual rainfall…ranged between 27 and 76 inches and averaged 54 inches (Figure 16)." How was this rainfall calculated? Is the result of calculations described in section 2.2.3 (see comment 9 above)?	Explain how rainfall was calculated.	PRISM data were used. Text will be added for clarification.
17	Section 2.4	No	p. 28, Figure 16: what does LOESS refer to? What is the significance of the	Explain what LOESS represents and provide a reference to it. Also, please	See comment 13.

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			smoothing parameter = 0.3, i.e., is this a relatively low, medium, or high value?	explain the significance of the value chosen for the smoothing parameter.	
18	Section 2.4	No	p. 27, line 4, cumulative rainfall deficit "…of about 55 inches…" is in the text, but the largest value shown in Figure 17 (p. 29) is less than 50 inches.	Correct the discrepancy between text (p. 27, line 4) and Figure 17.	The deficit is between 1998 and 2012. 55 inches is the difference between cumulative rainfall deficit between 1998 and 2012.
19	Section 2.5	No	p. 29, lines 10-13: "A decline in annual minimum seven-day average streamflow was observed…." Since this sentence is in a paragraph describing changes in groundwater use and water levels caused by population increases, apparently it is intended to infer that the increased pumpage has caused a decrease in streamflow.	Please explicitly document the linkage between the decreased streamflow and increased population and pumpage using credible data or references or eliminate this sentence.	These are reported observations separated by a paragraph that are not necessarily implying a linkage
20	Section 2.5	No	(See comment 17 above) pp. 31-32, Figures 20, 21, and 22: what does LOESS refer to? What is the significance of the smoothing parameter = 0.3, i.e., is this a relatively low, medium, or high value?	Explain what LOESS represents and provide a reference to it. Also, please explain the significance of the	See comment 13.

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				value chosen for the smoothing parameter.	
21	Section 2.5	No	A potentiometric map of groundwater levels in the Upper Floridan Aquifer would help explain the relation between the Upper Floridan Aquifer and the Aucilla and Wacissa Rivers.	A potentiometric map of groundwater levels in the Upper Floridan Aquifer in the Aucilla River Watershed needs to be included.	A potentiometric map will be added.
22	Section 2.6	No	p. 33, lines 1-10: "Nutall Rise…(Figure 23)" is not shown on Figure 23. According to the text, "at least 12 springs", "16 springs", and "22 springs" occur along the Wacissa River; 18 springs are shown on Figure 23.	Correct discrepancies between text (p. 33, lines 1-10) and Figure 23.	Text will be edited to avoid Springs number discrepancy and Figure 23 cross-reference will be replaced with cross-reference of Figure 8.
23	Section 2.6	No	p. 34, line 1: "…at the Wacissa gage…." There are *four* gages on the Wacissa River in Figure 6; which Wacissa gage is referred to here?	Indicate specifically which Wacissa gage was used in developing Figures 24 and 25.	Text will be edited to clarify the gage references.
24	Section 2.6	No	Figures 24 and 25, p. 35: Some of the high flows and residuals are very poorly correlated with the groundwater levels at	Explain the discrepancies between some of the high flows and residuals and the	Text will be added to attempt to explain residuals and areas of poor correlation. Greater

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			well S019430002; is there an explanation for this?	groundwater levels at well S019430002.	residuals at high flows may be due to a delay in aquifer response to rainfall events. The serial correlation is speculated to be due to seasonal variation of submerged vegetation.
25	Section 2.7.1	No	p. 36, line 15, and p. 37, Figure 26: Why are "Biscayne Aquifer" and "Coastal Lowlands Aquifer System" included in the map legend?	Remove "Biscayne Aquifer" and "Coastal Lowlands Aquifer System" from the map legend.	Figure will be edited.
26	Section 2.7.1	No	p. 36, lines 24 and 27, re: "evince" and "thalweg".	Define "evince" and "thalweg".	These are commonly used terms.
27	Section 2.7.1	No	p. 36, last paragraph, lines 27-33: "….the rate of gains and losses from the river to the UFA are a function of the difference in hydraulic head associated with river stage and the UFA potentiometric surface." In addition to the profile view shown in Figure 27, a potentiometric map in plan	Add a potentiometric surface map of groundwater levels in the Upper Floridan Aquifer (in plan view) in the Aucilla River Watershed.	A potentiometric map will be added.

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			view is needed to help explain the hydraulic connection between the gaining and losing upstream and downstream river reaches and the Upper Floridan Aquifer.		
28	Section 2.7.1	No	p. 37, Table 6: How was the flow gain in column 6 calculated for Nutall Rise? If the gain was calculated by subtracting discharges at Wacissa and Scanlon from the discharge at Nutall Rise (1,097-380-720 = -3.0 cfs), then the flow gain in column 6 should be -3.0 cfs, not -2.61 cfs, and the yield gain in column 8 should be -0.4 in/yr, not -0.34 in/yr.	Check calculations for flow gain and yield gain forNutall Rise and correct if necessary.	The flows are rounded to nearest integer in Column 4. Flow Gain and Yield Gain in the Table will be modified to show consistent significant digits.
29	Section 2.7.2	No	p. 38, last paragraph: What is the point of this discussion? Plotting annual discharge at Lamont versus annual rainfall would be a better, quantitative way to investigate and illustrate the relationship between rainfall and discharge rather than trying to explain the relationship qualitatively in terms of	Plot annual discharge at Lamont versus annual rainfall in the Aucilla River Watershed.	Cumulative deviation better explains persistence or trend. Annual discharge and rainfall relationship is discussed in Section 2.7.3.

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			cumulative departures from long-term mean values.		
30	Section 2.7.3	No	p. 40, line 4: "…associated weighted rainfall…." How was this calculated?	Explain how this rainfall was calculated by referencing previous sections and/or figures.	Rw (Weighted Rainfall) is defined in the middle of pg 40.
31	Section 2.7.3	No	p. 40, line 23: "…SPSS…." What is SPSS?	Identify and reference SPSS.	Currently, SPSS is the trade name (i.e., it stands for SPSS). of a statistical package owned by IBM.
32	Section 2.7.3	No	p. 40, last paragraph, lines 23-26: In addition to Figures 30 and 31, a plot of the annual discharge at Lamont versus weighted annual rainfall (results from Equations 4 or 5) would help illustrate the relationship between rainfall and discharge in the Aucilla River Watershed.	Plot annual discharge at Lamont versus weighted annual rainfall to supplement the results plotted in Figures 30 and 31.	Plot will be added.
33	Section 2.7.3	No	p. 42, second paragraph. Lines 9-11: "Based on local groundwater level trend, water use data and regression analysis, there is no persistent evidence of	Provide specific references to previous report sections, figures, and tables to justify this conclusion.	Section references will be provided.

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			anthropogenic impacts on the streamflow at Lamont gage for the POR…." How was this determined, i.e., what is the basis for this conclusion?		
34	Section 2.7.4.1	No	p. 44, Figure 35: What is the source for the rating curve data, i.e., whose data are plotted?	Explain how these data were derived or reference the source of the data.	A gage reference will be added. Data sources are identified in previous tables – e.g., Table 2.
35	Section 2.7.4.1	No	p. 44, line 3: "[Figure 35]…shows an inflection point…." No, perhaps there is a steepening or increase in the slope, but certainly not an inflection point where the slope would change from positive to negative (or negative to positive).	Correct the description of the change in slope in Figure 35.	An inflection point is where the change in slope changes from positive to negative or the vice versa (i.e., second derivative is zero). Text will be modified to describe a steepening of the slope around 52 ft NGVD.
36	Section 2.7.4.2	No	The reference to Bruner *2008a* is the only reference to Bruner in 7 References.	Change the citation to Bruner *2008*.	Citation will be edited.

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37	Section 2.7.4.2.1	Yes	p. 45, lines 9-12: "The flow distributions used in the Taylor model represent the river as a losing stream with flow decreasing in the downstream direction beginning at river mile 36.98." Where is river mile 36.98? Is this result consistent with the results in Table 6 (p.37)?	Indicate where river mile 36.98 is located and compare the Taylor model results with results in Table 6.	River mile 36.98 is near Lamont gage. Taylor model was converted to HEC-RAS from an earlier HEC-2 . We retained the hydraulic parameters and incorporated appropriate flow gains as shown in Table 6.
38	Section 2.7.4.2.1	Yes	p. 45, line 23: "The model input/output tables [for the Wacissa HEC-RAS model] are included in Appendix A." Appendix A contains the hydrodynamic model results for the Aucilla River; where is the description of the Wacissa River HEC-RAS model and the input and output tables?	A description of the Wacissa HEC-RAS model with input and output tables needs to be included in the report.	Appendix with the tables will be added.
39	Section 2.7.4.2.1	No	p. 46, Figure 37: This figure illustrating profiles for the HEC-RAS model of the Wacissa River is not referred to in the text (p. 45, last paragraph) describing the Wacissa River HEC-RAS model.	Refer to Figure 37 in the text in the last paragraph on p. 45.	Reference will be added.

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40	Section 2.7.4.2.2	Yes	Did HSW use the refined Aucilla HEC-RAS model to calculate new water-surface profiles for the Aucilla River that replaced the water-surface profiles that had been calculated previously using the Taylor Engineering model (shown in Figure 36, p. 45)?	If new water-surface profiles were calculated using the refined Aucilla HEC-RAS model, the results should be included in the report and compared to the results from the Taylor Engineering HEC-RAS model (Figure 36).	See Response for Comment 37.
41	Section 2.8	No	Re: p. 47, lines 4-6: "Based on the analysis of [the] relationship between rainfall and flow at Lamont…." Where is this analysis?	Please indicate the section in the report where this analysis is described.	Reference to Section 2.7.3 will be added to the text
42	Section 2.8	No	Re: p. 48, line 4: "…watershed yield analysis…." Where is this analysis?	Please indicate the section in the report where this analysis is described.	Reference to section 2.7.1. will be added to the text
43	Section 2.8	No	Re: p. 48, lines 8 and 10: "Wacissa gage…." Which Wacissa gage is this?	There are four gages on the Wacissa River in Figure 38. Please indicate which Wacissa gage is referred to consistent with the name of the gage in Figure 38.	Gage reference will be added.

