

Executive Summary

Introduction

On June 13, 2012, the Florida Department of Environmental Protection (FDEP) submitted new and revised water quality standards for review by the U.S. Environmental Protection Agency pursuant to section 303(c) of the Clean Water Act (CWA). These new and revised water quality standards are set out primarily in Rule 62-302 of the Florida Administrative Code (F.A.C.) [Surface Water Quality Standards]. FDEP also submitted amendments to Rule 62-303, F.A.C. [Identification of Impaired Surface Waters], which sets out Florida's methodology for assessing whether waters are attaining State water quality standards. Both Rules 62-302 and 62-303 (referred to collectively as Rule in this Summary) incorporate by reference supporting documentation which was submitted as part of the Rule package. In addition to the supporting technical documentation, FDEP submitted a September 2012 Nutrient Standards Implementation Document. These documents provide important information with respect to the scientific basis for FDEP's numeric nutrient standards and FDEP's intentions regarding their implementation; therefore the EPA has reviewed as a whole the amendments to Chapters 62-302 and 62-303, in conjunction with the technical supporting documents and the Nutrient Standards Implementation Document.

FDEP's new and revised water quality standards include, among other provisions, additions and revisions to the State's definitions and the addition of numeric criteria for springs, lakes, streams, and estuaries, as well as a procedure for developing alternative criteria. The changes made by FDEP reflect an overall effort to interpret the existing nutrient narrative criterion and reflect a hierarchy for criteria development by site-specific analysis, stressor-response relationships, or reference distribution. The following Decision Document provides the details and conclusions of the EPA's review.

Summary of FDEP Rule

FDEP has developed a hierarchical approach to the development of the numeric nutrient Rule. This approach sets out the method by which FDEP will interpret their narrative nutrient criterion which states that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Rule's hierarchical approach gives preference to site-specific analyses that result in numeric interpretations of the narrative criteria.

A hierarchy 1 criterion, the preferred numeric criterion, is obtained with a site-specific analysis such as a total maximum daily load (TMDL), site-specific alternative criterion (SSAC), water quality based effluent limitation (WQBEL), or other FDEP approved action that numerically interprets the narrative criterion. If these site-specific analyses have already been developed or as they become developed in the future, they are considered the numeric interpretation of the narrative criteria under hierarchy 1 and are the applicable criteria for the specific waterbody. If a hierarchy 1 interpretation is not available, the Rule's hierarchical approach then gives preference to numeric nutrient values based on quantifiable stressor-response relationships between nutrients and biological response (*i.e.*, springs and lakes) under hierarchy 2. If no quantifiable stressor-response relationship has been established, such as is the case for Florida streams, reference-based nutrient thresholds, in conjunction with biological information, are used to determine the applicable interpretation of the narrative criteria under hierarchy 3. For those waters without a numeric interpretation under any of these approaches, the narrative criteria continue to apply to the waterbody. This overall method to deriving numeric criteria for lakes, springs, streams and

estuaries makes for a well-balanced and technically sound approach that is more effective and efficient than FDEP's long standing approach of individual interpretations of the narrative for each and every water body in the state. FDEP's hierarchical approach is consistent with 40 CFR 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to CWA section 303(c).

Springs Criterion

For springs, FDEP will apply a criterion of 0.35 mg/L of nitrate-nitrite as an annual geometric mean, not to be exceeded more than once in a three consecutive calendar year period for spring vents. The spring vent nitrate-nitrite criterion is based on a hierarchy 2, stressor-response relationship between nitrate-nitrite and the presence of nuisance algal mats, with the criterion established at a concentration that would prevent nuisance mats from occurring. FDEP will assess spring vents against this criterion as part of the five year basin rotation cycle for monitoring and assessing waters. If a spring vent meets the criterion, it is assessed as attaining water quality standards (WQS). If it exceeds the criterion, the spring vent is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL. The magnitude, frequency and duration of the water quality criterion for nitrate-nitrite adopted by FDEP for spring vents are identical to the criterion published in the EPA's December 2010 final rule, and provide the same level of protection; therefore they are consistent with the requirements of 40 CFR 131.11(b)(1)(iii) and are approved by the EPA pursuant to CWA section 303(c).

Lake Criteria

FDEP has classified lakes into three categories: colored lakes, clear lakes with high alkalinity and clear lakes with low alkalinity. The lakes criteria were based on a hierarchy 2, stressor-response relationship between total nitrogen and total phosphorus (TN and TP) and phytoplankton response (chlorophyll *a*). The lakes chlorophyll criteria were derived using multiple lines of evidence yielding chlorophyll criteria for each of the lake categories. From the chlorophyll criteria, acceptable ranges were determined for TN and TP. All three of these criteria are applied as annual geometric means, not to be exceeded more than once in a three consecutive calendar year period. FDEP will assess lakes against these criteria through their five year basin rotation cycle for monitoring and assessing waters. If a lake's chlorophyll, TN or TP levels are at or below the corresponding criterion, the lake will be assessed as meeting the criteria. Under certain circumstances TN and TP criteria can differ on an annual basis, depending on the current levels of TN and TP, as long as those levels fall within the acceptable ranges and the chlorophyll is below the appropriate threshold. If any of the parameters do not meet the criteria or are outside of the acceptable ranges, the lake is assessed as impaired and placed on the CWA 303(d) list as requiring a TMDL. Based upon the review of the lake criteria including the categorization, chlorophyll criteria, and concentration ranges for TN and TP, the EPA determined the criteria development and implementation to be scientifically defensible and consistent with the requirements of 40 CFR 131.11(b)(1)(iii). Therefore the provisions are approved by the EPA pursuant to CWA section 303(c).

Stream Criteria

For stream criteria, FDEP has developed reference-based nutrient thresholds, in conjunction with biological information, to determine the applicable interpretation of the narrative criteria under hierarchy 3. Despite an exhaustive effort to develop stressor-response relationships between nutrients and biological responses in streams, insufficient responses were observed to develop numeric nutrient

criteria. Therefore, to assess whether a stream attains the narrative criteria, an evaluation of water chemistry and biological data (flora and fauna), is used to determine if a stream's nutrient concentrations are protective of balanced flora and fauna. It is our understanding that FDEP's numeric water quality criteria for streams apply to all Class I and/or III flowing waters (except South Florida flowing waters) unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch.

FDEP's approach to protective stream criteria is based upon the belief that nutrients (TN and TP), in streams are only a problem when in excess, and then only if the excess nutrients stimulate excess plant or algal growth which then has the potential to adversely affect aquatic animals. The amount of excess plant or algal growth impacts aquatic animals by smothering their habitat, disturbing the food webs, or when decomposed, by depleting the available oxygen in the water. These changes in an aquatic system can be expected to show up in biological indicators, such as excessive algal mats, excess water column chlorophyll, excess nuisance vascular plant growth, and/or failing health scores for faunal communities. Adverse changes in these biological endpoints beyond a certain level can be considered evidence of an imbalance of aquatic flora and/or fauna.

Since adverse effects of nutrient over-enrichment primarily manifest themselves through excessive algae and plant production, FDEP's criteria for streams includes information such as floral (plant) response variables to identify impaired streams. This biological information augments the reference-based nutrient thresholds. FDEP follows this approach in the design of the stream criteria by making floral and faunal health considerations critical components of the Rule. Floral imbalance is determined by floral metrics derived by FDEP based on data and scientific information that indicate support for the State's recreation and aquatic life use: "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife." FDEP has derived floral metrics for chlorophyll levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition. FDEP states that if any one of the floral measures indicates an imbalance, then the stream does not attain the numeric nutrient criteria. These metrics are included in the technical support documents submitted as part of the Rule package and specifically referenced in the Rule itself, and in the Nutrient Standards Implementation Document. Faunal (animal) imbalance is measured by the stream condition index or SCI. The SCI is a biological assessment procedure that measures the degree to which flowing fresh waters support a healthy, well-balanced biological community, as indicated by benthic macroinvertebrates. Attainment of the SCI threshold is an indication that the faunal community of the stream is not being adversely affected by nutrients to the extent that there is a loss in designated use. However, failure of the SCI alone does not necessarily mean that the stressor causing the loss of designated use is nutrients. The numeric nutrient thresholds included in the State Rule are the numeric nutrient criteria derived by the EPA for streams in the December 2010 final rule for Florida's lakes and flowing waters.

For streams, not addressed under a site-specific interpretation under hierarchy 1, FDEP uses a two-part method to interpret the narrative nutrient criterion. For the first part of the two-part method FDEP determines if certain floral responses (demonstrated by undesirable chlorophyll levels, the presence of excessive algal mats or blooms, nuisance aquatic plant growth, and undesirable changes in algal species composition) are each independent indications of imbalanced flora. If they are not, then FDEP concludes there is no imbalance of flora in the waterbody. If any one of these floral measures indicates an imbalance, then the whole of the stream segment is imbalanced. For the second part of the two-part method, FDEP evaluates faunal responses (demonstrated by SCI) and water chemistry (TN and TP

concentrations). If the stream exhibits either an average SCI score of 40 or greater (indicating balanced fauna) or concentrations of TP and TN equal to or less than the established thresholds, FDEP concludes that the waterbody is meeting its designated use.

Due to the complexity of the stream criteria, FDEP submitted an accompanying Nutrient Standards Implementation Document. This document explains how FDEP intends to implement the stream criteria and determine imbalance of flora and fauna. It includes examples and scenarios of how FDEP would assess compliance with the stream criteria and when a stream would be listed on Florida's verified list, study list, or planning list. Note that waters on both the verified and study list are included in the CWA 303(d) list as waters requiring TMDLs.

Following analysis of the rule and SCI Primer, in conjunction with the subsequent clarification provided by the Nutrient Standards Implementation Document, the EPA has determined FDEP's multi-metric criterion has addressed the variability associated with biological response in streams in a reasonable manner and is a scientifically defensible way to achieve protection of the designated uses in the defined streams. This integrated approach provides a strong basis for protecting streams. It builds upon FDEP's extensive experience and technical expertise in assessing water bodies for biological impairment. Therefore, the EPA finds that all components of FDEP's stream criterion, as well as the new or revised water quality standards from the SCI Primer, are consistent with 40 CFR Part 131 and are approved by the EPA pursuant to CWA section 303(c).

Estuary Criteria

Estuary-specific numeric interpretations of the narrative criteria were derived for estuaries along the South and Southwest Coast. This includes: Tampa Bay, Clearwater Harbor, Sarasota Bay, Charlotte Harbor, Clam Bay and South Florida marine waters. FDEP adopted these criteria to protect recreation and a healthy, well-balanced population of fish and wildlife, and included them as hierarchy 1 interpretations. For Tampa Bay, Clearwater Harbor, Sarasota Bay and Charlotte Harbor derivation of numeric criteria was based upon the research, data, and work of the National Estuary Programs or NEPs. The criteria for these estuaries were derived through a collaborative effort to improve and restore sea grass. The conceptual model used is described as a pathway that relates seagrass health through a series of steps back to input of nutrients TN and TP. The steps in the pathway consist of: (1) seagrass growth and reproduction, as controlled by (2) seagrass light requirements, which are in turn affected by (3) light attenuation in the water column, that results in part from (4) chlorophyll which is influenced by (5) TN and TP loads. All southwest estuary criteria, except for Tampa Bay which are expressed as delivery ratios, are expressed as concentrations not to be exceeded more than once in three consecutive years. FDEP developed criteria for the coastal waters of southernmost Florida by grouping those waters geographically into four large south Florida systems (Tidal Coghatchee River/Ten Thousand Islands, Florida Bay, the Florida Keys, and Biscayne Bay) and then using a maintain healthy conditions approach. Important biological communities, water quality conditions, and nutrient sources were evaluated in each system to establish the status and determine if a system, or part of a system, is meeting the designated use. Using statistics with a prediction interval, FDEP calculated criteria that reflect healthy conditions in the waterbody while shielding against a statistically false positive result (that is, identification of a healthy waterbody as impaired).

FDEP also included a schedule for the development of criteria for the remaining estuaries in the State. A Rule with numeric nutrient criteria for Perdido Bay, Pensacola Bay (including Escambia Bay), St.

Andrews Bay, Choctawhatchee Bay, St. Joseph Bay, and Apalachicola Bay was to be completed by June 30, 2013. However, FDEP adopted numeric nutrient criteria for these estuaries on November 13, 2012 and will be submitting these for EPA review. A Rule for numeric nutrient criteria for the remaining estuaries will be completed by June 30, 2015. The EPA concludes that the criteria provided in FDEP's current rule are protective of healthy, well-balanced biological communities in the waters to which they apply and are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria. Therefore, this provision is approved by the EPA pursuant to CWA section 303(c).

Downstream Protection

Protection of downstream waters is required in FDEP's nutrient Rule by the statement, "The loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." FDEP will implement this provision by: using models to allocate to upstream watersheds when establishing the TMDL for the downstream waterbody; requiring dischargers, at the time of permit issuance, to provide reasonable assurance that their effluent does not cause or contribute to nutrient impairments in the receiving waterbody and downstream waterbodies; and identifying increasing trends in nutrient concentrations in all waters, including downstream waters, during the assessment cycle. For permitting, if a downstream water is currently attaining its nutrient standards, then current conditions in the upstream waters provide for the attainment condition and therefore loading of nutrients from the waterbody would be limited to current conditions. However, a comprehensive water quality based effluent limit would be required to evaluate the impacts on downstream waters if the facility requests an increase in their permitted load. If a downstream waterbody is not attaining nutrient standards, the permit could not be issued until reasonable assurance was provided that the facility's discharge was not contributing to the impairment. In this case modeling can be used to ensure that loading of nutrients from the upstream waterbody is limited as necessary to provide for the attainment and maintenance of the water quality standards of downstream waters.

The FDEP Rule includes an evaluation of trends to ensure that conditions are not increasing in a manner that could result in impairment downstream. If there is an increasing trend of chlorophyll and the waterbody is expected to become impaired within 5 years, then it is placed on Florida's verified list and CWA 303(d) list for nutrient impairment. FDEP will expedite the development of a TMDL to address and prevent the potential impairment. If there is an increasing trend of chlorophyll, nitrate-nitrite, TN or TP and the waterbody is expected to become impaired within 10 years, then it is placed on Florida's study list and CWA 303(d) list. Applicable studies would be conducted within the current or next listing cycle to determine if the waterbody requires a TMDL. If there is a statistically significant adverse trend in chlorophyll, TN or TP without a projected impairment within 10 years, the waterbody will initially be placed on Florida's planning list so that a more rigorous statistical analysis can be conducted. A determination of impairment status will be made for these waterbodies in the next listing cycle.

FDEP's Rule provides a quantitative process that will serve to ensure the attainment and maintenance of downstream waters by requiring nutrient control measures not only in cases where nutrient impairment has already been documented, but also in cases where nutrient standards are currently met in downstream waters, but maintaining compliance with those nutrient standards is threatened as documented by water quality trends. The State's downstream methodology will enable effective and expeditious development of numeric nutrient levels needed to attain downstream standards. In addition, the EPA has determined pursuant to CWA section 303(c)(4)(B) that numeric values are not necessary to meet CWA requirements with respect to downstream protection. For these reasons, FDEP's downstream

protection provisions are approved by the EPA pursuant to CWA section 303(c) subject to the district court modifying the consent decree to not require the EPA to promulgate numeric downstream protection values (DPVs) in Florida.

Site-Specific Alternative Criteria

FDEP's Rule also includes provisions for site-specific alternative criteria or SSAC for nutrients. This provides a predictable approach to developing nutrient SSACs. The Rule language provides clear expectations on the water quality and biological data needed to characterize existing nutrient concentrations and aquatic health. The EPA determined that FDEP's provision is a scientifically defensible approach for development of SSAC for nutrients, and therefore this provision is approved by the EPA pursuant to CWA section 303(c).

Impaired Waters Rule

FDEP also made changes to their impaired waters Rule (IWR) which include the trend analysis discussed above and provide processes to determine if waterbodies (or waterbody segments) should be placed on the verified list and CWA 303(d) list of impaired waterbodies for subsequent TMDL development. The listings are made in accordance with evaluation thresholds, data sufficiency and data quality requirements in the IWR. The results of the assessment are used to identify waters in each basin for which TMDLs will be developed. The IWR also includes the provision for the new "study list." Pursuant to section 303(c) of the CWA, the EPA has reviewed and is approving those portions of the amended IWR that the Agency has determined to be new or revised water quality standards.

**Decision Document of
United States Environmental Protection Agency Determination
Under § 303(c) of the Clean Water Act
Review of Amendments to Florida’s Rule 62-302 and 62-303**

On June 13, 2012, the Florida Department of Environmental Protection (the FDEP or the Department) submitted new and revised water quality standards for review by the U.S. Environmental Protection Agency (the EPA or the Agency) pursuant to section 303(c) of the Clean Water Act (CWA or Act). These new and revised water quality standards (WQS) are set out primarily in Rule 62-302 of the Florida Administrative Code (F.A.C.) [Surface Water Quality Standards]. The State also submitted amendments to Rule 62-303, F.A.C. [Identification of Impaired Surface Waters], which sets out Florida’s methodology for assessing whether waters are attaining state water quality standards. As set out more fully below, where the EPA has determined that amendments to Rule 62-302 and/or Rule 62-303 are, themselves, new or revised water quality standards, the EPA has reviewed and approved those revisions pursuant to section 303(c) of the CWA.¹

Both Rules 62-302 and 62-303 incorporate by reference several documents that were submitted as part of the State’s documentation. As set out more fully below, where EPA has determined that those documents, or portions of those documents, constitute new or revised water quality standards, the EPA has reviewed and approved those revisions pursuant to section 303(c) of the CWA. In addition, the State submitted a list of Total Maximum Daily Loads (TMDLs), which represent numeric interpretations of the nutrient narrative criterion that the EPA will be reviewing and approving or disapproving as site-specific criteria. Those TMDL-based site-specific criteria submittals will be addressed under separate cover.

Section 303 of the Clean Water Act, 33 U.S.C. § 1313, requires states to establish water quality standards and to submit any revised or new standards to the EPA for approval or disapproval. The revisions addressed in this document were approved for adoption by the Florida Environmental Regulation Commission (ERC) at a public hearing on December 8, 2011. The State Legislature waived the requirement that the rules be ratified by the legislature. Following a multi-day hearing on a challenge to the State rules, Administrative Law Judge Bram D. E. Canter ruled in favor of FDEP on all aspects on June 7, 2012. The Rules were then submitted to the EPA in a letter dated June 13, 2012, from Thomas M. Beason, General Counsel for the FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA’s Region 4 Office. The General Counsel certified that the WQS revisions were duly adopted pursuant to Florida law.

Water quality standards must be based on scientifically defensible methods, pursuant to section 304(a) of the CWA or other scientifically defensible methods. The EPA develops water quality criteria guidance, pursuant to section 304(a) of the Act, based on the latest available scientific knowledge related to the effects of pollutants on water quality. Where states rely on such criteria guidance in developing new or revised water quality standards, the EPA considers those standards to be based on scientifically defensible methods. The EPA has developed 304(a) guidance for the development of

¹ EPA has provided FAQs on “What is a New or Revised Water Quality Standard Under CWA 303(c)(3)?” at <http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm>. The link provides detailed information of such analysis.

nutrient criteria.² On December 6, 2010, the EPA published a final rule establishing numeric nutrient criteria, or numeric limits on the amount of total nitrogen, total phosphorus, nitrate-nitrite, and chlorophyll *a* allowed in Florida's inland waters (i.e., lakes, streams and springs except flowing waters in South Florida) while still protecting applicable designated uses (December 2010 final rule).³ In developing those criteria, the EPA relied on the science underlying the Agency's 304(a) guidance and on its review of the latest scientific data and knowledge available regarding the effects of nutrients on waters in Florida. Where FDEP's new or revised water quality standards are consistent with the EPA's guidance or other scientifically defensible methods (e.g., with the EPA's December 2010 final rule), the EPA will consider those standards to be scientifically defensible and protective of CWA 101(a)(2) designated uses (protection and propagation of fish, shellfish, and wildlife and recreation in and on the water).

On January 14, 2009, the EPA issued a determination under CWA section 303(c)(4)(B) that new or revised WQS in the form of numeric water quality criteria for nutrients are necessary to protect the designated uses that Florida has set for its Class I and Class III waters. The FDEP rule does not provide numeric nutrient criteria for all waters of the State that are addressed in the EPA determination (and required to be covered by the consent decree). Specifically the WQS provisions of Chapter 62-302 do not cover South Florida flowing waters, certain estuaries, or coastal waters. The FDEP rule relies on the narrative nutrient standard for protection of these waters (although FDEP has adopted a schedule in rule to adopt numeric nutrient criteria for the remaining estuaries). Because these waters are classified as Class I and/or III waters, EPA has developed proposed numeric nutrient criteria for these waters per the determination and consent decree. EPA will sign a notice of final rulemaking regarding such criteria by the deadlines in the consent decree, and such criteria will remain in place for these waters unless and until FDEP submits new or revised water quality standards relevant to the control of nutrients for such waters, EPA approves such standards, and EPA withdraws federal criteria for these waters. It is our understanding that FDEP's numeric water quality criteria apply to all Class I and/or III flowing waters (except South Florida flowing waters) unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., it is a tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch. EPA understands that, in some cases, there may be questions regarding the appropriate designated use for some of these waters (e.g., hydrologically modified waters/canals), and FDEP has developed a mechanism for addressing those waters through the Class III-Limited Use category, which would involve FDEP conducting a use attainability analysis (UAA), adopting and submitting to EPA a revised designated use of Class III-Limited for such water(s), and EPA approving such revision. It is EPA's view that any waters excluded by Florida's stream definition that are Class I and/or III still merit the protection afforded by nutrient criteria because these waters may provide important habitat for a diverse range of aquatic plants and animals and may be vulnerable to the effects of nutrient pollution.

As set out more fully below, EPA believes that the provisions in FDEP's new or revised water quality standards addressing downstream protection will provide for quantitative approaches to ensure the attainment and maintenance of downstream waters consistent with 40 CFR 131.10(b). The provisions themselves, however, do not consist of numeric values as required by the January 2009 determination.

² EPA's technical guidance documents describing the techniques used to develop nutrient criteria for use in state and tribal water quality standards can be found at:

http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/guidance_index.cfm

³ Federal Register, Vol. 75, No. 233, 75762, December 6, 2010. Water Quality Standards for the State of Florida's Lakes and Flowing Waters.

However, EPA has amended that determination to specify that such numeric DPVs are not necessary in Florida to meet CWA requirements. Because EPA is currently subject to a Consent Decree deadline to sign a rule proposing numeric downstream protection values (DPVs) for Florida by November 30, 2012, EPA is proposing numeric DPVs to comply with the Consent Decree. EPA will ask the court to modify the Consent Decree consistent with the Agency's amended determination, i.e., to not require EPA to promulgate numeric DPVs for Florida. Accordingly, EPA is approving the State's downstream protection provisions subject to the district court modifying the Consent Decree to not require EPA to promulgate numeric DPVs for Florida. If the district court declines to so modify the Consent Decree, EPA expects to revisit its approval of the State Rule's downstream protection provisions to modify or withdraw that approval. Therefore, EPA is reserving its authority to do so in this approval.

We note that FDEP's September 2012 document titled "Implementation of Florida's Numeric Nutrient Standards Document Submitted to the EPA in Support of the Department of Environmental Protection's Adopted Nutrient Standards for Streams, Spring Vents, Lakes, and Selected Estuaries" (Nutrient Standards Implementation Document), addresses how and when the state intends to implement its nutrient criteria.⁴ While EPA does not consider the Implementation Document to include water quality standards, this document provides important insight into the scientific basis for FDEP's numeric nutrient standards and their implementation. EPA's approval of portions of Florida's new or revised water quality standards is based on the Agency's understanding that FDEP will implement the streams criteria as provided in its Nutrient Standards Implementation Document. Due to a recent administrative challenge filed in the State of Florida Department of Administrative Hearings, there is uncertainty as to whether FDEP will be able to implement its newly approved state water quality standards consistent with the Nutrient Standards Implementation Document. If, as a result of the legal challenge, FDEP is unable to implement its Rule as provided in its Nutrient Standards Implementation Document, EPA would intend to revisit portions of its approval of Florida's new or revised water quality standards. EPA has therefore reserved its authority to withdraw or modify portions of this approval.

As set out more fully below, the EPA is approving the Rules submitted by FDEP that are new or revised water quality standards, pursuant to section 303(c) of the CWA. It is our understanding that the provisions of F.A.C. 62-302.531(9) (hereafter "the all-or-nothing provisions") are not triggered by the actions EPA is taking today, both in this approval document and in EPA's Phase I and Phase II proposals. However, if those provisions are interpreted in a manner that prevents FDEP's numeric nutrient criteria from becoming effective for Florida's lakes, springs or flowing waters, or if there are any modifications or decisions with respect to FDEP's TSDs or Nutrient Standards Implementation Document that render the rules unable to be implemented consistent with EPA's approval, then EPA may need to revisit this approval decision to either modify or withdraw it. This would result in our Phase I lakes and springs criteria taking effect and EPA would possibly proceed to finalize numeric nutrient criteria for all Class I and/or III flowing waters in accordance with our Consent Decree obligations.

EPA'S DECISION

⁴ We note that FDEP's Nutrient Standards Implementation Document addresses how and when the state intends to translate its nutrient criteria into NPDES permit limits for point source dischargers. EPA does not consider these permitting procedures to be part of the water quality standards submission and this decision document does not address the Agency's approval or disapproval of these permitting procedures.

Each of FDEP’s water quality standards revisions is addressed in detail below along with the EPA’s analysis and conclusions.

Overview of Revisions to Chapter 62-302⁵

Review of Non-substantive Revisions to Water Quality Standards

The EPA determined that changes within 62-302.200, including the addition of the phrase “[a]s used in this chapter”, the renumbering of the definitions, minor typographical changes to 62-302.200(1), (2), (5), (7), (9)-(15), (18), (20), (21), (34), (38), (40), and (44) [as numbered in the submitted regulatory changes], were editorial, non-substantive changes to Florida’s EPA-approved water quality standards. Additional minor typographical changes were made in 62-302.800(1) and 62-302.800(2)(c)2 that were also considered editorial, non-substantive changes to Florida’s EPA-approved water quality standards. The EPA approves these editorial, non-substantive changes as being consistent with the CWA and the EPA’s implementing regulations. The EPA notes, however, that its approvals of these editorial, non-substantive changes do not re-open the EPA’s prior approvals of the underlying substantive water quality standards.

Review of Remaining Revisions

Definitions

Rule 62-302.200

The Department made a number of changes to the definitions set out in Rule 62-302.200, as described in more detail below. Note that the subsection numbers correspond to the appropriate numbers in the revised Rule.

Subsection 62-302.200(4)

The definition of “biological health assessment” was added and reads as follows:

(4) “Biological Health Assessment” shall mean one of the following aquatic community-based biological evaluations: Stream Condition Index (SCI), Lake Vegetation Index (LVI), or Shannon-Weaver Diversity Index.

This definition describes the listed biological indices as types of “biological health assessments” and limits application of that term to those listed biological indices. This definition creates an umbrella term for the three listed biological indices used in Florida’s standards, each of which is a new or revised WQS in its own right. The EPA previously approved a definition of “bioassessment” in Florida’s Impaired Waters Rule (IWR), at 62-303.200(1). Section 62-302.200(4) revises that definition. The definition of each individual biological index is discussed below. This definition is consistent with 40 CFR part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act. The EPA also notes that the revisions to this definition also affect the use of the term “biological health assessment” in other parts of Florida WQS, since an assessment of a water body’s biological health that is required under

⁵ Unless otherwise stated, all rule and subsection citations are to provisions in the Florida Administrative Code.

other provisions of the WQS is now limited to an evaluation using one of these three indices that evaluate the aquatic community.

Subsection 62-302.200(16)

The definition of “lake” was added and reads as follows:

(16) “Lake” shall mean, for purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., a lentic fresh waterbody with a relatively long water residence time and an open water area that is free from emergent vegetation under typical hydrologic and climatic conditions. Aquatic plants, as defined in subsection 62-340.200(1), F.A.C., may be present in the open water. Lakes do not include springs, wetlands, or streams (except portions of streams that exhibit lake-like characteristics, such as long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions).

This provision defines the physical extent that water quality criteria adopted for freshwater lakes in 62-302.531(2)(b)1. apply and thus establishes expectations for certain ambient fresh waters. The EPA previously approved a definition of “lake” in Florida’s Impaired Waters Rule (IWR), at 62-303.200(8). That provision was also revised during the State’s nutrient rulemaking and is addressed more fully below. The EPA notes that the definition of “lake” in 62-302.200(16) now differs slightly from the definition in 62-303.200(8), in that the 62-302.200(16) definition limits the applicability of the definition to “purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C.”

The EPA used a similar definition in its December 2010 final rule.⁶ Florida’s definition specifically includes the portions of streams that exhibit characteristics of lakes. The State’s definition also states that lakes are free from emergent vegetation under typical hydrologic and climatic conditions, and that aquatic plants⁷ may be present in lakes.

Florida’s additional descriptions and restrictions clarify further the intended use of this water body type as it relates to application of nutrient criteria.

Based on the EPA’s review, a water body classified as a lake when implementing the December 2010 final rule will also be considered as a lake under the State’s definition. Therefore, the EPA agrees that the definition is appropriate to delineate freshwater water bodies in the application of nutrient water quality criteria for lakes. For the reasons explained in the EPA’s December 2010 final rule, this definition is consistent with 40 CFR part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(17)

The definition of “lake vegetation index” was added and reads as follows:

⁶ The EPA promulgated the following definition of “lake” in the Agency’s December 2010 final rule: “a slow-moving or standing body of freshwater that occupies an inland basin that is not a stream, spring, or wetland.” Federal Register Vol. 75, No. 233, Page 75805.

⁷ F.A.C. 62-340.200 defines aquatic plant as “a plant, including the roots, which typically floats on water or requires water for its entire structural support, or which will desiccate outside of water.”

