

Florida Numeric Interpretation of the Narrative Nutrient Water Quality Criterion Through Water Quality Based Effluent Limits (WQBELs) to Establish a Hierarchy 1 (H1): Water Quality Standards (WQS) Decision Document

H1: Nutrient WQBEL for Sweetwater Branch (waterbody identification (WBID) 2711)

Location: Alachua County, Florida

Status: Final

Criteria Parameter(s): The site-specific numeric interpretations of the narrative nutrient criterion are:

- 1.9 µg/L chlorophyll *a*, expressed as an annual geometric mean (AGM) concentration not to be exceeded more than once in any consecutive three-year period and applied as a spatial average over the extent of Sweetwater Branch.
- 215,616 lbs/yr Total Nitrogen (TN) not to be exceeded in any year.
- 16,038 lbs/yr Total Phosphorus (TP) not to be exceeded in any year.
- 0.3 mg/L TP expressed as an AGM, not to be exceeded in any year and applied as a spatial average over the extent of Sweetwater Branch.

Background: The Florida Department of Environmental Protection (FDEP) submitted the final *Hierarchy I Numeric Nutrient Criteria for Sweetwater Branch (Alachua County): Level II Water Quality Based Effluent Limitations for Gainesville Regional Utilities' Main Street Water Reclamation Facility and Kelly Generating Station* (the WQBEL report) by letter dated April 21, 2023. The final WQBEL report dated August 2021 includes H1 target concentrations and loads and was received by the EPA on April 21, 2023. The draft WQBEL report for Sweetwater Branch is dated March 2021 and was received by the EPA on April 5, 2021.

The submission included:

- Submittal letter
- Hierarchy I Numeric Nutrient Criteria for Sweetwater Branch (Alachua County): Level II Water Quality Based Effluent Limitations for Gainesville Regional Utilities' Main Street Water Reclamation Facility and Kelly Generating Station
- Documents related to Public Hearing
- Documents related to Public Notice for Rulemaking and Rule Adoption
- Public Comments Received

This document explains how the submission meets the Clean Water Act (CWA) statutory requirements for the approval of WQS under section 303(c) and the EPA's implementing regulations in Title 40 of the Code of Federal Regulations (40 C.F.R.) part 131. The EPA's decision document memorializes the EPA's review and approval of the WQS, in accordance with section 303(c) of the CWA.

WQS REVIEWER: Katherine Snyder, WQS Coordinator, snyder.katherine@epa.gov

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This document contains the EPA's review of the above-referenced H1. This review document includes WQS review guidelines that state or summarize currently effective statutory and regulatory requirements applicable to this approval action. Review guidelines are not themselves regulations. Any differences between review guidelines and the EPA's implementing regulations should be resolved in favor of the regulations themselves. The italicized sections of this document describe the EPA's statutory and regulatory requirements for approvable H1s. The sections in regular type reflect the EPA's analysis of the state's compliance with these requirements.

I. WQS Decision – Supporting Rationale

Section 303(c) of the CWA and the EPA's implementing regulations at 40 C.F.R. part 131 describe the statutory and regulatory requirements for approvable WQS. Set out below are the requirements for WQS submissions, under the CWA and the regulations. The information identified below is necessary for the EPA to determine if a submitted WQS meets the requirements of the CWA and, therefore, may be approved by the EPA.

1. Use Designations

Section 131.10(a) provides that each state must specify appropriate water uses to be achieved and protected. The classification of the waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the United States.

Assessment: Sweetwater Branch is classified as Class III Freshwater (fish consumption; recreation; and propagation and maintenance of a healthy, well-balanced population of fish and wildlife).

2. Protection of Downstream Uses

Section 131.10(b) provides that in designating uses of a waterbody and the appropriate criteria for those uses, the state shall take into consideration the WQS of downstream waters and shall ensure that its WQS provide for the attainment and maintenance of the WQS of downstream waters.