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SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
44	Section 2.8	No	Re: p. 48, line 10: "A spring-flow rating was developed and uses groundwater level as the explanatory variable." Where is this analysis?	Please indicate the section in the report where this analysis is described.	Reference to section 2.6 will be added to the text.
45	Section 4.1	No	p. 85, line 31: What is AWSS?	Please identify what AWSS represents.	Identified in Section 1, p. 1, 2nd sentence.
46	Section 4.1	No	p. 87, Table 15: What is the basis for the "15 % reductions" in Table 15?	Provide references to sources for this value such as journal articles, reports, water management district policy statements, and other supporting documents.	The 15% threshold has been applied to numerous peer reviewed MFLs reports and Rules. It is mentioned in the report again in Section 4.3 pg 93 in the 3rd paragraph. References will be added to the report in Section 4.3 but they mostly establish precedence for the 15% threshold. We agree that research is needed to verify the 15 % threshold assumption.

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

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47	Section 4.3	No	MFLs assessment methods (Munson and Delfino 2007 and Neubauer et al. 2008) should also be referenced in section 4.1 and Table 15.	MFLs assessment methods (Munson and Delfino 2007 and Neubauer et al. 2008) should be referenced in section 4.1 and Table 15.	Reference will be added as suggested.
48	Section 6.1	No	p. 122, lines 9-10: "…a flow reduction that results in no greater than a 15% reduction in a metric…was considered to be a threshold flow reduction for most of the resources evaluated."	The 15% reduction in a metric needs to be better established by appropriate references (see comment no. 46 pertaining to Table 15, p. 87).	See comment 46.
49	Section 6.1	No	p. 122, lines 3-4: "The Aucilla and Wacissa Rivers…were evaluated to determine flow regimes that would be protective of fish and wildlife habits and recreational activities." These need to be identified as WRVs, along with Estuarine Resources (from p. 10).	p. 122: In this discussion and summary section, it should be repeated from Section 1.3 (p. 10) specifically which three "…WRVs were investigated to identify the threshold hydrologic conditions for developing MFLs."	WRVs will be identified.
50	Section 6.2	No	p. 126-129, Figures 79 and 80, and Tables 28-30: This section is well written	No action recommended.	

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			and effectively presents the results of the MFL investigations for the Aucilla and Wacissa Rivers and Priority Springs.		
51	Section 7	No	The reference to PRISM 2014 (p. 20) is not in the list of references in Section 7. Also, Munson and Delfino (2007) is identified only by its title in Section 7.	Add PRISM 2014 to Section 7 and identify journal and page numbers for Munson and Delfino (2007).	Reference will be added.
52	Appendix E	No	First page, first paragraph, lines 5-6: "The intermediate projection of 5.1 inches was used in the model…."	Provide equation from USACE (2011) that was used to calculate sea-level rise.	The equation will be provided.

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Name and Affiliation of Reviewer: E. Lynn Mosura-Bliss

Discipline specialty covered by this review: Environmental Science, Planning

This document is for the use of project peer reviewers retained by the Suwannee River Water Management District (District) for the purpose of providing a technical peer review of a District report, including manuscripts prepared by District staff and consultants.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT:

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1. The data and information used were properly collected;
2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and SRWMD hydrologic monitoring networks.

B. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:

1. If the assumptions are clearly stated, reasonable and consistent with the best information available; and
2. Assumptions were eliminated to the extent possible, based on available information.

C. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;
2. The procedures and analyses incorporate appropriate factors;
3. The procedures and analyses were correctly applied;
4. Limitations and imprecision in the information were reasonably handled;
5. The procedures and analyses are repeatable;
6. Conclusions based on the procedures and analyses are supported by the data.

Task 5. **If a proposed method used in the MFL report is not scientifically reasonable, the CONTRACTOR shall:**

A. Deficiencies: List and describe scientific deficiencies;
B. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
C. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of time and effort required to develop and implement; and
D. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and Peer Reviewers shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the DISTRICT's development of MFLs. CONTRACTOR and Peer Reviewers shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the scope of work. These givens include:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The determination of the baseline from which "significant harm" is to be determined;
3. The definition of what constitutes "significant harm" to the water resources or ecology of the area

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Instructions:

10. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
11. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(5), in the discipline noted above.
12. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer:	**Date of Peer Review:** 11/17/15

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder:	**Date of Response:** January 8, 2016

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SUWANNEE RIVER WATER MANAGEMENT DISTRICT

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1	P 1, Section 1.1, second sentence	No	Please specify which FWC reference is used by denoting "a" or "b".	Add corrected citation.	The reference is neither "a" or "b".
2	P 3, Figure 1	No	Base map used in this figure is unreadable; therefore features depicted have little geographic reference.	Improve readability of base map features.	Base map will be edited to improve readability.
3	P 5, Section 2	No	Update this Section following improvements to Table 2 addressed in next comment.	Update consistent with changes.	Table 2 and associated text will be updated.
4	P 4, Table 1 and P 5, Section 1.2	No	No mention of importance of hydric hammocks in water storage? Does consideration of prevalence of hydric hammocks in coastal Jefferson and Taylor counties, justify a higher intrinsic score for water storage.	Revise Section 1.2 item 5. Consider raising score Water storage intrinsic value to "2".	Our working definition of WRV 5 is "The protection of an amount of freshwater supply for permitted users at the time of MFLs determinations."

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	item # 5				
5	P 6, Table 2	No	In addition to using Lenz, 2006, which is specific to the Aucilla, the table references updates to table from FNAI 2012 from Suwannee, Hamilton and Columbia Counties. These are old references from counties outside Aucilla and Wacissa River systems. If appropriate to use, please specify justification.	Update Table 2 with current FNAI data additions from (at a minimum) Jefferson, Madison and Taylor Counties and perhaps other counties. Species listed in Table 2 provide the broad overview, which is then culled for Table 13 to focus on species potentially affected by flow reductions". So Table 13 will need further evaluation with changes to Table 2.	Justification will be provided.
6	P 7	No	Is there any commercial fishing or oyster harvesting in estuarine waters off Jefferson, northern Taylor Counties?	If commercial fishing occurs in these estuarine waters, mention applicable resources.	No commercial fishing and oysters harvesting in estuarine water. Edits not required.

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7	P 8, Section 1.2, item 5, last sentence	No	If freshwater storage is amply protected by water use regulations statewide, seems like no point in evaluating this WUV anywhere. Somewhat circuitous reasoning.	Revise this section. Need another justification to discount this WUV.	See comment 4.
8	P 69-71	No	Missing narrative between pages 69 and 70.	Please provide missing narrative.	Text from P. 69 is duplicated in P. 71. Duplicated text will be deleted.
9	P 76	No	Clewell et al 2002 missing from References.	Add to Section 7 References	Reference will be added.
10	P 77, in >12pt section	No	Should this say represents the downstream limit for transition from "sawgrass to black needlerush" rather than reverse.	Evaluate and change, if needed.	Text will be revised.

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11	P 77, Table 13	No	Revise list considering current FNAI for Jefferson, Madison and Taylor Counties.	Revise Table 13 and related narrative in 3.6, and appropriate subsections.	Table 13 and narrative in 3.6 will be revised. Addressed in the other reviewer comments.
12	P 80, Section 3.6.4	No	Of the five other wading birds, little blue heron may be more vulnerable to flow reductions since they rely on freshwater forage sites to raise young, until they become more tolerant of high salt content prey (Rodgers, 1982)	Consider adding reference note	A complete citation was not provided by reviewer. A Rodgers (1982) paper on nestling little blue herons in the Florida Field Naturalist does describe salt tolerance as a factor. However, the FWC (2013) report "A Species Action Plan for Six Imperiled Wading Birds" describes salt tolerance as a factor and references a Rodgers (1996) paper in the book (Rare and endangered biota of

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					Florida: Volume V). A reference to FWC (2013) will be added. .
13	P 95, end of paragraph 2 and Section 7	No	Munson and Delfino, 2007 reference citation incomplete in Section 7.	Complete citation in Section 7	Citation will be updated.
14	P 95. Section 5.1	No	There is an assumption that a 15% reduction in paddling days is ok. This supposition is not supported. Also there is a seasonal component to recreation. When will the additional 24 days of lost paddling typically occur? This was not addressed.	Provide further explanation.	Text will be revised and references added. Numerous MFLs have been adopted using this assumption.
15	P 110, first	No	This is a significant assumption regarding 15% reduction. Provide a citation for this statement.	Add citation	References will be added.

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	paragraph, last sentence				
16	P 117, Section 5.4, second paragraph	No	There is no evaluation of boat launching sites provided. If there are none, then say so. Unable to find citation (lboats 2009) in references.	Consider evaluation of boat launch sites relative to MFL. If none, please say so. Please add citation to Section 7 references	Boat launch information is deemed not important to MFL establishment. Reference will be added.
17	P 117, third paragraph	No	There is an assumption that a 15% reduction in motorized boat passage days is ok. This supposition is not supported. Also there is a seasonal component to recreation. When will the additional 27 days of lost motorized boating typically occur? This was not addressed.	Provide further explanation.	Text will be revised with further explanation. 27 days per year is an average loss over the entire period of record.