(17) "Lake Vegetation Index (LVI)" shall mean a Biological Health Assessment that measures lake biological health in predominantly freshwaters using aquatic and wetland plants, performed and calculated using the Standard Operating Procedures for the LVI in the document titled *LVI 1000: Lake Vegetation Index Methods* (DEP-SOP-003/11 LVI 1000) and the methodology in *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (DEP-SAS-002/11), both dated 10-24-11, which are incorporated by reference herein. Copies of the documents may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

The LVI is one of the three aquatic assessments included in the term "biological health assessments" in 62-302.200(4), above. The LVI is a new biological assessment criterion, replacing the Lake Condition Index (LCI). The LVI is applied in 62-303.330(3)(d) and 62-303.430(2)(a) and (c), where specific levels of the index are used to execute decisions that waters do not meet the narrative criterion and thus do not attain WQS. Those provisions are addressed later in this document. This provision, as applied in 62-303.330 and 62-303.430, defines an ambient condition of water that supports an aquatic life designated use and therefore establishes a level of protection that is applied to a water body. The LVI is also applied in 62-302.800(3), as part of the qualifying conditions for a demonstration that the narrative nutrient criteria in 62-302.530(47)(b) are met in the process of establishing a Type III Site Specific Alternative Criteria (SSAC) for nutrients. The revised definition of LVI further defines a new biological assessment criterion to Florida's currently approved water quality criteria for biological integrity contained in 62-302.530(10).

The definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act because it helps to clarify which tests the State will use when conducting biological health assessments. The actual index and corresponding scoring system is discussed later in this document.

This provision also references two documents, *LVI 1000: Lake Vegetation Index Methods* (LVI 1000) and *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (the LVI Primer), which contain the information on how to complete the steps that are necessary to conduct a biological health assessment based on the LVI for freshwater lakes. These documents are not new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since they only contain the details of analytical procedures that are used to calculate the LVI, a relative index of biological health for freshwater lakes. The EPA also notes that this definition is repeated in 62-303.200(9).

Subsection 62-302.200(19)

The definition of "natural background" was revised as follows:

(19) (16) "Natural Background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, or on historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background

conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped according to ambient total phosphorus and total nitrogen concentrations in the following lake zones:

(a) The TP1 phosphorus zone consists of the USEPA Lake Regions 65-03, and 65-05.

(b) The TP2 phosphorus zone consists of the USEPA Lake Regions 75-04, 75-09, 75-14, 75-15 and 75-33.

(c) The TP3 phosphorus zone consists of the USEPA Lake Regions 65-01, 65-02, 75-01, 75-03, 75-05, 75-11, 75-12, 75-16, 75-19, 75-20, 75-23, 75-24, 75-27, 75-32 and 76-03.

(d) The TP4 phosphorus zone consists of the USEPA Lake Regions 65-04, 75-02, 75-06, 75-08, 75-10, 75-13, 75-17, 75-21, 75-22, 75-26, 75-29, 75-31, 75-34, 76-01 and 76-02.

(e) The TP5 phosphorus zone consists of the USEPA Lake Regions 75-18, 75-25, 75-35, 75-36 and 76-04.

(f) The TP6 phosphorus zone consists of the USEPA Lake Regions 65-06, 75-07, 75-28, 75-30 and 75-37.

(g) The TN1 nitrogen zone consists of the USEPA Lake Region 65-03.

(h) The TN2 nitrogen zone consists of the USEPA Lake Regions 65-05 and 75-04.

(i) The TN3 nitrogen zone consists of the USEPA Lake Regions 65-01, 65-02, 65-04, 75-01, 75-02, 75-03, 75-09, 75-11, 75-15, 75-20, 75-23, 75-33 and 76-03.

(j) The TN4 nitrogen zone consists of the USEPA Lake Regions 65-06, 75-05, 75-06, 75-10, 75-12, 75-13, 75-14, 75-16, 75-17, 75-18, 75-19, 75-21, 75-22, 75-24, 75-26, 75-27 and 75-29, 75-31, 75-32, 75-34 and 76-02.

(k) The TN5 nitrogen zone consists of the USEPA Lake Regions 75-07, 75-08, 75-25, 75-28, 75-30, 75-35, 75-36, 75-37, 76-01 and 76-04.

The Lake Regions document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

This provision references a document, *Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR)*, which contains information on lake location and characteristics. This document is not a new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since it only contains reference material relating to previous lake research completed for the studied lakes.

The addition of "paleolimnological examination of sediment cores" and "examination of geology and soils" to the "natural background" definition provides two additional methods for documenting natural background. FDEP has also added a third method for considering natural background TP and TN concentrations in lakes, based on a previous EPA study completed for Florida lakes, with subsequent refinement by a representative of the Florida Lake Watch program.

By adding these three methods, the State is clarifying the types of analyses available to support a conclusion of what would be expected as the natural background condition for a given waterbody. The first two options provide a narrative description of the type of analyses, while the third option provides TP and TN zones "grouped according to ambient [concentrations]" specifically for lakes. These types of

analyses are likely to be useful in future applications of the State's SSAC provisions when determining whether an elevated TP or TN concentration is the result of a natural background condition. Any application of this provision that results in a change to the existing water quality standard would be subject to the normal state rulemaking and EPA review processes at that time. The EPA does not consider any of these methods, alone, to be sufficient to demonstrate natural conditions, absent a site-specific demonstration that the method is appropriate to establish background for a particular lake.

Therefore, these revisions are consistent with 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(22)

The definition of "nutrient" was added and reads as follows:

(22) "Nutrient" shall mean total nitrogen (TN), total phosphorus (TP), or their organic or inorganic forms.

This provision creates a term that serves to make the component terms operable in this rule. The definition also clarifies what is meant by "nutrient" in terms of the State's narrative criteria for nutrients, the numeric interpretations of the narrative criteria, and any other application of the term "nutrient" within Florida's water quality regulations. The State's definition of "nutrient" is consistent with the EPA's 304(a) guidance on nutrient criteria⁸, 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(23)

The definition of "nutrient response variable" was added and reads as follows:

(23) "Nutrient response variable" shall mean a biological variable, such as chlorophyll *a*, biomass, or structure of the phytoplankton, periphyton or vascular plant community, that responds to nutrient load or concentration in a predictable and measurable manner. For purposes of interpreting paragraph 62-302.530(47)(b), F.A.C., dissolved oxygen (DO) shall also be considered a nutrient response variable if it is demonstrated for the waterbody that DO conditions result in biological imbalance and the DO responds to a nutrient load or concentration in a predictable and measurable manner.

The first sentence of this provision defines a term, "nutrient response variable," that serves to make the component terms operable in this rule. The addition of the second sentence adds dissolved oxygen to the list of "nutrient response variables," when the biological response to DO can be attributed to nutrient concentration or load. Both of these sentences refer to a response to causal nutrient concentrations in a "predictable and measurable manner." FDEP's Nutrient Standards Implementation Document, provides additional detail regarding how the term "predictable and measurable" is defined.

⁸ Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs [EPA-822-B-00-001]. Nutrient Criteria Technical Guidance Manual: Rivers and Streams [EPA-822-B-00-002], and the November 14, 2001 Memorandum from Geoff Grubbs titled *Development and Adoption of Nutrient Criteria into Water Quality Standards*.

Standard statistical tests, such as regression or other appropriate empirical or deterministic models, are used to demonstrate a “predictable and measurable” DO response to nutrients. The p value associated with the regression or other statistical model should be less than 0.05 and the variability in DO explained by nutrients should be sufficient (*e.g.*, $r^2 \geq 0.25$) to expect that nutrient reductions would lead to improvements in DO and maintain or restore a healthy, well balanced biological community. (Page 33 of Nutrient Standards Implementation Document)

The State’s definition of “nutrient response variable” is consistent with the EPA’s 304(a) guidance and policy on nutrient criteria⁹, 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

The EPA notes that the second sentence of 62-302.200(23) is operative only for purposes of 62-302.530(47)(b). Rule 62-3-2530(47)(a) continues to require the discharge of nutrients to be limited as needed to prevent violations of other standards contained in chapter 62-302. The requirement in 62-302.200(23) that DO will act as a nutrient response variable only if it is demonstrated that DO conditions in a particular waterbody result in biological imbalance does not apply in instances where nutrient levels contribute to non-attainment of the state DO water quality criteria.

Subsection 62-302.200(24)

The definition of “nutrient threshold” was added and reads as follows:

(24) “Nutrient Threshold” shall mean a concentration of nutrients that applies to a Nutrient Watershed Region and is derived from a statistical distribution of data from reference or benchmark sites. Nutrient Thresholds are only applied to streams as specified in paragraph 62-302.531(2)(c), F.A.C.

This provision makes clear what numeric nutrient criteria, or “nutrient thresholds” as defined by the State, apply to streams. The remaining terminology (“nutrient watershed region”) and concepts (criteria selection and application to streams) are discussed elsewhere in this document. The definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(25)

The definition of “nutrient watershed region” was added and reads as follows:

(25) “Nutrient Watershed Region” shall mean a drainage area over which the nutrient thresholds in paragraph 62-302.531(2)(c), F.A.C., apply.

⁹ Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs [EPA-822-B-00-001]. Nutrient Criteria Technical Guidance Manual: Rivers and Streams [EPA-822-B-00-002], and the November 14, 2001 Memorandum from Geoff Grubbs titled *Development and Adoption of Nutrient Criteria into Water Quality Standards*.

- (a) The Panhandle West region consists of the Perdido Bay Watershed, Pensacola Bay Watershed, Choctawhatchee Bay Watershed, St. Andrew Bay Watershed, and Apalachicola Bay Watershed.
- (b) The Panhandle East region consists of the Apalachee Bay Watershed, and Econfina/Steinhatchee Coastal Drainage Area.
- (c) The North Central region consists of the Suwannee River Watershed and the “stream to sink” region in Alachua, Marion and Levy Counties that is affected by the Hawthorne Formation.
- (d) The West Central region consists of the Peace, Myakka, Hillsborough, Alafia, Manatee, Little Manatee River Watersheds, Sarasota/Lemon Bay Watershed and small, direct Tampa Bay tributary watersheds south of the Hillsborough River Watershed.
- (e) The Peninsula region consists of the Waccasassa Coastal Drainage Area, Withlacoochee Coastal Drainage Area, Crystal/Pithlachascotee Coastal Drainage Area, small, direct Tampa Bay tributary watersheds west of the Hillsborough River Watershed, small, direct Charlotte Harbor tributary watersheds south of the Peace River Watershed, Caloosahatchee River Watershed, Estero Bay Watershed, Imperial River Watershed, Kissimmee River/Lake Okeechobee Drainage Area, Loxahatchee/St. Lucie Watershed, Indian River Watershed, Daytona/St. Augustine Coastal Drainage Area, St. John’s River Watershed, Nassau Coastal Drainage Area, and St. Mary’s River Watershed.
- (f) The South Florida region consists of those areas south of the Peninsula region, such as the Cocohatchee River Watershed, Naples Bay Watershed, Rookery Bay Watershed, Ten Thousand Islands Watershed, Lake Worth Lagoon Watershed, Southeast Coast – Biscayne Bay Watershed, Everglades Watershed, Florida Bay Watershed, and the Florida Keys.
- A map of the Nutrient Watershed Regions, dated October 17, 2011, is incorporated by reference herein and may be obtained from the Department’s internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

A given Nutrient Watershed Region (NWR), as specifically described above, defines the physical areas where the previously described nutrient concentration values for streams apply. In addition, the provision incorporates by reference a map of the nutrient regions. This locational information, both in narrative format and the referenced map, defines where the criteria apply and therefore lays out the expectation of water quality for these ambient waters in each NWR.

In the December 2010 final rule, the EPA established five separate NWRs, which were composed of individual watersheds based on NOAA coastal, estuarine, and fluvial drainage areas with modifications to the NOAA drainage areas in the West Central and Peninsula Regions that account for unique watershed geologies. The State’s definition of NWR differs in three aspects from the regions developed by the EPA in its December 2020 final rule. The differences include: the Sarasota/[Lemon] Bay watershed is now listed within the West Central region instead of the Peninsula, the Imperial River watershed is newly listed in the Peninsula region, and the addition of the phrase “and the ‘stream to sink’ region in Alachua, Marion and Levy Counties that is affected by the Hawthorne Formation” to the North Central region.

Where the EPA's December 2010 final rule has already provided the documentation to support the above described geographic locations as appropriate nutrient watershed regions¹⁰, no further review was completed. However, where the geographic locations differ from those established in the EPA's December 2010 final rule, the Agency reviewed the submitted materials from the State and found that the differences from the federal rule are due to consideration of additional information, described in *FDEP's Technical Support Document: Development of Numeric Nutrient Criteria for Florida Lakes, Springs Vents and Streams (2012)* (FDEP's Freshwater TSD). Pages 86 through 93 of FDEP's Freshwater TSD further explains the specific details of the State's analysis of "more recent geological information and watershed connections." The following text was also provided by FDEP on August 24, 2012, in a document titled "DEP's Responses to EPA's Questions and Requests for Clarification," (FDEP's Q&A Document) to further explain the newer geologic information.

Sarasota Area

The "Hydrogeologic Framework of the Southwest Florida Water Management District", which was published in 2008 by the DEP (Arthur et al., Florida Geologic Bulletin No. 68) in cooperation with the SWFWMD, is the most up-to-date and thorough analysis of geology in this area. When mapped, the data show the phosphorus rich Hawthorn Formation to be widely distributed near the ground surface in Sarasota County (Figure 2). The data show Sarasota County to be influenced by naturally occurring phosphorus and that Sarasota Bay and Lemon Bay Watersheds should more appropriately be included in the West Central Nutrient Watershed Region than in the Peninsula (Figure 3). The analysis of the data from the 2008 geologic report clearly shows that phosphorus rich deposits are present in Sarasota County in both of the major coastal Estuarine Drainage Areas (EDA). Water quality data demonstrates that freshwater concentrations are very similar in the existing Peninsular and West Central Regions (Figure 4). Applying the Peninsular total phosphorus standards to the coastal EDAs will result in the erroneous conclusion that natural levels of phosphorus are due to anthropogenic inputs.

Alachua County Area

After consulting with local scientists, DEP concluded that the areal extent over which water quality is influenced by naturally occurring phosphorus deposits in Alachua County was more extensive than either DEP or EPA originally realized. There is a group of "stream to sink" watersheds along the Central Florida Ridge that DEP ultimately included in the North Central NWR. After capture by the sinkholes, the groundwater flow in this area is to the north/northwest, toward the Santa Fe and Suwannee Rivers, both of which are in the North Central region (Figure 5). Based on direct observations by DEP staff, streams in this area down-cut through the phosphorus-rich Hawthorn Group and discharge to the Floridan aquifer through these active sink holes.

Additional descriptions of the changes to the nutrient regions are provided in the TSD (p.86 [and 92]).

¹⁰ The regions developed by EPA in its Final Rule can be found at 40 CFR 131.43(c)(2). The basis for the regionalization in EPA's Final Rule, as well as a map of the regions, is provided in Chapter 1 of *Technical Support Document for U.S. EPA's Final Rule for Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Inland Surface Waters*.

The inclusion of the Imperial River watershed simply appears to be a clarification to add the name of this watershed within the Peninsula Region watersheds listed at 62-302.200(25)(e). In DEP's Responsiveness Summary, dated April 30, 2012, the State replied, "[t]he peninsula region extends to and includes the Imperial River." Response to Comment Number 16. Since there appears to be no difference in coverage, no further review of the inclusion of the "Imperial River Watershed" is required for the reasons already described above.

In conclusion, the EPA has determined that the information submitted by FDEP provides a sound scientific basis for the NWR set out in the state rule. Therefore, the geographical information adopted by the State, although different from the EPA's December 2010 final rule, is consistent with 40 CFR 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(29)

The definition of "predominantly fresh waters" was revised and now provides:

(29) (22) "Predominantly Fresh Waters" shall mean surface waters in which the chloride concentration at the surface is less than 1,500 milligrams per liter or specific conductance is less than 4,580 μ mhos/cm.

The intended objective of this definition is to establish a clear distinction between freshwater and marine environments, which have significant differences in water chemistry and adapted aquatic life. In practice, the definition functions to determine application of appropriate criteria to a given waterbody to provide protection for the characteristic life. Deletion of the text "at the surface" from the above definition of "predominantly fresh waters" removes a qualifying restriction in the use of this definition to distinguish between fresh and marine waters. This becomes particularly important at or near the natural boundaries between the two, where mixing is complicated and the actual interface tends to be very dynamic, typically driven by tides, seasonal hydrology, local bathymetry, etc. Measurement of salinity only at the surface does not accurately characterize the predominant salinity in this zone, which is often stratified vertically. A fluctuating range of salinity in this zone (vertically and/or horizontally) is a natural phenomenon to which the aquatic life utilizing this zone has become specifically adapted to tolerate and exploit. This change in definition should not affect the level of protection, but will allow a definitive characterization of waters. A more accurate distinction between fresh and marine waters will allow for more appropriate application of fresh and marine criteria. (FDEP's "Overview of Approaches for Numeric Nutrient Criteria Development in Marine Waters" (Marine Overview TSD), pp. 2, 63-69; FDEP's Response to Public Comments, Comment # 219).

Addition of the phrase "or specific conductance is less than 4,580 μ mhos/cm" to the definition above provides an alternative to chloride concentration as a reliable surrogate for salinity that may be used for determination of the effective salinity in the State's waters. In the FDEP's Q&A Document, on page 28, responses number 3, FDEP states, "[b]ecause there is a well known, established relationship between chloride, conductivity, and salinity, and because conductivity data are far more available than chloride data (which was formerly required), DEP chose to add the equivalent conductivity value as an alternate way to determine the fresh versus marine waters distinction." Therefore, since a specific conductance of 4,580 μ mhos/cm can be considered equivalent to a chloride concentration of 1,500 mg/L, with both being representative of the same level of salinity, this change in definition should not affect the level of

protection provided by distinction of freshwater from marine water, but will allow the State enhanced capability for characterizing waters where data for either parameter is available.

These two specific refinements serve to make the definition of the term, “predominantly fresh waters” more precisely operable in this rule and to the application of the included criteria. As defined and based on the above discussion, the State’s interpretation of what constitutes “predominantly fresh waters” for the purposes of this rule is consistent with 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(30)

The definition of “predominantly marine waters” was revised and now provides:

(30) (23) “Predominantly ~~m~~Marine ~~w~~Waters” shall mean surface waters in which the chloride concentration ~~at the surface~~ is greater than or equal to 1,500 milligrams per liter or specific conductance is greater than or equal to 4,580 μ mhos/cm.

Similar to the preceding term, the intended objective of this definition is to establish a clear distinction between marine and freshwater environments, which have significant differences in water chemistry and adapted aquatic life. In practice the definition functions to determine application of appropriate criteria to a given waterbody to provide protection for the characteristic life. Deletion of the text, "at the surface" from the above definition of “predominantly marine waters” removes a qualifying restriction in the use of this definition to distinguish between marine and fresh waters. This becomes particularly important at or near the natural boundaries between the two, where mixing is complicated and the actual interface tends to be very dynamic, typically driven by tides, seasonal hydrology, local bathymetry, etc. Measurement of salinity only at the surface does not accurately characterize the predominant salinity in this zone which is often stratified vertically. A fluctuating range of salinity in this zone (vertically and/or horizontally) is a natural phenomenon to which the aquatic life utilizing this zone has become specifically adapted to tolerate and exploit. This change in definition should not affect the level of protection, but will allow a definitive characterization of waters. A more accurate distinction between marine and fresh waters will allow for more appropriate application of fresh and marine criteria. (Marine Overview TSD, pp. 2, 63-69; FDEP's Response to Public Comments, Comment # 219).

Addition of the phrase "or specific conductance is less than 4,580 μ mhos/cm" to the definition above provides an alternative to chloride concentration as a reliable surrogate for salinity that may be used for determination of the effective salinity in the State's waters. In FDEP’s Q&A Document, on page 28, response number 3, FDEP states, "[b]ecause there is a well known, established relationship between chloride, conductivity, and salinity, and because conductivity data are far more available than chloride data (which was formerly required), DEP chose to add the equivalent conductivity value as an alternate way to determine the fresh versus marine waters distinction." Therefore, since a specific conductance of 4,580 μ mhos/cm can be considered equivalent to a chloride concentration of 1,500 mg/L, with both being representative of the same level of salinity, this change in definition should not affect the level of protection provided by distinction of marine from fresh water, but will allow the State enhanced capability for characterizing waters where data for either parameter is available.

These two specific refinements serve to make the definition of the term, “predominantly marine waters” more precisely operable in this rule and to the application of the included criteria. As defined and based

on the above discussion, the State's interpretation of what constitutes "predominantly marine waters" for the purposes of this rule is consistent with 40 CFR Part 131, and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(35)

The definition of "spring vent" was added and reads as follows:

(35) "Spring vent" shall mean a location where groundwater flows out of a natural, discernable opening in the ground onto the land surface or into a predominantly fresh surface water.

This provision, in conjunction with the State's definition of surface water,¹¹ defines the physical extent that water quality criteria adopted for spring vents in 62-302.531(2)(b)2 apply to freshwaters, and thus establishes legal expectations for certain ambient fresh waters. The EPA notes that the same definition for spring vent was adopted by the State in 62-303.200(27).

The EPA used a similar definition in the December 2010 final rule.¹² Florida's definition includes a restriction that a spring vent flows into freshwaters, which is the same as the EPA's approach, as the Agency's final rule applies to inland waters only. Based on the EPA's review, a water body classified as a spring when implementing the December 2010 final rule will also be considered as a spring under the State's definition of spring vent. Therefore, the EPA agrees that the definition is appropriate to delineate freshwater water bodies in the application of water quality criteria for spring vents. This definition is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.200(36)

The definition of "stream" was added and reads as follows:

(36) "Stream" shall mean, for purposes of interpreting the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., under paragraph 62-302.531(2)(c), F.A.C., a predominantly fresh surface waterbody with perennial flow in a defined channel with banks during typical climatic and hydrologic conditions for its region within the state. During periods of drought, portions of a stream channel may exhibit a dry bed, but wetted pools are typically still present during these conditions. Streams do not include:
(a) non-perennial water segments where fluctuating hydrologic conditions, including periods of desiccation, typically result in the dominance of wetland and/or terrestrial taxa (and corresponding reduction in obligate fluvial or lotic taxa), wetlands, or portions of streams that exhibit lake characteristics (e.g., long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions) or tidally influenced segments that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions; or

¹¹ F.A.C. 62-302.200(38) defines surface water as water upon the surface of the earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs shall be classified as surface water when it exits from the spring onto the earth's surface.

¹² The December 2010 final rule defined "spring" as "a site at which ground water flows through a natural opening in the ground onto the land surface or into a body of surface water." Federal Register Vol. 75, No. 233, Page 75805.

- (b) ditches, canals and other conveyances, or segments of conveyances, that are man-made, or predominantly channelized or predominantly physically altered and;
1. are primarily used for water management purposes, such as flood protection, stormwater management, irrigation, or water supply; and
 2. have marginal or poor stream habitat or habitat components, such as a lack of habitat or substrate that is biologically limited, because the conveyance has cross sections that are predominantly trapezoidal, has armored banks, or is maintained primarily for water conveyance.

This provision defines the physical area where the provisions of 62-302.531(2)(c) apply and thus helps set legal expectations for ambient waters. The EPA notes that this definition differs from the revisions to the same definition in 62-303, in that the 62-303.200(28) definition applies a more general definition for use within chapter 62-303. In addition, the EPA used a broader definition of streams in the December 2010 final rule¹³ than either the 62-302 or 62-303 revised definitions.

Through this definition, the State has chosen to limit the application of the “stream” criteria adopted in 62-302.531(2)(c) to a subset of the State’s Class I and III flowing waters. Pursuant to 62-302.531(1), the narrative nutrient provisions remain the applicable water quality standards for those flowing waters that are not defined as a “stream” for purposes of 62-302.531(2)(c). It is our understanding that FDEP’s numeric water quality criteria apply to all Class I and/or III flowing waters unless and until FDEP makes an affirmative determination that a particular water body meets one of the exclusions under F.A.C. 62-302.200(36), i.e., it is a tidally influenced segment, non-perennial stream, or an actively maintained conveyance, such as a canal or ditch.

Providing a very descriptive narrative for where a specific criterion is intended to apply is within the State’s discretion in its criteria development process. The State decided that it was appropriate to apply numeric values to a subset of their waterbodies because such application would be consistent with the scientific procedures and methods used to establish the numeric nutrient concentrations to other waterbodies. The State explains its basis for limiting the numeric criteria to “streams” in Section 1.4 of FDEP’s Freshwater TSD. The Freshwater TSD sets out why numeric criteria are inappropriate for 1) artificial, predominantly channelized, or predominantly altered systems, 2) non-perennial water segments, 3) wetlands, and/or 4) streams that exhibit lake-like characteristics. For artificial, predominantly channelized, or predominantly altered systems, the State concludes on page 4 of the Freshwater TSD that the data used to derive the stream nutrient thresholds “did not include canals or manmade/altered conveyances.” The FDEP Nutrient Technical Advisory Committee recommended the use of the benchmark site approach where a site-specific assessment of biological response to nutrients could be made for benchmark candidate waters, however, there is not a tool available to perform biological assessments for canals and other altered systems. Similarly, non-perennial water segments are excepted from the definition of stream because these types of waters are not represented in the “reference site data distribution” used to develop FDEP’s nutrient thresholds. Under the FDEP rule, these two categories of waterbodies, as well as wetlands, will continue to be protected by the narrative criteria until scientific information allowing derivation of numeric nutrient criteria are available for these three types of waters. For streams that exhibit lake-like characteristics, FDEP determined that the

¹³ The December 2010 final rule defined “stream” as “a free-flowing, predominantly fresh surface water in a defined channel, and includes rivers, creeks, branches, canals, freshwater sloughs, and other similar water bodies.” Federal Register Vol. 75, No. 233, Page 75805.

numeric lake criteria more appropriately address protection of the designated uses in lake-like flowing waters. Lastly, the reasons for excluding application of numeric criteria to “tidally influenced segments that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions” are described on pages 1, 2, and 64 of FDEP’s Marine Overview TSD. Generally, FDEP concluded that there is insufficient information to develop accurate criteria for these waters. In the Marine Overview TSD, FDEP concluded that because “the mouths of tributary rivers or streams would generally not be representative of the mixed, open water portions [and] would not be part of the original data distribution from which the criteria were developed” it would not be appropriate to apply the stream criteria to these types of waters.

States have the authority to decide the areal extent of state water quality criteria. Therefore, the EPA finds that these revisions to the stream definition as consistent with 40 CFR Part 131 and the CWA and is approving them pursuant to section 303(c) of the Act. By approving these restrictions on the areal extent of FDEP’s numeric nutrient criteria for flowing waters, however, the EPA is not making any decision as to whether numeric nutrient criteria are necessary or possible to derive for those flowing waters not covered by the State’s rule.

Subsection 62-302.200(37)

The definition of “stream condition index” was added and reads as follows:

(37) “Stream Condition Index (SCI)” shall mean a Biological Health Assessment that measures stream biological health in predominantly freshwaters using benthic macroinvertebrates, performed and calculated using the Standard Operating Procedures for the SCI in the document titled *SCI 1000: Stream Condition Index Methods* (DEP-SOP-003/11 SCI 1000) and the methodology in *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11), both dated 10-24-11, which are incorporated by reference herein. Copies of the documents may be obtained from the Department’s internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. For water quality standards purposes, the Stream Condition Index shall not apply in the South Florida Nutrient Watershed Region.

The definition for Stream Condition Index (SCI) is applied in multiple provisions of 62-302 and 62-303. The SCI provides a measurement of biological integrity and indicates an adverse response in the macroinvertebrate community. A failing score indicates that the macroinvertebrate community has been subject to some form of stress, which could include excess nutrient enrichment. This definition, and its applications in 62-302.531(2)(c), 62-302.800(3), 62-303.330, and 62-303.430, define an ambient condition of water that supports an aquatic life designated use and therefore establish a level of protection that is applied to a water body. The provisions of 62-302 and 62-303 which apply the SCI are addressed later in this document. The definition of the SCI, and its inapplicability to the South Florida Nutrient Watershed Region, further define a new biological assessment criterion, in addition to Florida’s currently approved biological water quality criteria contained in 62-302.530(10).

This provision also references two documents, *SCI 1000: Stream Condition Index Methods* (SCI 1000) and *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11), which contain the procedures and methodology for conducting a biological health

assessment in freshwater streams. The first document, and portions of the second document, were determined to not be new or revised WQS for the purposes of the EPA's CWA section 303(c) review, since they contain the details of the procedures that are used to calculate the SCI, a relative index of biological health for streams, and other guidance on when use of the SCI may be informative to various water quality management or criteria processes. The EPA's review of portions of the second document which were determined to be new or revised water quality standards will be discussed within the analysis of the provision 62-302.531(2)(c).

The definition is consistent with 40 CFR Part 131 and the CWA because it helps to clarify which tests the State will use when conducting biological health assessments and is approved by the EPA pursuant to section 303(c) of the Act. The actual index and corresponding score is discussed later in this document.

Subsection 62-302.200(39)

The definition of "total maximum daily load" was added and reads as follows:

(39) "Total Maximum Daily Load" (TMDL) for an impaired waterbody or waterbody segment shall mean the sum of the individual wasteload allocations for point sources and the load allocations for nonpoint sources and natural background. Prior to determining individual wasteload allocations and load allocations, the maximum amount of a pollutant that a waterbody or water segment can assimilate from all sources without exceeding water quality standards must first be calculated. A TMDL shall include either an implicit or explicit margin of safety and a consideration of seasonal variations.

This provision simply restates the language already included in 62-303. Therefore, this provision was determined not to be a change to water quality standards.

Subsection 62-302.200(42)

The definition of "water quality standards" was revised and now states:

(42) (31) "Water quality standards" shall mean standards composed of designated present and future most beneficial uses (classification of waters), the numerical and narrative criteria, including Site Specific Alternative Criteria, applied to the specific water uses or classification, the Florida anti-degradation policy, and the moderating provisions, such as variances, mixing zone rule provisions, or exemptions, contained in this rule and in Chapter 62-4, adopted pursuant to Chapter 403, F.S.

The revisions clarify the State's provisions that are considered a "water quality standard," however, this provision does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments nor does it establish a designated use.

Revisions to Rule 62-302.530

Rule 62-302.530 consists of a table of the water quality criteria that apply to Florida's surface waters. While no revisions were made to the table itself, the introductory paragraph to the table was revised to include the following sentence:

Numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530 (47)(b), F.A.C., shall be expressed as spatial averages and applied over a spatial area consistent with their derivation.

It is reasonable to expect that the extent of the time and location to which a criterion applies to a specific waterbody should be consistent with its derivation. By doing so, the State is ensuring that sampling is compatible with the procedures used to establish the criteria. Page 104 at Nutrient Criteria Technical Guidance Manual: Rivers and Streams. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. This provision clarifies that FDEP will apply the numeric nutrient criteria over an area consistent with derivation of those criteria.¹⁴ This provision is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act.