Sweetwater Branch flows south to the Sweetwater Wetlands Park, then to Paynes Prairie, and eventually some of the discharge may reach Alachua Sink. Paynes Prairie is designated as an Outstanding Florida Water (OFW). The WQBEL was specifically designed to address downstream protection of Paynes Prairie as an OFW and for the TN TMDL of Alachua Sink. See Figures 1-1 and 1-2 of the WQBEL report for a map representation.

Chapter 62-302.700(1), F.A.C., states “It shall be the Department policy to afford the highest protection to Outstanding Florida Waters and Outstanding National Resource Waters. No degradation of water quality, other than that allowed in subsections 62-4.242(2) and (3), F.A.C., is to be permitted in Outstanding Florida Waters and Outstanding National Resource Waters, respectively, notwithstanding any other Department rules that allow water quality lowering.” Baseline water quality in the OFW is determined by Chapter 62-4.242 (2)(c). F.A.C., which reads “For the purpose of this section the term "existing ambient water quality" shall mean (based on the best scientific information available) the better water quality of either (1) that which could reasonably be expected to have existed for the baseline year of an Outstanding Florida Water designation or (2) that which existed during the year prior to the date of a permit application. It shall include daily, seasonal, and other cyclic fluctuations, taking into consideration the effects of allowable discharges for which Department permits were issued or applications for such permits were filed and complete on the effective date of designation.”

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Therefore, the most constraining TN and TP loadings from the Main Street Water Reclamation Facility (MSWRF) to Paynes Prairie are those that were allowed by FDEP during the last NPDES permit, because those loadings represented a reduction from loadings that occurred when Paynes Prairie was designated an OFW in 1990. Note that the state Environmental Resource Program (ERP) permit also requires the discharge from the enhancement wetlands to achieve a TN concentration of 3 mg/L and a TP concentration of 0.3 mg/L (expressed as a 5-year rolling average). The TP concentration of 0.3 mg/L is included in this H1 site-specific criteria to provide assurance that downstream protection is achieved.

Table 1-2 in the WQBEL report compares the baseline OFW loads with the calculated future loads discharging from the enhancement wetland to Paynes Prairie based on the proposed WQBELs. For OFW purposes, the period of 2013 to 2016 was used to calculate the baseline nutrient loads to Paynes Prairie from the MSWRF and Kelly Generating Station (KGS), while stormwater loads (representing a wet year) were from the FDEP TMDL document for Alachua Sink (Gao et al., 2006). The future TP and TN loads to Paynes Prairie are reduced by 1,738 lbs/yr and 50,122 lbs/yr, respectively as compared to the OFW baseline.

Therefore, the project and associated WQBELs comply with OFW provisions for Paynes Prairie and the downstream TMDL for Alachua Sink.

Assessment: The H1 is providing use protection for the downstream waters.

3. Water Quality Criteria

Section 131.11(a) provides that states must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use.

The FDEP used the IWR Database to assess water quality impairments in Sweetwater Branch (WBID 2711). Sweetwater Branch is not impaired for nutrients (TN, TP, or chlorophyll *a*) during Group 1 Cycle 5 (approved by EPA July 26, 2022). Sweetwater Branch was listed for biology (SCI) during Group 1 Cycle 5; however, a stressor identification study was conducted as part of this WQBEL effort that was able to demonstrate that nutrients are not the causative pollutant. The responsible stressors are hydrologic modification, sediment movement, and habitat alterations.

Using phaeophytin-corrected Sweetwater Branch chlorophyll *a* data from IWR run 55 (downloaded 8-1-18), data previously assembled for this WQBEL report, and recent data provided by Alachua County, AGMs were calculated for years with four or more data points (see Section 3.3.2 of the WQBEL report). Using the same equation FDEP employed for promulgating estuary NNC, the 90th percentile prediction interval of the Sweetwater Branch chlorophyll *a* AGMs was calculated to be 1.9 µg/L (FDEP, 2012). An AGM of 1.9 µg/L is proposed as a site-specific chlorophyll *a* criterion for Sweetwater Branch not to be exceeded more than once in a three-year period.

