**1.0 EXECUTIVE SUMMARY**

## Will be submitted with final peer review report.

**2.0 INTRODUCTION**

The North Florida Southeast Georgia (NFSEG) groundwater model is being developed by the St. Johns River Water Management District (SJRWMD) and the Suwannee River Water Management District (SRWMD) to provide a shared tool that can be used by both water management districts to assess the impacts of current and future groundwater withdrawals on water resources in north Florida. The model encompasses parts of Florida, Georgia, and South Carolina covering an area of approximately 60,000 square miles. The model is fully three-dimensional and utilizes seven layers to represent the surficial aquifer system, the intermediate confining unit, the Upper Floridan aquifer, the middle semiconfining unit, the upper zone of the Lower Floridan aquifer, the lower semiconfining unit, and the Fernandina Permeable zone of the lower Floridan aquifer where these hydrogeologic units are present. In its present form, the model has been calibrated to steady-state hydrologic conditions representing 2001 and 2009. To improve initial estimates of recharge and maximum saturated evapotranspiration for input to the NFSEG groundwater model, surface-water models have been developed for all surface-water basins within the groundwater model boundaries using the Hydrological Simulation Program-FORTRAN (HSPF) software. Version 1.0 of the NFSEG groundwater model and the HSPF-derived surface-water models was completed in 2016 and distributed in August 2016 to stakeholder groups that consisted of government organizations, water utilities, private industry, and environmental organizations and other interested parties throughout north Floridan and south Georgia for their use and review. Version 1.1 of the NFSEG groundwater model and the HSPF-derived surface-water models has been developed to address changes and improvements recommended for Version 1.0. Preliminary calibration results for Version 1.1 of the NFSEG groundwater model and the HSPF-derived surface-water models were completed in May 2017, and documentation and model files of Version 1.1 of the NFSEG and HSPH models were completed for final peer review in April 2018.

A panel of modeling experts was convened by SJRWMD and SRWMD in March 2017 to provide independent technical peer review of the NFSEG groundwater model and the HSPF models as the final phase of Version 1.1 of the model was being developed. This was intended to provide opportunities for the SJRWMD and SRWMD modeling team to incorporate peer review suggested changes into the model as it was being completed. Responsibilities of the Peer Review Panel included conducting a thorough review of the groundwater and surface-water models and model documentation reports and assessing the following topics:

* Model objectives, conceptualization, and design;
* Assumptions and limitations of input data;
* Model calibration and sensitivity;
* Model documentation (explanation of model, data sources, and assumptions);
* Suitability of MODFLOW and related HSPF models for the intended applications;
* Appropriateness, defensibility, and validity of the model/relationships;
* Validity and appropriateness of all assumptions used in the development of the model/relationships; and
* Deficiencies, errors, or sources of uncertainty in model/relationship development, calibration, and application.

Also, the Peer Review panel has provided answers to a set of questions concerning model documentation, implementation, calibration, and application including questions listed in Appendix A of the Charter of the SJRWMD – SRWMD Cooperative Groundwater Model Development Project.

To date, the Peer Review Panel has completed the first three tasks (Tasks A, B, and C) and Task D.1 of the final Task D. The effort for Task A consisted of reviewing applicable documents and background materials prepared for Version 1.0 of the NFSEG model and proposed improvements for Version 1.1 (Task A.1), attending a kick-off meeting at the SJRWMD in Palatka on March 29, 2017 (Task A.2), preparing draft initial recommendations that were presented at a teleconference to SJRWMD, SRWMD, and stakeholders on April 13, 2017 (Task A.3), and preparing and submitting a technical memorandum on May 1, 2017 (Task A.4), which contained the panel’s final initial recommendations for changes and modifications to the MODFLOW and HSPF models. The panel’s recommendations were grouped into recommendations for changes to Version 1.1 of the NFSEG model that could be completed by July 1, 2017 (Phase 1) and changes that could be considered later for Phase 2 or for future updates. The effort for Task B consisted of reviewing the Phase 1 results for Version 1.1 of the NFSEG model. This included reviewing preliminary model calibration results presented by SJRWMD and SRWMD at a teleconference on May 5, 2017 and making suggestions to facilitate the model improvements proposed by SJRWMD and SRWMD (Task B.1) and reviewing Phase 1 model files, draft figures and tables, and calibration statistics and attending a technical review meeting in Palatka on June 21, 2017 (Task B.2). A technical memorandum was prepared to present a summary of key findings as well as specific suggestions from each peer review panel member for completing outstanding tasks during the remainder of the NFSEG Version 1.1 development period (Phase 2 period) so that the NFSEG Version 1.1 model could be finalized. The specific suggestions include consideration of a no-pumping/pre-development scenario, an uncertainty analysis, and a verification run for the model, and editorial suggestions for figures and tables. Preliminary answers to Task D.2 questions regarding questions #2A-F Model Implementation and #3A-D, G, and H Model Calibration and Application also were included in the Task B.2 technical memorandum. The effort for Task C consisted of reviewing the Phase 2 results for Version 1.1 of the NFSEG model. Task C.1 consisted of reviewing the interim Phase 2 model calibration results presented by SJRWMD and SRWMD at a Preliminary Phase 2 Results Meeting on July 26, 2017 and making suggestions to facilitate model improvements. Task C.2 consisted of reviewing an update of the Phase 2 calibration results presented by SJRWMD and SRWMD at a Phase 2 Review Meeting on December 7, 2017.

Task D consists of reviewing the final NFSEG v1.1 model and documentation. Task D.1 has consisted of reviewing the draft NFSEG v1.1 and supporting HSPF documentation in preparation for a Task D.1 Draft NFSEGv1.1 meeting on April 18, 2018. Task D.2 has consisted of reviewing an updated (5/7/2018) draft NFSEG v1.1 and supporting HSPF documentation, preparing peer review documentation, and preparing the draft peer review report contained in this document. Task D.3 will consist of preparing the Final Peer Review Report, which will be based on the Draft Peer Review Report, any new information received during meetings, and any other information received from SJRWMD and/or SRWMD.