New Rule 62-302.531

FDEP's nutrient rule numerically interprets the State's narrative nutrient criterion, which provides that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Rule is organized in a hierarchical manner, representing FDEP preferred approaches to establishing numeric interpretations for its narrative criterion.

The first hierarchy in Florida's Rule provides that, where a site-specific nutrient analysis has been performed for any particular waterbody, that site specific analysis will be considered the applicable numeric interpretation of the narrative criterion for a particular waterbody.¹⁵ A site-specific analysis may be developed through a total maximum daily load (TMDL), site-specific alternative criterion (SSAC), water quality based effluent limitation (WQBEL), or other FDEP approved action that numerically interprets the narrative criterion. Hierarchy 1 also includes estuary-specific numeric interpretations of the narrative nutrient criterion established in Rule 62-302.532. Where a site-specific numeric interpretation is not available, the second hierarchy in Florida's Rule establishes numeric nutrient values based on quantifiable stressor-response relationships between nutrients and biological response. FDEP was able to develop such stressor-response relationships for lakes and springs and has established criteria based on those relationships in this rule. For Florida streams, FDEP determined that available scientific data and information were insufficient to establish accurate quantifiable stressor-response relationships. Therefore, for streams where there is no site-specific numeric interpretation available, the third hierarchy in Florida's rule establishes reference-based numeric nutrient thresholds. These thresholds, applied together with biological information, determine the applicable numeric interpretation of the narrative criteria that apply to streams. Both water chemistry and biological data, where available, are evaluated to determine whether a stream is attaining the nutrient criteria. Waters that are not addressed under any of the three hierarchies continue to be subject to Florida's narrative nutrient criteria.

¹⁴ The specific spatial areas that apply for each waterbody type are described further in the discussion of 62-302.531(7).

¹⁵ A site-specific numeric interpretation of the narrative will not be effective for CWA purposes until that interpretation is approved as a new or revised WQS by EPA, pursuant to section 303(c) of the CWA.

Due to the extensive nature of the new provisions promulgated in 62-302.531 (Numeric Interpretations of Narrative Nutrient Criteria), each subsection of the rule is set out below, followed by EPA's analysis and conclusions. As set out more fully below, the EPA has determined that Rule 62-302.531 is consistent with the requirements of the CWA.

Subsection 62-302.531(1)

The narrative water quality criteria for nutrients in paragraphs 62-302.530(47)(a) and (b), F.A.C., applies to all Class I, Class II, and Class III waters.

Florida's narrative water quality criteria for nutrients contain two components. 62-302.530(47)(a), which is applicable to all designated use classifications in Florida, requires nutrients to be limited as necessary to prevent violation of other state water quality criteria. 62-302.530(47)(b), which applies only to designated use classifications I, II, and III, prohibits nutrient concentrations from being altered so as to cause an imbalance of natural populations of aquatic flora or fauna. Subsection 62-302.531(1) restates that both provisions of the narrative nutrient criteria continue to apply to Class I, II, and III waters. This provision does not change the content of either 62-302.530(47)(a) or (b). It does not establish a level of protection related to the magnitude, duration, or frequency of Florida's nutrient criteria. Therefore, this provision is not a revised or new water quality standard as that term is used in CWA Section 303(c) or the regulations in 40 CFR Part 131, and thus the EPA is taking no action on it.

Subsection 62-302.531(2)

The narrative water quality criterion for nutrients in paragraph 62-302.530(47)(b), F.A.C., shall be numerically interpreted for both nutrients and nutrient response variables in a hierarchical manner as follows:

(a) Where a site specific numeric interpretation of the criterion in paragraph 62-302.530(47)(b), F.A.C., has been established by the Department, this numeric interpretation shall be the primary interpretation. If there are multiple interpretations of the narrative criterion for a waterbody, the most recent interpretation established by the Department shall apply. A list of the site specific numeric interpretations of paragraph 62-302.530(47)(b), F.A.C., may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

This subsection introduces the structure of the three different hierarchical levels that the State will use for numeric interpretation of its narrative nutrient criterion. The subsection describes which numeric interpretation is the applicable numeric interpretation where more than one exists for a particular waterbody. For CWA purposes, the EPA construes the site-specific numeric interpretations of the narrative set out in this subsection as site-specific alternative criteria for nutrients for a particular waterbody. While not addressed in this provision, pursuant to 40 CFR § 131.21(c), such site-specific numeric interpretations of the narrative are not effective for CWA purposes until the interpretation is approved as a new or revised WQS by the EPA, pursuant to section 303(c) of the CWA.

The use of a procedure and guidelines for translating a narrative criterion, as well as clarifying which site specific numeric interpretation is applicable to particular waterbodies, is consistent with 40 CFR Part 131 and the CWA and is approved by the EPA pursuant to section 303(c) of the Act. Each hierarchical level is discussed separately below.

Note that in the remainder of this document, references to Florida’s narrative nutrient criterion refer to 62-302.530(47)(b), unless otherwise stated.

Subparagraph 62-302.531(2)(a)1.

The primary site specific interpretations are as follows:

- a. Total Maximum Daily Loads (TMDLs) adopted under Chapter 62-304, F.A.C., that interpret the narrative water quality criterion for nutrients in paragraph 62-302.530(47)(b), F.A.C., for one or more nutrients or nutrient response variables;
- b. Site specific alternative criteria (SSAC) for one or more nutrients or nutrient response variables as established under Rule 62-302.800, F.A.C.;
- c. Estuary-specific numeric interpretations of the narrative nutrient criterion established in Rule 62-302.532, F.A.C.; or
- d. Other site specific interpretations for one or more nutrients or nutrient response variables that are formally established by rule or final order by the Department, such as a Reasonable Assurance Demonstration pursuant to Rule 62-303.600, F.A.C., or Level II Water Quality Based Effluent Limitations (WQBEL) established pursuant to Rule 62-650.500, F.A.C. To be recognized as the applicable site specific numeric interpretation of the narrative nutrient criterion, the interpretation must establish the total allowable load or ambient concentration for at least one nutrient that results in attainment of the applicable nutrient response variable that represents achievement of the narrative nutrient criterion for the waterbody. A site specific interpretation is also allowable where there are documented adverse biological effects using one or more Biological Health Assessments, if information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicate there are no imbalances in flora and a stressor identification study demonstrates that the adverse biological effects are not due to nutrients.

Subparagraph 62-302.531(2)(a)2.

For the primary site specific interpretations in subparagraph 62-302.531(2)(a)1., F.A.C., the notice of rulemaking or other public notice shall state that the Department is establishing a site specific interpretation for the receiving waterbody, and offer an opportunity for a public meeting and public comment.

Subparagraph 62-302.531(2)(a)1 establishes what FDEP expects to be the primary site-specific numeric interpretations of the narrative nutrient criteria under FDEP’s nutrient rule: TMDLs, SSAC, estuary criteria established in 62-302.532, or other rules or orders formally established by the State. Additionally, 62-302.531(2)(a)1.d provides that for site-specific criteria to be established based on “other site specific interpretations,” the interpretation must establish a total allowable load or ambient concentration for at least one nutrient that results in the attainment of the applicable response variable that represents attainment of the narrative nutrient criterion. Furthermore, a site-specific criterion does not need to address both causal variables or both causal and response variables in order to establish a “site-specific interpretation.” However, consistent with FDEP’s expectation outlined on page 2 of FDEP’s Nutrient Standards Implementation Document, EPA expects that the unaddressed variable(s) will be covered by the criteria outlined in subsections 62-302.531(2) or (3). Lastly, 62-302.531(2)(a)1.d also states that site-specific criteria for nutrients may be established for waters that have failed the

respective biological health assessments, if there is no floral impairment and the applicant demonstrates, through a stressor identification study, that the observed biological impairment is not due to excess nutrients. This situation would most likely occur with faunal impairments (as indicated by SCI, LVI or Shannon-Weaver) are due to hydrologic modifications or other non-nutrient causes. The EPA understands that a Type I or II SSAC would be developed in this situation.

Because the purpose of this provision is to establish site-specific water quality criteria, for those rules or orders which are not already subject to a WQS administrative process, the State's provision at subparagraph 62-302.531(2)(a)2 makes it clear that notice of these orders and rules are subject to public notice, meeting, and comment procedures.

FDEP's approach is consistent with 40 CFR part 131, including 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to section 303(c) of the Act. The procedures laid out in this provision are consistent with 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act. While not addressed in Subparagraph 62-302.531(2)(a)1 or 2, pursuant to 40 CFR § 131.21(c), a site-specific numeric interpretation of the narrative will not be effective for CWA purposes until that numeric interpretation is approved as a new or revised WQS by the EPA, pursuant to section 303(c) of the CWA. The TMDLs that the State intended to be reviewed and approved or disapproved by the EPA were provided separately, and will be addressed under separate cover.

Paragraph 62-302.531(2)(b)

If site specific numeric interpretations, as described in paragraph 62-302.531(2)(a), F.A.C., above, have not been established for a waterbody, but there is an established, quantifiable cause-and-effect relationship between one or more nutrients and nutrient response variables linked to a value that protects against an imbalance in the natural populations of the aquatic flora or fauna, then the numeric values for the nutrients or nutrient response variables, set forth in this paragraph (2)(b), shall be the applicable interpretations. Absent a numeric interpretation as established in paragraph 62-302.531(2)(a), F.A.C., site specific numeric interpretations are established as follows:

Paragraph 62-302.531(2)(b) establishes the hierarchical process for the application of water quality criteria for nutrients for lakes (in subparagraph 1.) and spring vents (in subparagraph 2.) as site-specific numeric interpretations of paragraph 62-302.530(47)(b). This paragraph provides that for lakes and springs, in the absence of primary site-specific interpretation for any particular waterbody, the numeric values established in subparagraphs 1 and 2 shall be the applicable interpretation of the narrative nutrient criterion. FDEP states that these values are based upon a "quantifiable cause-and-effect relationship between one or more nutrients and nutrient response variables linked to a value that protects against an imbalance in the natural populations of the aquatic flora or fauna."

The State hierarchical process is based on the State's determination that a site-specific interpretation of the narrative nutrient criterion is preferable in cases where information for a water body justifies the use of a criterion that is different from the criteria listed in subparagraph 1 and 2. FDEP's approach is consistent with 40 CFR part 131, including 131.11(b)(1)(ii), which allows adoption of water quality criteria by states that "reflect site-specific conditions," and is approved by the EPA pursuant to section 303(c) of the Act.

Numeric Nutrient Criteria for Lakes

Subparagraph 62-302.531(2)(b)1.

For lakes, the applicable numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., for chlorophyll *a* are shown in the table below. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability of chlorophyll *a* data and the concentrations of nutrients and chlorophyll *a* in the lake, as described below. The applicable numeric interpretations for TN, TP, and chlorophyll *a* shall not be exceeded more than once in any consecutive three year period.

This provision provides that the numeric interpretations for TN and TP for a lake will vary on an annual basis, according to the details of clause 1.a. This subparagraph also establishes the allowable frequency of exceedences of the water quality criteria for chlorophyll *a*, TN, and TP for lakes (which are listed in the table in clause 62-302.531(2)(b)1.b.) as no more than once in any consecutive three-year period. (The EPA’s conclusion regarding this provision and the magnitude, frequency and duration of the State's numeric criteria for chlorophyll *a*, TN, and TP in the table are addressed in the EPA's review of 62-302.531(2)(b)1.b.)

Clause 62-302.531(2)(b)1.a.

If there are sufficient data to calculate the annual geometric mean chlorophyll *a* and the mean does not exceed the chlorophyll *a* value for the lake type in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of lake TN and TP samples, subject to the minimum and maximum limits in the table below. However, for lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 0.49 mg/L TP streams threshold for the region; or

Clause 62-302.531(2)(b)1.b.

If there are insufficient data to calculate the annual geometric mean chlorophyll *a* for a given year or the annual geometric mean chlorophyll *a* exceeds the values in the table below for the lake type, then the applicable numeric interpretations for TN and TP shall be the minimum values in the table below.

| <u>Long Term Geometric Mean Lake Color and Alkalinity</u> | <u>Annual Geometric Mean Chlorophyll <i>a</i></u> | <u>Minimum calculated numeric interpretation</u> | | <u>Maximum calculated numeric interpretation</u> | |
|---|---|--|---|--|---|
| | | <u>Annual Geometric Mean Total Phosphorus</u> | <u>Annual Geometric Mean Total Nitrogen</u> | <u>Annual Geometric Mean Total Phosphorus</u> | <u>Annual Geometric Mean Total Nitrogen</u> |
| <u>> 40 Platinum Cobalt Units</u> | <u>20 µg/L</u> | <u>0.05 mg/L</u> | <u>1.27 mg/L</u> | <u>0.16 mg/L¹</u> | <u>2.23 mg/L</u> |
| <u>≤ 40 Platinum Cobalt Units and > 20 mg/L</u> | <u>20 µg/L</u> | <u>0.03 mg/L</u> | <u>1.05 mg/L</u> | <u>0.09 mg/L</u> | <u>1.91 mg/L</u> |

| | | | | | |
|--|---------------|------------------|------------------|------------------|------------------|
| <u>CaCO₃</u> | | | | | |
| <u>≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO₃</u> | <u>6 µg/L</u> | <u>0.01 mg/L</u> | <u>0.51 mg/L</u> | <u>0.03 mg/L</u> | <u>0.93 mg/L</u> |

¹ For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 0.49 mg/L TP streams threshold for the region.

Clauses 1.a. and b. of paragraph 62-302.531(2)(b) establish the process for calculating a lake’s “applicable [annual] interpretations” of the narrative nutrient criterion for TN and TP. Clause 1.b. also contains a table that establishes numeric values for annual geometric mean chlorophyll *a*, TP, and TN. The numeric values established through this subparagraph serve the purposes of nutrient water quality criteria for TN and TP, in addition to the chlorophyll *a* criteria. Other than the criteria for TP for lakes with color levels greater than 40 platinum cobalt units (PCU) in the West Central Nutrient Watershed Region (which are discussed below), the criteria adopted by the State in the table in clause 1.b are identical to the magnitude, frequency, and duration of the nutrient criteria promulgated by the EPA for Florida lakes in the EPA’s December 2010 final rule.

Clauses 1.a and b. provide two methods for applying the numeric values for a given lake. Which method is used depends on whether available chlorophyll *a*, TN, and TP data are sufficient to meet the data requirements of 62-302.531(6), which requires at least four temporally-independent samples per year with “at least one sample collected between May 1 and September 30 and at least one sample collected during the other months of the calendar year” in order to calculate an annual geometric mean. The clauses also specify an alternate maximum calculated numeric TP interpretation for lakes in the West Central Watershed Region of the State with ambient color levels that exceed 40 platinum color units (PCU).

Clause 1.a establishes a process to apply the lake numeric values for TN and TP where the calculated annual geometric mean for chlorophyll *a* in a particular lake does not exceed the chlorophyll *a* value for that lake type in the table set out in clause 1.b. In that case, the TN and TP values for the lake are the annual geometric means of lake TN and TP samples, subject to the minimum and maximum values set out in the table. This process is followed for each year for which sufficient chlorophyll *a*, TN, and TP data are available. Where there is insufficient data to establish the chlorophyll *a* annual geometric mean or where that annual geometric mean exceeds the values set out in the table, clause 1.b provides that the numeric interpretations of the narrative nutrient criterion for TN and TP are the minimum values set out in the table.

On page 4 of FDEP’s Nutrient Standards Implementation Document, Florida explains the State’s implementation of this provision as follows:

If there are insufficient data to calculate the annual geometric mean chlorophyll *a* for a given year or the annual geometric mean chlorophyll *a* exceeds the values in Table 1 for the lake type, then the applicable numeric interpretations for TN and TP are the minimum values in the table. If there are sufficient data to calculate the annual geometric mean chlorophyll *a* and the mean does not exceed the chlorophyll *a* value for the lake type in Table 1, then the TN and TP numeric interpretations for that calendar year are the annual geometric means of ambient TN and TP samples for that lake, subject to the minimum and maximum TN and TP limits in the table.

If a lake is influenced by an upstream NPDES discharger, the Water Quality-Based Effluent Limitation (WQBEL) evaluation for that discharge would determine the specific TN and TP levels (again subject to the upper nutrient values for TN and TP) that would maintain the appropriate chlorophyll a target for the lake (6 or 20 µg/L) during all years, including years representing critical conditions. This evaluation would involve water quality modeling set to achieve a “never to exceed” chlorophyll target scenario. DEP evaluated the inter-annual variability in lake chlorophyll a levels and found that inter-annual standard deviation (natural log-transformed) typically ranges from 0.305 to 0.533. Given this level of variability, the long-term geometric chlorophyll a concentration in a colored or alkaline clear lake would need to be between 12.8 and 15.5 µg/L to be consistently found in compliance with the chlorophyll a standard of 20 µg/L. Consequently, the numeric nutrient permit limits for a point source discharger that influences a downstream lake would need to be adjusted to ensure attainment of chlorophyll a targets in this lower range during all years, with the precise permit limits being dependent upon site specific factors. If this demonstration of attainment cannot be made, the discharger could pursue other options, which include effluent nutrient reductions, discharge re-location (e.g., land application), or a Site Specific Alternative Criterion (establish alternate chlorophyll and nutrient targets that are fully protective of designated uses).

Based on the State’s explanation of this process, the development of nutrient controls will be based on meeting the appropriate nutrient criteria for all years, including the “critical” year or years, based on review of available data. The State provided further details of the WQBEL process on page 45 and 46 of the Nutrient Standards Implementation Document:

For lakes, the WQBEL may be derived to ensure that the discharge does not cause or contribute to exceedances of the numeric interpretation for the waterbody segment, which is expressed as a lake average. As stated previously, Florida’s wastewater permitting process puts the burden on the applicant to provide all of the necessary documentation for permit issuance, including demonstrating that their discharge will not cause violations of the water quality standards applicable to the lake. Depending on the circumstances of the lake, either a Level I or Level II WQBEL is established that implements this numeric interpretation of the narrative criteria. This is accomplished as follows:

- If the discharge can meet the applicable numeric interpretation, a Level I WQBEL is calculated to ensure the discharge does not exceed the Total Nitrogen and Total Phosphorus values contained in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C.; or
- For existing discharges, a Level I WQBEL can be established at permitted nutrient loads if the receiving lake attains the numeric interpretation of the narrative expressed at sub-subparagraph 62-302.531(2)(b)1.a., F.A.C.; or
- For new or expanded discharges to a lake that attains the applicable criteria, a Level II WQBEL must be established that ensures the lake will continue to attain the numeric interpretation of the narrative; or
- If the lake does not attain the baseline TN or TP values in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C., but attains the applicable chlorophyll a value in sub-subparagraph 62-302.531(2)(b)1.a., F.A.C., a Level II WQBEL must ensure attainment of the applicable chlorophyll a value in all years. The Level II WQBEL must also ensure that ambient lake nutrient conditions do not exceed the upper end of the range Total Nitrogen and Total

Phosphorus limits in sub-subparagraph 62-302.531(2)(b)1.b., F.A.C.

The EPA's approach for lakes in the December 2010 final rule is similar to the approach used by the State to derive the nutrient criteria set out in the table in clause 1.b, including similar data sufficiency requirements.¹⁶ Both the EPA's and the State's approach require at least four samples in the calculation of an annual geometric mean, with at least one measurement of TN, TP, or chlorophyll *a* between May and September. The EPA's approach allowed a one-time modification of a lake's TN or TP criterion to a value in the same range of values as adopted by the State.¹⁷ As described above, the State's provision allows for annual calculation of TN and TP criteria for an individual lake where the lake has been demonstrated to comply with its chlorophyll *a* criterion for a given year.

Under the State's approach, for years where the calculated annual geometric mean chlorophyll *a* exceeds the applicable criteria in the table in clause 1.b or the data sufficiency requirements for chlorophyll *a* are not met, the lake TN and TP criterion for that given year cannot be greater than the minimum numeric value in the table, which is the same as the lake criteria establish in the EPA's December 2010 final rule. Therefore, although this provision of Florida's Rule allows the lake criteria to vary on an annual basis, under certain circumstances, the State's approach achieves the same level of protection as the EPA's approach in the December 2010 final rule.

The EPA's federally promulgated criteria for Florida lakes reflect the "latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence" of nutrients in Florida's lakes. CWA section 304(a)(1). Based on the EPA's review, the criteria adopted by the State at 62-302.531(2)(b)1, 62-302.531(2)(b)1.a, and 62-302.531(2)(b)1.b provide the same level of protection as the EPA's federally promulgated criteria, and therefore are consistent with the requirements of 40 CFR part 131, including 131.11(b), and are approved by the EPA pursuant to section 303(c) of the Act.

After review of TP, TN, and chlorophyll *a* data in the West Central Region, FDEP concluded that the relationship between TP and chlorophyll *a* in West Central colored lakes was "extremely weak ... suggesting that other factors (e.g., nitrogen-limitation, residence time) greatly confound the influence of TP on algal response." FDEP Freshwater TSD, p. 187. The State evaluated only data from the West Central Region lakes in Figure 10-15 of the Freshwater TSD and determined that these data show that a wide range of chlorophyll *a* levels in these lakes occurs over a relatively small range of TP concentrations, and that very little variation in the chlorophyll *a* measurements were related to ambient TP concentrations. Based on a review of these data, Florida concluded that "(t)he lack of a strong predictive relationship demonstrates that little would be gained, in terms of within lake designated use protection, by controlling TP in colored West Central NWR [lakes]." FDEP Freshwater TSD, p. 188-189.

¹⁶ EPA's December 2010 final rule includes the following data requirements for lakes: "Sufficient data include at least four measurements per year, with at least one measurement between May and September and one measurement between October and April each year." Federal Register Vol. 75, No. 233, Page 75806.

¹⁷ See 40 CFR section 131.43(e).

However, in light of the need to ensure downstream protection from elevated levels of TP, the State chose to adopt an upper TP threshold for West Central colored lakes at the same criterion value adopted for the regional TP threshold for freshwaters streams, i.e., 0.49 mg/L. In FDEP's Q&A Document, the State summarized its decision process, as follows:

The University of Florida requested that we assess the effectiveness of lake regions in explaining the chlorophyll response to nutrients for various parts of the state. DEP conducted a residuals analysis and found that the statewide regression between TP and chlorophyll was inaccurate for lakes in the West Central, high phosphorus region of the state ... After more closely examining the lakes in this geologic area (which was best explained by aggregating the lakes to match the West Central Stream Nutrient region), we re-ran the TP versus chlorophyll regression and applied an upper prediction interval. The upper prediction interval for the lakes TP would have actually been higher than the streams criteria, so we capped the TP value at the TP value for streams in the region to ensure downstream protection.

Based on the EPA's review, FDEP's development of the maximum TP threshold for West Central colored lakes is scientifically defensible and, therefore, is consistent with the requirements of 40 CFR part 131, including 131.11(b), and is approved by the EPA pursuant to section 303(c) of the Act.

Clause 62-302.531(2)(b)1.c.

c. For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 micromhos/cm used to estimate the 20 mg/L CaCO₃ alkalinity concentration until such time that alkalinity data are available.

In addition to including 20 mg/L CaCO₃ as a threshold for establishing subcategories of Florida lakes (which was also the EPA's approach in the December 2010 final rule), Florida included specific conductance as an alternate parameter that may be used to classify lakes in the absence of sufficient alkalinity data. The Technical Advisory Committee (TAC) for the State's development of numeric nutrient criteria discussed the use of alkalinity and specific conductance cut-offs for nutrient criteria for clear lakes. As stated on page 171 of the Freshwater TSD, "[t]he TAC suggested that different nutrient and chlorophyll a expectations should be established for high alkalinity (>20 mg CaCO₃/L or specific conductance >100 µmhos/cm) clear lakes because of the naturally higher, aquifer-derived phosphorus levels this subset of clear lakes." This recommendation was evaluated by FDEP in order to determine whether the relationship between nutrients and chlorophyll a was different for clear lakes with specific conductance values above and below 100 µmhos/cm such that 100 µmhos/cm should serve as an alternate threshold for sub-categorizing Florida's lakes. FDEP determined that the 100 µmhos/cm cut-off for specific conductance would "capture lakes that receive input from calcareous aquifer sources, which naturally contain higher levels of phosphorus than do lakes that receive most of their water from (low conductivity) rainfall," and would, therefore, "capture the differences between lakes receiving groundwater input from calcareous aquifer sources (higher alkalinity), which contain natural higher levels of phosphorus, from lakes that receive most of their water from (low alkalinity) rainfall." Freshwater TSD, page 177.

Based on the EPA's review of the State's rationale, the State's decision to provide an option to use specific conductance data in the absence of alkalinity data achieves a similar result in determining the applicability of nutrient criteria for these lakes and is, for the reasons above and in FDEP's Freshwater TSD, a scientifically defensible approach for criteria development and implementation. Therefore, this provision is consistent with the requirements of 40 CFR part 131, including 131.11(b), and is approved by the EPA pursuant to section 303(c) of the Act.

The EPA notes that this provision also specifies that color, alkalinity, and specific conductance assessments for these lakes must be "based on a minimum of ten data points over at least three years with at least one data point in each year." This part of clause 62-302.531(2)(b)1.c addresses data reliability, but does not establish or revise the magnitude, duration, or frequency of the chlorophyll *a* criteria established by the State, and thus is not a new or revised WQS for the purposes of the EPA's CWA's Section 303(c) review.

Numeric Nutrient Criteria for Springs

Subparagraph 62-302.531(2)(b)2.

For spring vents, the applicable numeric interpretation of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., is 0.35 mg/L of nitrate-nitrite (NO₃ + NO₂) as an annual geometric mean, not to be exceeded more than once in any three calendar year period.

The EPA's December 2010 final rule, in part, established a numeric nutrient criterion for Florida's springs in Class I and Class III freshwaters to assure the attainment of the State's applicable water quality designated uses.

The magnitude, frequency and duration of the water quality criterion for nitrate-nitrite (NO₃ + NO₂) adopted by the State for freshwater spring vents in subparagraph 62-302.531(2)(b)2 are identical to the criterion published in the EPA's December 2010 final rule. Both the State's and the EPA's numeric criteria for springs are based on interpretation of Florida's nutrient narrative provision at 62-302.530(47)(b) for springs designated as Class I and Class III freshwaters.

EPA, in the preamble to the final EPA Inland Rule, stated:

EPA proposed criteria for nitrate+nitrite because one of most significant factors causing adverse changes in spring ecosystems is the pollution of groundwater, principally from nitrate+nitrite, resulting from human activities, land use changes, cultural practices, and population growth. EPA's criterion was based on multiple lines of stressor-response evidence, including laboratory and field-based data. The results from these studies provided strong empirical evidence of a stressor-response relationship between nuisance algae and nitrate+nitrite and indicated specific concentrations above which undesirable growth of nuisance algal were likely to occur. EPA concluded that the data available provided a sound scientific rationale for the nitrate+nitrite concentration of 0.35 mg/L. This value is intended to prevent imbalanced or excess nuisance algal growth and is supportive of a balanced natural population of aquatic flora and fauna in Florida springs.

In Chapter 3 of the Agency's Technical Support Document for U.S. EPA's Final Rule for Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Inland Surface Fresh Waters (TSD), EPA stated:

Derivation of EPA's Numeric Nutrient Criteria for Springs explains that nitrate-nitrogen (NO₃+NO₂) concentrations are the pre-eminent and driving factor linked to adverse changes in Florida spring ecosystems. While there are a variety of sources of nitrogen in springs, there appears to be no geologic source of nitrate+nitrite. The nitrate+nitrite concentrations are principally anthropogenic in nature, i.e. linked to population growth and associated with urban and agricultural activities. The nitrate+nitrite concentrations then seep into groundwater and emerge at spring vents. Excess algal and plant growth results in adverse effects in springs including reduced habitat and food sources for native wildlife and reduced beneficial submerged aquatic vegetation. EPA found no evidence to link levels of phosphorus to the adverse effects observed in Florida's springs. EPA also found no evidence of excess planktonic algal growth, as indicated by water column algal or phytoplankton biomass (chlorophyll *a*) in Florida springs. This observance is likely due to short residence times (high flushing/flow rates) of water at spring discharges resulting in low phytoplankton chlorophyll *a*. Florida's current transparency criterion protects clarity in Florida's springs in order to maintain the low sediment, dissolved organic and water column algal biomass levels.

EPA established a spring nitrate+nitrite criterion duration considering the variable temporal responses of algae to nitrate-nitrite and concluded that the spring criterion should not be exceeded more than once as an annual geometric mean over a three year period. EPA found in its review of springs data and information that nitrate concentrations can be variable from month to month, and this intra-annual variability was not necessarily associated with impairment of the designated use. Therefore, to account for intra-annual variability, EPA chose to express the nitrate+nitrite criterion for springs on an annual basis. This approach is protective of cumulative effects in shorter periods of time than three years.

The EPA's federally promulgated criterion for Florida springs reflects the "latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence" of nutrients in Florida's springs. CWA section 304(a)(1). Based on the EPA's review, the criterion for spring vents adopted by the State provide the same level of protection as the EPA's federally promulgated criterion for springs in Florida, and therefore is consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by the EPA pursuant to section 303(c) of the Act.

Numeric Nutrient Criteria for Streams

Paragraph 62-302.531(2)(c)

For streams, if a site specific interpretation pursuant to paragraph 62-302.531(2)(a) or (2)(b), F.A.C., has not been established, biological information shall be used to interpret the narrative nutrient criterion in combination with Nutrient Thresholds. The narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., shall be interpreted as being achieved in a stream segment where information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicates there are no imbalances in flora or fauna, and either:

1. the average score of at least two temporally independent SCIs performed at representative locations and times is 40 or higher, with neither of the two most recent SCI scores less than 35,
or
2. the nutrient thresholds set forth in the table below are achieved.

| <u>Nutrient Watershed Region</u> | <u>Total Phosphorus Nutrient Threshold¹</u> | <u>Total Nitrogen Nutrient Threshold¹</u> |
|--------------------------------------|---|---|
| <u>Panhandle West</u> | <u>0.06 mg/L</u> | <u>0.67 mg/L</u> |
| <u>Panhandle East</u> | <u>0.18 mg/L</u> | <u>1.03 mg/L</u> |
| <u>North Central</u> | <u>0.30 mg/L</u> | <u>1.87 mg/L</u> |
| <u>Peninsular</u> | <u>0.12 mg/L</u> | <u>1.54 mg/L</u> |
| <u>West Central</u> | <u>0.49 mg/L</u> | <u>1.65 mg/L</u> |
| <u>South Florida</u> | <u>No numeric nutrient threshold. The narrative criterion in paragraph 62- 302.530(47)(b), F.A.C., applies.</u> | <u>No numeric nutrient threshold. The narrative criterion in paragraph 62- 302.530(47)(b), F.A.C., applies.</u> |

¹These values are annual geometric mean concentrations not to be exceeded more than once in any three calendar year period.