The proposed WQBELs for the primary point source dischargers, MSWRF and KGS, were evaluated using a water quality model (QUAL2K). QUAL2K, a water quality model supported by EPA, is an appropriate tool to evaluate one-dimensional (longitudinal) river water quality in Sweetwater Branch. It employs steady-state hydraulics which allowed for the testing of conservatively protective flow scenario

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simulations including a worst-case flow condition with higher nutrient pollutant loadings than the proposed QBELs. The model was calibrated using water quality conditions observed during 2013-2016. Scenario modeling results demonstrated relative insensitivity of Sweetwater Branch eutrophic responses to simulated nutrient loading scenarios including the worst-case scenario. Simulated responses were notably comparable to the unimpaired floral condition in Sweetwater Branch. Based on the modeling, the proposed site-specific nutrient criteria for Sweetwater Branch will not cause floral or faunal imbalances, which complies with the narrative nutrient criterion at 62-302.530(48)(b), F.A.C. In addition, the modeling demonstrates that the Sweetwater Enhancement Wetlands would achieve the 3 mg/L TN and 0.3 mg/L TP limits as specified in the Sweetwater Enhancement Wetlands Project's Environmental Resource Permit (ERP).

Sweetwater Branch originates in downtown Gainesville, near Northeast 10th Ave. and Northeast 2nd St. The intent of the H1 numeric nutrient criteria (NNC) is to include Sweetwater Branch from its headwaters, terminating at the Sweetwater Enhancement Wetland adjacent to Paynes Prairie. The geographic extent of the site-specific criteria is shown in Figure 1-1 of the QBEL report.

A QBEL is recognized as the applicable interpretation of the narrative nutrient criteria if:

- The documentation for the QBEL includes a site-specific numeric interpretation of the narrative criterion at Rule 62-302.530(48)(b), F.A.C., for the waterbody;
- The QBEL is established pursuant to the Level II Process contained in Rule 62-650.500, F.A.C.; and
- The public notice for the QBEL specifically states that the Level II QBEL includes a site-specific interpretation of the narrative for the receiving waterbody.

As noted on page 10 of the QBEL report, the developed QBELs “are the site-specific numeric interpretations of the narrative nutrient criterion for Sweetwater Branch,” and the Level II process and notice requirements were completed.

Assessment: The Sweetwater Branch site-specific NNC are:

- 1.9 µg/L chlorophyll *a*, expressed as an AGM concentration not to be exceeded more than once in any consecutive three-year period.
- 215,616 lbs/yr Total Nitrogen (TN) not to be exceeded in any year
- 16,038 lbs/yr Total Phosphorus (TP) not to be exceeded in any year
- 0.3 mg/L TP expressed as an AGM, not to be exceeded in any year and applied as a spatial average over the extent of Sweetwater Branch.

The TN target concentration of 6.0 mg/L is given for comparative purposes only. The TN criterion is expressed as a load. The resulting water quality will protect the designated uses for this waterbody. Per 62-302.531(2)(a)1.d, these site-specific criteria comprise the nutrient standard for Sweetwater Branch; the stream standard in 62-302.531(2)(c) no longer applies. Any other criteria applicable to this waterbody remain in effect.

4. Scientific Defensibility

Section 131.11(b) provides that, in establishing criteria, states should establish numerical values based on 304(a) guidance, 304(a) guidance modified to reflect site-specific conditions, or other scientifically defensible methods.

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Sweetwater Branch is not impaired for nutrients (TN, TP, or chlorophyll *a*) during Group 1 Cycle 5 (approved by EPA July 26, 2022). Although there is a biology impairment, the responsible stressors are hydrologic modification, sediment movement, and habitat alterations. The WQBELs, which are site-specific interpretations of the narrative nutrient criterion, were derived using water quality-based modeling and the QUAL2K model. The derived loads included 215,616 lbs/yr TN and 16,038 lbs/yr TP, both expressed as not to be exceeded in any year. The loads were derived to achieve instream concentration targets of 0.6 mg/L TN, 0.3 mg/L TP, and 1.9 µg/L chlorophyll *a*. The TN concentration is for comparative purposes only. The TN criterion is expressed as a load. The 0.3 mg/L TP is incorporated from requirements in the state ERP to ensure downstream protection and expressed as an AGM for a spatial average and not to be exceeded in any year. The 1.9 µg/L chlorophyll *a* is expressed as an AGM, not to be exceeded more than once in a 3-year period.