PEER REVIEW FORM
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Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Name and Affiliation of Reviewer: David L. Evans

Discipline specialty covered by this review: Biological Response

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Signature of Reviewer:	Date of Peer Review:
David L. Evans	11/18/15

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder: Kenneth D Watson	**Date of Response:** January 8, 2016

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1	p. 66, par. 3	No	2nd sentence wording "pebbly gravel an exposed large rock" need clarification	Edit as appropriate	Noted; will change "an" to "and"
2	p. 66, par. 4	No	S. kurziana is spelled incorrectly	Correct typo	Noted; will change to "kurziana"
3	p. 66, par. 5	No	The first word "and" in the first sentence should not be italicized	Correct typo	Noted; "and" will be unitalicized
4	p. 66, par. 5	No	Pontederia is spelled incorrectly	Correct typo	Noted; will change to "Pontederia"
5	p. 66, par. 5	No	Salix caroliniana is spelled incorrectly	Correct typo	Noted; will change to "caroliniana"
6	p.66, par. 6	No	Inconsistent formatting of citation for (FWC, 2012)	Delete comma to read: (FWC 2012)	Noted; will revise
7	p. 77, last par.	No	FWC acronym used in text is apparently listed as FFWCC in references section	Choose one acronym for consistency and clarity	Noted; FWC will be used throughout report
8	p. 77, last par.	No	There are multiple listing for USFWS 2015 in references section	Use a "2015a, 2015b" style format help the reader identify appropriate references	Noted; suffix "a", "b", etc. identifiers will be added in text as needed and in reference section

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9	P. 78, par. 1	No	FNAI 2012 references listed are outdated and list records outside the basins of interest. These references probably DO NOT represent the basis of information given in the report.	List the correct references in the references section and change citations in this paragraph accordingly.	Will revise text, Tables 2 and 13, and references to reflect FNAI listings, updated October 2015, for Jefferson, Madison, and Taylor Counties
10	P. 78, par. 3	No	The word "of" in the first sentence should be "or"	Correct typo	Noted; will change "of" to "or"
11	p. 78, Table 13	No	The following species have a Florida State rank of S1 and are known to occur in the three counties containing the drainage basins of interest: Elfin Skimmer *Nannothemis bella* S1S2 Allegheny River Cruiser *Macromia alleghaniensis* S1 Smokey Shadowfly *Neurocordulia molesta* S1 Mayfly *Asioplax dolani* S1S2 Narrowleaf Naiad *Najas filifolia* S1 State Status: T	Add these species to Table 13 and develop descriptive text in the appropriate following sections OR add text to the report that explains why these species are not considered pertinent to setting the MFL.	The five species will be added to Table 2, and the four insects (Elfin skimmer, Allegheny River Cruiser, Smoky shadowfly, and mayfly) will be added to Table 13. Text will be added to Section 3.6.1 (Aquatic Macroinvertebrates) that the mayfly and odonates inhabit freshwater streams and could possibly be affected by a flow

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					reduction. Their life stages and feeding patterns are such that the protection of EPT is presumed would be protective of these four listed species.
12	p. 78, Table 13	No	The federal status of Suwannee moccasinshell was recently elevated to Proposed Threatened (see see Federal Register Vol. 80 (No. 193): 60335-60348)	Indicated federal rank as PT in Table 13 and add explanation in legend as appropriate.	Its current status will be identified in Tables 2 and 3
13	p. 79, par. 1	No	Several odonates and one mayfly may be added to Table 13 (see p. 78, Table 13 comments).	Expand Section 3.6.1 Aquatic MacroInvertebrates to discuss of these species as appropriate.	See response to comment 13
14	p. 79, par. 1	No	Ephemeropterans is spelled incorrectly and by widely used convention should not be italicized (not a genus or specific epithet)	Correct typos	Noted; reference to Ephemeropterans will be deleted
15	p. 80, Sect. 3.6.2	No	The federal status of Suwannee moccasinshell was recently elevated to Proposed Threatened (see Federal Register	Expand this section to acknowledge the change in status, linkage of status to	The species status will be acknowledged with

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			Vol. 80 (No. 193): 60335-60348). The announcement contains a through literature review some of which should be brought to light in the MFL document	water withdrawal as a potential threat, possible use of black-banded and/or brown darters as a surrogate for evidence of possible occurrence (both have been shown to be viable *M. walkeri* hosts in lab experiments).	reference to black-banded darter as host
16	p. 80, Sect. 3.6.2	No	Third sentence: italics in Williams et al. 2010 seem inconsistent with other citations in the document	Remove italics in Williams et al. 2010 for consistency	Noted; will remove italics
17	p. 80, Sect. 3.6.2	No	Sacpcinsky 2015 citation is apparently listed as Sacpcinsky 2012 in references section	Correct and clarify the apparent discrepancy	The text citation will be revised to indicate 2012 personal communication
18	p. 80, Sect. 3.6.3	No	In the second sentence Micropterus is spelled incorrectly; Lepomis should be italicized, and the period following "Esox" should be removed	Correct typos	Noted; typos will be corrected
19	p. 80, Sect. 3.6.3	No	In the third sentence the hyphen following "brown" seems unnecessary or incorrect	Correct typo	Noted; typo will be corrected

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20	p. 80, Sect. 3.6.3	No	FWC acronym used in text is apparently also listed as FFWCC in references section	Choose one acronym for consistency and clarity	Noted; FWC will be used throughout in text, citations, and reference list
21	p. 102, par. 1	No	Gore 2013 is not in references section. Personal communication should be listed for completeness and consistency with other sections.	Add Gore 2013 personal communication to references section.	Personal communication will be added to reference section
22	p. 104, par. 1	No	The word "Identify" is spelled incorrectly	Correct typo	Noted; typo will be corrected
23	p. 104, Fig. 64	No	For consistency the word "stage" in the figure title should be lower case	Correct title formatting	Noted; the case will be changed
24	p. 105, Table 19	No	Heading of last column "Flow Reduction (%) needs re-formatting to avoid wrap-around	Correct formatting.	Noted; heading will be reformatted
25	p. 105, last par.	No	For consistency in citation formatting, Knight et al. should not be italicized and the comma should be removed.	Change citation to "(Knight et al. 1991)"	Noted; citation will be reformatted
26	p. 106, par. 2	No	Jordan 1998 in second sentence should read "Jordan et al. 1998"	Correct typo	Noted; typo will be corrected

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27	p. 106, par. 2	No	The "a" can be eliminated in Hill and Cichra 2002a since apparently there are not multiple citations for that year	Remove the "a" in the citation and in the reference listed	Noted; citation will be revised
28	p. 107, Last par.	No	For consistency in citation formatting, Light et al. 2002 should not be italicized and the comma should be removed.	Change citation to "(Light et al. 2002)"	Noted; a consistent format will be used
29	p. 107, Last par.	No	In the last sentence of the paragraph give the full citation for clarity: Light et al. 2002	Present full citation.	Noted; a consistent format will be used
30	p. 108, Fig. 66	No	The word "Wetland" in the figure legend appears to be truncated.	Correct legend.	Noted; legend will be corrected
31	p. 121, Table 25	No	The second note in the table legend erroneously refers to the "shallow/fast guild"	Change reference to the "shallow/slow guild" in the legend	"fast" will be changed to "slow" in table footnote #2
32	App. B, p. 2, par. 2	No	The citation for Jowett et al. 2014 has a misplaced period	Correct typo	Noted; typo will be corrected

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33	App. B, p. 3, par. 1	No	The citation for Jowett et al. 2014 has a misplaced period	Correct typo	Noted; typo will be corrected
34	App. B, p. 4, Table 1	No	Ephemeroptera and Trichoptera are spelled incorrectly	Correct typos	Noted; typos will be corrected
35	App. B, p. 4, Table 1	No	Table 1 apparently lists 39 Habitat Suitability Curves. The text states that 40 curves were analyzed.	Add the missing curve if appropriate.	40 habitats were analyzed; Channel Catfish life stages will be revised to indicate "Juvenile (nonspecific)" and "Juvenile (spring, summer, fall, warmwater)"
36	App. B, p. 6, References	No	Aquatic Habitat Analysts, Inc. 2012 does not appear to be specifically cited in the Appendix B text.	Cite this reference where appropriate.	Noted; a reference to the citation will be added to the text on page 2 in both Appendix B.

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
37	App. C, p. 2, par. 2	No	The citation for Jowett et al. 2014 has a misplaced period	Correct typo	Noted; typo will be corrected
38	App. C, p. 4, par. 1	No	The citation for Jowett et al. 2014 has a misplaced period	Correct typo	Noted; typo will be corrected
39	App. C, p. 4, Table 1	No	Ephemeroptera and Trichoptera are spelled incorrectly	Correct typos	Noted; typos will be corrected
40	App. C, p. 4, Table 1	No	Table 1 apparently lists 39 Habitat Suitability Curves. The text states that 40 curves were analyzed.	Add the missing curve, if appropriate.	40 habitats were analyzed; Channel Catfish life stages will be revised to indicate "Juvenile (nonspecific)" and "Juvenile (spring, summer, fall, warmwater)"
41	App. C, p. 5,	No	For consistency, the value associated with 10% reduction should read "34.90"	Correct typo	Noted; typo will be corrected

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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	Table 3				
42	App. C, p. 6, par. 1	No	For consistency and accuracy the figure referenced in the last sentence should be Figure A2.	Correct the figure reference in text.	Noted; the sentence will be revised to reference Figure A2
43	App. C, p. 6, par. 3	No	Although P. ephippiatum has a high percent habitat reduction value of 33.3%, the reviewer agrees that this species should be dropped from consideration due to its low mean habitat value.	No change recommended.	Acknowledged
44	App. C, p. 7, References	No	Aquatic Habitat Analysts, Inc. 2012 does not appear to be specifically cited in the Appendix C text.	Cite this reference where appropriate.	Noted; a reference to the citation will be added to the text on page 2 in both Appendix B.

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Name and Affiliation of Reviewer: Kirk Stage

Discipline specialty covered by this review: Wetland Ecology, Plants, And Listed Species.