For streams, paragraph 62-302.531(2)(c) applies where neither a primary hierarchy level site-specific numeric interpretation nor a second hierarchy level quantifiable cause-and-effect relationship has been established for a particular waterbody. The State has elected to use a criterion comprised of a two-part method to interpret its narrative nutrient criterion for such streams. The criterion includes a combination of biological information and numeric thresholds for TN and TP. The State will consider whether aquatic flora have been adversely affected by nutrients (or some other stressor), based on a list of floral response indicators, together with either a fauna biological health assessment, in this case SCI, or the nutrient threshold concentrations set out in subparagraph 62-302.531(2)(c)2.

For the first part of the two-part method to interpret the narrative nutrient criterion, the State has determined that certain biological responses (demonstrated by undesirable chlorophyll *a* levels, the presence of excessive algal mats or blooms, nuisance macrophyte growth, and undesirable changes in algal species composition) are each independent indications of imbalanced flora. If none of these responses has occurred in a particular waterbody, then the State believes there is no indication of imbalanced flora in that waterbody. For the second part of the two-part method, either an average SCI score of 40 or greater¹⁸ (indicating balanced fauna) or concentrations of TP and TN equal to or less than those established in 62-302.531(2)(c)2, is required to conclude that the waterbody's Class III designated use is being supported.

Before discussing the State's approach in further detail, it is worth noting what the EPA's review addresses. Florida's biological indicators were established to coincide with a certain level of protection

¹⁸ The criterion also requires that neither of two most recent SCI scores be less than 35.

related to a specific recreation and aquatic life use support goal. That use goal is established by the State in their existing water quality standards as the Class III recreation and aquatic life use of “recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife.” To protect this use from nutrient pollution, nutrients must not cause “an imbalance in natural populations of aquatic flora or fauna” pursuant to paragraph 62-302.530(47)(b). The State selected floral and faunal thresholds utilizing the State’s scientific knowledge and best professional judgment to incorporate existing data and information into thresholds that reflect the selected level of use protection associated with the State’s policy goal. Other states have made different policy decisions, some of which may reflect more or less conservative goals to reflect the level of protection desired in their respective waters.¹⁹ Furthermore, some other states have chosen to utilize biological and/or nutrient information in a different combination, or even in an entirely separate format, than that adopted by Florida. The State of Florida has developed a suite of floral metrics that, taken as a whole, are intended to adequately consider the variability in biological responses of Florida streams covered under the Rules to nutrient overenrichment.²⁰ The State’s approach is an interpretation of the narrative nutrient criterion with a significant emphasis on biological indicators that, when all are met, are intended to indicate use attainment regardless of the level of nutrients (TN and TP) in the waterbody.²¹ Although a definitive threshold relationship between biological responses and nutrient concentrations in Florida’s streams is difficult to discern at this time, the EPA’s review of this provision focuses on whether the individual components of this integrated, multimetric provision are protective of the waterbody’s uses and are consistent with the CWA and regulatory requirements for criteria development. Florida’s narrative includes a reference to an imbalance of flora and fauna, which FDEP has chosen to interpret through this numeric interpretation of the narrative by focusing on a use support test designed to assess whether the waterbody’s flora and fauna remain in balance considering the level of nutrients.

The State has chosen to adopt the format set out at 62-302.531(2)(c), which includes multiple biological components, based on its conclusion that application of the numeric threshold concentrations alone may not be appropriate for every Florida waterbody.²² Instead, where a site-specific interpretation has not

¹⁹ EPA also notes that FDEP has identified SCI thresholds that protect higher levels of biological condition, although they were not adopted as part of the current rulemaking effort.

²⁰ As outlined on pages 10-11 in FDEP’s implementation document, neither FDEP nor EPA was able to identify a “floral health/impairment threshold....Until these Biocriteria are developed, the Department’s approach is to compare floral measures from streams to Benchmark (reference) stream floral data to determine whether a stream has a balanced floral community...These assessments were chosen because they: represent the entire range of potential floral response to nutrients...; may routinely be conducted by Department staff...; and comprise the most advanced floral assessment tools currently available for the State of Florida.”

²¹ The nutrient thresholds, in the absence of floral and faunal information, will be used in attainment decisions. See discussion of 62-303.390.

²² Section 6.7 of FDEP’s Freshwater TSD generally concludes that the results of the analyses to determine the effects of anthropogenic nutrient increases on the biological communities demonstrate a statistically significant response to nutrient enrichment, that although weakly related statistically, do support the values derived using the Nutrient Benchmark Approach. “Both the analysis of the [RPS] and the analysis of the second change point in the stream periphyton response to nutrients indicate that the biological response to nutrient enrichment will generally occur at levels higher than the values generated using the Benchmark Distribution Approach.”

been developed for a particular stream, the third hierarchy applies the reference approach-based stream thresholds in conjunction with determining whether or not the biological health is being supported at that place and time. Absent a positive showing of floral and faunal health, waters that exceed the numeric thresholds are not attaining the narrative numeric criterion and will be deemed to have an impaired use pursuant to CWA section 303(d). However, where both flora and fauna have been confirmed to be healthy, waters may be in attainment of the narrative criterion when TN and/or TP levels are above the numeric thresholds. In section 2.7.1 of the document titled *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (dated October 24, 2011) (SCI Primer), Florida states that “if data show that biological health is fully supported in an aquatic system (no adverse responses consistent with the ecological model), it may be concluded that the associated nutrient regime is inherently protective of the waterbody, and the narrative nutrient criterion is achieved.” Where a stream surpasses the TN and/or TP thresholds and there is insufficient biological information to fully demonstrate that flora or fauna are balanced, the stream is not attaining the narrative nutrient criterion and will be included on the Study List (i.e., the water will be identified as having an impaired use pursuant to CWA section 303(d)). This process is more fully described later within the 62-303 sections of this document.

Since adverse effects of nutrient over-enrichment primarily manifest themselves through excessive algae and plant production, FDEP’s criteria for streams includes information such as floral response variables to identify impaired streams. This biological information augments the reference-based nutrient thresholds. Paragraph 62-302.531(2)(c) addresses four measures of algal response to nutrients: chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition. Paragraph 62-302.531(2)(c) also addresses the SCI and how SCI scores are to be considered in relation to the narrative nutrient criterion. How these measures are to be assessed under FDEP’s nutrient rule is described in additional detail within Section 2.7 of the SCI Primer and within FDEP’s Nutrient Standards Implementation Document.

The EPA determined that only certain portions of the SCI Primer document, specifically a subset of the text in Section 2.7, were new or revised water quality standards in the form of constituent thresholds within an integrated multimetric standard for nutrients in streams. These provisions provide thresholds for considering each of the biological components contained in FDEP’s integrated multimetric criterion for nutrients in streams. The discussion of paragraph 62-302.531(2)(c), below, addresses each provision of that paragraph together with the relevant sections of the SCI Primer. The relevant sections of the SCI primer address the “floral” response variables and the SCI threshold. Consideration of each of these components was necessary for the EPA to determine whether the adopted provision is protective of the designated uses of Florida streams. Paragraph 62-302.531(2)(c) must be read together with the SCI Primer and FDEP’s Nutrient Standards Implementation Document, which clarify how these biological components will function with the TN and TP thresholds as an integrated water quality criterion.

Paragraph 62-302.531(2)(c) clearly indicates that all floral metrics must be met to demonstrate attainment of the narrative nutrient criterion. Failure of a single individual floral component leads to the conclusion that the use is not being attained for a particular waterbody. In addition to all of the floral metrics, a stream must also meet either the TN and TP thresholds or the faunal metric, the SCI threshold, to demonstrate attainment of the narrative nutrient criterion.

On page 16 of FDEP’s Nutrient Standards Implementation Document, the State states that “if any one of these floral measures indicates an imbalance, then the stream does not attain the NNC”. This establishes

that a water body must satisfy each of the metrics in Table 3, which correspond to the same values found in the SCI primer, in order to satisfy FDEP's narrative. These are the same floral metrics established in the SCI Primer, which was incorporated by reference in FDEP's rule. Further, a decision matrix, included on page 23 of FDEP's Nutrient Standards Implementation Document, clarifies the State's interpretation of how each floral metric will be used, providing that "any one floral measure not attained" indicates the criterion at 62-302.531(2)(c) is not attained. In addition, according to page 9 of FDEP's Nutrient Standards Implementation Document, if floral data are unavailable for a stream and either the TN or TP thresholds are exceeded, then the criterion is not met and the stream is placed on the Study List, which is included as part of the State's 303(d) list of impaired waters.

The first step in determining whether the narrative nutrient criterion is being attained in a stream without a site-specific interpretation of the narrative is determining whether the four identified floral measures indicate the stream has balanced flora. Each of the identified floral measures, as further described in the SCI Primer and the Nutrient Standards Implementation Document, is discussed below.

Floral Response Variables

Presence of algal mats

SCI Primer Section 2.7.3 (page 22)

[I]f a stream exhibits RPS rank 4-6 percent coverage between the mean percent observed at these minimally disturbed and healthy sites (6-8%) and the associated 90th percentile values (25-32%), this would be considered an indication of no imbalance of flora.

Section 2.7.3 of the SCI Primer discusses the Rapid Periphyton Survey (RPS) as a quantitative measurement associated with an "abundance of nuisance or problematic algal growth" that will be used by the State to determine when a given level of algal response indicates a floral imbalance. The EPA reviewed the information in Sections 2.7.3, including the specific threshold for "algal mats" incorporated by reference, and the additional detail provided by the State in FDEP's Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora, relative to the "algal mats" component of 62-302.531(2)(c).

Based on FDEP's experience observing periphyton growth at minimally disturbed nutrient benchmark sites, FDEP concluded on page 10 of the Nutrient Standards Implementation Document, that "no imbalance of flora" is demonstrated when "a stream exhibits RPS rank 4-6 percent coverage of 25% or less in both samples." The selection of 25% reflects the 90th percentile of percent coverage of algae at minimally disturbed streams used by Florida in its derivation of this threshold. Furthermore, on the same page, FDEP concluded "use of an RPS evidentiary threshold based on the 90th percentile of the EPA reference sites would be consistent with the manner in which the nutrient thresholds were derived." As discussed previously, one sample not meeting the threshold is sufficient to conclude the stream does not attain the narrative. Page 23 at FDEP's Nutrient Standards Implementation Document.

The quantitative factors regarding RPS coverage and changes in algal species composition provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. The 25% coverage value represents the State's effort to quantify the algal mats component of the stream provision at 62-302.531(2)(c). Considering the maximum allowable percentage coverage of the specified thickness of algal mats and the demonstration required to indicate

floral health provides information regarding the condition of nutrient enrichment and the resulting expectation of what indicates balance and imbalance. The State's decision that less than 25% coverage by algal mats demonstrates that algal mats don't represent imbalance, which was based on the 90th percentile of benchmark sites, and the corresponding requirement that this coverage be exhibited in two consecutive sampling events, represent reasonable conclusions regarding stream floral health related to "algal mats". It is appropriate to use the 90th percentile for the benchmark distribution because the least-disturbed sites identified in Florida that are used to derive the criteria more closely approximate minimally-impacted conditions. (See EPA's December 2010 final rule, fn 99, page 75776 and see pages 41-42, below, and citations at fn 33-38.) As a result, the EPA concludes that the "algal mats" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific provisions related to "algal mats" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "algal mats" component of the integrated multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the algal mat component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Nuisance macrophyte growth

SCI Primer Section 2.7.4 (page 23)

[I]f a stream exhibits a C of C score of >2.5 and a frequency of occurrence of FLEPCC exotics is <25% of the total plant occurrences, this would be considered an indication of no imbalance of flora.

Section 2.7.4 of the SCI Primer discusses the Linear Vegetation Survey (LVS) as a measurement associated with a "relative lack of nuisance macrophyte growth" that will be used by the State to determine when a given level of macrophyte growth is considered a nuisance, and therefore indicates a floral imbalance. The EPA reviewed the information in Section 2.7.4, including the specific thresholds for "nuisance macrophyte growth" incorporated by reference, and the additional detail provided by the State in FDEP's Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora, relative to the "nuisance macrophyte growth" component of 62-302.531(2)(c).

Based on FDEP's experience and analysis by expert botanists in a 2011 initiative²³, the State has concluded that a Coefficient of Conservatism (C of C) score of ≥ 2.5 and a Florida Exotic Pest Plant Council (FLEPPC) frequency of $\leq 25\%$ of the total plant occurrences indicates balanced flora. Page 13 of FDEP's Nutrient Standards Implementation Document summarizes FDEP's evaluation:²⁴

²³ Page 23 of the SCI Primer indicates that a list of C of C scores, FLEPPC taxa, and other vascular plant attributes relevant to the LVS, can be found in DEP SOP LVI 1000 Appendix LVI 1000-1. The 2011 initiative is referenced on page 23.

²⁴ Although the Primer document makes reference to 58 sites with 19 sites having sufficient plant growth, Appendix A-2 lists 41 sites. This discrepancy was addressed on page 28 of the Q&A Document. The 58 sites were part of "an earlier data set that included both sites that were part of EPA's reference stream list and sites that were determined to be healthy by passing the SCI. To be consistent with the EPA methodology used for establishing the actual numeric thresholds for TN and TP, DEP chose to include only the EPA reference sites with sufficient plant information (41 sites) when establishing the final guidance on the LVI, which are presented in Appendix A-2 of the Implementation document."

The Department evaluated LVS data from the EPA reference streams and found that if a site's average C of C score is greater than or equal to 2.5 (the 10th percentile of the distribution), the plant community composition may be considered to be part of the reference site distribution. Based on the Department's experience in minimally disturbed streams and the types of plants associated with C of C scores greater than or equal to 2.5, this threshold was determined to be reasonable and protective.

The Department also analyzed the frequency of occurrence of FLEPCC exotics in the EPA reference streams, and found that, due to the influence of a few streams at the 90th percentile, FLEPCC exotics made up approximately 40% of the total plant occurrences. Considering the somewhat limited number of reference streams with vascular plants [41 sites] and the variability in the data, the Department decided to set the FLEPCC threshold at the 80th percentile of the distribution. Therefore, if the frequency of occurrence of FLEPCC exotics at a site is less than or equal to 25% of the total plant occurrences (the 80th percentile of the distribution), the site may be considered to be part of the reference site distribution.

The quantitative factors regarding nuisance macrophyte levels, as interpreted using C of C scores and a specified frequency of exotic plant occurrence, provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. Furthermore, for the same reasons outlined in the "presence of algal mats" section, the incorporation of the requirement to have two LVS scores to indicate floral health is an important demonstration that elevated nutrient concentrations are not causing an imbalance in flora. The State's decisions that a C of C score greater than 2.5 and a FLEPCC frequency less than 25% demonstrates that the macrophyte growth present does not represent imbalance, which were based on the 10th and 80th percentiles of benchmark sites, respectively, and the corresponding requirement that this coverage be exhibited in two consecutive sampling events, represent reasonable conclusions regarding stream floral health related to "macrophyte growth." In situations where a lower score represents a less desirable condition, such as the case in a C of C score less than 2.5, the use of the 10th (which is comparable to the 90th percentile in other scenarios) has been considered to be consistent with guidance for considering the data associated with least-disturbed, healthy streams that are supporting designated uses, and that data is associated with a high level of confidence. See pages 40-41, below, and citations at fn 33-38. Similarly, due to less confidence in the data, it is reasonable to select a different percentile, the 80th percentile in the case of the FLEPCC threshold. As a result, the EPA concludes that the "nuisance macrophyte growth" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific thresholds for "nuisance macrophyte growth" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "nuisance macrophyte growth" component of the integrated, multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the nuisance macrophyte component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Algal blooms and Chlorophyll a levels

SCI Primer Section 2.7.5 (page 24)

An unacceptable phytoplankton bloom would consist of a situation where an algal species, whose noxious characteristics or presence in sufficient number, biomass, or areal extent may reasonably be expected to prevent, or unreasonably interfere with, the designated use of the waterbody.

DEP evaluates the autecological information for the dominant bloom species, in conjunction with the associated chlorophyll *a* and the persistence of the bloom, as a line of evidence when assessing imbalances of flora.

If a stream exhibits annual geometric mean chlorophyll concentrations between the mean observed at these minimally disturbed and healthy sites (2.0-2.1µg/L) and the associated 90th percentile values (3.2-3.5µg/L), this would be considered a clear indication of no imbalance of flora.

Section 2.7.5 of the SCI Primer discusses the qualitative and quantitative measures of algal blooms and chlorophyll *a* concentrations that will be used by the State to determine whether these measures indicate a floral imbalance. The EPA reviewed the information in Section 2.7.5, including the specific provisions for “algal blooms” and “chlorophyll *a* levels” incorporated by reference, and the additional detail provided by the State in the Nutrient Standards Implementation Document, to determine how the State will interpret what indicates an imbalance in flora relative to the “algal blooms” and “chlorophyll *a* levels” components of 62-302.531(2)(c).

For algal blooms, the State has provided a narrative statement to explain what conditions would be considered to be an “unacceptable phytoplankton bloom”. Consideration of the dominant bloom species and the persistence of the bloom complete the qualitative descriptions of algal bloom measures. Both of these considerations affect the interpretation of the “algal blooms” component of 62-302.531(2)(c).

The State also included quantitative measurements in Section 2.7.5 related to chlorophyll *a* concentrations to use when determining whether streams are attaining the narrative nutrient criterion and the associated integrated, multimetric criterion. In the same SCI Primer section, since the State determined that a definitive chlorophyll *a* criterion that “did, or did not, support aquatic life uses” could not be established, the State established upper and lower bounds for chlorophyll *a* concentrations that serve as the basis for attainment decisions, while waters exhibiting chlorophyll *a* concentrations between the upper and lower bound will be evaluated on a site specific basis.

The upper bound implements Florida’s existing “one-sided” impairment threshold for chlorophyll *a* in streams. See fn 25. The impairment threshold of 20 µg/L was approved by the EPA in 2008 as an upper boundary condition above which a water body is not meeting its applicable water quality standards (unless demonstrated otherwise) and is identified as impaired. Waters below the use impairment threshold, however, are not considered in attainment of the narrative criterion. Such waters are considered “unassessed” rather than “unimpaired”.²⁵

²⁵ “Determination Upon Review of Amended Florida Administrative Code Chapter 62-303, Identification of Impaired Surface Waters, Appendix B”, United States Environmental Protection Agency, February 19, 2008.

Page 24 of the SCI Primer establishes a lower bound, which represents chlorophyll a concentrations associated with levels commonly found in FDEP's benchmark streams, based on the existing data considered by the State. FDEP concluded that "if a stream exhibits annual geometric mean chlorophyll concentrations [less than 3.2 µg/L], this would be considered a clear indication of no imbalance of flora." Therefore, chlorophyll a concentrations less than 3.2 µg/L, based on the 90th percentile benchmark value, indicate balanced flora.

Where streams have chlorophyll a concentrations between the upper and lower bounds (i.e., 3.2 and 20 µg/L), the State requires a site-specific analysis to determine whether the stream is achieving the narrative nutrient criterion. Page 14 of FDEP's Nutrient Standards Implementation Document states that "the range in 'healthy' stream chlorophyll a values is due to a variety of site specific factors, such as system morphology, water residence time, and presence of lentic taxa [and] may indicate a healthy aquatic stream in a natural transition from a lotic to lentic system during the time period studied." Page 14 also indicates "[i]f a site has chlorophyll values within the 3.2 µg/L to 20 µg/L range, the assessment is inconclusive until the Department documents a decision regarding whether chlorophyll a conditions reflect [an] imbalance in flora or not. Therefore, where there is not a site-specific demonstration, the EPA expects that waters in the range between 3.2 and 20 µg/L would be included on the Study List (a component of the State's CWA section 303(d) list) for further evaluation, pursuant to section 62-303.390(2)(e). Further discussion regarding how FDEP will use chlorophyll a data in attainment decisions is set out in the discussions of 62-303. As described above, the EPA considers this method to be consistent with previous conclusions regarding the 20 µg/L chlorophyll a impairment threshold because the same expectation exists that the waters are considered "unassessed" when in the range between 3.2 µg/L to 20 µg/L.

Florida's rule at 62-302.531(2)(c) requires a demonstration that all four floral metrics have been met in order to determine that a stream is achieving the narrative nutrient criterion. Thus, the additional factors provided by SCI Primer Section 2.7 provide information regarding how FDEP will implement the chlorophyll a and algal blooms components of 62-302.531(2)(c). The State's selection of 3.2 µg/L, which was based on the 90th percentile of benchmark sites, represents a reasonable conclusion regarding stream floral health related to "chlorophyll a levels." It is appropriate to use the 90th percentile for the benchmark distribution because the least-disturbed sites identified in Florida that are used to derive the criteria more closely approximate minimally-impacted conditions. (See EPA's December 2010 final rule, fn 99, page 75776 and see analysis on pages 40-41 and citations at fn 33-38.) As a result, the EPA concludes that the "chlorophyll a levels" and "algal blooms" components of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the specific threshold and qualitative assessments for "chlorophyll a levels" and "algal blooms," respectively, incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "chlorophyll a levels" and "algal blooms" components of the integrated, multimetric criterion in 62-302.531(2)(c), including the provisions identified in the SCI Primer that are associated with the algal blooms component of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Changes in algal species composition

SCI Primer Section 2.7.3 (page 22)

[I]f the percentage of sampled points with a thickness rank of 4-6 is 20% or greater, the biologist collects a composite sample of the dominant groups of periphyton in the stream segment for lab identification of the dominant algal taxa. If autecological information is available for the dominant taxa, this is also qualitatively evaluated.

Section 2.7.3 of the SCI Primer and pages 11 through 12 of FDEP's Nutrient Standards Implementation Document discuss the methods for determining whether specific changes in algal species composition indicate a floral imbalance.²⁶ The EPA reviewed the information in these sections, including the specific provision for "changes in algal species composition" incorporated by reference in the SCI Primer, to determine how the State will determine an imbalance in flora, relative to the "changes in algal species composition" component of 62-302.531(2)(c).

As further clarified in FDEP's Nutrient Standards Implementation Document, the State has determined that there is no need to evaluate algal species composition when the RPS 4-6 coverage is less than 20%, since this lower level of coverage indicates no imbalance of flora due to algal presence. However, when the coverage is greater than 20%, the algal species composition will be evaluated. The State's Nutrient Standards Implementation Document indicates that the five most dominant taxa will be identified. Next, the autecological information will be analyzed, and significant changes in algal species composition will be evaluated using the references in Appendix B of FDEP's Nutrient Standards Implementation Document. Page 12 of FDEP's Nutrient Standards Implementation Document includes a decision key for algal species composition which includes the question "Do dominant taxa [where dominant species are those that individually constitute approximately 10% or more of the community] of algal community include taxa known to be nutrient enrichment indicators?" Answering the question affirmatively results in a conclusion that the nutrient standard at Rule 62-302.531(2)(c) is not achieved. In this way, FDEP assesses the environmental information associated with dominant algal taxa, using the scientific literature, to determine if the taxa are indicative of nutrient enriched/imbalanced conditions.

The quantitative factors regarding RPS coverage and changes in algal species composition provide information regarding the expectation of what is indicative of nutrient enrichment and the resulting imbalance that can occur. Thus the additional factors provided by SCI Primer Section 2.7 provide information regarding how FDEP will implement the changes in algal species composition component of 62-302.531(2)(c). The use of scientific literature that represents well accepted, peer reviewed expectations related to taxa that are indicative of different nutrient conditions represents a reasonable process for assessing changes in algal species composition. As a result, the EPA concludes that the "algal species composition" component of the provision in 62-302.531(2)(c), as further described in the SCI Primer and the Nutrient Standards Implementation Document, along with the analysis associated "algal species composition" incorporated by reference in the SCI Primer, are protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the "algal species composition" component of the integrated, multimetric criterion in 62-302.531(2)(c), including the

²⁶ "Where the RPS 4-6 coverage is greater than 20%, an evaluation of the algal species composition (identifying the five most dominant taxa) is also conducted to provide additional information whether there is no imbalance of flora. Where RPS 4-6 coverage is <20%, there is no need to collect samples for algal species composition because the stream is clearly within the reference distribution, and therefore, the algal species composition is presumed to be acceptable. (Page 10 of FDEP's Nutrient Standards Implementation Document)

provisions identified in the SCI Primer that are associated with the algal species composition of the new or revised water quality criterion (shown as bolded excerpts at the beginning of this section), are located on pages 42-43.

Analysis of the SCI Threshold

As discussed earlier, FDEP is using the SCI to determine whether a stream is exhibiting balanced fauna by measuring the health of the macroinvertebrate community within the stream. In Section 7.7 of FDEP's Freshwater TSD, the State explains that the many of the metrics that make up the SCI are sensitive to algal response.²⁷ Several of the metrics are expected to respond negatively to increased levels of algae, while other metrics would increase in response to algae. As noted on page 133 of the Freshwater TSD, "[a]ll of the above metric responses to algae would lower the SCI score." Therefore, it would be reasonable to expect that a waterbody with a "passing" SCI score would have scored well for these various metrics (and others that make up the SCI) and therefore is meeting its designated use.

Some commenters on Florida's rule objected to the use of the SCI in implementing the State's nutrient rule, arguing that the test is primarily a measure of biological response to human disturbance rather than a specific measure of nutrient pollution. An acceptable score on the SCI demonstrates that the fauna in a particular waterbody has not been compromised by environmental stress, either from nutrient pollution or any other type of environmental stress (e.g., human disturbance).²⁸

Paragraph 62-302.531(2)(c)(1) provides that, together with a showing that the floral metrics required by 62-302.531(2)(c) are attained, an "average [SCI] score of...40 or higher, with neither of the two most recent SCI scores less than 35" can be used to demonstrate that a stream is attaining the narrative nutrient criterion, even where the stream exceeds the numeric nutrient thresholds established in 62-302.531(2)(c)(2). The basis for this SCI threshold is described in FDEP's Freshwater TSD, specifically Section 3.4.1, which provides:

In 2007, DEP calibrated the SCI using primarily the Biological Condition Gradient approach resulting in 35 as the value at which the designated use of a healthy, well-balanced community is met, and exceptional threshold of 67.... The examination of the average of the two most recent visits to 55 reference streams showed that the 2.5th percentile of reference data was an SCI score of 40 points, within a confidence interval that ranged from 35-44 points. Therefore, selection of an average SCI score of 40 as a threshold for aquatic life protection balances Type I and Type II errors.

The use of an SCI minimum score prevents a score less than 35, which represents an unhealthy community, from being averaged with a higher score to result in a "passing" average SCI score. This additional provision ensures that determinations of use support, based on an average SCI score of 40 or

²⁷ These include: number of sensitive taxa, number of Ephemeroptera taxa, number of Trichoptera taxa, percent filter-feeders, number of long-lived taxa, percent very tolerant, and percent dominant taxon. The last two would increase in response to toxic or non-toxic algae expressed in either the phytoplankton or periphyton, while the others would respond negatively to increases levels of algae, whether toxic or non-noxious varieties. The other metrics that make up an SCI score, number of total taxa, number of clinger taxa, percent Tanytarsini, were not specifically mentioned in section 7.7.

²⁸ See Florida Wildlife Federation et al v. Department of Environmental Protection, Fla. DOAH Case No. 11-6137, Final Order, June 7, 2012. Page 30.

greater, accurately represent the level of use support at a given site during all times of measurement.

The SCI Primer document discusses the use of the SCI in conjunction with other biological endpoints and water chemistry information. Section 2.7.6 of the SCI Primer document summarizes:

Attainment of the SCI threshold is an indication that the faunal community of the stream is not being adversely affected by nutrients to the extent that there is no loss in designated use. However, failure of the SCI threshold also does not mean that the stressor causing the loss of designated use is nutrients. Evaluation of other factors, as indicated by the nutrient enrichment model in 2.7.1 (including nutrient concentrations and floral communities) is useful information that could indicate nutrients are a factor. While the stressor may not be known, a failed SCI score does indicate that fauna is not well-balanced.

The use of the water chemistry data, specifically the numeric TP and TN thresholds, in conjunction with the floral and fauna components of this provision (62-302.531(2)(c)), and how conclusions of use support are made weighing together these different lines of evidence, is demonstrated in the examples provided in section 2.7.8 of the SCI Primer. In all six stream examples, the water chemistry data indicated exceedances of the TP and TN thresholds, but only in the four examples where flora and/or fauna were imbalanced did the State conclude the nutrient narrative criterion was not being achieved. In the two other examples, one example had no indication of imbalanced flora or fauna (even though the TP and TN thresholds were exceeded), and therefore was meeting the narrative nutrient criterion.²⁹ The other example had an imbalance of fauna (i.e., average SCI score < 40), but FDEP determined the imbalance was not caused by nutrients during the stressor identification study, in which case the water would be included on either the study list (if the pollutant causing the impairment was not identified) or the verified list (if the pollutant causing the impairment was identified).³⁰

The use of the SCI and the threshold score of 40 was addressed in the EPA's December 2010 final rule, at pages 75774 and 75775:

In the January 2010 proposal, EPA used a reference condition approach to derive numeric criteria that relied on the identification of biologically healthy sites that were unimpaired by nitrogen or phosphorus. EPA identified these sites from FDEP's streams data set, selecting sites where Stream Condition Index (SCI) scores were 40 and higher. The SCI is a multi-metric index of benthic macroinvertebrate community composition and taxonomic data developed by FDEP to assess the biological health of streams[.] An SCI score > 40 has been determined to be indicative of biologically healthy conditions based on an expert workshop and analyses performed by both FDEP and EPA. Please refer to the EPA's January 2010 proposal and the final TSD

²⁹ Although a different scenario from the assumptions made in these examples, Section 7.8 of FDEP's Freshwater TSD also envisions that because "nutrient responses are dependent of many other factors in streams, it is possible that there are site specific situations where nutrient concentrations below the reference based thresholds may not provide for the needed protection..."

³⁰ Note that a water with imbalanced flora would be included on FDEP's Study List as biologically impaired, even where the imbalance is demonstrated to be caused by a stressor other than nutrients, unless the state demonstrates that the biological impairment is not caused by a pollutant. See EPA's February 19, 2008 IWR decision.

accompanying this final rule for more information on the SCI and the selection of the SCI value of 40 as an appropriate threshold to identify biologically healthy sites.