Assessment: The EPA determined that the selection of 1.9 µg/L chlorophyll *a* as a response variable is appropriate and the technical approach to calculate nutrient loads is scientifically sound. Additional modeling detail is laid out in the WQBEL report.

5. Public Participation

Section 131.20(b) provides that states shall hold a public hearing when revising WQS, in accordance with provisions of state law and the EPA's public participation regulation (40 C.F.R. part 25). The proposed WQS revision and supporting analyses shall be made available to the public prior to the hearing.

A virtual public workshop/hearing was conducted by the FDEP on June 21, 2022, to obtain comments on the draft nutrient WQBELs for Sweetwater Branch. The public notice indicated the WQBELs will become the Hierarchy 1 site specific interpretations of the narrative nutrient criterion pursuant to sub-subparagraph 62-302.531(2)(a)1.d., F.A.C. for Sweetwater Branch, that will supersede otherwise applicable numeric nutrient criteria for this particular surface water segment.

Assessment: The FDEP has met the public participation requirements for this H1.

6. Certification by the State Attorney General

Section 131.6(e) requires that the state provide a certification by the state Attorney General or other appropriate legal authority within the state that the WQS were duly adopted pursuant to state law.

A letter from the FDEP General Counsel, Justin G. Wolfe, dated April 21, 2023, certified that the Sweetwater Branch H1 criteria were duly adopted as WQS pursuant to state law.

Assessment: The FDEP has met the requirement for Attorney General certification for this H1.

7. Endangered Species Act Section 7 Consultation

Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the Services, to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species.

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The U.S. Fish and Wildlife Service online Information for Planning and Conservation (IPaC) tool did not identify any endangered or threatened aquatic species or critical habitat in the vicinity of Sweetwater Branch (WBID 2711). In addition, the area covered by the site-specific Sweetwater Branch NNC is an inland area and does not have any species covered by the National Marine Fisheries Service. Therefore, an ESA section 7 consultation for this standards action is not required.

Assessment: The EPA has met the ESA requirements for this action.

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II. Conclusion

The EPA Region 4 Water Division Director is **APPROVING** the H1 NNC addressed by this decision document in accordance with section 303(c) of the CWA, as consistent with the CWA and 40 C.F.R. part 131.

The H1 NNC presented in this decision document will constitute the site-specific numeric interpretation of the narrative nutrient criterion set forth in paragraph 62-302.530(48)(b), F.A.C., that will replace the otherwise applicable numeric criteria for TN and TP in subsection 62-302.531(2)(c) for this particular water, pursuant to paragraph 62-302.531(2)(a)1.d., F.A.C. Based on the chemical, physical, and biological data presented in the development of the H1 NNC outlined above, the EPA concludes that the revised NNC for TN, TP, and chlorophyll *a* provide for and protect healthy, well-balanced, biological communities in the waters to which the NNC apply and are consistent with the CWA and its implementing regulations at 40 C.F.R. § 131.11.

Therefore, the revised nutrient criteria for TN and TP for Sweetwater Branch are 215,616 lbs/yr for TN and 16,038 lbs/yr for TP, not to be exceeded. In addition, a concentration-based TP criterion of 0.3 mg/L, expressed as an AGM not to be exceeded in any year and applied as a spatial average applies to Sweetwater Branch. The revised criterion for chlorophyll *a* is 1.9 µg/L, expressed as an AGM concentration not to be exceeded more than once in any consecutive 3-year period. All other criteria applicable to this waterbody remain in effect. The requirements of paragraph 62-302.530(48)(a), F.A.C. also remain applicable.

The EPA's decision document memorializes the EPA's review and approval of the water quality standard, in accordance with CWA section 303(c).