# Florida Numeric Interpretation of the Narrative Nutrient Water Quality Criterion Through Total Maximum Daily Loads (TMDLs) to Establish a Hierarchy 1 (H1): Water Quality Standards (WQS) Decision Document

**H1:** Nutrient TMDLs for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs (waterbody identification (WBID) 1345G, 1348A, and 1348E)

**Location:** Citrus County, Florida

**Status:** Final

**Criteria Parameter(s):** The site-specific nitrate criterion for WBIDs 1345G, 1348A, and 1348E is 0.23 mg/L, expressed as an annual arithmetic average not to be exceeded in any year.

**Background:** The Florida Department of Environmental Protection (FDEP) submitted the final H1 for the *Nutrient TMDLs for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs and Documentation in Support of the Development of Site-Specific Numeric Interpretations of the Narrative Nutrient Criterion* (the "report") by letter dated April 2, 2020. The draft report is dated September 2014 and was received by the EPA on October 15, 2014. The final report dated September 2014 includes H1 criterion concentrations.

The submission included:

- Submittal letter
- Nutrient TMDLs for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs and Documentation in Support of the Development of Site-Specific Numeric Interpretations of the Narrative Nutrient Criterion
- Documents related to Public Workshop
- 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; nothing herein should be construed to constitute a review or approval of the TMDL submitted pursuant to section 303(d) of the CWA. The EPA will conduct its review of the TMDL following this approval of the WQS.

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

*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**:* Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs are classified as Class III Marine (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.*

Rule 62-302.531(4) of the Florida Administrative Code (F.A.C.) requires that downstream uses be protected. An imbalance of flora occurring in the Homosassa Springs Group and surrounding springs is attributable primarily to elevated nutrient concentrations at the spring vents. The flow from these springs contributes to the Homosassa River, which continues downstream to the Gulf of Mexico. When the nutrient thresholds established in this report are met, algal growth that contributes to the floral imbalance will be reduced so that algal coverage will be at background levels (<20 %) (FDEP 2013). Since the source of elevated nutrients in this system is predominately from spring flow, decreasing the concentration from the springs will also reduce nutrients in the Homosassa River.

The Homosassa River is divided into a brackish and estuarine section with WBIDs 1345 and 1345F, respectively. The brackish WBID is a Class III marine waterbody and is listed as impaired for mercury but has no nutrient impairment. The estuarine WBID is a Class II estuary and is listed as impaired for mercury but not for nutrients. Tidal influence causing

increased salinity typically decreases algal propagation. Reductions in nutrients as prescribed in this TMDL are not expected to cause any nutrient impairments downstream and will result in water quality improvements to downstream waters.

***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.*

Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs were listed as impaired on the 2012 Verified List for nutrients (algal mats) based on their consistently elevated concentrations of nitrate and the corresponding evidence of imbalance in flora and fauna caused by algal smothering. Water quality data from the Southwest Florida Water Management District and the FDEP comprised the bulk of the nitrate data used in the assessment for the 2012 Verified list of impaired waters.

The site-specific nutrient criteria are based on a study by Stevenson et al. (2007), which documented the *Lyngbya* filamentous algae growth under a series of nitrate and orthophosphate concentrations, as described in the report (p. 80-82). The study used a freshwater *Lyngbya* species, which was determined to be appropriate for the springs in this report because the springs have freshwater runs with a tidal pressure that causes a salinity barrier. In turn, the fresh water from the spring vent pond in the run creates a longer holding time, thus making the results of the Stevenson et al. (2007) study appropriate for all the spring WBIDs (E. Rasnake at FDEP, personal communication, October 22, 2019).

The Stevenson et al. (2007) study found that the threshold concentration for growth of *Lyngbya* sp. had a saturating nitrate concentration of 0.23 mg/L and a saturating orthophosphate concentration of 0.028 mg/L. The study indicated that nutrient concentrations less than 0.028 mg/L orthophosphate and 0.23 mg/L nitrate are needed to slow the growth of *Lyngbya* sp.). Thus, the site-specific nitrate criterion concentration for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs is 0.23 mg/L, expressed as an annual average, not to be exceeded.[1]

Total phosphate was not considered a target nutrient for the Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs because monitoring data showed a stable temporal trend, and total phosphorus concentrations remained close to background conditions.

In the EPA's 2010 Technical Support Document for *U.S. EPA's Final Rule for Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Inland Surface Fresh Waters*, the EPA found that nitrate concentration can vary on an inter-annual basis (Brown et al. 2008). To accurately capture this variability, the EPA concluded that the most appropriate approach to characterizing nitrate in springs is

[1] The site-specific criterion replaces the generally applicable nitrate target of 0.35 mg/L, expressed as an annual geometric mean, not to be exceeded more than once in three years.

over an annual averaging basis. The FDEP has applied this rationale to the site-specific criterion for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs.

***Assessment:*** The site-specific nutrient criterion for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs are 0.23 mg/L nitrate, expressed as an annual average not to be exceeded in any year. This criterion is expected to protect the designated use of the waterbodies by reducing filamentous algae growth. Any other criteria applicable to these waterbodies 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.*

Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs were listed as impaired for nutrients (algal mats) on the 2012 Verified List of impaired waters.

The site-specific nitrate criterion is based on several studies conducted in similar Florida spring systems and laboratories that discuss filamentous algae growth in relation to residence time, salinity, seasonality, and nutrient concentrations. Nitrate criteria are established to represent conditions where algal coverage was within acceptable ranges of 20% coverage per the numeric nutrient criteria (NNC) for floral imbalance. For all the springs in this report, a nitrate criterion is established at 0.23 mg/L expressed as an annual average, not to be exceeded in any year. Reducing the growth rate of macroalgae (including *Lyngbya* and *Chaetomorpha*) through nutrient reduction will decrease the growth rate and coverage of filamentous algae.

***Assessment:*** The EPA determined that the selection of filamentous algal growth coverage as the response variable target is appropriate and the technical approach to determine nitrate and TN concentrations is scientifically sound. The resulting water quality is expected to protect the designated uses for this waterbody.

## 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 public workshop was conducted by the FDEP on September 30, 2014 in Homosassa, Florida, to obtain comments on the draft nutrient TMDLs for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs. The workshop notice indicated that the nutrient TMDLs, if adopted, constitute site-specific numeric interpretations of the narrative criterion set forth in paragraph 62-302.530(48)(b), F.A.C., that would replace the otherwise applicable NNC in subsection 62-302.531(2), F.A.C., for these particular waters. The FDEP also held a public hearing on May 14, 2019 in Tallahassee, Florida.

***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 2, 2020, certified that the Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs TMDLs 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.*

The U.S. Fish and Wildlife Service provided concurrence with the EPA's programmatic consultation on site-specific nutrient criteria for the FDEP on July 21, 2015 for any site-specific nutrient criteria that are more stringent than the existing default nutrient criteria in place in the state of Florida for the waterbody. Because the site-specific criterion in this report for nitrate are more stringent than the default criteria, an additional ESA Section 7 consultation for this standards action is not required.

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

## 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 criterion for nitrate in subsection 62-302.531(2) for these particular waters, pursuant to paragraph 62-302.531(2)(a)1.b., 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 nitrate provides for and protects 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 criterion for nitrate for Homosassa-Trotter-Pumphouse Springs group, Bluebird Springs, and Hidden River Springs are 0.23 mg/L nitrate, expressed as an annual average not to be exceeded any year. 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 303(c); nothing herein should be construed to constitute a review or approval of a TMDL pursuant to 303(d).