Therefore, as summarized in FDEP's analysis and previous statements within the preamble for the EPA's December 2010 final rule, the SCI scores are based on scientific workshops and analyses. The SCI is an important screening tool in the development of nutrient criteria concentrations and, used in combination with other information such as that contained in 62-302.531(2)(c), provides a quantitative measure regarding the faunal component needed to be protective of the designated uses of covered Florida streams. The conclusions of the EPA's review of the SCI component of 62-302.531(2)(c) are located on pages 42-43.

Analysis of the Total Nitrogen and Total Phosphorus Thresholds

The FDEP rule provides numeric thresholds for TN and TP for Florida streams that apply unless a positive showing of both floral and faunal biological health is made for any particular stream or unless alternative values are adopted by FDEP and approved by the EPA as site-specific criteria. Class III waters located in South Florida, which are not otherwise classified as lakes, wetlands, or those flowing waters excepted from the definition of "stream" in 62-302 are not subject to numeric threshold values in 62-302.531(2)(c) at this time. Rather, the narrative nutrient criterion continues to apply to those waters.³¹ The TN and TP thresholds, as annual averages, established in the FDEP rule are not to be exceeded more than once in any three consecutive years.

As stated on page 127 of FDEP's Freshwater TSD, FDEP concluded that "specific [dose-response] thresholds could not be established due to the inherent variability within and between streams and the compounding complexity from other factors." Therefore, FDEP relied upon the reference condition approach as described in more detail below to identify TN and TP concentrations that are protective of the designated uses in covered Florida streams. The reference condition approach, a long-standing peer-reviewed methodology published by the EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined.³² The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts,^{33,34,35,36,37,38} is used to derive numeric nutrient criteria that are protective of applicable

³¹ Rule 62-302.540, which established a TP criterion of 10 ppb within the Everglades Protection Area, was not revised by the state nutrient rule.

³² USEPA. 2000. *Nutrient Criteria Technical Guidance Manual: Rivers and Streams*. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.; USEPA-SAB. 2011. *Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters*. U.S. Environmental Protection Agency, Science Advisory Board, Washington, DC.

³³ USEPA. 2000a. *Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs*. EPA-822-B-00-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

³⁴ USEPA. 2000b. *Nutrient Criteria Technical Guidance Manual: Rivers and Streams*. EPA-822-B-00-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

³⁵ Stoddard, J. L., D. P. Larsen, C. P. Hawkins, R. K. Johnson, and R. H. Norris. 2006. Setting expectations for the ecological condition of streams: the concept of reference condition. *Ecological Applications* 16:1267 – 1276.

designated uses by identifying TN and TP concentrations occurring in least-disturbed, healthy streams that are supporting designated uses. Using that approach, FDEP established thresholds based on an upper percentile distribution of the benchmark distribution of streams, as described more fully below. FDEP concluded the 90th percentile was the percentile that it would use for TN and TP thresholds in its integrated multimetric criterion.

Page 128 of FDEP's Freshwater TSD summarizes (as quoted below) the reasons FDEP used the 90th percentile of the benchmark distribution (with the exception of the West Central nutrient watershed region, where it used the 75th percentile):

- It is consistent with EPA guidance;
- DEP conducted a rigorous verification to demonstrate that the benchmark sites were minimally disturbed;
- DEP confirmed that healthy, well balanced biological communities were maintained at nutrient levels above the 90th percentile (greatly minimizing Type II error, the mistake of classifying an impaired site as acceptable);
- ...
- Use of a 75th percentile would result in an excessive Type I error (25% of benchmark sites, and a large number of healthy sites would incorrectly be classified as impaired), and subsequent use of resources to “restore” such unimpacted sites would constitute unwise public policy, and would contradict State Law (Chapter 403, F.S.); and
- Although the 95th and 99th percentiles were considered, DEP determined that there was insufficient certainty in the inclusiveness of the 95th and 99th percentiles given the sparseness of data at the extreme end of the distribution. However, DEP has high assurance that the 90th percentile is inclusive of the distribution of minimally disturbed sites due to the sufficiency of the data surrounding this range in all nutrient regions except for the West Central. In the West Central the 75th percentile was used due to the limited amount of data available.

However, according to FDEP, the “lack of a demonstration that biological impairment actually occurs at specific nutrient levels greater than the 90th percentile of the benchmark sites is a disadvantage of using this approach [and for this reason] DEP plans to conduct additional evaluation at sites with nutrient values higher than the 90th percentile to definitively establish that nutrients are a reasonable cause of designated use impairment.” Freshwater TSD at page 127.

The EPA's review of FDEP's intent to use a multiple component process “to verify that biological impairment is occurring and, if so, to definitively establish that nutrients are a reasonable cause of

³⁶ Herlihy, A. T., S. G. Paulsen, J. Van Sickle, J. L. Stoddard, C. P. Hawkins, L. L. Yuan. 2008. Striving for consistency in a national assessment: the challenges of applying a reference-condition approach at a continental scale. *Journal of the North American Benthological Society* 27:860 – 877.

³⁷ U.S. EPA. 2001. Nutrient Criteria Technical Manual: Estuarine and Coastal Marine Waters. Office of Water, Washington, DC. EPA-822-B-01-003.

³⁸ USEPA-SAB. 2011. *Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters*. U.S. Environmental Protection Agency, Science Advisory Board, Washington, DC.

designated use impairment” is set out above. The remainder of this analysis will focus on FDEP’s derivation of the stream thresholds and the EPA’s review of those thresholds for consistency with regulatory and statutory requirements.

The State compiled data from numerous sources before screening the data to select a reference set of streams, which FDEP calls benchmark streams. FDEP then aggregated samples from the benchmark streams by waterbody identification number (WBID).³⁹ From this information, annual WBID geometric means for the reference set of streams were calculated, and then the resulting TN and TP 90th percentile values (or 75th percentile for the West Central) were calculated from those annual averages frequency distributions. As discussed on page 129 of FDEP’s Freshwater, the State concluded that the use of the “geometric mean, rather than an arithmetic mean, [provided] a more accurate representation of the central tendency of positively skewed data ... [and that the] annual geometric mean mutes the short-term variability in sampling quality data to provide a more reliable, long-term value for assessing the nutrient status in aquatic environments.” On page 193 of FDEP’s Freshwater TSD, FDEP articulates the basis of the annual average duration and once in a three year period frequency of excursions as “rooted precisely in how the criteria were calculated” and “based on EPA’s Technical Support Document for Water Quality-Based Toxics Control [which] when applied to non-toxic substances, such as nutrients, is inherently protective.”

Based on the effectiveness of the data quality screens in four of five NWRs, FDEP has concluded that the 90th percentile of annual average concentrations would be protective. In the remaining region, the West Central Region, because of fewer data screens to identify reference conditions in that NWR and subsequent lower confidence that these sites are least-disturbed conditions that support designated uses and natural populations of aquatic flora and fauna, FDEP has concluded the 75th percentile of annual average concentrations, rather than the 90th percentile, is the protective criterion-magnitude for the West Central region. Therefore, the magnitude values derived for the five NWRs are consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by EPA pursuant to section 303(c) of the Act. The duration and frequency values associated with FDEP’s numeric stream criteria are the same as those associated with the numeric criteria in the EPA’s December 2010 final rule, which reflect the “latest scientific knowledge...on the kind and extent of all identifiable effects on health and welfare...which may be expected from the presence” of nutrients in Florida’s waters. Based on EPA’s review, the duration and frequency value adopted by the State provide the same level of protection as the EPA’s federally promulgated duration and frequency for nutrients in Florida, and therefore is consistent with the requirements of 40 CFR part 131, including 131.11(b) and the CWA, and are approved by the EPA pursuant to section 303(c) of the Act.

For the reasons outlined above, the EPA finds that the numeric thresholds for TN and TP, as well as the duration and frequency components are protective of the designated uses of covered Florida streams. The conclusions of the EPA’s review of the nutrient thresholds component of 62-302.531(2)(c) are located on pages 42-43.

EPA Conclusion Regarding Numeric Nutrient Criteria for Streams

As summarized on page 133 of FDEP’s Freshwater TSD, the State has established a structure in its

³⁹ More extensive details on the data sources, data processing, and criteria derivation can be found in Section 7.6 of FDEP’s Freshwater TSD.

nutrient rule that is designed “to ensure with confidence that nutrient concentrations provide for a well balanced natural population of flora and fauna, it is necessary to also measure and evaluate the actual flora and fauna of the stream.” The State adopted TN and TP thresholds along with a suite of numeric response variables (chlorophyll *a*, periphyton coverage (measured via RPS), nuisance macrophyte growth (measured via LVS), algal taxa dominance, and SCI) to measure flora and fauna. The floral nutrient response variables as a whole are biologically responsive, sensitive to nutrients, and cover major pathways that nutrient effects manifest for the state of Florida. In addition, the rule and its supporting documents make clear how the State interprets the desired condition of balanced floral and faunal populations. For example, if any one of the floral variables is not attained then the floral population is not in balance and the stream is placed on the State’s list of impaired waters. Furthermore, if either one of the nutrient thresholds is not attained and the State does not have data to evaluate all the floral measures, or if both a TN/TP threshold and a nutrient response variable (measuring either flora or fauna) are exceeded, then the stream is placed on the State’s list of impaired waters.

The suite of parameters adopted by the State was reviewed by the EPA in its analysis of the integrated criteria in paragraph 62-302.531(2)(c). As summarized in the respective sections above, the EPA has determined that paragraph 62-302.531(2)(c) includes multiple metrics that are protective of the designated use in a given stream at a given place and time for streams.⁴⁰ Florida’s narrative nutrient criterion is based on preventing an imbalance of flora and fauna. The numeric components of the integrated criterion in 62-302.531(2)(c) interpret the narrative criterion in 62-302.530(47)(b) in a way that focuses on a use test designed to assess whether that imbalance has occurred, and where it has not occurred then the use is met with regard to this criterion. The rule also provides numeric TN and TP thresholds applicable to Florida streams in the absence of a positive showing that streams are biologically healthy both in terms of flora and fauna. Following the EPA’s analysis of the rule and SCI Primer, in conjunction with the subsequent clarification provided by the Nutrient Standards Implementation Document, the EPA has determined this multi-metric criterion has addressed the variability associated with biological responses in streams in a reasonable manner and is one scientifically defensible way to achieve protection of the designated uses in covered Florida streams. For the reasons outlined above, the EPA finds that all components of the integrated, multimetric criterion in 62-302.531(2)(c), including the components identified above from the SCI Primer that are part of the new or revised water quality criterion, are consistent with CWA section 303(c) and 40 CFR Part 131 and are approved by the EPA pursuant to section 303(c) of the Act.

Subsection 62-302.531(3)

Except for data used to establish historical chlorophyll *a* levels, chlorophyll *a* data assessed under this Chapter shall be measured according to the DEP document titled “Applicability of Chlorophyll *a* Methods” (DEP-SAS-002/10), dated October 24, 2011, which is incorporated by

⁴⁰ EPA specifies “at that place and time” because, for example, the nutrient concentrations at the place and time of the bioassessment cannot provide assurance that nutrients at that level will not cause a problem at either a later time or further downstream of that point. EPA expects FDEP will rely on other WQS provisions to address considerations of downstream protection. EPA also notes that the document, *Development of Type III Site Specific Alternative Criteria for Nutrients* also addresses the State’s recommendations for development for a study design for development of Type III SSAC, which provides factors that should be considered in conducting nutrient studies to ensure data quality and sufficiency in assessing ambient water quality conditions.

reference herein. Copies of the chlorophyll *a* document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. Chlorophyll *a* data collected after [effective date] shall be corrected for or free from the interference of phaeophytin.

Subsection 62-302.531(3) identifies the analytical methodology to be used for measurement of chlorophyll *a* concentrations assessed under Florida's nutrient rule and includes a reference to that methodology. This reference is not a new or revised WQS, as it does not establish or revise the magnitude, duration, or frequency of the chlorophyll *a* criteria established by the State. However, the last sentence in Subsection 62-302.531(3) specifies that chlorophyll *a* measurements made after the effective date of these WQS revisions must be corrected for, or free from, the interference of phaeophytin. Because this provision reflects a change in the compounds that are used to judge compliance with chlorophyll *a* criteria, the last sentence is a WQS revision that is subject to the EPA review under CWA section 303(c).

Using chlorophyll *a* data that is corrected for or free from the interference of phaeophytin is the same approach that the EPA used in developing federal nutrient criteria. Therefore, Florida's approach relies on the science underlying the EPA's criteria, and is consistent with the Agency's review of the latest scientific knowledge available regarding the effects of nutrients on waters in Florida.⁴¹ Phaeophytin is a degradation product of algal cell chlorophyll, and is not an appropriate measure of algal biomass or primary productivity. This sentence ensures that measurements of chlorophyll *a* are accurate and assess the same chlorophyll *a* levels that the EPA used in the promulgation of nutrient criteria for the State.

Therefore, the EPA finds that this provision is consistent with CWA section 303(c) and 40 CFR Part 131 and is approved by the EPA pursuant to section 303(c) of the Act.

Protection of Downstream Waters

Subsection 62-302.531(4)

(4) The loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters.

The EPA's regulation at 40 CFR section 131.10(b), provides:

In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.

Subsection 62-302.531(4) provides that "[t]he loading of nutrients from a waterbody shall be limited as necessary to provide for the attainment and maintenance of water quality standards in downstream waters." In addition to subsection 62-302.531(4), the State, in adopting revisions to Chapters 62-302 and

⁴¹ See footnote b to Table 1 in 40 CFR section 131.43(c).

62-303, further addressed the protection of downstream waters/downstream WQS in several new provisions of Florida WQS, including new/revised provisions at 62-302.800(3), 62-302.800(3)(a)3., 62-303.390(2)(a), and 62-303.450(4). In addition to these provisions of Florida WQS, the provisions of 62-303.390(3) also reinforce how these downstream protection provisions will be incorporated into nutrient criteria for certain waters included on Florida's CWA section 303(d) list. Each of these provisions serves as a fundamental component of the State's approach for protection of downstream water quality. In order to address all of the components in a holistic way, this review of 62-302.531(4) also addresses the downstream protection provisions located in other parts of Florida WQS, including the discussion of these provisions in FDEP's Nutrient Standards Implementation Document, which clarifies how FDEP will implement these provisions.

The State, at page 29 of the *NNC and Protection of Downstream Waters* section of its Nutrient Standards Implementation Document, has explained the intended implementation of this provision as follows:

- Using models to allocate to upstream watersheds when establishing the TMDL for the downstream waterbody;
- Requiring dischargers, at the time of permit issuance, to provide reasonable assurance that their effluent does not cause or contribute to nutrient impairments in the receiving waterbody and downstream waterbodies; and
- Identifying trends in nutrient concentrations in all waters, including downstream waters, during the assessment cycle.

The State also explained in that section of the Nutrient Standards Implementation document that a watershed model can be used to determine the appropriate nutrient levels from upstream waters that are needed to ensure compliance with downstream WQS. The State described that modeling, or similar approaches are to be used to demonstrate downstream standards attainment on page 6 of the document, *Development of Type III Site Specific Alternative Criteria for Nutrients*, stating "if the downstream waters do not attain water quality standards related to nutrient conditions, a demonstration must be made that the nutrient levels established by the Type III SSAC, when delivered to downstream waters ... provide for the attainment and maintenance of water quality standards, using water quality models or other scientifically defensible methods." (See additional discussion of this document, which is referenced in 62-302.800(3), below.) This approach was used by the EPA in the December 2010 final rule.⁴² The State, on page 29 of the Nutrient Standards Implementation Document, also discusses other options for such a determination, stating:

For example, if a downstream lake is currently attaining its nutrient standards, then current conditions in the upstream waters provide for that attainment condition (*i.e.*, loading of nutrients from the waterbody would be limited at current conditions to provide for the continued attainment and maintenance of water quality standards in downstream waters). However, a Level

⁴² 40 CFR section 141.43(c)(2)(ii)(B) allows the use of a "scientifically defensible technical model other than BATHTUB upon demonstration that use of another scientifically defensible technical model would protect the lake's designated uses and meet all applicable criteria for the lake. The State or EPA may designate the wasteload and/or load allocations from a TMDL established or approved by EPA as DPV(s) if the allocations from the TMDL will protect the lake's designated uses and meet all applicable criteria for the lake." 40 CFR 131.43(e) allows the development of site-specific alternative criteria in lieu of the federal criteria established by EPA. EPA has developed guidance for such SSAC which includes, among other requirements, that the SSAC are shown to be protective of downstream WQS.

II WQBEL⁴³ will be needed to evaluate the impacts on downstream waters if the facility requests an increase in their permitted load.

If a downstream waterbody is not attaining nutrient standards, the permit could not be issued until reasonable assurance was provided that the facility's discharge was not contributing to the impairment. This can be done in response to a Department adopted TMDL, or through independent modeling conducted in the watershed. Once modeling is conducted, the results of that modeling can be used to ensure that loading of nutrients from the upstream waterbody is limited as necessary to provide for the attainment and maintenance of the water quality standards of downstream waters.

The language in the Nutrient Standards Implementation Document clarifies that numeric values will be used to determine downstream protection. In the case of a water body that is attaining its nutrient standards, compliance with downstream standards will be evaluated using a direct comparison of ambient conditions with the downstream water's numeric criteria values. Also, as discussed below, the Nutrient Standards Implementation Document explains on page 30 how the trend analysis required in 62-303 operates to ensure downstream protection. In the case of a downstream water body that is not attaining its criteria, modeling will be conducted to determine a numeric WQBEL or TMDL to quantify the contributions of upstream nutrients that will meet the numeric downstream criteria values.

As explained above, other provisions of Florida WQS and the Nutrient Standards Implementation Document provide the details of the processes of Florida's quantitative approach for ensuring the attainment and maintenance of downstream WQS. These provisions, and how they relate to implementation of subsection 62-302.531(4), are discussed immediately below.

Section 62-302.800 Site Specific Alternative Criteria.

The Rule includes a new provision providing for the adoption of Type III Site Specific Alternative Criteria (SSAC) for nutrients (Type III SSAC). Prior to adoption of the rule, Florida WQS provided for two other categories of SSAC in 62-302.800: Type I SSAC, which allow for SSAC when a criterion cannot be met due to natural background conditions or due to man-induced conditions which cannot be controlled or abated; and Type II SSAC, which allow for SSAC to be established on the basis of site-specific reasons other than for a Type I SSAC.

The option of Type III SSAC was included as part of the Florida rule to enable adoption of criteria for specific water bodies where a nutrient criterion based on site specific conditions should replace the otherwise applicable numeric criteria established in 62-302.531, and to establish regulatory requirements for the technical and scientific justifications necessary to ensure that Type III SSAC are protective of the designated uses of the waters to which they apply. A petition for a Type III SSAC for a water body must include a demonstration that the proposed SSAC "achieve the narrative nutrient criteria in paragraph 62-303.530(47)(b), F.A.C., and are protective of downstream waters."

⁴³ 62-650.500(2) provides, "The WQBEL Level II Process is utilized to determine new discharge permit limits and to evaluate permit renewals when existing water quality data is insufficient to evaluate expected water quality impacts or when the available assimilative capacity of the water body is being completely utilized, or might reasonably be expected to be completely utilized by the discharge, either by itself, or in combination with other discharges to the receiving water body.

Section 62-302.800(3) addresses the requirements for development of Type III SSAC, including the requirement of a demonstration “that the proposed criteria ... are protective of downstream waters.” The details of this requirement are set out in 62-302.800(3)(a)3, which provides two options for demonstrating that a Type III SSAC protects the WQS of downstream waters. The first option is based on a demonstration that downstream waters are attaining water quality standards related to nutrient conditions pursuant to Chapter 62-303, F.A.C. The second option addresses cases where the downstream waters do not attain water quality standards related to nutrient conditions.

Where the downstream waterbody is attaining WQS, a Type III SSAC may be established for an upstream waterbody if downstream waters are attaining WQS for nutrients during water quality conditions in the upstream water body that are representative of the SSAC. 62-302.800(3)(a)3 refers to Chapter 62-303 to determine whether the downstream waterbody is attaining WQS for nutrients. Chapter 62-303 includes provisions at 62-303.390(2)(a) and 62-303.450(4) for assessing attainment based on the degree of change in nutrient parameters. This method is also known as the “trend analysis.” Particularly as applied to downstream waters such as lakes and estuaries, EPA understands that the trend analysis provides a mechanism to assess the continued attainment of nutrient WQS that will be considered in the development of Type III SSAC, and that will also provide a future check on SSAC that have been adopted for upstream waters. Should the downstream water develop an increasing trend that is predicted to result in exceedance of the numeric nutrient thresholds as established in 62-303.390(2)(a) and 62-303.450(4), the downstream water will be identified on the State’s section 303(d), based on 62-303.390(2)(a) or 62-303.450(4). The upstream waters flowing into that downstream water will be identified on the State’s CWA section 303(d) list based on subsection 62-302.531(4).

Where the downstream waters are impaired for nutrients, Type III SSAC may be established where the nutrients delivered pursuant to the SSAC either (a) meet the allocations of a downstream TMDL, or (b) provide for the attainment and maintenance of water quality standards in downstream waters. The EPA understands that the required “attainment and maintenance” demonstration would be made for cases where the State has not yet developed a TMDL for the downstream WQS impairment.

The provisions discussed above are set out in 62-302.800(3), which establishes the Type III nutrient SSAC. However, the requirement that SSAC protect downstream waters also applies to Type II nutrient SSAC. On page 34 of the NNC Implementation Document, FDEP states that the “requirement to ensure protection of downstream waters is explicitly described in the rule for Type III SSACs, but it is also required for Type II SSACs for nutrients”.

As discussed above, the provisions of 62-302.800 clearly require that the effect of nutrient loads from upstream waters on downstream waters be considered when establishing a nutrient SSAC. The State will utilize the numeric thresholds or criteria for waters that are attaining standards (in conjunction with the trend analysis, which is discussed below), will use numeric values for upstream sources that are necessary to comply with the allocations of a TMDL, or will develop numeric values based on demonstrating the nutrient load an impaired downstream water can receive from upstream waters and still attain downstream WQS. This quantitative approach results in nutrient SSAC incorporating numeric-based requirements for protection of downstream waters.

62-303.390 and 62-303.450 Assessment of Increasing Trends in Nutrient Concentrations

62-303.390(2)(a) and 62-303.450(4) establish WQS provisions that provide an objective, quantitative process to assess trends in ambient data for nutrient parameters. These provisions apply to all Class I, II, and III waters. While use of the trend analysis is not limited to situations where a waterbody is either upstream or downstream of another waterbody, the State's Nutrient Standards Implementation Document at page 30 describes the application of this provision as follows:

Even if both upstream and downstream waters are currently attaining nutrient standards or in situations where information for downstream waters is not available, the Department's nutrient standards include an evaluation of trends to ensure that conditions are not increased in a manner that could result in impairment downstream.

FDEP's rule at 62-303.390(2)(a) requires that a water body that is otherwise attaining its nutrient criteria be included on the Study List portion of Florida's CWA section 303(d) list if data for TN, TP, nitrate-nitrite, or chlorophyll a show a statistically-significant increasing trend and there is a reasonable expectation that the water will become impaired within 10 years, "taking into consideration the current concentrations of nutrients or nutrient response variables and the slope of the trend." FDEP's rule at 62-303.450 requires that a water body that is otherwise attaining its nutrient criteria be included on the Verified List portion of Florida's CWA section 303(d) list if data for nutrient response variables show a statistically-significant increasing trend and there is a reasonable expectation that the water will become impaired within 5 years.

The rule provides that some data can be excluded from the analysis to remove the effects of confounding variables, "such as climatic and hydrologic cycles, seasonality, quality assurance issues, and changes in analytical methods or method detection limits." The EPA agrees that it is reasonable to exclude data from such analyses under certain limited circumstances. The State's choice of data exclusions are reasonable in that they address water quality variations that may not directly relate to an analysis of whether nutrient contributions in a watershed are increasing over a period of multiple years. Also, the EPA notes that the increasing trend analyses conducted by the State are subject to the EPA's review of State CWA Section 303(d) listing decisions, including the State's decisions regarding specific ambient data that should be considered in the State's assessment process.

62-303.390(2)(a) and 62-303.450(4) refer to the provisions of 62-303.351(5), 62-303.352(3), 62-303.353(4) and 62-303.354(3), which require that the statistical evaluation of data for an increasing trend analysis be conducted using a Mann's one-sided upper-tail test. The Mann's test for trend is a nonparametric test, which is supported by a number of readily available statistical programs including Microsoft Excel and S-Plus. The EPA has reviewed this method and determined that this test is widely accepted as an appropriate tool for statistical evaluation to determine whether the individual points in a data set exhibit a significant trend and does not require a minimum sample size. The Mann's test for trend and the associated Kendall's rank correlation coefficient are considered to be reliable nonparametric trend tests due to their high power, regardless of the underlying distribution. (Helsel and Hirsch, *Statistical Methods in Water Resources*, 2002 USGS and Yue, *A comparison of the power of the t test, Mann-Kendall and bootstrap tests for trend detection*, Hydrological Sciences, 49(1) Feb. 2004.)

As discussed on page 30 of the Nutrient Standards Implementation Document, the State selected a confidence level of 95 percent for application of the test, which will identify trends that are clearly

statistically significant. The sections of 62-303.351(5), 62-303.352(3), 62-303.353(4), and 62-303.354(3) that use this test refer to the use of data for chlorophyll a, TN and TP “over the planning period.” As discussed more fully on pages 83 and 103 below related to the EPA’s complete review of 62-303.390(2)(e), the EPA considers this restriction of data to the “planning period” to be related to data reliability, and, therefore, the State’s references to the “planning period” in 62-303.351(5), 62-303.352(3), 62-303.353(4), and 62-303.354(3), as those terms are implemented in 62-303.390(2)(a) and 62-303.450(4), are not considered by the EPA to be a WQS for the purposes of the EPA’s review of these provisions.

The EPA considers the statistical utility of the Mann’s one-sided upper-tail test to be a scientifically defensible approach to assess possible trends of data for nutrient parameters, and the use of the test in these circumstances, as referenced in 62-303.390(2)(a) and 62-303.450(4), is approved by the EPA pursuant to CWA section 303(c).

In discussing how the trend analysis described above is one component of the State’s approach to downstream protection, FDEP included an example of how the increasing trend analysis would have been applied to the Weeki Wachee River on pages 31 and 32 of the Nutrient Standards Implementation Document:

Any TMDL developed to address the increasing trend in nitrate levels would, in addition to protecting the Weeki Wachee River, have the added benefit of protecting downstream waters even if there were no observable increases in nutrients or nutrient response variable in the downstream waters. Because the trend test applies to lakes and estuaries, as well as the streams that feed them, it provides an enhanced method to assure that downstream waters are fully protected. In addition to the above example, if an adverse trend in TP were observed in a downstream lake or estuary, a site specific criterion would be developed for the waterbody prior to it becoming impaired, and this action would establish TP expectations for upstream waters at a level that would prevent the lake or estuary from exceeding the applicable nutrient criteria. The adverse trend test, which is linked to the numeric criteria necessary to protect recreation and healthy, well balanced aquatic communities, allows for Hierarchy 1 site-specific and highly accurate downstream protection values to be developed prior to the downstream waters from becoming impaired.

The EPA’s September 16, 2009 letter to FDEP stated that there were “indications that the numeric values Florida is moving forward with ... may not provide for the attainment and maintenance of downstream water quality standards.” These concerns were based on the EPA’s comparison of the State’s proposed criteria to TMDL requirements, modeling and statistical analysis of downstream data and the levels of nutrients that appeared to be needed to protect downstream waters. Since then, the State has added, among other things, the provisions in 62-303.390(2)(a) and 62-303.450(4) related to the trend analysis. For cases where the downstream water body attains applicable nutrient criteria, a significant upward trend in ambient nutrient levels that is predicted to result in use impairment in either 10 years (Study List) or 5 years (Verified List) will result in listing of the applicable water body(ies) based on the “trend analysis” provision. If the downstream water body is not attaining applicable nutrient criteria, the State will continue its practice of listing the downstream water body as not attaining its designated use and its numeric nutrient criteria will be used to determine appropriate nutrient reductions/controls for all sources in the watershed.

The State's new numeric nutrient criteria in place for lakes and some estuaries makes implementation of the "trend analysis" more streamlined and less time-consuming and resource intensive. Any increasing trend would be considered in relation to the newly established criteria for the downstream water. The increasing trend WQS provision protects the downstream waters covered in this rule directly, establishes a scientifically defensible mechanism to identify waters that may become impaired in the future, and allows sufficient time for developing source control requirements to prevent impairments of downstream waters.

On page 30 of the Nutrient Standards Implementation Document, the State addressed the process for returning waters to attainment in cases where the increasing trend WQS provision is not met, that is, where a waterbody is projected to become impaired within ten or five years, whichever is applicable. For waters included on the Study List based on a trend analysis, FDEP will develop a site specific numeric interpretation of the narrative nutrient criterion for the waterbody. This interpretation would likely be a nutrient SSAC, and would be implemented and applied to upstream waters feeding the downstream waterbody. For waters on the Verified List, FDEP will develop a TMDL, which will also be a site specific numeric interpretation of the narrative nutrient criterion for the waterbody. See subsection 62-303.390(3). The TMDL would include wasteload allocations for point sources and load allocations for nonpoint sources, would be implemented in NPDES permits for upstream dischargers, and any needed reductions in nonpoint sources would be implemented via the BMAP for the TMDL, which is enforceable for nonpoint sources.

For the reasons above, the EPA finds that the trend analysis is a scientifically defensible quantitative approach for protecting waters that currently meet applicable nutrient WQS.

EPA's Conclusion Regarding Protection of Downstream Waters

Based on the EPA's review, the new and revised downstream WQS provisions adopted by the State provide for quantitative processes that will serve to ensure the attainment and maintenance of downstream waters by requiring nutrient control measures not only in cases where nutrient impairment has already been documented, but also in cases where nutrient standards are currently met in downstream waters, but maintaining compliance with those nutrient standards is threatened as documented by water quality trends. In addition to its general provision that the loading of nutrients be limited to protect downstream waters, the State has also included downstream protections in provisions related to establishing nutrient SSAC and waterbody assessment. The combination of these provisions will enable effective and expeditious consideration of downstream standards when developing numeric nutrient criteria. The provisions will also allow the State to address existing impairments due to nutrients, as well as a proactive component to address projections of impairments in the future.