This document is for the use of project peer reviewers retained by the Suwannee River Water Management District (District) for the purpose of providing a technical peer review of a District report, including manuscripts prepared by District staff and consultants.

SCOPE OF REVIEW REQUIRED BY THE DISTRICT:

Task 1. **Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

A. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:

1. The data and information used were properly collected;
2. Reasonable quality assurance assessments were performed on the data and information;

Note: The reviewers are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and SRWMD hydrologic monitoring networks.

B. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:

1. If the assumptions are clearly stated, reasonable and consistent with the best information available; and
2. Assumptions were eliminated to the extent possible, based on available information.

C. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:

1. The procedures and analyses were appropriate and reasonable, based on the best information available;
2. The procedures and analyses incorporate appropriate factors;
3. The procedures and analyses were correctly applied;
4. Limitations and imprecision in the information were reasonably handled;
5. The procedures and analyses are repeatable;
6. Conclusions based on the procedures and analyses are supported by the data.

Task 7. **If a proposed method used in the MFL report is not scientifically reasonable, the CONTRACTOR shall:**

A. Deficiencies: List and describe scientific deficiencies;
B. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
C. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of time and effort required to develop and implement; and
D. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable, based on published literature to the extent feasible.

REVIEW CONSTRAINTS

CONTRACTOR and Peer Reviewers shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes) affecting the DISTRICT's development of MFLs. CONTRACTOR and Peer Reviewers shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board (hereinafter referred to as "givens") is not included in the scope of work. These givens include:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The determination of the baseline from which "significant harm" is to be determined;
3. The definition of what constitutes "significant harm" to the water resources or ecology of the area

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Instructions:

16. The results of this review are for the use of the District and they are not to be revealed to others without the express permission of the District.
17. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that discipline noted above.
18. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer:	**Date of Peer Review:** 11/18/2015

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder:	**Date of Response:** January 8, 2016

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
1	Pg 55, Par 2, Sec 3.2	No	Reference: Lenze, 2006	In reference: Lenz	Noted; text will be revised to "Lenz"
2	Pg 58, Par 2	No	Sentence ending: …..where the river begins to flow below land surface for the first time.	Consider rewrite to clarify	Text will be rewritten to read…"where the river disappears underground for the first time"
3	Pg 58, Par 2	No	Sentence Above the trail the river is characterized by….	Suggest "upstream of" instead of Above	Text will be changed from "Above" to "Upstream of"
4	Pg 58, Par 3	No	Sentence: "Between Dead Man's Sink and Nuttall Rise, there are many rises and sinks Beginning at Dead Man's Sink….."	Missing "." (period)	Noted; period will be added.
5	Pg 58, Par 5	No	Sentence: The hydric portion of the freshwater segment	Rewrite sentence: hydric community portion….	Sentence will be rewritten as suggested
6	Pg 58, Par 5	No	Sentence At Nuttall Rise, the Aucilla River re-surfaces for the final time and in a short distance becomes tidal	Suggest clarify with rewrite: Nuttall Rise is the final Aucilla River resurgence and the Aucilla becomes tidal shortly downstream.	Sentence will be rewritten as suggested

PEER REVIEW FORM
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Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

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7	Pg 61, Par 1, Sec 3.2	No	Common name usage: Laurel oak and diamond leaf oak (page 57)	For consistency (even though the names are synonyms) change "diamond leaf oak" to laurel oak" assuming the binomial is correct.	Diamond leaf oak will be changed; laurel oak will be used
8	Pg 62, Par 1	No	Word "Its"	Replace with "It"	Noted; typo will be revised
9	Pg 64, Par 3	No	Clarify: vegetation communities	Suggest adding word floodplain to vegetation community.	"floodplain" will be added as a descriptor
10	Pg 64, Par 3	No	Sentence including: …mixed wetland hardwoods, floodplain swamp, bottomland forest, cypress, hydric hammock, gum pond, other wetland forested mixed, wet flatwoods, mixed scrub-shrub wetland, bottomland forest, and baygall	Names of Descriptions: Caps to be consistent with the next paragraph	Noted; name descriptions will be capitalized to be consistent with following paragraph and Table 10
11	Pg 64, Par 3	No	Phrase: "...that are identified by a land use code that begins with a "2" "	Is this needed?	The phrase will be deleted
12	Pg 64, Last line	No	Reference: NRCS (2000).	Add to references. Sentence is a widow.	Three references will be added:

PEER REVIEW FORM
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					(1) Allen, W.J. 1989. Soil survey of Jefferson County, Florida. U.S. Department of Agriculture Soil Conservation Service, Washington, D.C. (2) Howell D.A. and C.A. Williams 1990. Soil survey of Madison County, Florida. U.S. Department of Agriculture Soil Conservation Service, Washington, D.C. (3) Watts, F.C., E.L. Readle, D.A. Dearstyne, and R.L. Weatherspoon 2000. Soil survey of Taylor County, Florida. U.S. Department of Agriculture Soil Conservation Service, Washington, D.C.

PEER REVIEW FORM
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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
					The citation "NRCS (2000)" will be replaced with the 3 county-specific citations.
13	Pg 66, first line	No	Sentence: use of soils vs. soils series	Technically, soils should be replaced by soils series to be consistent with Table 11.	"series" will be added to sentence
14	Pg 66, Par 1	No	Clarify sentence	Suggest: The Surrency, Plummer, and Cantey Frequently Flooded soils series are the most commonly occurring soil series, accounting for 12.7% of the corridor area.	Sentence will be clarified as suggested.
15	Pg 66, Par 1	No	Sentence: The soils that comprise the series are characterized as fine sand and loamy sands that are frequently flooded.	Suggest Delete sentence	The sentence provides a contrast in soil type to the high organic content muck referenced in the following sentence
16	Pg 66, Par 1	No	Sentence: use of soils vs. soils series	Change soils to soils series	"series" will be added to sentence

PEER REVIEW FORM
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17	Pg 66, Sec 3.4, Par 3	No	Misspelled binomial	Change to: caroliniana	Noted; will change to "caroliniana"
18	Pg 77, Sec 3.6, Par 1	No	Include reference	Need reference here FNAI 2010	"FNAI (2010)" will be added to last sentence after "FNAI Tracking List Database"
19	Pg 78, Sec 3.6, Par 1	No	FNAI reference check	Check and correct. References include Columbia, Hamilton and Suwannee Include appropriate counties and if not used, check all references and lists associated with FNAI data.	See response to D.L. Evans review comment #10
20	Pg 78, Sec 3.6, Par 2	No	Recreational/commercial species inclusion.	Suggest a footnote for Recreational/commercial species	A footnote #4 will be added for Suwannee bass to indicate a "species important for recreational sport fishing"

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21	Pg 79, Table 13	No	Listed Plants. A brief review of FNAI for Taylor, Madison and Jefferson Counties resulted in additional plant species. Please review; add to Table 13 or Table (2 sic – page 6) if needed	Carex chapmanii Leitneria floridana Phyllanthus liebmannianus ssp. Platylepis Najas filifolia	See response to D.L. Evans review comment #12
22	Pg 81, Sec 3.6.5	No	Suggest add sentence. More detail about species provide later in section 4.1	Suggest adding explanation (similar to 3.6.4) to explain why beaked spikerush represents the vegetation to be potentially affected by reductions in flows and levels within the Aucilla-Wacissa system	Narrative will be added indicating that if freshwater flow reductions become too large, salinity may increase to a level that is no longer protective of beaked spikerush.
23	Pg 81, Sec 3.6.5	No	Add reference.	Suggest add reference: FLORIDA'S ENDANGERED AND THREATENED PLANTS, 5th edition, 2010, Richard E. Weaver, Jr., and Patti J. Anderson	A reference to Weave and Anderson, 2010 will be added to the 3rd sentence in Section 3.6.5 and the following citation added to the reference: Weaver, R. E. and P. J. Anderson.

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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					2010. Notes on Florida's endangered and threatened plants, 5th edition. Contribution No. 38. Bureau of Entomology, Nematology and Plant Pathology-Botany Section, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, Florida. 112 p.
24	Pg 99, Par 2	No	Confirm reference Munson *et al.*, 2005c	Edit if required: Munson *et al.*, 2007	The citation is correct, and the following reference section will be added: Munson, A. B., M. H. Kelly, J. Morales, and D. A. Leeper. 2005c. Proposed minimum flows and levels for the upper segment of the Hillsborough River, from

PEER REVIEW FORM
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					Crystal Springs to Morris Bridge, and Crystal Springs. Ecologic Evaluation Section. Southwest Florida Water Management District. Brooksville, FL. 216 pp + appendix.
25	Pg 99, Par 2	No	Add reference if appropriate	Gary Warren, FWC, personal communications, 2004	Personal communication will be added to references section
26	Pg 102, Par 1	No	Determine if reference is needed	RE J. Gore, written communication, 2013	Recommend the reference remain
27	Pg 102, Table 18	No	Edit to table	Bold hard to discern. Suggest bold and underline to illustrate AWS reduction greater than 15%	Noted; values > 15% will be underlined
28	Pg 104,	No	Edit title of figure	Capitalize Aucilla	Noted; will capitalize Aucilla (within the figure)

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	Figure 64				
29	Pg 105, Figure 65	No	Edit title of figure	Capitalize Aucilla	Noted; will capitalize Aucilla (within the figure)
30	Pg 107, last par	No	Acronym for RI – presume Return Interval	Edit- define RI acronym	The acronym is defined in first paragraph on page 93
31	Pg 109, Fig 67	No	Edit graphic to avoid overlapping information	Edit legend for wetland vegetation community (suggest box with white background).	Legend will be re-positioned
32	Pg 110, Sec 5.3, Par 2	No	Explain "Cell" and relate to computer model	Suggest edit to appropriate term: Change cell to estuary model cell or centerline cell	"cells" will be replaced with EFDC model grid cells"
33	Pg 115-116, Tables	No	Suggested table edit for clarity	Bold hard to discern. Suggest bold and underline to illustrate AWS reduction greater than 15%	Noted; values > 15% will be underlined in Tables 21, 22, and 23

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	21, 22, 23				
34	Pg 121, Table 25	No	Suggested table edit for clarity	Bold hard to discern. Suggest bold and underline to illustrate AWS reduction greater than 15%	Noted; values > 15% will be underlined
35 **	Pg 6 and page 17	No	There are two table 2, one critter, and one stream stations.	Redo TOC and titles	Noted; the caption for the table listing stream stations on page 17 (and all following tables) will be renumbered, text cross-references will be checked, and TOC updated

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Name and Affiliation of Reviewer: Douglas G. Strom – Water & Air Research, Inc.