The Agency also notes that subparagraph (9)(c) of Rule 62-302.400, *Classification of Surface Waters, Usage, Reclassification, Classified Waters*, requires the following affirmative finding prior to the reclassification of a water body: "The proposed reclassification will not allow for the nonattainment of water quality standards in downstream waters." This provision is an existing provision, previously adopted by FDEP, and approved by the EPA, and was not revised during the State's nutrient criteria rulemaking. It is identified in this review because it provides additional regulatory authority to ensure that downstream water protections are achieved in any regulatory revision that changes the designated use for any water body in the State.

EPA notes that it has determined, pursuant to CWA section 303(c)(4)(B), that numeric values are not necessary to meet CWA requirements with respect to downstream protection in Florida. Although EPA believes that Florida's downstream protection provisions, described above, will provide for quantitative processes to ensure the attainment and maintenance of downstream waters, EPA does not believe that the provisions themselves consist of numeric values. EPA does believe that the provisions protect designated uses. However, because EPA is currently subject to a consent decree deadline to sign proposed numeric downstream protection values (DPVs) for Florida by November 30, 2012, EPA is taking such action to comply with the consent decree. EPA will, however, be asking the court to modify the consent decree consistent with the Agency's determination, i.e., to modify the consent decree to not require EPA to promulgate numeric DPVs for Florida.

For the reasons outlined above, the State's downstream protection provisions in 62-302.531(4), 62-302.800(3), 62-302.800(3)(a)3., 62-303.390(2)(a), and 62-303.450(4) are approved by the EPA pursuant to CWA section 303(c) subject to the district court modifying the consent decree to not require EPA to promulgate numeric DPVs for Florida.

Subsection 62-302.531(5)

To qualify as temporally independent samples, each SCI shall be conducted at least three months apart. SCIs collected at the same location less than three months apart shall be considered one sample, with the mean value used to represent the sampling period.

This provision is related to data distribution requirements and does not establish or revise the magnitude, duration, or frequency of a criteria established by the State. Therefore, the EPA has concluded that this provision does not constitute a new or revised water quality standard.

Subsection 62-302.531(6)

To calculate an annual geometric mean for TN, TP, or chlorophyll *a*, there shall be at least four temporally-independent samples per year with at least one sample taken between May 1 and September 30 and at least one sample taken during the other months of the calendar year. To be treated as temporally-independent, samples must be taken at least one week apart.

This provision is related to data sufficiency requirements and does not establish or revise the magnitude, duration or frequency of the revised criteria. Therefore, the EPA has concluded that this provision does not constitute a new or revised water quality standard.

Subsection 62-302.531(7)

The numeric interpretation of the narrative nutrient criterion shall be applied over a spatial area consistent with its derivation.

(a) For numeric interpretations based on paragraph 62-302.531(2)(a), F.A.C., the spatial application of the numeric interpretation is as defined in the associated order or rule.

(b) For lakes covered under subparagraph 62-302.531(2)(b)1., F.A.C., the numeric interpretation shall be applied as a lake-wide or lake segment-wide average.

(c) For spring vents covered under subparagraph 62-302.531(2)(b)2., F.A.C., the numeric interpretation shall be applied in the surface water at or above the spring vent.

(d) For streams covered under paragraph 62-302.531(2)(c), F.A.C., the spatial application of the numeric interpretation shall be determined by relative stream homogeneity and shall be applied to waterbody segments or aggregations of segments as determined by the site-specific considerations.

This provision describes how four types of numeric interpretations will be applied spatially. The provision applies to site-specific criteria associated with 62-302.531(2)(a), lakes, spring vents, and streams. Site-specific criteria adopted to formalize specific orders or rules are to be adopted consistent with the spatial application developed at the time of those orders or rules. When applying the criteria established for lakes, spring vents and streams in paragraphs 62-302.531(2)(b) and (c), the State's intention is that the criteria apply at a representative location for the given waterbody type. In each case, the State's criteria derivation is consistent with how the spatial application is detailed in this particular provision. The State's intention is to aggregate those segments that are similar, but not aggregate those which are distinctly different. On pages 28 and 44 of the Nutrient Standards Implementation Document, the State provides the following examples regarding the State's interpretation of the rule provision.

Except for extremely large lakes (e.g., Lake Okeechobee, which has been subdivided), the lakes criteria apply to lakewide averages. ...For streams, the spatial application of the numeric interpretation shall be determined by relative stream homogeneity and shall be applied to waterbody segments or aggregations of segments as determined by the site-specific considerations. The stream nutrient thresholds were derived through a distributional analysis of data from homogeneous reference stream segments, with the spatial extent of each stream segment typically measuring approximately five linear miles. Two or more stream segments may be combined if the nutrient data are homogeneous, which is evaluated through routine statistical tests, such as Analysis of Variance or Student's t-test, and if the results show that the segments are not significantly different at the 90 percent confidence level. Data will be transformed (e.g., log) prior to statistical analysis if the data are not normally distributed. (Page 28)

Where a SSAC is the applicable interpretation, a WQBEL is derived to ensure that the discharge does not cause or contribute to an exceedance of the SSAC within the spatial area to which the SSAC is applicable (e.g. if a SSAC for a stream segment has been established as an annual geometric mean of 40 µg/L total phosphorus, the WQBEL is calculated to ensure that the discharge does not cause or contribute to the stream segment exceeding an annual geometric mean of 40 µg/L), in all years. (Page 44)

The State has provided examples to put some bounds on how large or small a segment, or aggregation of segments, could be and what the process for making such a decision would be based on. Since states are required to adopt criteria that protect their designated uses, describing the spatial extent consistent with the criteria derivation that protects the uses ensures that the spatial application of the criteria is also protective. As a result, the EPA finds that this provision is consistent with 40 CFR Part 131 and the CWA, and is approved by the EPA pursuant to CWA section 303(c).

Subsection 62-302.531(8)

Load-based or percent reduction-based nutrient TMDLs or Level II Water Quality Based Effluent Limitations (WQBELs) pursuant to Chapter 62-650, F.A.C., do not need to be converted

into concentration-based nutrient TMDLs or WQBELs to be used as the basis for the numeric interpretation of the narrative criterion. For percent reduction-based nutrient TMDLs, the associated allowable load or concentration is the numeric interpretation of the narrative criterion for the waterbody.

This provision clarifies the State's intentions to allow criteria to be derived in formats outside the traditional concentration-based format of many water quality criteria. This provision does not establish any magnitude, duration, or frequency and therefore is not be considered to be a new or revised water quality standard. Any future changes to water quality standards that are based on TMDLs or WQBELs will be reviewed by the EPA, following submittal by the State, to determine whether the submitted water quality criteria are protective of the designated use(s) and consistent with the CWA and its implementing regulations.

Subsection 62-302.531(9)

The Commission adopts rules 62-302.200(4), .200(16)-(17), .200(22)-(25), .200(35)-(37), .200(39), 62-302.531, and 62-302.532(3), F.A.C., to ensure, as a matter of policy, that nutrient pollution is addressed in Florida in an integrated, comprehensive and consistent manner. Accordingly, these rules shall be effective only if EPA approves these rules in their entirety, concludes rulemaking that removes federal numeric nutrient criteria in response to the approval, and determines, in accordance with 33 U.S.C. § 1313(c)(3), that these rules sufficiently address EPA's January 14, 2009 determination. If any provision of these rules is determined to be invalid by EPA or in any administrative or judicial proceeding, then the entirety of these rules shall not be implemented.

This provision does not constitute a new or revised water quality standard. It does not establish or revise designated uses for any waters or criteria protecting those uses. It also does not establish or revise any antidegradation policies for Florida waters. Therefore, the EPA is taking no action to approve or disapprove this provision pursuant to section 303(c) of the CWA.

As set out more fully elsewhere in this document, the EPA has reviewed each of the Rule provisions referenced in this subsection to determine whether the provisions constitute new or revised water quality standards as that term is used in section 303(c) of the CWA or the regulations at 40 C.F.R. Part 131. The EPA has determined that rules 62-302.200(4), .200(16), .200(17) [except as noted below], .200(22)-(25), .200(35)-(36), .200(37) [except as noted below], and 62-302.531 [except as noted below], F.A.C., constitute new or revised water quality standards subject to Agency review pursuant to section 303(c) of the Act. The EPA has reviewed those sections and approved them as consistent with the requirements of the CWA. The EPA has determined that rules 62-302.200(17) [specifically the two referenced documents], .200(37) [specifically the two referenced documents, excepting those provisions determined to be new or revised standards as detailed in the EPA's review of the provision 62-302.531(2)(c).], .200(39), 62-302.531 [specifically .531(1), a portion of .531(2)(b)1.c, .531(3), .531(5)-(6), and .531(8)-(9)], and 62-302.532(3), F.A.C., do not constitute new or revised water quality standards and, therefore, are not subject to the EPA review and approval or disapproval under the CWA. The fact that the EPA has not reviewed or acted upon those provisions that it determined are not new or revised water quality standards does not mean that the EPA has disapproved those provisions or that the EPA has made a determination that the provisions are invalid pursuant to the CWA.

Numeric Nutrient Criteria for Estuaries

Section 62-302.532

Introduction

Florida added this section 62-302.532 to provide numeric interpretations of the State's narrative nutrient criterion applicable to estuaries and marine waters which are defined by FDEP as coastal waters, and further described in the following paragraph. The provisions establish estuary-specific numeric interpretations for a designated portion of the State marine waters in subsection 62-302.532(1) along with a geographic coverage defining the applicability of those estuary specific numeric interpretations with keyed maps for a portion of Florida coastal marine waters (subsection 62-302.532(2)), and a schedule for the intended future development of numeric interpretation of the State's narrative nutrient criterion for the remaining coastal marine waters (subsection 62-302.532(3)).

While the term "estuary" is not specifically defined within this rule, the effective definition is provided by the State in supporting documentation. On page 2 of FDEP's Marine Overview TSD the State has said that "Florida water quality standards do not define 'estuaries'. Instead, they define "coastal waters" as "all waters in the state that are not classified as fresh waters or as open waters" and further define "open waters" as "all waters in the state extending seaward from the most seaward 18-foot depth contour line (3-fathom bottom depth contour) which is offshore from any island; exposed or submerged bar or reef; or mouth of any embayment or estuary which is narrowed by headlands. Contour lines shall be determined from Coast and Geodetic Survey Charts." The State cites the EPA's Nutrient Criteria Technical Guidance Manual (EPA 2001) as broadly defining estuaries to include all shallow coastal ecosystems, including "tidal rivers, embayments, lagoons, coastal river plumes, and river dominated coastal indentations," and defining coastal waters as those that "lie between the mean highwater mark of the coastal baseline and the shelf break, or approximately 20 nautical miles offshore when the continental shelf is extensive." The State therefore concluded, "Thus, "coastal waters" as defined in Florida's water quality standards are equivalent to the EPA's definition of estuary, and "open waters" are equivalent to the EPA's term "coastal waters."" Based on this clarification, it is the EPA's understanding that the "estuary specific numeric interpretations of the narrative nutrient criterion" provided in this rule, or committed to in a schedule for future adoption, apply only to what the EPA considers estuarine and nearshore marine waters, and as such, do not apply to offshore coastal marine waters extending out to the 3-mile limit of State waters. It remains the EPA's understanding that those offshore coastal marine waters out to the 3-mile limit of State waters will continue to be covered by the State's existing narrative criterion for nutrients.

The intended specific spatial applicability of these estuary values is further defined in FDEP's Marine Overview TSD, on page 2, where the State says "criteria developed for open estuaries should not apply to tidal creeks, embayments, or marine lakes, even if they meet the definition of predominantly marine waters." And the continuation on page 64 states "that if nutrients in the open water areas of a given estuary are acceptable, then nutrients in the adjacent wetland influenced tidal creeks should also be deemed non-problematic."

The State further adds, "[s]imilarly, because the ongoing criteria development for Florida systems is based on the mixed, open water portions of bays and lagoons, samples collected at the mouths of tributary rivers or streams would generally not be representative of the mixed, open water portions.

Therefore, nutrient values at such sites would not be part of the original data distribution from which the criteria were developed, and it would be inappropriate to use data from those sites to assess compliance." The State will apply the narrative criteria for waters not covered by numeric criteria. The EPA notes that although there are certain estuaries to which numeric criteria do not currently apply, the downstream protection approach will go into effect once either the EPA promulgates criteria or State-adopted criteria are approved by the EPA, according to the schedule at 62-302.532(3).

Each subsection within 62-302.352 (Estuary-Specific Numeric Interpretations of Narrative Nutrient Criteria) is shown below, followed by the EPA's analysis and conclusion for each grouping.

Subsection 62-302.532(1)

Estuary-specific numeric interpretations of the narrative nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., are in the table below. The concentration-based estuary interpretations are open water, area-wide averages. The interpretations expressed as load per million cubic meters of freshwater inflow are the total load of that nutrient to the estuary divided by the total volume of freshwater inflow to that estuary.

| <u>Estuary</u> | <u>Total Phosphorus</u> | <u>Total Nitrogen</u> | <u>Chlorophyll <i>a</i></u> |
|---|---|--|-----------------------------|
| <u>(a) Clearwater Harbor/St. Joseph Sound</u> | <u>Annual geometric mean values not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.</u> | | |
| <u>1. St. Joseph Sound</u> | <u>0.05 mg/L</u> | <u>0.66 mg/L</u> | <u>3.1 µg/L</u> |
| <u>2. Clearwater North</u> | <u>0.05 mg/L</u> | <u>0.61 mg/L</u> | <u>5.4 µg/L</u> |
| <u>3. Clearwater South</u> | <u>0.06 mg/L</u> | <u>0.58 mg/L</u> | <u>7.6 µg/L</u> |
| <u>(b) Tampa Bay</u> | <u>Annual totals for nutrients and annual arithmetic means for chlorophyll <i>a</i>, not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.</u> | | |
| <u>1. Old Tampa Bay</u> | <u>0.23 tons/million cubic meters of water</u> | <u>1.08 tons/million cubic meters of water</u> | <u>9.3 µg/L</u> |
| <u>2. Hillsborough Bay</u> | <u>1.28 tons/million cubic meters of water</u> | <u>1.62 tons/million cubic meters of water</u> | <u>15.0 µg/L</u> |
| <u>3. Middle Tampa Bay</u> | <u>0.24 tons/million</u> | <u>1.24 tons/million cubic meters of</u> | <u>8.5 µg/L</u> |

| | | | |
|--|---|--|------------------|
| | <u>cubic meters of water</u> | <u>water</u> | |
| <u>4. Lower Tampa Bay</u> | <u>0.14 tons/million cubic meters of water</u> | <u>0.97 tons/million cubic meters of water</u> | <u>5.1 µg/L</u> |
| <u>5. Boca Ciega North</u> | <u>0.18 tons/million cubic meters of water</u> | <u>1.54 tons/million cubic meters of water</u> | <u>8.3 µg/L</u> |
| <u>6. Boca Ciega South</u> | <u>0.06 tons/million cubic meters of water</u> | <u>0.97 tons/million cubic meters of water</u> | <u>6.3 µg/L</u> |
| <u>7. Terra Ceia Bay</u> | <u>0.14 tons/million cubic meters of water</u> | <u>1.10 tons/million cubic meters of water</u> | <u>8.7 µg/L</u> |
| <u>8. Manatee River Estuary</u> | <u>0.37 tons/million cubic meters of water</u> | <u>1.80 tons/million cubic meters of water</u> | <u>8.8 µg/L</u> |
| <u>(c) Sarasota Bay</u> | <u>Annual geometric mean values for nutrients and annual arithmetic means for chlorophyll <i>a</i>, not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.</u> | | |
| <u>1. Palma Sola Bay</u> | <u>0.26 mg/L</u> | <u>0.93 mg/L</u> | <u>11.8 µg/L</u> |
| <u>2. Sarasota Bay</u> | <u>0.19 mg/L</u> | <u>See paragraph 62-302.532(3)(i), F.A.C.</u> | <u>6.1 µg/L</u> |
| <u>3. Roberts Bay</u> | <u>0.23 mg/L</u> | <u>0.54 mg/L</u> | <u>11.0 µg/L</u> |
| <u>4. Little Sarasota Bay</u> | <u>0.21 mg/L</u> | <u>0.60 mg/L</u> | <u>10.4 µg/L</u> |
| <u>5. Blackburn Bay</u> | <u>0.21 mg/L</u> | <u>0.43 mg/L</u> | <u>8.2 µg/L</u> |
| <u>(d) Charlotte Harbor/Estero Bay</u> | <u>Annual arithmetic mean values for nutrients and annual arithmetic means for chlorophyll <i>a</i>, not to be exceeded more than once in a three year period. Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.</u> | | |
| <u>1. Dona and Roberts Bay</u> | <u>0.18 mg/L</u> | <u>0.42 mg/L</u> | <u>4.9 µg/L</u> |
| <u>2. Upper Lemon Bay</u> | <u>0.26 mg/L</u> | <u>0.56 mg/L</u> | <u>8.9 µg/L</u> |
| <u>3. Lower Lemon Bay</u> | <u>0.17 mg/L</u> | <u>0.62 mg/L</u> | <u>6.1 µg/L</u> |

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| <u>4. Charlotte Harbor Proper</u> | <u>0.19 mg/L</u> | <u>0.67 mg/L</u> | <u>6.1 µg/L</u> |
| <u>5. Pine Island Sound</u> | <u>0.06 mg/L</u> | <u>0.57 mg/L</u> | <u>6.5 µg/L</u> |
| <u>6. San Carlos Bay</u> | <u>0.07 mg/L</u> | <u>0.56 mg/L</u> | <u>3.5 µg/L</u> |
| <u>7. Tidal Myakka River</u> | <u>0.31 mg/L</u> | <u>1.02 mg/L</u> | <u>11.7 µg/L</u> |
| <u>8. Matlacha Pass</u> | <u>0.08 mg/L</u> | <u>0.58 mg/L</u> | <u>6.1 µg/L</u> |
| <u>9. Estero Bay (including Tidal Imperial River)</u> | <u>0.07 mg/L</u> | <u>0.63 mg/L</u> | <u>5.9 µg/L</u> |
| <u>(e) Tidal Cocohatchee River/Ten Thousand Islands</u> | <u>Annual geometric means that shall not be exceeded more than once in a three year period</u> | | |
| <u>1. Tidal Cocohatchee River</u> | <u>0.057 mg/L</u> | <u>0.47 mg/L</u> | <u>5.8 µg/L</u> |
| <u>2. Collier Inshore</u> | <u>0.032 mg/L</u> | <u>0.25 mg/L</u> | <u>3.1 µg/L</u> |
| <u>3. Rookery Bay/Marco Island</u> | <u>0.046 mg/L</u> | <u>0.30 mg/L</u> | <u>4.9 µg/L</u> |
| <u>4. Naples Bay</u> | <u>0.045 mg/L</u> | <u>0.57mg/L</u> | <u>4.3 µg/L</u> |
| <u>5. Inner Gulf Shelf</u> | <u>0.018 mg/L</u> | <u>0.29 mg/L</u> | <u>1.6 µg/L</u> |
| <u>6. Middle Gulf Shelf</u> | <u>0.016 mg/L</u> | <u>0.26 mg/L</u> | <u>1.4 µg/L</u> |
| <u>7. Outer Gulf Shelf</u> | <u>0.013 mg/L</u> | <u>0.22 mg/L</u> | <u>1.0 µg/L</u> |
| <u>8. Blackwater River</u> | <u>0.053 mg/L</u> | <u>0.41 mg/L</u> | <u>4.1 µg/L</u> |
| <u>9. Coastal Transition Zone</u> | <u>0.034 mg/L</u> | <u>0.61 mg/L</u> | <u>3.9 µg/L</u> |
| <u>10. Gulf Islands</u> | <u>0.038 mg/L</u> | <u>0.44 mg/L</u> | <u>3.4 µg/L</u> |
| <u>11. Inner Waterway</u> | <u>0.033 mg/L</u> | <u>0.69 mg/L</u> | <u>5.2 µg/L</u> |
| <u>12. Mangrove Rivers</u> | <u>0.021 mg/L</u> | <u>0.71 mg/L</u> | <u>3.7 µg/L</u> |
| <u>13. Ponce de Leon</u> | <u>0.024 mg/L</u> | <u>0.52 mg/L</u> | <u>3.0 µg/L</u> |
| <u>14. Shark River Mouth</u> | <u>0.022 mg/L</u> | <u>0.75 mg/L</u> | <u>2.2 µg/L</u> |
| <u>15. Whitewater Bay</u> | <u>0.026 mg/L</u> | <u>0.82 mg/L</u> | <u>4.1 µg/L</u> |
| <u>(f) Florida Bay</u> | <u>Annual geometric means that shall not be exceeded more than once in a three year period</u> | | |
| <u>1. Central Florida Bay</u> | <u>0.019 mg/L</u> | <u>0.99 mg/L</u> | <u>2.2 µg/L</u> |
| <u>2. Coastal Lakes</u> | <u>0.045 mg/L</u> | <u>1.29 mg/L</u> | <u>9.3 µg/L</u> |
| <u>3. East Central Florida Bay</u> | <u>0.007 mg/L</u> | <u>0.65 mg/L</u> | <u>0.4 µg/L</u> |
| <u>4. Northern Florida Bay</u> | <u>0.010 mg/L</u> | <u>0.68 mg/L</u> | <u>0.8 µg/L</u> |
| <u>5. Southern Florida Bay</u> | <u>0.009 mg/L</u> | <u>0.64 mg/L</u> | <u>0.8 µg/L</u> |
| <u>6. Western Florida Bay</u> | <u>0.015 mg/L</u> | <u>0.37 mg/L</u> | <u>1.4 µg/L</u> |
| <u>(g) Florida Keys</u> | <u>Annual geometric means that shall not be exceeded more than once in a three year period</u> | | |
| <u>1. Back Bay</u> | <u>0.009 mg/L</u> | <u>0.25 mg/L</u> | <u>0.3 µg/L</u> |
| <u>2. Backshelf</u> | <u>0.011 mg/L</u> | <u>0.23 mg/L</u> | <u>0.7 µg/L</u> |
| <u>3. Lower Keys</u> | <u>0.008 mg/L</u> | <u>0.21 mg/L</u> | <u>0.3 µg/L</u> |
| <u>4. Marquesas</u> | <u>0.008 mg/L</u> | <u>0.21 mg/L</u> | <u>0.6 µg/L</u> |
| <u>5. Middle Keys</u> | <u>0.007 mg/L</u> | <u>0.22 mg/L</u> | <u>0.3 µg/L</u> |

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| <u>6. Oceanside</u> | <u>0.007 mg/L</u> | <u>0.17 mg/L</u> | <u>0.3 µg/L</u> |
| <u>7. Upper Keys</u> | <u>0.007 mg/L</u> | <u>0.18 mg/L</u> | <u>0.2 µg/L</u> |
| <u>(h) Biscayne Bay</u> | <u>Annual geometric means that shall not be exceeded more than once in a three year period</u> | | |
| <u>1. Card Sound</u> | <u>0.008 mg/L</u> | <u>0.33 mg/L</u> | <u>0.5 µg/L</u> |
| <u>2. Manatee Bay – Barnes Sound</u> | <u>0.007 mg/L</u> | <u>0.58 mg/L</u> | <u>0.4 µg/L</u> |
| <u>3. North Central Inshore</u> | <u>0.007 mg/L</u> | <u>0.31 mg/L</u> | <u>0.5 µg/L</u> |
| <u>4. North Central Outer-Bay</u> | <u>0.008 mg/L</u> | <u>0.28 mg/L</u> | <u>0.7 µg/L</u> |
| <u>5. Northern North Bay</u> | <u>0.012 mg/L</u> | <u>0.30 mg/L</u> | <u>1.7 µg/L</u> |
| <u>6. South Central Inshore</u> | <u>0.007 mg/L</u> | <u>0.48 mg/L</u> | <u>0.4 µg/L</u> |
| <u>7. South Central Mid-Bay</u> | <u>0.007 mg/L</u> | <u>0.35 mg/L</u> | <u>0.2 µg/L</u> |
| <u>8. South Central Outer-Bay</u> | <u>0.006 mg/L</u> | <u>0.24 mg/L</u> | <u>0.2 µg/L</u> |
| <u>9. Southern North Bay</u> | <u>0.010 mg/L</u> | <u>0.29 mg/L</u> | <u>1.1 µg/L</u> |

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| <u>(i) Sarasota Bay</u> | <p><u>For TN, the annual geometric mean target is calculated from monthly arithmetic mean color by region and season. Annual geometric means that shall not be exceeded more than once in a three year period. The Sarasota Bay regions are defined as north (Manatee County) and south (Sarasota County). The wet season for Sarasota Bay is defined as July through October and the dry season is defined as all other months of the year. The seasonal region targets are calculated using monthly color data and shall be calculated as follows:</u></p> $\underline{NW_i = \text{Ln}[(13.35 - (0.32 * CN_i)) / 3.58]}$ $\underline{ND_i = \text{Ln}[(10.39 - (0.32 * CN_i)) / 3.58]}$ $\underline{SW_i = \text{Ln}[(8.51 - (0.32 * CS_i)) / 3.58]}$ $\underline{SD_i = \text{Ln}[(5.55 - (0.32 * CS_i)) / 3.58]}$ <p><u>Where,</u></p> <p><u>NW_i is the TN target for i^{th} month calculated for the north region during the wet season</u></p> <p><u>ND_i is the TN target for i^{th} month calculated for the north region during the dry season</u></p> <p><u>SW_i is the TN target for i^{th} month calculated for the south region during the wet season</u></p> <p><u>SD_i is the TN target for i^{th} month calculated for the south region during the dry season</u></p> <p><u>CN_i is the arithmetic mean color during the i^{th} month within the north region</u></p> <p><u>CS_i is the arithmetic mean color during the i^{th} month within the south region</u></p> |
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| | <p><u>The annual TN target is calculated as the geometric mean of all monthly regional and season targets as follows:</u></p> <p><u>Nutrient and nutrient response values do not apply to tidally influenced areas that fluctuate between predominantly marine and predominantly fresh waters during typical climatic and hydrologic conditions.</u></p> | |
| (j) Clam Bay (Collier County) | <p><u>No more than 10 percent of the individual Total Phosphorus (TP) or Total Nitrogen (TN) measurements shall exceed the respective TP Upper Limit or TN Upper Limit.</u></p> | |
| | <p><u>TP Upper Limit (mg/L) = $e^{(-1.06256 - 0.0000328465 * \text{Conductivity } (\mu\text{S}))}$</u></p> | <p><u>TN Upper Limit (mg/L) = $2.3601 - 0.0000268325 * \text{Conductivity } (\mu\text{S})$</u></p> |

Subsection 62-302.532(1) and the associated table establish estuary-specific numeric interpretations of the State's existing narrative nutrient criterion for nine estuarine or coastal areas referenced by name in 62-302.532(1) (a) through (j). Eight of these nine named estuarine or coastal areas are further segmented spatially as functional entities with criteria values derived for each. Criteria for each segment of each estuary are provided for the parameters of TP, TN, and chlorophyll *a*, and, except for Tampa Bay, Sarasota Bay, and Clam Bay (which are described further below), are expressed as open-water, area-wide annual geometric (in some cases, arithmetic) mean concentrations not to be exceeded more than once in a three year period. For each segment of Tampa Bay the criteria are expressed as annual total loads (tons, aggregated from all sources) of TP and TN per million cubic meters of water delivered to the segment⁴⁴ and annual arithmetic means of chlorophyll *a* not to be exceeded more than once in a three year period. For Sarasota Bay proper, the TN criterion is stated as a formula relationship that reflects variation in color, according to season and a north/south delineation, resulting in a TN concentration value. For Clam Bay, the TN and TP criteria are defined as formulas which adjust for conductivity, to calculate limits above which no more than 10 percent of individual TP or TN concentration measurements can exceed.

As indicated in the estuary criteria table, all of the criteria (with the exception of the criteria for Clam Bay) are associated with an exceedance frequency of not more than once in a three year period. Page 25 of FDEP's Marine Overview TSD provides, "[a]n acceptable excursion frequency can be set using a 3-year period as the basis of assessment. The excursion frequency should account for inter-annual nutrient patterns and be established at a frequency that allows for effective and timely nutrient control; that is, it should account for and allow natural inter-annual variability associated with climatic cycles, and recognize that multiple high nutrient years can occur in succession. A consideration of this inter-annual correlation would suggest that the excursion frequency should allow for multiple excursions in a three-year period, such as two out of five or three out of five years. However, regulatory agencies often target

⁴⁴ The phrases "total load of that nutrient to the estuary", "annual totals for nutrients", and "tons/million cubic meters of water" within the rule text refer to a concept represented by the term, nutrient delivery ratio (NDR), as discussed in the technical support documentation for Tampa Bay. An NDR is a segment aggregate term, found by taking the total *aggregate* load of the nutrient to an estuary segment from all sources and dividing it by the total *aggregate* volume of freshwater inflow to that segment.

a more rapid assessment period to allow for the implementation of corrective action in a timely manner, making less frequent excursions more desirable for expressing the criteria (*e.g.*, only once in a 3-year period).” In further discussion on page 26 of the Marine Overview TSD, FDEP also provides, “[f]rom a management perspective, allowing less frequent excursions (*e.g.*, once in a 3-year period) would provide a more effective nutrient control strategy than waiting for a full 3 years to take corrective actions. Furthermore, not allowing for any exceedances (*i.e.*, 0 in 3 years) is not realistic, since this would not allow for the full range of natural variability and would result in an excessive number of false positive exceedances. Therefore, the Department is proposing to derive protective nutrient thresholds based on a no more than 1-in-3 year excursion frequency.” While some of the estuary system reports in the TSD include justification and recommendation of a 2-in-5 year exceedance frequency, the State's rule consistently specifies a 1-in-3 year exceedance frequency for all systems (with the exception of Clam Bay). Since a 1-in-3 year exceedance frequency allows less exceedance over a shorter interval of consideration than that of a 2-in-5, it is considered more protective and sufficiently supported by FDEP's justification of its use in other waterbodies covered by this rule. Consistent with the specific language of the Rule and further assured by language in the Implementation Document, it is the EPA's expectation that the FDEP will assess the West Coast estuaries and South Florida marine waters using the 1-in-3 year exceedance frequency.