Discipline specialty covered by this review: Biology of the Aucilla and Wacissa Rivers

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REVIEW CONSTRAINTS

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1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
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PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

Instructions:

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20. By signing this form, the reviewer certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042(5), in the discipline noted above.
21. The reviewer also certifies that the review was conducted according to the Scope and Conditions specified above.

Signature of Reviewer:	**Date of Peer Review:** 11/23/2015

Responders Certification: The comments and criticisms provided by the Peer Reviewer have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments: Ken Watson, HSW Engineering Inc.	
Signature of Responder:	**Date of Response:** January 8, 2016

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

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1	Page 1-5	No	On the fifth line on this page the citation given (Lenz, R. J., 2006) does not conform to the format used elsewhere in this document.	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
2	Page 1	No	Line 6 on this page mentions the "MFLs priority list."	That phrase should be changed to "**MFL** priority list." To match the reference given.	Phrase will be updated
3	Page 3	No	The first sentence on this page starts with" Based on a review of available information and data performed by HSW and Janicki Environmental in 2015…" Should that information be given as a reference cited?	Cite this information as a citation and in the reference section as appropriate.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
4	Table 2 on Page 6	No	Under the Table title the citation given (Lenz, R. J., 2006) does not conform to the format used elsewhere in this document.	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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5	Table 2 on Page 7	No	Under the Table the citation given as the "Source" (Lenz, R. J., 2006) does not conform to the format used elsewhere in this document.	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
6	Page 9	No	The reference cited in the later part of the second paragraph as EPA 2001 should be changed to match the other USEPA citations. This reference is not given in the reference list	Add the citation to the reference list, and correct it to USEPA 2001.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
7	Page 11	No	The reference "(Torak, L.J. et al 2010)" cited three times on this page is not in standard format as used elsewhere in this document.	Remove the initials of the author, and add a period after "al" (et al.). In general pick a citation format and apply it consistently throughout the document. As is the citations and reference section is inconsistent and needs work.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
8	Page 12	No	On the fifth line on this page the citation given (Webb, S.D., 2006). does not	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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			conform to the format used elsewhere in this document.		be corrected, as appropriate
9	Page 13	No	Under the Table the citation given as the "Source" "(Torak, L.J. et al 2010)" does not conform to the format used elsewhere in this document.	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
10	Page 14	No	There is a web citation on the fourth line from the bottom of the first paragraph that only gives the link, but no author or date. (www.americantrails.org).	That link is given n the references list, but inadequately connected to an author or date of information retrieval. The author and date should be used for the text citation, not the inserted link that is given in the reference section. Fix this reference. See the GADNR 2011 reference list citation as an example.	Author and Date missing in the original article http://www.americantrails.org/nationalrecreationtrails/trailNRT/Wacissa-River-Trail-FL.html Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
11	Page 14	No	At the end of the first paragraph the citation is improperly referenced. No date for the publication or web access is given. (Wacissa Paddling Trail Guide, FDEP).	That link is given n the references list, but inadequately connected to an author or date of information	The web access link will be added.

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
				retrieval. The author and date should be used for the text citation, not the publication title - that is given in the reference section. Fix this reference. See the GADNR 2011 reference list citation as an example.	https://www.dep.state.fl.us/gwt/guide/designated_paddle/Wacissa_guide.pdf
12	Table 2 on Page 17	No	Long strings under the title give links to the data portals from where the data was retrieved.	We suggest that these be given as citations to reference list entries.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
13	Figure 8 on Page 19	No	The sources cited for this figure - Source: "FDEP & SRWMD" are very unspecific and lack a date of publication or web accession date.	We suggest that these be given as citations to reference list entries with dates of publications or web access given.	The GIS files will be cited
14	Table 3 on	No	The sources cited for this figure - Source: "[Source: USGS NWIS, SRWMD Water Data Portal]" are very unspecific and lack a date of publication or web accession date.	We suggest that these be given as citations to reference list entries with dates of	Citation, grammatical, consistency, and typographical errors will

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
	Page 20			publications or web access given.	be corrected, as appropriate
15	Page 20	No	The reference **PRISM 2014** given on the penultimate line on this page is not given in the references cited list. There is a citation under "Descriptions of PRISM…" but it is not formatted correctly as to author and date	Add this reference to the references cited list and or fix the reference given incorrectly.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
16	Executive summary and Pages 22 & 24	No	The acronym "WY" is given in several places, including text and figures, but was not introduced prior to its use.	Introduce the acronym **WY** with full text for its first use In the document.	Acronym WY will be expanded for its first use in the document
17	Page 28		In the first two paragraphs, population data is given, but no source for it is cited. Similarly, mining is cited as a base industry for the area, and its groundwater usage discussed, but no source is given, except for an obscure (permit?) number -	We recommend that these data be supported with references of their sources given as citations and references in the references cited section. The last sentence	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			(WUP 2-123-217887-1). The sentence beginning with "Mining doesn't make grammatical sense. It might also be missing the word industry after "pulp mill."	beginning with "Mining" should be rewritten with correct grammar.	
18	Page 29	No	On the second line of the first paragraph the citation (dePaul *et al.*, 2008) does not match the reference list, where the name is given as DePaul. Also there is an extra space before the next sentence.	Fix the citation and remove the extra space between the sentences.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
19	Figure 18 on Page 30	No	The citation in the figure caption is not given in the reference section. **Miller 1986**	Add the reference for this citation to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
20	Figure 18 on Page 31	No	Under the Table the citation given as the "Source" "(Torak, L.J. et al 2007)" does not conform to the format used elsewhere in this document. Also, this reference is not listed in the references cited section.	Remove the initials from the citation to match format usage elsewhere in this document. Add the reference for this citation to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
21	Figure 19 on Page 31	No	The acronym "UFA" is given in this figure caption, but was not introduced prior to use in the document. The caption does not mention that these were well data depicted.	Introduce the acronym **UFA** with full text for its first use In the document. The caption should be more specific in noting that these were well data and their data source(s).	Acronym UFA will be introduced with full text for its first use in the document. Text will revised to indicate the data source
22	Page 32	No	MFLs is used in the first sentence as "MFLs assessment."	This would read better as "MFL" assessment so we recommend that change.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
23	Figure 21 & 22 on Page 32	No	The acronym "UFA" is given in these figure captions, but was not introduced prior to use in the document. The caption does not mention that these were well data depicted.	Introduce the acronym **UFA** with full text for its first use In the document. The captions should be more specific in noting that these were well data and their data source(s).	See Comment 21
24	Page 33	No	There is a web citation on the second (penultimate) line from the bottom of the first paragraph that only gives the link, but	Cite an author (the District) and date of web access in the text, and add that to the references cited list – or fix the	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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			no author or date. (www.mysuwanneeriver.com)	citation that is there that is for "SRWMD web site" but gives no accession date.	
25	Figure 23 on Page 33	No	Under the Table the citation given as the "Source" (Lenz, R. J., 2006) does not conform to the format used elsewhere in this document.	Remove the initials from the citation to match format usage elsewhere in this document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
26	Page 44	No	At the end of the third line of the second paragraph the reference Brunner 2008a is given. There was only one citation in the references cited list from this author.	Remove the "a" from this reference citation since it is not necessary when an author has only one citation per date of authorship in a publication.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
27	Page 46	No	On the fourth line of the first paragraph here is an extra space before the comma after "(**Error! Reference source not found.**)."	Remove the extra space before the comma after "(**Error! Reference source not found.**)."	Cross reference will be updated
28	Page 49	No	At the end of the last full sentence in the first paragraph a citation is given as "(Darst, M.R. et al 2002)" does not conform to the format used elsewhere in	Remove the initials from the citation to match format usage elsewhere in this document. Also add a period after "al"	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			this document. Also "et al" lacks a period after "al."		
29	Figure 42 Page 53	No	The citation Florida Department of Environmental Protection 2012 given in the figure caption is not abbreviated as is done elsewhere in the document.	Suggest giving that citation as FDEP 2012 as given done elsewhere in the document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
30	Page 53	No	The citation USEPA 2013 does not have a comma after the author name as is done elsewhere in the document. This is true of all the citations in section 3.2.	Please review and make the citations given in the text consistent in format and style.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
31	Page 65	No	The citation NRCS (2000) given at the bottom of page 65 was not listed in the references cited section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
32	Page 63	No	The citation FWC 2007 given at the bottom of page 65 was not listed in the references cited section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
33	Page 69	No	The citation FWC 2012b given at the fifth line from the bottom of the third paragraph appears to be the only FWC citation for that date (unless a citation with the same date is missing).	Remove the "b" suffix from this citation and from the reference section listing for that reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
34	Page 72	No	The acronym "FWRI" is used in the fourth line from the bottom of the second paragraph. This acronym was not introduced earlier in the publication.	Introduce this acronym with the full name at its first use in the document.	Acronym FWRI will be expanded for its first use in the document
35	Figure 55 Page 73	No	The acronym FFWCC used in the figure caption is inconsistent with the use of FWC for the same organization elsewhere in the document.	Suggest using FWC instead of the acronym given for consistency.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
36	Table 12 Page 74	No	The acronym FFWCC used in the table last column is inconsistent with the use of FWC for the same organization elsewhere in the document.	Suggest using FWC instead of the acronym given for consistency. FWC should also be used in the references cited section. instead of FFWCC.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
37	Table 12	No	The reference Cohen (2007) used in the table last column is incorrect.	Correct this reference to Cohen and Grizzle (2007) to	Citation, grammatical, consistency, and

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	Page 75			match the reference in the references cited section.	typographical errors will be corrected, as appropriate
38	Page 76	No	In the middle of the second paragraph the reference Clewell *el al.*(2002) is not given in the references cited section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
39	Page 77	No	At the beginning of the last paragraph on this page the reference FWC (2012) does not seem to match the entry for that date in the reference section. Is t	Add this reference to the references cited list if necessary If added, the two FWC (2012) references should be labeled with suffix "a" and "b," respectively..	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
40	Page 78	No	On the second line of the first paragraph on this page the reference FWC 2013 is not given in the reference section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
41	Page 79	No	In the penultimate sentence of the first paragraph in the Aquatic macroinvertebrates section the term	We suggest using the family name "Ephemeroptera" in this usage, but "ephemeropteran"	Citation, grammatical, consistency, and typographical errors will

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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			"(*Ephemoeropterans*)," is given for the mayfly insect order. This is incorrect.	would also be correct, if **not** capitalized.	be corrected, as appropriate
42	Page 80	No	On the fourth and fifth lines of the first paragraph in the Freshwater Mussels section the reference "J. Sacpcinsky, Malacology Collections manager, Florida Museum of Natural History, personal communication, 2015´is given as an overly long citation.	We suggest using Sacpcinsky, 2015 as the reference in the text, since it is given in the references cited section.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
43	Page 81	No	The document mentioned in the short Plants section - USF's Atlas of Florida Vascular Plants – should be cited as a reference, not listed in the text, so that others can find it.	Add this reference to the references cited list and cite it as a reference in the text..	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
44	Page 82	No	On the first line in the Biota of Interest section, there is an extra space before the comma after the word "rivers."	Remove the extra space after the word rivers.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

PEER REVIEW FORM
SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Project or Report Name: Technical Report – MFL Establishment for the Aucilla and Wacissa River and Springs

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
45	Page 82	No	In the Biota of Interest section, there is an issue with the two paragraphs. Should these be one paragraph? There is a readability issue there.	Suggest rewriting and/or consolidating those two paragraphs.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
46	Table 14 Page 83	No	In the table under Wood stork two references USFWS (1997 and 2011).are given that are not listed in the references section.	Add these references to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
47	Page 85	No	On the second line on this page there is an extra space between the words "are" and "important."	Remove the extra space.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
48	Page 85	No	At the end on the penultimate line on this page is the run together word "callof." The sentence does not make sense.	Rewrite that sentence to correct it.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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SUWANNEE RIVER WATER MANAGEMENT DISTRICT

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
49	Table 15 Page 87	No	In the last column, first row is listed "Florida Designated Paddling Trails Guide, Aucilla River." That reference is given in the references cited section, and should be cited, not listed. The reference in the references cited section also should be corrected to add an author and date of web access.	Add the citation to the table. We suggest it is an FDEP reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
50	Table 15 Page 87	No	The "Key Sources" cited in the last column of the table, second to fourth rows are obscure and cannot be verified as to their content by the reader.	The obscure allusions to references given in the last column, the second to fourth rows should be replaced with citations to relevant references listed in the references cited section.	Relevant references will be provided
51	Table 15 Page 87	No	In the table under the row Wildlife habitat – wading bird" the reference USFWS (1999).is given that is not listed in the references cited section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
52	Table 15 Page 87	No	In the last column o f the table on the row for Wildlife habitat – wading bird" the	Cite this reference as Coulter et al. (1999).	Citation, grammatical, consistency, and typographical errors will

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			reference Coulter (1999) has multiple authors.		be corrected, as appropriate
53	Table 15 Page 88	No	In the last column, third row is given the following link and text: "http://www.dcr.virginia.gov/ natural_heritage/ natural_communities/ncEIc.shtml." That reference is given in the references cited section, and should be cited, not listed. The reference in the references cited section also should be corrected to add an author and date of web access.	Add the citation to the table. We suggest it is a Virginia DNR reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
54	Page 89	No	In the second line in the HEC-RAS Modeling section the following phrase is given – "…12 flow regimes range from 1 to 95 percent…	We suggest replacing "range" with "ranging."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
55	Page 90	No	In the fourth line of the third paragraph the citation FDEP 2013 is not listed in the references cited section.	Add this reference to the references cited list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
56	Page 93	No	In the fourth line of the third paragraph the citation Kelly *et al.*, 2005 is one of four citation with this author and date.	Designate this Alafia River citation and the reference with a letter designation as Kelly *et al.*, **2005a**.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
57	Page 95	No	In the title of this section it says "Water Resources Values."	To be consistent with prior use in this document and elsewhere we suggest using "Resource" instead of "Resources" in this section title.	Resource is correct and will be used
58	Page 95	No	On the fifth line from the bottom of the second paragraph there is given a citation "(Florida Designated Paddling Trails-Aucilla River)."	As recommend earlier in this list, give this citation as an FDEP citation.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
59	Figure 58 Page 96	No	In the caption is given this link; http://www.dep.state.fl.us/gwt/guide/designated_paddle/Aucilla_guide.pdf].	As recommend earlier in this list, give this citation as an FDEP citation. The link is already given in that section.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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60	Page 99	No	In the second line of the second paragraph the citation Kelly *et al.*, 2005a, b, c is given.	These citations (and the references for them in the references cited section) should be labeled as **b, c, and d**, not a, b, and c, as the **a** designation was used for the Alafia River report.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
61	Page 99	No	In the second line of the second paragraph the citation Munson *et al.*, 2005c is not given in the references cited section.	Add this reference to the references cited list, and remove the "c" suffix, as it is unnecessary for this author and date.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
62	Figure 63 Page 103	No	In the caption is given this link; [Source: http://oceanicwilderness.com/2011/02/]	Give this citation as a citation and a reference entry in the references cited section entry.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
63	Page 105	No	On the last line of this page the word "nesting" is not the best term to describe fish reproduction activities."	On the last line of this page it is recommended to replace the word "nesting" with spawning."	Noted. Text will be revised

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
64	Page 106	No	On this page several references are given with "et al." not italicized as was done elsewhere in this document. Also, there is not a comma after the author as given elsewhere.	We recommend a global review and revision of the citation style, and we suggest to pick a convention and apply it consistently. That admonition also applies to the references cited section, in which a wide array of styles are applied with little consistency.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
65	Pages 131-138	No	The references section employs a variety of formats and styles as if multiple authors contributed entries without coordination or an agreed upon format. In some cases important information is missing or given in the wrong place in the citation.	The references section should be reviewed and rewritten to standardize entries and to make sure all references are included, are complete, and match their text citations.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
66	Page 131	No	The reference Brunner, G.W. 2008a is the only citation for this author and date. Also, there are double spaces after each period, while the other references listed only have single spaces after the periods.	Remove the "a" after the date for this reference, and remove one of the spaces after each period for this reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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67	Page 131	No	The reference Bryan, Dana C. 2002 is in a non-standard format.	Use an initial for the first name of the author instead of the whole first name, as was done with other references in this section.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
68	Page 131	No	For the reference Clewell, A. F., R. S. Beaman, C. L. Coultas, and M. E. Lasley 1999., there is no period after the author list string as was done for other references in this section. Also, there are double spaces after each period, while the other references listed only have single spaces after the periods.	Add the period after the author string, and remove one of the spaces after each period for this reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
69	Page 131	No	For the reference Cohen, L.D. and Grizzle, R.E. 2007, commas were used after the authors and date, as opposed to using periods in these positions as was done for the other references in this section.	Replace these commas with periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
70	Page 131	No	The reference Coulter, M. C., J. A. Rodgers, J. C. Ogden and F. C. Depkin.	Add the comma after that author.	Citation, grammatical, consistency, and

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			1999. Is missing a comma after the author Ogden as was done elsewhere in this section.		typographical errors will be corrected, as appropriate
71	Page 131	No	The reference Darst, Melanie R., Light, Helen M., and Lewis, Lori J. 2002. is in a non-standard format.	Use initials for the first names of the authors instead of the whole first name, as was done with other references in this section.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
72	Page 131	No	For the reference DePaul, T.T., Rice, D.E., Zapecza, O.S. 2008, a comma was used after the date, as opposed to using a period in that position as was done for the other references in this section.	Replace the comma after the date with a period.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
73	Page 132	No	The reference beginning with "Descriptions of PRISM Spatial Climate Datasets…" appears to lack an author, and the date is given in the wrong place in the re3ference listing. This reference was cited in the text as "PRISM, 2014," but the author(s) should be cited, not the acronym for their product.	Correct the author and date and general arrangement of the listing for this reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
74	Page 132	No	The reference Dunson, W.A., C.J. Paradise and R.L. VanFleet. 1997. Is lacking a comma after the second author, and lacks the physical location in Florida (i.e., Live Oak, Florida) where the report can be obtained. Also, there i s another reference (ECT 2006) appended to this reference that is not cited in the document.	Add the comma after that author and the location where the report was produced and/or can be obtained. Remove the ECT 2006 reference part of this listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
75	Page 132	No	The reference Florida Department of Environmental Protection. 2012 lacks the acronym used to cite it in the text.	The acronym "(FDEP) should be inserted after the full name of the author since it was cited as the acronym in the text. See the example of the reference for FDEP (2014) for how this should be done correctly.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
76	Page 132	No	The next four FDEP references starting with "FDEP 2012" do not fit the recommended format as described just above and given for the FDEP 2014 citation. Also, there are two FDEP 2012	These references should be modified to fit the format of FDEP (2014). The tow FDEP 2012 references should be listed and cited in the text with	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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			references cited. These are also out of alphabetical order in the reference list.	"a" and "b" designation suffixes on the date. Check the list and make sure it is in alphabetical order.	
77	Page 132	No	For the reference Finger, T.R. and Stewart, E.M. 1987., there is no space after the period after the date of this citation. The state of publication (location of Norman is not given at the end of the citation. Also, the word "in" is not capitalized and italicized. Also, although there are two editors, the parentheses holds the letters "(ed)."	Add a space after the period after the date of this citation, and add the city and state of publication, and capitalize and italicize the word "in." Replace "(ed)" with "(Editors)."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
78	Page 132	No	The two references cited that start with "Florida Designated Paddling Trails-" are in a non-standard format.	These references should be cited as FDEP publications (as discussed above, do not use only an acronym to cite a reference), with either the date of authorship given or if that is not know the date of web access. See the reference for	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
				Bryan 2002 as a preferred way to cite web document access.	
79	Page 132	No	The reference FFWCC 2004 is given in a non-standard format, the reference is incomplete, and a comma was used after the date, as opposed to using a period in that position as was done for the other references in this section..	The entire name of the author should be spelled out, with the acronym given after the author name. The acronym is not the one used elsewhere in this document (i.e., FWC). the location where the report was produced and/or can be obtained should be added. See the following reference FWC (2005) for an example of how this reference ought to be cited.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
80	Page 133	No	For the reference Florida Fish and Wildlife Conservation Commission (FWC) 2012., there is an extra space after the word species, and before the comma.	Remove the extra space before the comma.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
81	Page 133	No	The reference Florida Fish and Wildlife Conservation Commission / Fish and	The acronym is not the one used elsewhere in this	Citation, grammatical, consistency, and