In discussion on page 9 of FDEP's Marine Overview TSD the State quotes 62-302.530(47)(b) of its nutrient narrative to be translated by the approaches outlined in the document. The State goes on to identify "a healthy well-balanced community" as a key concept for that translation and describes how it is defined. The State says it has developed these criteria to protect healthy, well-balanced natural populations of aquatic flora and fauna from the effects of excess anthropogenic nutrient enrichment. The State defines a healthy community as one that maintains a characteristic community structure and function (specific to the resource), while allowing for modest changes in biological community structure compared with background. The State contends that a healthy, well-balanced community is therefore not restricted to one described as “pristine” or “100% natural.” The State accepts anthropogenically induced ecosystem change as acceptable as long as the following conditions are present:

- there continue to be reproducing populations of sensitive taxa,
- an overall balanced distribution of all expected major groups is maintained, and
- ecosystem functions are largely intact due to redundant system attributes (Davies and Jackson 2006).

According to page 13 of the Marine Overview TSD the State utilized four different approaches to develop criteria protective of healthy, well-balanced natural populations of aquatic flora and fauna in estuary and marine waters. Those four approaches were identified and described in this document by the State as:

- maintain healthy conditions approach
- historical conditions approach
- response-based approach using modeling or empirical evidence, and
- reference site approach

Through additional dialogue with the State, the EPA understands that these approaches, although discussed as discrete analytical methods for criteria derivation, are actually used to provide broad qualitative descriptions of the water quality characteristics found among Florida estuarine systems. Analytically, each approach mentioned above applies a similar, if not identical method to derive numeric

nutrient criteria that support the water quality characteristics noted for each system. The EPA considers all of FDEP's listed approaches to be applications of a reference condition approach, whether the reference is a current condition, an historical condition, or a desired condition. Then data representing that reference condition is subjected to distributional statistics or regression analysis to arrive at nutrient levels that will maintain that condition on average over time.

The following text describes the respective estuary-specific derivation processes for each of the nine estuary areas. In each case, estuary-specific numeric interpretations of the narrative criterion were developed for TN, TP, and chlorophyll *a* as listed in the table with components of magnitude, frequency, and duration. The criteria in the table are specifically expressed as annual geometric means (or in a few cases, annual arithmetic means) not to be exceeded more than once in a three year period.

Based upon the Rule text, the EPA would expect implementation of the criteria for all included estuarine and marine waters to involve independent evaluation of each criteria according to the process described on pages 21 and 41-42 of FDEP's Nutrient Standards Implementation Document. However, for Tampa Bay, page 41 of FDEP's Nutrient Standards Implementation Document states " For the Tampa Bay estuarine system, where nutrient standards are expressed as a delivery ratio, the Tampa Bay Estuary Program (TBEP) has agreed, pursuant to their binding Reasonable Assurance agreement, to provide the hydrologic and loading information (for both point and nonpoint sources) needed to calculate and assess annual delivery ratios on at least a five year frequency, which is consistent with DEPs watershed assessment cycle. However, TBEP has agreed to evaluate chlorophyll *a* targets on an annual basis, and will provide the Department with the needed information more frequently if chlorophyll *a* targets are exceeded for two consecutive years." While this statement describes something different than the specific language of the rule, the EPA expects that, consistent with the adopted rule language and CWA requirements, FDEP will evaluate the suite of parameters independently with a "not to be exceeded more than once every three years" frequency.

South West Coast Estuaries

Four of the nine named estuary areas are located along the west coast of Florida and are either included within the boundaries of, or immediately adjacent to three National Estuary Programs (NEP).⁴⁵ The four areas referred to by name are Clearwater Harbor/St. Joseph Sound, Tampa Bay, Sarasota Bay, and Charlotte Harbor/Estero Bay. Criteria for these estuaries were developed and proposed to FDEP by the respective NEP or county and are described in separate technical reports prepared by Janicki Environmental, Inc. on behalf of the NEP or county and submitted to the EPA by the State. These documents, "Proposed Numeric Nutrient Criteria for Clearwater Harbor and St. Joseph Sound, Sept 2011" (TSD for CH/SJS), "Proposed Numeric Nutrient Criteria for Tampa Bay, Sept 2011" (TSD for TB), "Proposed Numeric Nutrient Criteria for Boca Ciega Bay, Terra Ceia Bay, and Manatee River, Florida, Sept 2011" (TSD for BCB/TCB/MR), "Proposed Numeric Nutrient Criteria for Sarasota Bay, Sept 2011" (TSD for SB), and "Proposed Numeric Nutrient Criteria for the Charlotte Harbor National Estuary Program Estuarine System, Sept 2011" (TSD for CH/EB), include a description of approaches applied, a summary of analytical techniques used, and recommended criteria for each system. The State accepts the conclusions presented in each of these reports with some modification (in magnitude,

⁴⁵ West Coast NEPs include: Tampa Bay National Esuary Program (TBNEP), Sarasota Bay National Estuary Program (SBNEP), and Charlotte Harbor National Estuary Program (CHNEP).

frequency, and duration) to ensure nutrient levels that will be fully protective of healthy, well-balanced biological communities in these estuaries and has established the associated criteria in this rule based upon that acceptance.

The supporting documentation provided by the State to the EPA was organized geographically and is reflected in the following discussion. In a general sense, these estuaries have certain similarities, such that, the estuary specific approaches all share a common conceptual model. A condition of balanced populations of flora and fauna is presumed to be represented by healthy seagrass, i.e., seagrass which is stable or increasing in acreage over a period of record. The conceptual model is described as a pathway that relates seagrass health through a series of steps back to the input of nutrients TN and TP. The steps in the pathway consist of: (1) seagrass growth and reproduction, as controlled by (2) seagrass light requirements, which are in turn affected by (3) light attenuation in the water column, that results in part, from (4) chlorophyll *a*, and chlorophyll *a* levels are influenced by (5) TN and TP loads.

For Clearwater Harbor/St. Joseph Sound, Tampa Bay, Sarasota Bay, and Charlotte Harbor/Estero Bay, a reference period approach was used to derive management targets and thresholds, defined by a period of time when seagrass acreage was stable or increasing, which the State assumed to be indicative of designated use support. Seagrass thresholds were determined by comparing historical years of seagrass acreage (dependent on the system) to more current years of acreage, overlapping them to define segments of the systems in which seagrass could be categorized into “protection” or “restoration” management goals. The seagrass targets, with derivation varying somewhat by system, were used to inform the chlorophyll *a* thresholds. The chlorophyll *a* targets were calculated as annual means established over the reference period in each system. A combination of reference period and stressor-response analysis were used to derive TN and TP thresholds.

Because different amounts of data were available for each system, the variability in the data set was unique to each analysis. Given this information, the NEP stakeholders in each system, reflecting locally specific considerations, identified the appropriate standard deviation or standard error to apply to the criteria in order to establish the threshold values. Chlorophyll *a* and seagrass depth (light attenuation) targets, as well as TN and TP targets for each of the system segments were developed using data from the reference period described in the preceding paragraph. The standard deviations were calculated using a data set spanning a longer time period to capture long term variation in each individual system. The final proposed numeric nutrient criteria (chlorophyll *a*, TN, and TP thresholds) relied on either annual arithmetic or geometric mean nutrient concentration targets plus a specific multiple of the standard deviation (Clearwater Harbor/St. Joseph Sound, Charlotte Harbor, Sarasota Bay) or standard error for the period of record, which accounted for variation around the derived targets on a yearly basis. The addition of the standard deviation or standard error value over the period of record to arrive at a threshold was performed to account for variability, while minimizing Type I and II errors in assessment (FDEP, Marine Overview TSD, Sections 2.3-2.5). The chlorophyll *a* target concentrations were derived directly from the light attenuation targets supportive of the chosen seagrass endpoint. This distinction excludes Tampa Bay, where the Delivery Ratios apply.

(a). Clearwater Harbor/St. Joseph Sound (CHSJS) (further subdivided in the rule into sub-segments (a) 1. through (a) 3.)

For the Clearwater Harbor/St. Joseph Sound estuary area, FDEP promulgated segment specific TN, TP, and chlorophyll *a* concentration thresholds based on a reference period (2003-2009) for three segments-

St. Joseph Sound, Clearwater Harbor North, and Clearwater Harbor South. Because seagrasses are currently considered to be improving throughout the CHSJS since 1999, FDEP concluded that recent TN concentrations are sufficient to maintain designated uses in the estuary. (FDEP, TSD for CH/SJS, p. 17-19). Therefore, a reference period approach using data from 2003-2009 was used to establish management targets and thresholds for TN. FDEP utilized the TP criteria expressed as concentrations that were also presented in the TSD appendix, and considered them appropriate for promulgation in addition to TN and chlorophyll *a* criteria that were developed by the NEP.

To establish that a reference condition approach was appropriate, past and present biological and water quality data were examined. In particular, seagrass extent was evaluated using aerial photo interpretation of historical acreage and recent seagrass coverage surveys for Clearwater Harbor. Because conditions in recent years were determined to be supportive of healthy conditions and presumed to provide designated use support, a reference period from 2003-2009 was used (FDEP, TSD for CH/SJS). The NEPs used a reference period of time in which they determined seagrass was stable or increasing. The NEPs assume seagrass to be reflective of aquatic life use support and that assumption was extended to all aquatic life throughout the water body and accepted by FDEP. It should be noted that although seagrass trends were used to justify the use of a reference period approach, they were not used to establish the chlorophyll *a* targets as seen in other NEP systems. TN and chlorophyll *a* concentration targets were based on an annual geometric mean of data over the reference period, derived from water quality sampling data collected using Pinellas County's probabilistic water quality sampling design (FDEP, TSD for CH/SJS, p. 14, 18, 20). For TN and chlorophyll *a* concentration targets, data was first log transformed, and then each year was averaged. All means for each individual year during the reference period were then averaged to arrive at the geometric mean over the entire reference period. Threshold concentrations values were calculated based on a statistical analysis that showed that if concentrations in any year were not different from reference period conditions, the geometric mean value would be lower than the reference period mean plus 1.96 times the standard deviation of the annual geometric averages (FDEP, TSD for CH/SJS, p. 20).

FDEP has provided support of this rule demonstrating that the numeric nutrient criteria adopted by the State are based on a scientific rationale and will serve to protect the uses designated by the State for the estuarine and marine waters covered by this rule. FDEP concluded that this approach will provide sufficient protection of designated uses for these waters. The EPA concludes that the criteria provided at Subsection 62-302.532(1) (a). Clearwater Harbor/St. Joseph Sound and sub-segments are based on a scientific rationale and protect the uses designated by the State in this estuarine area and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(b). Tampa Bay (further subdivided in the rule into sub-segments (b) 1. through (b) 8., including Boca Ciega, Terra Ceia, and Manatee River)

For the Tampa Bay estuary area, FDEP promulgated segment-specific nutrient load thresholds calculated with the "Nitrogen Delivery Ratio" during a 1992-1994 reference period for both Tampa Bay proper and the additional sub-segments. The four main segments of Tampa Bay are Old Tampa Bay, Hillsborough Bay, Middle Tampa Bay, and Lower Tampa Bay. Criteria were also derived and proposed separately for four additional segments denoted as Manatee River, Terra Ceia, Boca Ciega north, and Boca Ciega south. All segmentation was based on a pre-existing TMDL implementation plan, informed by analysis of water quality parameters under the Tampa Bay Nitrogen Management Consortium annual review of water quality data and biannual review of bay-wide seagrass extent (FDEP, TSD for TB,

Appendix A). This same bay segmentation scheme for Tampa Bay was used for the federally approved TMDL for TN and the associated implementation plan (FDEP Q & A Document, p.9). For all segments, seagrass targets were developed using aerial photo interpretation of historical acreage and recent seagrass coverage maps. Areas supporting seagrass in the 1990s (later years) were defined as protection areas; restoration areas were those with seagrass in 1950 but not in the 1990s (found by overlaying coverage maps) (FDEP, TSD for TB, p. 9). The seagrass target for the bay was set based on 95% of the resulting seagrass acreage resulting from summing the restoration and protection areas.

Chlorophyll *a* thresholds and seagrass depth (light attenuation) targets were established using data from the reference period (1992-1994; 2003-2007 for the Manatee River) (FDEP, TSD for TB, p. 10-11; FDEP TSD for BCB/TCB/MR, p.13). The chlorophyll *a* targets were set as the lower value of either the annual average derived from empirical model predictions, or the annual average of the 1992-1994 data. Chlorophyll *a* thresholds were established as the target plus two standard errors around the mean annual chlorophyll *a* concentrations for the period of record of available data in each segment. The period of record was used to capture the greatest amount of variability. The shorter period of reference was selected because it was representative of when seagrass was stable or increasing in acreage, which the State assumes to be indicative of designated use support.

For the four main segments, 1992-1994 annual average TN loads were initially established using a reference period approach, and the concurrent observations of TN load levels and seagrass levels determined to be acceptable by the consensus TMDL process (FDEP TSD for TB, p. 11; FDEP TSD for BCB/TCB/MR, p. 14).

Through years of data collection and analysis, TBNEP concluded residence time of water has a significant effect on water quality. As residence time shortens when freshwater inputs are greater, loadings move through the system more quickly and thus biological processes have less time to convert nutrients into chlorophyll *a*. Therefore, both TN levels and hydraulic loading should be accounted for when establishing criteria in all Tampa Bay segments (FDEP TSD for BCB/TCB/MR, p.16-17; FDEP TSD for TB, p.1316 and Appendix C). A Nitrogen Delivery Ratio, defined as the amount of TN delivered, in tons, per million cubic meters of freshwater delivered, was used to calculate load thresholds for each segment, measured as the mass (load) of TN delivered to that segment from all sources per volume of water, based on 1992-1994 reference conditions. The Delivery Ratio is a weighted average based on seven main identified sources of wet and dry loads to Tampa Bay, and is not directly comparable to concentration criteria values. TN criteria for the Tampa Bay group of estuaries are expressed as segment-specific Nitrogen Delivery Ratios that were observed during the 1992-1994 reference period. TP criteria are also expressed as segment specific Phosphorus Delivery Ratios that were developed by the NEP in addition to TN and chlorophyll *a* criteria.

An assessment process for Tampa Bay, described in the TSD and confirmed on page 42 of the Implementation Document, allows for annual comparison to the chlorophyll *a* threshold, and if this threshold is exceeded more than two consecutive years, then the Nitrogen Delivery Ratio will be assessed during that period for the given segment.

FDEP has provided support of this rule demonstrating that the numeric nutrient criteria adopted by the State are based on a scientific rationale and will serve to protect the uses designated by the State for the estuarine and marine waters covered by this rule. The FDEP has relied upon the previously established and successful ongoing restoration efforts in these waters. These efforts have resulted in collective

reduction of nutrients to the overall system and associated water quality improvements as indicated by progress on seagrass recovery goals. FDEP concluded that this approach will provide sufficient protection of designated uses for these waters. The EPA concludes that the criteria provided at Subsection 62-302.532(1) (b). Tampa Bay and sub-segments are based on a scientific rationale and are protective of the uses designated by the State in this estuarine area, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(c). Sarasota Bay (further subdivided in the rule into sub-segments (c) 1. through (c) 5.)⁴⁶

For the Sarasota Bay estuary area, FDEP promulgated segment-specific TN, TP, and chlorophyll *a* concentrations (expressed as mean annual TN, TP, and chlorophyll *a* concentrations). Using data from within the 1998-2008 time period, a combination of reference condition and stressor-response analyses was used to derive TN, TP, and chlorophyll *a* criteria. (FDEP TSD for SB)

Seagrass targets were developed using aerial photo interpretation of historical acreage and recent seagrass coverage maps. Areas supporting seagrass in recent coverage years were defined as "protection areas," while "restoration" areas were identified as those areas having historical seagrass coverage, but lacking coverage in recent maps (found by overlaying coverage maps). The seagrass targets were established as the greater of either the historic or recent (2004-2006) seagrass coverage in each segment, excluding Little Sarasota Bay (FDEP TSD for SB).

The chlorophyll *a* criteria were established as the target (mean concentration from 2001-2005) plus one standard deviation of the mean annual chlorophyll *a* concentrations for the entire period of record, which varied in each segment. Similarly, the TP criteria were established based on calculating the sum of the annual mean of the reference period (2001-2005) and mean annual standard deviation in each segment for the segment-specific period of record (FDEP TSD for SB).⁴⁷ The shorter period of reference was selected because it was representative of when seagrass was stable or increasing in acreage, which the State assumes to be indicative of designated use support.

A regression approach was used to derive TN criteria for all segments in Sarasota Bay except Palma Sola where a reference period approach was applied. (FDEP TSD for SB). Data within the 1998-2009

⁴⁶ The named estuary area, Sarasota Bay, includes Sarasota Bay as a subsegment and four other subsegments. Furthermore, the Sarasota Bay subsegment includes two further segmented geographic regions, the North and South regions. This geographic distinction only applies in the case of the TN criteria. The Sarasota Bay subsegment at (c)2. of the table, references (i) of the table, which further delineates the North and South regions of Sarasota Bay proper. Within (i), the TN criteria are provided as a formula.

⁴⁷ From "Proposed NNC for Tampa Bay," p. 10-11; "Proposed NNC for Sarasota Bay," p. 9-10; "Proposed NNC for Charlotte Harbor," p. 8-9; Specific chlorophyll *a* targets were determined as the average annual levels during the reference period for the estuary developed from empirical model predictions, or the 1992-1994 average annual levels, whichever was lower. Chlorophyll *a* targets were then adjusted upward to allow for some degree of interannual variation that was not expected to cause significant reductions in seagrass, and that level was identified as the chlorophyll *a* threshold. Similarly, TN and TP thresholds for Charlotte Harbor were established by adding some degree of interannual variation to the target value. The actual amount of adjustment varied estuary by estuary, as some fraction or multiple of the associated standard deviation or standard error for the period of record for each estuary. A basis for the difference in practice may be attributable to varying confidence in the quantity or quality of the available data.

time period were used in the regression analyses. A standard deviation of the annual means for the segment-specific period of record was applied. (FDEP TSD for SB) For the Sarasota Bay subsegment (c)2., TN criteria are provided as a formula further down the table at (i) to be used to determine annual geometric means calculated from monthly arithmetic mean color for each North and South region with consideration of wet versus dry seasonality. Through years of data collection and analysis, local experts have noted a unique response to tannins during wet and dry seasons in Sarasota Bay proper that does not appear in other segments of the estuary system. Local experts attribute this phenomenon to additional leaf litter from mangroves and other vegetation found in higher quantities in this segment of the estuary. For more details see the FDEP TSD for SB.

FDEP has provided support of this rule demonstrating that the numeric nutrient criteria adopted by the State are based on a scientific rationale and will serve to protect the uses designated by the State for the estuarine and marine waters covered by this rule. The FDEP has relied upon the previously established and successful ongoing restoration efforts in these waters. These efforts have resulted in collective reduction of nutrients to the overall system and associated water quality improvements as indicated by progress on seagrass recovery goals. FDEP concluded that this approach will provide sufficient protection of designated uses for these waters. EPA concludes that the criteria provided at Subsection 62-302.532(1) (c). Sarasota Bay and sub-segments, as well as Subsection 62-302.532(1) (i) are based on a scientific rationale and are protective of uses designated by the State in this estuarine area, and , therefore, are consistent with the CWA, 40 CFR Part 131, and EPA's 304(a) guidance on nutrient criteria.

(d). Charlotte Harbor/Estero Bay (further subdivided in the rule into sub-segments (d)1. through (d)9.)⁴⁸

For the Charlotte Harbor estuary area, FDEP promulgated segment-specific mean annual TN, TP, and chlorophyll *a* criteria, using a reference period approach (2003-2007) with data collected during a period of time when seagrass acreage was stable or increasing, which the State assumes to be indicative of designated use support. Under this approach, a segment classified as a seagrass "protection" segment received a TN concentration criterion calculated by summing the annual mean from the reference period (2003-2007) and one standard deviation (for the period of record). However, if a segment was classified as a seagrass "restoration" segment the TN concentration criterion was calculated by summing the annual mean from the reference period (2003-2007) and one-half standard deviation (for the period of record) (FDEP TSD for CH/EB, p. 9). The addition of the standard deviation value over the period of record to arrive at a threshold was performed to account for variability, while minimizing Type I and II errors in assessment (FDEP TSD for CH/EB, p. 50).

To determine segmentation, water quality data was normalized and used to examine the heterogeneity in water quality among segments within the study area. Four segmentation schemes were compared using Principal Components Analysis and Spearman's rank for color, salinity, TP, TN, chlorophyll *a*, dissolved oxygen, total organic carbon, total suspended solids, and turbidity (Janicki Environmental, Inc., July 2009, p. 15). All segments proposed were based on Coastal Charlotte Harbor Monitoring Network,

⁴⁸ The criteria contained in the table located at 62-302.532(1)(d) do not specifically address the Tidal Caloosahatchee River or the Tidal Peace River. The Tidal Caloosahatchee River is included in the list of TMDLs under review by EPA and the Tidal Peace River which may be addressed site specifically as Hierarchy 1 interpretation at a future date.

except for Pine Island Sound, Estero Bay, and Lemon Bay which were ultimately divided, for a total of 9 segments.

Seagrass targets were developed using aerial photo interpretation of historical acreage and recent seagrass coverage maps. This information was used to identify both "protection" (areas supporting seagrass in 1990) and "restoration" (those with seagrass in 1950 but not in 1990) areas in the harbor ("Water Quality Target Refinement Project, Seagrass Target Development Interim Report 2, 2009, p.8, 26). The CHNEP seagrass target for each segment was determined to be the greater of either the adjusted baseline acreage or the mean of all recent seagrass surveys (FDEP TSD for CH/EB). Chlorophyll a thresholds and seagrass depth (light attenuation) targets were also established using data from the reference period (2003-2007). The annual arithmetic mean TN/TP concentration of the monthly mean values were calculated for each year from 2003-2007 and the average of these annual means was designated as the TN and TP concentration targets for this segment (FDEP TSD for CH/EB, p. 50). The segment-specific annual mean TN and TP criteria were then calculated by summing the annual average during the reference period (2003-2007) and the associated standard deviation value for the period of record according to the segments classification

FDEP has provided support of this rule demonstrating that the numeric nutrient criteria adopted by the State are based on a scientific rationale and will serve to protect the uses designated by the State for the estuarine and marine waters covered by this rule. The FDEP has relied upon the previously established and successful ongoing restoration efforts in these waters. These efforts have resulted in collective reduction of nutrients to the overall system and associated water quality improvements as indicated by progress on seagrass recovery goals. FDEP concluded that this approach will provide sufficient protection of designated uses for these waters. The EPA concludes that the criteria provided at Subsection 62-302.532(1) (d). Charlotte Harbor/Estero Bay and sub-segments are based on a scientific rationale and are protective of the uses designated by the State for this estuarine area, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

Additional South Florida Marine Systems

The State developed criteria for the marine waters of southernmost Florida by grouping those waters geographically into four large south Florida systems identified as the Tidal Cocohatchee River/Ten Thousand Islands, Florida Bay, the Florida Keys, and Biscayne Bay. FDEP developed criteria for these waters using the "Maintain Healthy Conditions Approach" that is described in Section 2 of the Marine Waters Overview with further specific supporting documentation provided in separate reports for each of the four systems. The EPA's analysis of that material is reflected in the following discussion.

Based upon data, information, and analyses obtained from local experts (e.g., FIU scientists, the National Park Service, etc.) in a series of workshops convened by the State, criteria were developed for the estuarine and coastal marine waters of south Florida. FDEP established a regionalization scheme based on the unique water quality and geologic characteristics of each system. Important biological communities, water quality conditions, and nutrient sources were evaluated in each system to establish the status of the system and conclude a condition of designated use support. The existence in certain instances of §303(d) listings for nutrient impairment for some of the waters, or some periods of time in these waters, or for some contributing tributaries to these waters was not considered by the State to be a significant issue to the overall assumption of use support. EPA concluded that the inclusion of data for the §303(d) listed waters did not significantly affect the data distribution for the south Florida marine

waters. After summarizing the health of the system FDEP segmented each system based on a principal components analysis and hierarchical cluster analysis. Criteria for each system were then calculated using the upper 80 percent prediction limit of the spatially averaged annual geometric means, with a frequency and duration of no more than 1 annual geometric mean exceeding the limit in a 3-year period.

FDEP has provided information on the declining levels of nutrients and chlorophyll *a*, as well as the excellent transparency, in the Florida and Biscayne Bays. [Madden, T. 1231] FDEP also determined that the weight of the evidence demonstrates that the Florida Keys had a healthy, well-balanced population of flora and fauna during the baseline period described below. FDEP found the Keys exhibited low nutrient levels, very low chlorophyll *a* concentrations, and seagrass beds that are among the most extensive in the world. [Ex. 424, p. 13, 29 and 37] For the Southwest estuaries, FDEP determined that the weight of the evidence demonstrates that these estuaries had a healthy, well-balanced population of flora and fauna during the baseline period described below. This finding is supported by very low nutrient levels, very low chlorophyll *a* concentrations, no increasing trends in nutrients or chlorophyll *a* and a large percentage (>80 %) of conservation land in the basin, including the largest undisturbed mangrove forests in the state. [Joyner, T. 1057, 1058, 1069; Ex 404A, pp. 10-17]

(e). Tidal Cocohatchee River/Ten Thousand Islands (further subdivided in the rule into sub-segments (e) 1. through (e) 15.)

These Southwest Coastal Estuaries are geographically located between Naples Bay and Whitewater Bay, but also include the Cocohatchee River.⁴⁹ Criteria for the Tidal Cocohatchee River/Ten Thousand Islands are presented in the table in subsection 62-302.532 (1)(e). The general “Maintain Healthy Conditions Approach” as referenced above for south Florida systems was used to develop criteria in the Southwest Coastal Estuaries. In south Florida marine waters, an approach based on literature and input from local experts using least-disturbed reference conditions is reasonable to determine TN, TP, and chlorophyll *a* concentrations when these waters were supporting designated uses. Therefore, relying upon the reference condition approach to identify numeric nutrient criteria concentrations that protect the designated uses, and avoid any adverse change in natural populations of aquatic flora or fauna is an acceptable approach. Based on a segmentation approach developed by local experts from Florida International University (FIU) and National Park Service (NPS), FDEP proposed 15 segments for criteria derivation. The data period used for segmentation and criteria development ranged from September 1992-September 2009 for Whitewater Bay and Ten Thousand Islands, from January 1999-September 2009 for Pine Island to Rookery Bay, and from May 1995-September 2007 for the Shelf (FDEP, Site-Specific Information in Support of Establishing Numeric Nutrient Criteria for the Southwest Coastal Estuaries, Including Naples Bay, Rookery Bay, and the Ten Thousand Islands, Oct. 2011). Criteria for each system were then calculated using the long-term dataset for each waterbody using the approach described above for South Florida marine systems.

FDEP has provided information on the declining levels of nutrients and chlorophyll *a*, as well as the excellent transparency, in the Florida and Biscayne Bays. [Madden, T. 1231] FDEP also determined that the weight of the evidence demonstrates that the Florida Keys had a healthy, well-balanced population of flora and fauna during the baseline period described below. FDEP found the Keys exhibited low

⁴⁹ These estuaries are shown in the maps labeled "Marine Nutrient Regions - October 19, 2011 - Southwest Florida/10,000 Islands" (files: nnc_10000islands_1_estuarymap_ltr.pdf and nnc_10000islands_2_estuarymap_ltr.pdf).

nutrient levels, very low chlorophyll *a* concentrations, and seagrass beds that are among the most extensive in the world. [Ex. 424, p. 13, 29 and 37] For the Southwest estuaries, FDEP determined that the weight of the evidence demonstrates that these estuaries had a healthy, well-balanced population of flora and fauna during the baseline period described below. This finding is supported by very low nutrient levels, very low chlorophyll *a* concentrations, no increasing trends in nutrients or chlorophyll *a* and a large percentage (>80 %) of conservation land in the basin, including the largest undisturbed mangrove forests in the state. [Joyner, T. 1057, 1058, 1069; Ex 404A, pp. 10-17]

As discussed in the streams section of the document, above, the reference condition approach, a long-standing peer-reviewed methodology published by EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined. The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts, is used to derive numeric nutrient criteria that are protective of applicable designated uses by identifying numeric nutrient criteria concentrations occurring in least-disturbed, healthy coastal and south Florida marine waters that are supporting designated uses.

The EPA concludes that the criteria provided at Subsection 62-302.532(1) (e). Tidal Cocohatchee River/Ten Thousand Islands and sub-segments are based on scientific rationale and are protective of the uses designated by the State in these marine waters, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(f). Florida Bay (further subdivided in the rule into sub-segments (f) 1. through (f) 6.)

Criteria for Florida Bay are presented in the table in subsection 62-302.532 (1)(f). The general "Maintain Healthy Conditions Approach" as referenced above for south Florida systems was used to develop criteria in Florida Bay. In south Florida marine waters, an approach based on literature and input from local experts using least-disturbed reference conditions is reasonable to determine TN, TP, and chlorophyll *a* concentrations when these waters were supporting designated uses. Therefore, relying upon the reference condition approach to identify numeric nutrient criteria concentrations that protect the designated uses, and avoid any adverse change in natural populations of aquatic flora or fauna is an acceptable approach. Based on a segmentation approach developed by local experts from Florida International University (FIU) and National Park Service (NPS), FDEP proposed six segments for criteria derivation. Segmentation of Florida Bay was performed using data collected as part of FIU's Coastal Water Quality Monitoring Network from March 1991-December 2007. Criteria were calculated using "water quality monitoring data collected from 1995 to 2009 by Florida International University's (FIU) Southeast Environmental Research Center (SERC)." (FDEP, Site-Specific Information in Support of Establishing Numeric Nutrient Criteria for Florida Bay, Oct. 2011).

FDEP has provided information on the declining levels of nutrients and chlorophyll *a*, as well as the excellent transparency, in the Florida and Biscayne Bays. [Madden, T. 1231] FDEP also determined that the weight of the evidence demonstrates that the Florida Keys had a healthy, well-balanced population of flora and fauna during the baseline period described below. FDEP found the Keys exhibited low nutrient levels, very low chlorophyll *a* concentrations, and seagrass beds that are among the most extensive in the world. [Ex. 424, p. 13, 29 and 37] For the Southwest estuaries, FDEP determined that the weight of the evidence demonstrates that these estuaries had a healthy, well-balanced population of flora and fauna during the baseline period described below. This finding is supported by very low nutrient levels, very low chlorophyll *a* concentrations, no increasing trends in nutrients or chlorophyll *a* and a

large percentage (>80 %) of conservation land in the basin, including the largest undisturbed mangrove forests in the state. [Joyner, T. 1057, 1058, 1069; Ex 404A, pp. 10-17]

As discussed in the streams section of the document, above, the reference condition approach, a long-standing peer-reviewed methodology published by EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined. The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts, is used to derive numeric nutrient criteria that are protective of applicable designated uses by identifying numeric nutrient criteria concentrations occurring in least-disturbed, healthy coastal and south Florida marine waters that are supporting designated uses.