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			Wildlife Research Institute (FFWCC/FWRI) 2011. is in a non-standard format. It lacks the location where the report can be obtained, and uses a different acronym for FWC than was used in the document in general. Also, there is an extra space after the date.	document (i.e., FWC). the location where the report was produced and/or can be obtained should be added. See the following reference FWC (2005) for an example of how this reference ought to be cited. The extra space after the date should be removed.	typographical errors will be corrected, as appropriate
82	Page 133	No	For the reference FFWCC 2010, is in a non-standard format. It lacks the location where the report can be obtained, and uses a different acronym for FWC than was used in the document in general. Also, there is a comma after the date instead of a period.	The entire name of the author should be spelled out, with the acronym given after the author name. The acronym is not the one used elsewhere in this document (i.e., FWC). the location where the report was produced and/or can be obtained should be added. See the following reference FWC (2005) for an example of how this reference ought to be cited. The extra space after the	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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				date should be removed. Replace the comma after the date with a period.	
83	Page 133	No	The reference Florida Fish and Wildlife Conservation Commission (FWC) 2012b lacks a period after author, and there is an extra space after the date. Since there was only one citation called FWC 2012, the letter designation (e.g., "b") is not necessary.	Add the period after the author, remove the extra space, and take off the "b" designation.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
84	Page 133	No	For the reference FWC 2015., the entire name of the authors is not spelled out. Also, there are two spaces after each period in the citation. It is also not in alphabetical order relative to the other references listed.	The entire name of the author should be spelled out, with the acronym given after the author name, it should be put in the correct alphabetical position on the list, and one of the spaces after each period for this reference should be removed.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
85			For the reference Galat et al. 1998, there is no space between the name of the journal and the specific article volume &	Insert a space after the name of the journal. Add the missing	Citation, grammatical, consistency, and typographical errors will

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
			page citation, and some commas are missing after some authors listed.	commas after the authors where needed.	be corrected, as appropriate
86	Page 133	No	For the reference GADNR 2001, commas were used after the author and date, as opposed to using periods in these positions as was done for the other references in this section.	Replace these commas with periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
87	Page 133	No	For the reference GADNR 2002, commas were used after the author and date, as opposed to using periods in these positions as was done for the other references in this section.	Replace these commas with periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
88	Page 134	No	For the reference Graff, L. and J. Middleton. 2002, It lacks the location where the report can be obtained.	The city and state where the report can be obtained should be added to the citation.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
89	Page 134	No	For the reference Halyk, L.C. and E.K. Balon, 1983, There is no space between the period after the date and the article name.	Add a space between the period after the date and the article name.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
90	Page 134	No	The reference Hill, J.E. and C.E. Cichra. 2002a is the only citation for this author and date.	Remove the "a" after the date for this reference.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
91	Page 134	No	The reference Hornsby, David, and Ron Ceryak, 1998. Is in a non-standard format.	Use initials for the first names of the authors instead of the whole first name, as was done with other references in this section. Replace the comma after the authors with a period. The location where the report can be obtained should be listed last in the reference listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
92	Page 134	No	In the reference listing for Hornsby,D., and R. Ceryak. 2000., the name of the Suwannee River Water Management District is abbreviated. Also there is not space between "Hornsby" and "D."	The name of the District should be given in the citation in full, not abbreviated. Add a space between "Hornsby" and "D."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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93	Page 134	No	For the reference listing for HSW, Engineering, Inc. (HSW). 2007, the location where the report can be obtained is not given.	The location where the report can be obtained should be added to the reference listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
94	Page 134	No	The reference HSW 2014 was not cited in the document.	Remove that reference from the reference list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
95	Page 134	No	The last four listings on this page are in non-standard format. The author is listed in the wrong place in the last reference.	Correct these reference list entries. The web references should be cited similar to FDEP 2012. The last reference on the page could be cited similarly to GADNR 2001.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
96	Page 135	No	The reference Ji, Zhen-Gang 2008 lacks a period after the author, and the author citation is in a non-standard format.	Use initials for the first name of the author instead of the whole first name, as was done with other references in this section.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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97	Page 135	No	The reference Jassby, A. D., W. J. Kimmerer, S. G. Monismith, C. Armor, J. E. Cloern, T. M. Powell, J. R. Schubel, and T. J. Vendlinski 1995. Lacks a period after the author list, and there are two spaces after the date.	Add the period after the author list and remove one of the spaces after the date.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
98	Page 135	No	The reference Jordan, F., K. J. Babbitt, and C. C. Mclvor.(1998) is in a non-standard format, and lacks a space after the author list and before the date.	Remove the parentheses around the date and add a space after the author list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
99	Page 135	No	The reference Kelly, M., Munson, A., Morales, J., and Leeper, D., 2005, has commas instead of periods after the author list and date, and does not give the location of the office where the report could be obtained. Also, this reference should have an "a" suffix to the date, since it is one of four references with this author list and date given.	Replace these commas with periods. Provide the location of the city and state where it can be obtained. Add the "a" suffix to the date.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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100	Page 135	No	The reference Kelly, M. H., A. B. Munson, J. Morales, and D. A. Leeper. 2005a. should have a "b" suffix to the date instead of an "a," since it is the second reference from this author list and date given	Replace the "a" suffix with a "b" suffix.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
101	Page 135	No	The reference Kelly, M. H., A. B. Munson, J. Morales, and D. A. Leeper. 2005b. should have a "c" suffix to the date instead of a "b," since it is the third reference from this author list and date given	Replace the "b" suffix with a "c" suffix.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
102	Page 135	No	The reference Kelly, M. H., A. B. Munson, J. Morales, and D. A. Leeper. 2005c. should have a "d" suffix to the date instead of an "c," since it is the fourth reference from this author list and date given	Replace the "c" suffix with a "d" suffix.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
103	Page 135	No	The reference Lenz, R.J. Aucilla River. 2006. Appears to have the title interpolated with the author and date. Also there are	The tile should be moved to after the date, one of the spaces after the date should be	Citation, grammatical, consistency, and typographical errors will

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
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			two spaces after the date, and the location where the report can be obtained is not given.	removed, and the location of the city and state where the report can be obtained should be added as a suffix to the reference listing.	be corrected, as appropriate
104	Page 135	No	For the reference Lewis, F.G., Wooden, N.D., and Bartel, R.L. 2009, there are two spaces after the date.	One of the spaces after the date should be removed.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
105	Page 135	No	For the reference Lorenz, J.J. 2000, there is no space between the data and report title. Also, the citation appears to be missing a complete report reference.	Add a space after the date, provide the complete report citation (e.g., USGS Open File Report Number).	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
106	Page 131	No	For the reference Ceryak 2005, there is a comma after the chapter name, and the word "in" is not capitalized and italicized.	Replace the comma after the chapter name with a period, and capitalize and italicize the word "in."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
107	Page 135	No	For the reference listing Lorenz, J. J., J. C. Ogden, R. D. Bjork, and G. V. N.	Italicize the word "in."	Citation, grammatical, consistency, and typographical errors will

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			Powell. 2002., the word "In" is not italicized.		be corrected, as appropriate
108	Page 136	No	For the reference Montagna, P. 2006, there are commas instead of periods after the author and date. Also the reference provided is too vague, and the city and state where the report can be obtained is not given.	Replace the commas with periods, provide a more specific reference citation than the vague sentence at the end, and add the city and state where the report can be obtained.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
109	Page 136	No	The reference Munson, A. B., Delfino J. J. 2007, has a comma after the date, and the reference listing is incomplete. Also the word "florida" is not capitalized in the title.	Replace the comma after the date with a period, and please provide the complete citation of that publication (journal volume, pages, etc…).	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
110	Page 136	No	The reference National Resource Conservation Service (NRCS) 2005. Lacks a period after the author.	Add a period after the author. Capitalize the word Florida.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
111	Page 136	No	The reference Pezold, 1998. Lacks a space after the period after the date.	Add a space after the period after the date.	Citation, grammatical, consistency, and typographical errors will

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					be corrected, as appropriate
1123	Page 136	No	The reference Poizat and Crivelli 1997. lacks a period after the authors list.	Add a period after the authors list.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
113	Page 136	No	The reference Rantz, S.E 1992. lacks a period after the author's name.	Add a period after the author' name.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
114	Page 136	No	The reference Rosenau, J. C., G. L. Faulkner, C. W. Hendry, Jr., and R. W. Hull. 1977. lacks the city and state where the report can be obtained.	Add the city and state where the report can be obtained.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
115	Page 136	No	The reference Ross, S. T., Baker, J.A., 1983. has a comma after the author list instead of a period.	Replace the coma with a period.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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116	Page 136	No	In the reference Sacpcinsky, J. 2012. an acronym is given that is not introduced.	Provide the full name of the organization instead of the acronym in the reference listing.	Acronym FMNH will be expanded
117	Page 136	No	The reference Simpson, D. and C. Coarsey 2014. lacks a period after the author list, and after each of the periods there are two spaces.	Add the period after the author list and remove one space after each of the periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
118	Page 136	No	The reference Smithsonian Marine Station (SMS) 2015, there is no period after the author and a comma after the date.	Add the period after the author and replace the comma after the date with a period.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
119	Page 136	No	For the reference Southwest Florida Water Management District (SWFWMD). 2002 there are two spaces after the words Draft and Department.	Remove one of the spaces from each of these positions.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
120	Page 136	No	For the reference Southwest Florida Water Management District (SWFWMD) 2004, there is no period after the author,	Remove one of the spaces after each period and add a period after the author.	Citation, grammatical, consistency, and typographical errors will

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			and there are two spaces after each period in the citation.		be corrected, as appropriate
121	Page 136	No	For the reference Southwest Florida Water Management District (SWFWMD) 2006, there is no period after the author, and there are two spaces after each period in the citation.	Remove one of the spaces after each period and add a period after the author.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
122	Page 137	No	Fr the reference Southwest Florida Water Management District (SWFWMD) 2010, , there is no period after the author, and there are two spaces after each period in the citation.	Remove one of the spaces after each period and add a period after the author.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
123	Page 137	No	Fr the reference Southwest Florida Water Management District (SWFWMD) 2011, there is no period after the author, and there are two spaces after each period in the citation.	Remove one of the spaces after each period and add a period after the author.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
124	Page 137	No	On this page are five SRWMD references cited that are incomplete and need to be corrected. One web reference lacks a web address and a date (SRWMD website).	See the SWFWMD references for format (including corrections detailed above). These references need	Citation, grammatical, consistency, and typographical errors will

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				revision and correction. The entire name of the District should be spelled out, as per the SWFWMD listings above. The GADNR 2002 listing is a better example for the web citations.	be corrected, as appropriate
125	Page 137	No	For the reference Taylor Engineering, Inc. 2002, there are two spaces after each period in the citation.	Remove one of the spaces after each period.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
126	Page 137	No	For the reference Thompson, K.E. 1972, the word "in" is not capitalized and italicized, and there are extra spaces after the title and before the city and state.	Capitalize and italicize the word "in," and remove the extra spaces.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
127	Page 137	No	The reference Toth, L.A. 1991, lacks a space before "South."	Add a space before "South."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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128	Page 9	No	The citation EAP 2001 was not listed in the references cited section.	Add this reference to the references cited section.	Grammatical, consistency, and typographical errors will be corrected, and a reference was added.
129	Page 137	No	For the reference Toth, L.A. 1993, there is a string at the end of the listing (FWS 2004.) that does not seem to belong there.	We recommend removing that text string.	Text string will be removed.
130	Page 137	No	For the reference U.S. Environmental Protection Agency (USEPA), 1994, commas are given after the author and date instead of periods.	Replace those commas with periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
131	Page 137	No	For the reference U.S. Environmental Protection Agency (USEPA), 2013, commas are given after the author and date instead of periods.	Replace those commas with periods.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
132	Page 137	No	The reference U.S. Fish & Wildlife Service. 2010. seems incomplete; the report reference (number and type)is missing.	Please complete this reference listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

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133	Page 137	No	The reference U.S. Fish and Wildlife Services (USFWS) 2015 lacks a period after the author and there are two spaces after the date. The USFWS acronym should be added. Also there are two USFWS 2015 references.	The period after the author should be added, the extra space removed, the USFWS acronym should be added to the reference listing, and the two USFWS 2015 citations and reference listings should be labeled "a" and "b" in order of their citation in the document.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
134	Page 137	No	The document U.S. Geological Survey (USGS). 2005 was not cited in the report.	This reference should be removed from the references listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
135	Page 138	No	The reference USGS 2002 was not cited in the report.	This reference should be removed from the references listing.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
136	Page 138	No	For the reference Warren, G. L., and E. J. Nagid. 2008, there is no space between the	Add a space between the report number and the string	Citation, grammatical, consistency, and

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			report number and the string "Florida Fish and Wildlife Conservation Commission."	"Florida Fish and Wildlife Conservation Commission."	typographical errors will be corrected, as appropriate
137	Page 138	No	For the reference Water Resource Associates, SDII Global, and Janicki Environmental 2005, there is no period after the author, and there are two spaces after each period in the citation.	Remove one of the spaces after each period and add a period after the author.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
138	Page 138	No	For the reference Webb, S. D. (Eds.). (2006), there is a single editor listed.	Replace "Eds. with the non-plural "Editor."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
139					
140	Page 24	No	On this page in the last paragraph is given the phrase "…The influence of spring flows in the Waccia…"	Replace "Waccia" with "Wacissa River."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
141	Page 38	No	On the fourth line from the bottom of the first paragraph the phrase "…is one that	Separate the run together words "impactedhistorical."	Citation, grammatical, consistency, and typographical errors will

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			reflects unimpacted or minimally-impactedhistorical…" is given.		be corrected, as appropriate
142	Page 47	No	On the title of section 2.8 the words "SummaryRelevance" are run together.	Separate those run together words.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
143	Page 55	No	In the second sentence on the first line of the last paragraph there is the run together string "Florida,the."	Separate these run together words and characters.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
144	Page 55	No	In the last paragraph on this page the citation "Lenze 2006" is given. is this incorrect; should it be Lenz 2006?	Correct the citation as appropriate.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
145	Page 56	No	On the first line of this page is the word "Tallhahassee."	Correct the spelling of Tallahassee.	Noted. Text will be revised
146	Page 60	No	In the last sentence on this page, "Most of the lower Aucilla is withing the St. Marks…" is a misspelling	Correct this word to "within."	Noted. Text will be revised

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147	Page 63	No	The last line on this page starts with" Historical reports from FWC (2004, 2007, 2012)..	Add "and" before 2012.	Noted. Cross-reference will be revised
148	Page 66	No	In the second to last paragraphs from the bottom on this page the water lily genus is misspelled *Nymphea.*	Correct this word to ***Nymphaea***	Noted. Text will be revised
149	Page 66	No	In the second to last paragraphs from the bottom on this page the Pickerelweed genus is misspelled *Pondeteria*	Correct this word to ***Pontederia.***	Noted. Text will be revised
150	Page 80	No	On the second line of the Fish section, the black bass genus is misspelled *Miropterus*	Correct this word to ***Micropterus.***	Noted. Text will be revised
151	Page 129	No	The second bullet on this page begins with the phrase "The Wacissa Springs Group is a collection of of at least…	Remove the second "of."	Noted. Text will be revised
152	Page 92	No	The acronym "IFIM" is used on this page and elsewhere, but it is not introduced (spelled out in full) in its first use.	Introduce the acronym IFIM in its first use.	Acronym IFIM will be expanded for its first use in the document

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153	Page 122	No	The second line of the third paragraph starts with the phrase "… and 11.5-year period from WY 2001 through WY 2014…"	Suggest adding the word "an" after the word "and" in this phrase.	Noted. Text will be revised
154	Page 90	No	The acronym "ADVM" is used on this page and elsewhere, but it is not introduced (spelled out in full) in its first use.	Introduce the acronym ADVM in its first use.	Acronym ADVM will be expanded for its first use in the document
155	Page 126	No	The third line of the first paragraph on this page begins with "…protective of recreation on the rivers, riverine, floodplain and estuarine habitats.	Suggest you add a comma after "floodplain."	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate
156	Page 126	No	On the fourth line of the first paragraph on this page a sentence begins with "MFLs are represented as percent-of-flow flow reductions…	Is the repeated word "flow" intentionally repeated here? If not, recommend removing one of the repeated words.	The repetition is intentional
157	Page 127	No	In the first three paragraphs/bullets on this page the Table 26 citations are in bold font.	This does not match table citations elsewhere in the document s we recommend that these be given in regular font.	Citation, grammatical, consistency, and typographical errors will be corrected, as appropriate

Comment No.	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		To be completed by report author(s)
			A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Action to be Taken in Response to Comment
158	Page 127	No	The second bullet on this page starts with "A flow reduction of up to 17% would remain protective of floodplain habitat…"	Suggest adding "for flows over 558 cfs" after habitat in that phrase. It could be added enclosed in parentheses for readability if desired.	Noted. Text will be revised
159	Page 127	No	The last bullet on this page contains the sentence "Estuarine habitat also would remain protected."	Suggest adding "under this regime" to the end of that sentence.	Noted. Text will be revised
160	129	No	The second line on this page begins with "(SRWMD 2015). Nutall Rise is a resurgence, primarily of Aucilla River…	Recommend adding "the" before "Aucilla," or add "water" after "River."	Noted. Text will be revised
161					
162	Page 1-3	No	Sections 5.2.2.1, 5.2.2.2, and 5.2.2.3 are not listed in the Table of Contents.	Add these sections to the Table of Contents.	TOC will be corrected
163	Page 1-4	No	Sections 5.5.2.1, 5.5.2.2, and 5.5.2.3 are not listed in the Table of Contents.	Add these sections to the Table of Contents.	TOC will be corrected