The EPA concludes that the criteria provided at Subsection 62-302.532(1) (f). Florida Bay and sub-segments are based on scientific rationale and are protective of the uses designated by the State in these marine waters, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(g) The Florida Keys (further subdivided in the rule into sub-segments (g) 1. through (g) 7.)

Criteria for the Florida Keys are presented in the table in subsection 62-302.532 (1)(g). The general "Maintain Healthy Conditions Approach" as referenced above for south Florida systems was used to develop criteria in the Florida Keys. In south Florida marine waters, an approach based on literature and input from local experts using least-disturbed reference conditions is reasonable to determine TN, TP, and chlorophyll *a* concentrations when these waters were supporting designated uses. Therefore, relying upon the reference condition approach to identify numeric nutrient criteria concentrations that protect the designated uses, and avoid any adverse change in natural populations of aquatic flora or fauna is an acceptable approach. Based on a segmentation approach developed by local experts from Florida International University (FIU) and National Park Service (NPS), FDEP proposed seven segments for criteria derivation. Segmentation of Florida Bay was performed using data collected as part of FIU's Coastal Water Quality Monitoring Network from March 1995-October 2009. Criteria for each system was then calculated using the long-term dataset for each waterbody.

The TSD for the Florida Keys, entitled "Site-Specific Information in Support of Establishing Numeric Nutrient Criteria for the Florida Keys," (October 2011) defines a halo zone around the land masses of the Florida Keys which extends from the shoreline to 500 meters offshore. In the TSD, FDEP indicates an intention to establish criteria for waters within the halo zone using concentrations developed in the *Florida Keys Reasonable Assurance Document* (FKRAD) (FDEP 2008). The process for development of criteria described in the TSD is focused on the open waters between the seaward edge of the halo zone and the outer boundary of the state jurisdictional limits and was developed using the "Maintain Healthy Conditions Approach" described above for all south Florida systems. The EPA's review of the submitted information, in the TSD, leads the EPA to conclude that as stated, the criteria in subsection 62-subsection 302.532(1)(g) apply from the shoreline to the state jurisdictional limit. Verbal discussions with FDEP and statements on page 25 of their Question and Answer document have confirmed that they intend to submit the FKRAD as a Hierarchy 1 Site Specific Alternative Criteria at a later date for review as a Hierarchy 1 SSAC. Until such action is approved by the EPA, criteria for the segments in the table at subsection 62-302.532(1)(g), apply to all the applicable waters surrounding the Florida Keys, as shown in maps referenced at subsection 62-302.532(2).

FDEP has provided information on the declining levels of nutrients and chlorophyll *a*, as well as the excellent transparency, in the Florida and Biscayne Bays. [Madden, T. 1231] FDEP also determined that the weight of the evidence demonstrates that the Florida Keys had a healthy, well-balanced population of flora and fauna during the baseline period described below. FDEP found the Keys exhibited low nutrient levels, very low chlorophyll *a* concentrations, and seagrass beds that are among the most extensive in the world. [Ex. 424, p. 13, 29 and 37] For the Southwest estuaries, FDEP determined that the weight of the evidence demonstrates that these estuaries had a healthy, well-balanced population of flora and fauna during the baseline period described below. This finding is supported by very low nutrient levels, very low chlorophyll *a* concentrations, no increasing trends in nutrients or chlorophyll *a* and a large percentage (>80 %) of conservation land in the basin, including the largest undisturbed mangrove forests in the state. [Joyner, T. 1057, 1058, 1069; Ex 404A, pp. 10-17]

As discussed in the streams section of the document, above, the reference condition approach, a long-standing peer-reviewed methodology published by EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined. The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts, is used to derive numeric nutrient criteria that are protective of applicable designated uses by identifying numeric nutrient criteria concentrations occurring in least-disturbed, healthy coastal and south Florida marine waters that are supporting designated uses.

The EPA concludes that the criteria provided at Subsection 62-302.532(1) (g). Florida Keys and sub-segments are based on scientific rationale and are protective of the uses designated by the State in these marine waters, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(h). Biscayne Bay (further divided in the rule into sub-segments 1 through 9)

Criteria for the Biscayne Bay are presented in the table in subsection 62-302.532 (1)(h). The general "Maintain Healthy Conditions Approach" as referenced above for south Florida systems was used to develop criteria in the Biscayne Bay. In south Florida marine waters, an approach based on literature and input from local experts using least-disturbed reference conditions is reasonable to determine TN, TP, and chlorophyll *a* concentrations when these waters were supporting designated uses. Therefore, relying upon the reference condition approach to identify numeric nutrient criteria concentrations that protect the designated uses, and avoid any adverse change in natural populations of aquatic flora or fauna is an acceptable approach. Based on a segmentation approach developed by local experts from Florida International University (FIU) and National Park Service (NPS), FDEP proposed nine segments for criteria derivation. Segmentation of Biscayne Bay was performed using data collected as part of FIU's Coastal Water Quality Monitoring Network for Central-South Biscayne Bay using data from September 1993 - September 2008 and for North-Central-South Biscayne Bay using data from June 1996 - September 2009. Criteria were "calculated using long-term water quality data collected from 1995 to 2009 by FIU, with the exception of Manatee Bay-Barnes Sound where only data collected prior to 2006 were used to calculate criteria." (FDEP, Site-Specific Information in Support of Establishing Numeric Nutrient Criteria in Biscayne Bay, Oct. 2011).

FDEP has provided information on the declining levels of nutrients and chlorophyll *a*, as well as the excellent transparency, in the Florida and Biscayne Bays. [Madden, T. 1231] FDEP also determined that the weight of the evidence demonstrates that the Florida Keys had a healthy, well-balanced population

of flora and fauna during the baseline period described below. FDEP found the Keys exhibited low nutrient levels, very low chlorophyll *a* concentrations, and seagrass beds that are among the most extensive in the world. [Ex. 424, p. 13, 29 and 37] For the Southwest estuaries, FDEP determined that the weight of the evidence demonstrates that these estuaries had a healthy, well-balanced population of flora and fauna during the baseline period described below. This finding is supported by very low nutrient levels, very low chlorophyll *a* concentrations, no increasing trends in nutrients or chlorophyll *a* and a large percentage (>80 %) of conservation land in the basin, including the largest undisturbed mangrove forests in the state. [Joyner, T. 1057, 1058, 1069; Ex 404A, pp. 10-17]

As discussed in the streams section of the document, above, the reference condition approach, a long-standing peer-reviewed methodology published by EPA, was designed to develop protective numeric nutrient criteria where reference conditions can be confidently defined. The reference condition approach, which has been well documented, peer reviewed, and developed in a number of different contexts, is used to derive numeric nutrient criteria that are protective of applicable designated uses by identifying numeric nutrient criteria concentrations occurring in least-disturbed, healthy coastal and south Florida marine waters that are supporting designated uses.

The EPA concludes that the criteria provided at Subsection 62-302.532(1) (h). Biscayne Bay and sub-segments are based on scientific rationale and are protective of the uses designated by the State in these marine waters, and therefore, are consistent with the CWA, 40 CFR Part 131, and the EPA's 304(a) guidance on nutrient criteria.

(j). Clam Bay (Collier County)

Criteria for Clam Bay (Collier County) were presented above in the form of an equation to calculate the applicable criteria. Clam Bay is included in the overall mapped area labeled Southwest Florida/Ten Thousand Islands, and is distinguished from the larger area and more specifically delineated in supporting documentation⁵⁰. The supporting documentation, "Clam Bay NNC Report, 2012" and "NNC Technical Note on Clam Bay, 2012," indicates the available reference sites from the larger area had "very different salinity and freshwater conditions than the much smaller coastal barrier creek and lagoon system of Clam Bay..." and describes "confounding biological variables that exist in Clam Bay." Clam Bay was originally included in the WBID 3278Q, but was separated from Moorings Bay after a Mann-Whitney comparison of medians test indicated statistically significant differences in water quality. Data were provided directly from the Collier County Coastal Zone Management Program that collects monthly ambient water quality samples from nine stations located in Clam Bay or queried from IWR Run 42 data (supplied by FDEP). To characterize current conditions of Clam Bay, an assessment was done to determine if Clam Bay water quality fell above or below "impairment" for DO or chlorophyll *a* by comparing data against State standards at F.A.C. 62-303.470 and 62-303.353. For DO the data were compared the standard to be measured as an instantaneous concentration of 4.0 mg/L and for chlorophyll *a* the data were compared to 11 µg/L. If data indicated impairment they were also compared to the existing threshold concentrations established by FDEP (2010) and EPA (2007).⁵¹ (CB Report). It was

⁵⁰ See file: nnc_10000islands_1_estuarymap_ltr.pdf

⁵¹ Threshold values were TN=1.0 mg/L and TP=0.19 mg/L from the following sources:

FDEP. 2010. *TMDL Report: Dissolved Oxygen TMDLs for Brushy Creek (WBID 1498) and Sweetwater Creek (WBID 1516), and for DO and Nutrients in Lower Rocky Creek (WBID 1563)*. FDEP Southwest District.

noted that while Clam Bay was impaired for fecal coliform bacteria and DO, it was not impaired for chlorophyll *a* or nutrients based on the screening values of fn 51 or the “impairment threshold” chlorophyll *a* of 11 µg/L.

Based on the conclusions regarding the current conditions, FDEP developed and proposed salinity-normalized numeric criteria targets, for both TN and TP in Clam Bay. FDEP derived salinity-based criteria due to natural temporal variability observed in the TN and TP data, in addition to historically observed differences in nutrients that were related to salinity in other nearby estuaries (Estero Creek wetlands). Because DEP determined that the existing conditions in Clam Bay (data from 2006, 2009, 2010, and 2011) were supportive of the designated uses, a healthy existing conditions approach was used (Pers-comm., Daryll Joyner, FDEP, 2012). FDEP also used water quality data, pollutant loading model development, benthic invertebrate evaluation, toxin quantification, and sediment accumulation rate assessments to determine whether Clam Bay reflected a “healthy” system under this approach.

The numeric nutrient criteria for Clam Bay were derived based on the salinity normalized nutrient criteria approach previously applied in the Hendry Creek TMDL for the Estero Bay wetlands, a system in close proximity to Clam Bay.⁵² (CB Report). The conductivity (a proxy for salinity) values for each waterbody from the Hendry Creek TMDL were first compared to evaluate the hydrologic similarities between water bodies. Prediction limits at 95% were used to calculate TN concentrations for Estero Bay Wetlands and Hendry Creek based on average conductivity. Regressions were run to determine the line of best fit to calculate nutrient targets based on conductivity in the Estero Bay wetlands. Only data collected from within Clam Bay during healthy conditions (2006, 2009, 2010, and 2011) and adjusted for salinity were used. FDEP then developed Clam Bay TN and TP concentration targets (mg/L) based on the exponential relationship found between TP and conductivity in the Estero Bay Wetlands regression and Clam Bay salinity with 90 percent prediction limits, (CB Tech Note). Using the average conductivity value 42,453 µS (25.4 ppt) for Clam Bay, the corresponding TN value is 0.60 mg/L and TP value is 0.057 mg/L. To maintain consistency with the existing calculation of the 10th percentile of DO values from reference waterbodies used by FDEP, the upper 10th prediction limit for the regression between TN or TP and conductivity (from Clam Bay) was used to establish the final numeric criteria. The upper 10th percentile prediction limit was selected to identify the number of TN and TP values at the corresponding conductivity that exceed the upper boundaries of the relationship. Within a calendar year, each individual TN and TP value collected within the waterbody would be compared to the 90th percent prediction limit of the regression relationship between nutrients and conductivity, with a 10 percent exceedance frequency, (CB Tech Note).

The EPA concludes that the criteria provided at Subsection 62-302.532(1) (j). Clam Bay are based on a scientific rationale and are protective of the uses designated by the State in these marine waters and therefore are consistent with the CWA, 40 CFR Part 131, and the EPA’s 304(a) guidance on nutrient criteria. Therefore, this provision is approved by the EPA pursuant to CWA section 303(c).

EPA. 2007. *Total Maximum Daily Loads for the Northern and Central Indian River Lagoon and Banana River Lagoon, Florida: Nutrients and Dissolved Oxygen*. USEPA Region 4.

⁵² A state established and EPA approved TMDL available at the following link:

http://ofmpub.epa.gov/tmdl/attains_impaired_waters.tmdl_report?p_tmdl_id=35222

Subsection 62-302.532(2)

Estuarine and marine areas are delineated in the eight maps of the Florida Marine Nutrient Regions, all dated October 19, 2011, which are incorporated by reference. Copies of these maps may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

This section defines the geospatial extent of the estuary areas identified by name in the previous subsection. The rule incorporates by reference maps of each of the named estuary areas covered by the above section with specific spatial delineation of the included subsegments corresponding to entries in the criteria table. Direction to a website link and a contact mailing address are provided. The URL address provided by the State in the rule links to a page on the State's website with a heading "Florida Marine Nutrient Regions Maps" with separate individual links as follows:

- Tampa Bay/Clearwater Harbor/St. Joseph Sound
- Sarasota Bay
- Charlotte Harbor⁵³
- Southwest Florida/Ten Thousand Islands (including Clam Bay)
- Florida Bay
- Florida Keys⁵⁴
- Biscayne Bay

This provision identifies the specific spatial coverage where the criteria listed in the previous section are to be applicable in order to provide protection for the subject estuarine waters. EPA concludes that this provision in conjunction with the criteria values in the previous section provides protection of healthy, well-balanced biological communities in the subject estuaries and consistent with the CWA, 40 CFR Part 131, and EPA's 304(a) guidance on nutrient criteria. Therefore, this provision is approved by EPA pursuant to CWA section 303(c).

Subsection 62-302.532(3)

The Department shall establish by rule or final order estuary specific numeric interpretations of the narrative nutrient criteria for TN and TP for Perdido Bay, Pensacola Bay (including Escambia Bay), St. Andrews Bay, Choctawhatchee Bay, and Apalachicola Bay by June 30, 2013, subject to the provisions of Chapter 120, F.S. The Department shall establish by rule or final order the estuary

⁵³ The Charlotte Harbor estuary area map identifies the 9 subsegments included in the table at 62-302.532(1)d., but also identifies the Tidal Caloosahatchee River and the Tidal Peace River, which were not reviewed as part of the estuarine criteria adopted by FDEP. However, the Tidal Caloosahatchee River was included in the list of TMDLs under review by EPA, and will be addressed as part of that review, and since at this time, the Tidal Peace River has not been submitted to EPA, it is expected that it may be addressed site specifically as Hierarchy 1 interpretation at a future date.

⁵⁴ The delineated map of the Florida Keys does not distinguish the "halo zones" around the islands referenced in the Florida Keys TSD as separate from waters extending out from the islands to the seaward extent of the criteria application. As discussed in the text of the Florida Keys subsection above, EPA assumes the criteria for the Florida Keys applies to the entire area identified in this map.

specific numeric interpretation of the narrative nutrient criteria for TN and TP for the remaining estuaries by June 30, 2015, subject to the provisions of Chapter 120, F.S.

This provision establishes a future commitment by the State to develop protective numeric nutrient criteria for TN and TP applicable to additional estuary waters by specified dates. The State has clarified in communication with the EPA that criteria for chlorophyll a will also be developed at that time. This future action would serve to extend the application of numeric nutrient criteria to estuaries beyond those covered by the current rule to much, if not all, of the State's recognized estuarine and coastal waters (as defined by the State and further described above in the EPA's introductory analysis of Section 62-302.532).

Since this provision serves only to schedule actions to be taken by the State in the future, it does not by itself at this time constitute a change to the current water quality standards, and therefore the EPA takes no action on this provision at this time.

Rule 62-302.800

Site Specific Alternative Criteria

Florida WQS allow for the adoption of Site Specific Alternative Criteria (SSAC) in 62-302.800. Before the revisions in FDEP's recent rulemaking, Florida WQS authorized two categories of SSAC. Type I SSAC are allowed when a criterion cannot be met due to natural background conditions or due to man-induced conditions which cannot be controlled or abated. Type II SSAC are allowed, based on site-specific reasons other those supporting a Type I SSAC, where it can be demonstrated that the proposed criterion would fully maintain and protect human health, existing uses, and designated uses. Florida's nutrient rule includes a new provision authorizing the adoption of Type III SSAC for nutrients. Also, while nutrients had previously been included on a list of pollutants ineligible for Type II SSAC; FDEP has revised its WQS to allow Type II SSAC for nutrients.

Subsection 62-302.800(2)

Type II Site Specific Alternative Criteria: In accordance with the procedures set forth below, affected persons may petition the Department, or the Department may initiate rulemaking, to adopt an alternative water quality criterion for a specific ~~waterbody~~ water body, or portion thereof, on the basis of site-specific reasons other than those set forth above in subsection 62-302.800(1), F.A.C. The Department shall process any such petition as follows: ...

The EPA is taking no action on the addition of the phrase "or the Department may initiate rulemaking" to the first sentence of this provision. Although the first sentence was arguably covered by, but not specifically mentioned in, the EPA's previous approval actions, the EPA does not consider it to be a WQS that is subject to the EPA's CWA section 303(c) authorities because it is not a legally binding norm that describes the desired or expected ambient condition of the water body, specifies the designated use, or establishes antidegradation requirements. Under CWA section 303(c), EPA only has authority to approve or disapprove new or revised WQS. Because this sentence is not a WQS, the EPA could have not previously approved this provision. Thus the EPA hereby clarifies that the Agency did not take CWA section 303(c) action on the first sentence of this provision in its previous approval actions.

Paragraph 62-302.800(2)(d)

The provisions of this subsection do not apply to criteria contained in Rule 62-302.500, F.A.C., or criteria that apply to:

1. Biological Integrity (subsection 62-302.530(10), F.A.C.).
2. B.O.D. (subsection 62-302.530(11), F.A.C.).
- ~~3. Nutrients.~~
- ~~3.~~ 4. Odor (subsections 62-302.500(1), 62-302.530(21), 62-302.530(48), and paragraphs 62-302.530 (49)(b) and 62-302.530(52)(a), F.A.C.).
- ~~4.~~ 5. Oils and Greases (subsection 62-302.530(49), F.A.C.).
- ~~5.~~ 6. Radioactive Substances (subsection 62-302.530(57), F.A.C.).
- ~~6.~~ 7. Substances in concentrations that injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, animals, or plants (subsection 62-302.530(61), F.A.C.).
- ~~7.~~ 8. Substances, other than nutrients, in concentrations that result in the dominance of nuisance species (subsection 62-302.200(20), F.A.C.).
- ~~8.~~ 9. Total Dissolved Gases (subsection 62-302.530(66), F.A.C.).
- ~~9.~~ 10 No change.

The revisions to 62-302.800(2)(d) add citations from 62-302.530, *Table: Surface Water Quality Criteria*, and for the definition of “nuisance species,” for the parameters which are not candidates for Site-Specific Alternative Criteria (SSAC) under the provisions of Rule 62-302.800. These citations were included to lower the degree of inherent complexity of the regulation and to facilitate a better understanding of the provisions referenced in this paragraph. However, these provisions were considered editorial, non-substantive changes and are hereby approved. The EPA notes, however, that its approval of these editorial, non-substantive changes do not re-open the EPA’s prior approvals of the underlying water quality standards.

Type II SSAC

The State removed “nutrients” from the list of parameters excluded from Type II SSAC. The EPA’s review of the new and revised WQS provisions that warrant the revisions to 62-302.800(2)(d) related to nutrients are addressed in other portions of this decision document. The EPA’s December 2010 final rule establishing nutrient criteria for Florida waters includes a provision that allows for the development of site-specific alternative criteria for nutrients⁵⁵, and nothing in 40 CFR Part 131 excludes any nutrient parameter from consideration by states as a candidate for site-specific criteria development. As a result, the EPA finds that these revisions are consistent with 40 CFR Part 131 and the Clean Water Act.

Type III SSAC for Nutrients

Subsection 62-302.800 (3)

⁵⁵ 40 CFR section 131.43(e) provides that “(t)he Regional Administrator may determine that site-specific alternative criteria shall apply to specific surface waters in lieu of the criteria established in paragraph (c) of this section. Any such determination shall be made consistent with Sec. 131.11.

Type III Site Specific Alternative Criteria (SSAC) for Nutrients: Upon petition by an affected person or upon initiation by the Department, the Department shall establish, by Secretarial Order, site specific numeric nutrient criteria when an affirmative demonstration is made that the proposed criteria achieve the narrative nutrient criteria in paragraph 62-302.530(47)(b), F.A.C., and are protective of downstream waters. Public notice and an opportunity for public hearing shall be provided prior to adopting any order establishing alternative criteria under this subsection.

(a) The Department shall establish a Type III SSAC if all of the following conditions are met:

1. The petitioner demonstrates that the waterbody achieves the narrative nutrient criteria in paragraph 62-302.530(47)(b), F.A.C.

a. For streams, such a demonstration shall require:

i. information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicating that there is not an imbalance in flora, and
ii. at least two temporally independent SCIs, conducted at a minimum of two spatially-independent stations representative of the waterbody or water segment for which a SSAC is requested, with an average score of 40 or higher, with neither of the two most recent SCI scores less than 35.

b. For lakes, such a demonstration shall require:

i. information on chlorophyll *a* levels, algal mats or blooms indicating that there is not an imbalance in flora or fauna, and
ii. at least two temporally independent LVIs, with an average score of 43 or above.

c. SCIs and LVIs collected at the same location less than three months apart shall be considered to be one sample, with the mean value used to represent the sampling period. SCIs and LVIs shall be conducted during the water quality sampling period described in subparagraph 62-302.800(3)(a)2, F.A.C. There shall be a minimum of two assessments per station or lake, with at least one assessment conducted during the final year.

2. The petitioner provides sufficient data to characterize water quality conditions, including temporal variability, that are representative of the biological data used to support the SSAC. The water quality data shall be collected in the same waterbody segment as the biological monitoring stations and at a frequency and duration consistent with the study design concepts described in the document titled *Development of Type III Site Specific Alternative Criteria (SSAC) for Nutrients* (DEP-SAS-004/11), dated October 24, 2011, which is incorporated by reference herein. Copies of this document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. Water quality data associated with extreme climatic conditions, such as floods, droughts, and hurricanes, shall be excluded from the analysis.

3. Demonstration of downstream protection by one of the following methods:

a. Downstream waters are attaining water quality standards related to nutrient conditions pursuant to Chapter 62-303, F.A.C.; or

b. If the downstream waters do not attain water quality standards related to nutrient conditions:

i. The nutrients delivered by the waterbody subject to the Type III SSAC meet the allocations of a downstream TMDL; or

ii. The nutrients delivered by the waterbody are shown to provide for the attainment and maintenance of water quality standards in downstream waters.

(b) The SSAC shall be established at a level representative of nutrient loads or concentrations that have been demonstrated to be protective of the designated use by maintaining balanced,

natural populations of aquatic flora and fauna. This demonstration shall take into account natural variability by using statistical methods appropriate to the data set, as described in *Development of Type III Site Specific Alternative Criteria (SSAC) for Nutrients* (DEP-SAS-004/11).

Subsection 62-302.800(3) establishes the demonstration requirements and the administrative process to establish a Type III SSAC. The demonstration requirements for adoption of Type III SSAC are established in paragraphs (a) and (b) of this subsection. Prior to State adoption of a Type III SSAC, two demonstrations are required: (1) the SSAC must achieve the narrative nutrient criteria in paragraph 62-302.530(47)(b), and (2) the SSAC must be protective of downstream waters. Type III SSAC are adopted by Secretarial Order, and the administrative process for adoption of a Type III SSAC must include a public notice of a proposed SSAC and provide for an opportunity for a public hearing on the proposed revision to WQS. These provisions of 62-302.800(3) are consistent with the requirements of 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act. The EPA is taking no action on the phrase “upon initiation by the Department” for the same reasons outlined in the the EPA’s analysis of 62-302.800(2) above.

The EPA notes that each adoption of a Type III SSAC for nutrients will be reviewed by the EPA to ensure that all of the requirements for State revision of WQS have been completed, and to determine whether the provisions of 40 CFR section 131.11(a) and (b) are met. A State-adopted SSAC for nutrients based on this provision will only become effective for purposes of the CWA after approval by the EPA pursuant to CWA section 303(c).

Type III SSAC Compliance with 62-302.530(47)(b)⁵⁶

Sub-subparagraph (3)(a)1.a. addresses the demonstration requirements for Type III SSAC for streams. In order to demonstrate that a Type III stream SSAC achieves the narrative nutrient criteria in paragraph 62-302.530(47)(b), a petition or proposal must present (1) information on chlorophyll a levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition indicating that there is not an imbalance in flora, and (2) at least two temporally independent SCIs, conducted at a minimum of two spatially-independent stations representative of the waterbody or water segment for which a SSAC is requested, with an average score of 40 or higher, with neither of the two most recent SCI scores less than 35.

The information requirement for demonstration of no imbalance in flora for freshwater streams focuses on site specific data on chlorophyll a levels, algal mats or blooms, nuisance macrophyte growth and changes in algal species composition. These are appropriate aspects of a stream’s floral diversity and relative composition that are typically used to determine if a stream’s community of flora has been affected due to the presence of nutrients and whether an imbalance of the natural population of flora has occurred or would be expected at certain floral thresholds. See EPA’s analysis of 62-302.531(2)(c). For the reasons discussed in the EPA’s review of 62-302.531(2)(c), the EPA finds that the SSAC demonstration requirements in subclause (3)(a)1.a.i are consistent with the requirements of 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act.

⁵⁶ 62-302.530 (47)(b) is part of Florida’s narrative nutrient criteria, and states, “In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.”

The second qualifying criteria for a Type III SSAC for streams requires a minimum average SCI score of 40, with neither of the two most recent SCI assessment scores of less than 35. As discussed in the EPA's analysis of 62-302.531(2)(c), the State has chosen to utilize the SCI as a measure of compliance with the component of 62-302.530(47)(b) for protection of aquatic fauna.

In the preamble to the December 2010 final rule, the EPA stated that an analysis of indicators of long-term stress, such as the SCI, in addition to other documentation, is an integral component of nutrient SSAC development. Federal Register Vol. 75, No. 233, Page 75790. See also EPA's analysis of 62-302.531(2)(c). For the reasons discussed in the EPA's review of 62-302.531(2)(c), the EPA finds that the demonstration requirements in subclause (3)(a)1.a.ii are consistent with the requirements of 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act.

Sub-subparagraph (3)(a)1.b addresses demonstration requirements for Type III SSAC for freshwater lakes. In order to demonstrate that a Type III SSAC for a freshwater lake achieves the narrative nutrient criteria in paragraph 62-302.530(47)(b), a petition or proposal must present (1) information on chlorophyll *a* levels, algal mats or blooms indicating that there is not an imbalance in flora or fauna, and (2) at least two temporally independent LVIs, with an average score of 43 or above.

The information requirement for demonstration of no imbalance in flora for freshwater lakes focuses on chlorophyll *a* levels and site-specific data on algal mats or blooms. The presence of algal mats or blooms are appropriate aspects of a lake's flora diversity and relative composition that are typically used to determine if a lake's community of flora has been affected due to the presence of nutrients to the extent that an imbalance of the natural population of flora has occurred, or would be expected at certain chlorophyll *a* levels. In the EPA's Interim Draft document, *Technical Assistance for Developing Nutrient Site-Specific Criteria in Florida*, June 2011, the EPA included algal mats as the type of qualitative data that are appropriate to evaluate the need and protectiveness of a SSAC in the Agency's discussion of information necessary to support a proposed SSAC, and stated that any modeling in support of a SSAC should simulate algal responses.⁵⁷ See also the EPA's analysis of 62-303.352(2).

Florida has adopted the use of the LVI as an appropriate biological assessment criterion for freshwater lakes. The EPA's evaluation of the State's selection of an LVI value of 43 as an ambient condition that supports Florida's aquatic life designated use is addressed in the EPA's review of 62-303.330(3)(d).

For the reasons discussed above, as well as the reasons discussed in the EPA's review of 62-303.330(3)(d), the EPA finds that the demonstration requirements in sub-subparagraph (3)(a)1.b are consistent with the requirements of 40 CFR Part 131 and the CWA and are approved by the EPA pursuant to section 303(c) of the Act.

The first sentence of FDEP's rule at 62-302.800(3)(a)1.c. requires that assessments using the SCI or LVI methodologies which are collected at the same location less than three months apart will be considered as one sample, using the average of the individual calculated indices. This provision establishes similar requirements as those in 62-302.531(5), and both provisions relate to data reliability regarding the development of site specific numeric interpretations of 62-302.530(47)(b). For the same reasons as

⁵⁷ See http://www.epa.gov/region4/water/wqs/documents/draft_tech_asst_for_ssac_in_florida_june_2011.pdf

summarized in the EPA's review of 62-302.531(5), this provision is not considered to be a new or revised water quality standard.

The second sentence of 62-302.800(3)(a)1.c. requires that SCI or LVI assessments made in support of the development of a SSAC are conducted during the same time frame as ambient water quality monitoring for the water body under consideration for a Type III SSAC. This provision contains restrictions as to the extent, timing and relative location of water quality data that must be used in conjunction with biological health assessments to develop a Type III SSAC. This provision establishes that the two types of data, i.e., water quality and biological, must be sufficiently temporally and geographically related in order to ensure that water quality criteria protect a biological condition that will maintain or attain the designated use of the water body. This is a scientifically defensible approach for development of SSAC, and this provision is approved by the EPA pursuant to section 303(c) of the Act.

The third sentence of FDEP's rule at 62-302.800(3)(a)1.c. also requires a minimum of two biological assessments per station or lake under consideration for a SSAC, with a minimum of one assessment during the final year of sampling. Although the EPA agrees that this is a scientifically defensible approach to development of SSAC, this provision does not describe the ambient condition of the water or establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that the State uses to identify water quality limited segments, nor does it establish a designated use. Therefore, this provision is not a water quality standard as that term is used in CWA Section 303(c) or the regulations in 40 CFR Part 131.

FDEP's rule at 62-302.800(3)(a)2. provides that a petition or proposal must be based on "sufficient data to characterize water quality conditions, including temporal variability, that are representative of the biological data used to support the SSAC," and "(t)he water quality data shall be collected in the same waterbody segment as the biological monitoring stations and at a frequency and duration consistent with the study design concepts described in the document titled *Development of Type III Site Specific Alternative Criteria (SSAC) for Nutrients*." This provision contains restrictions as to the extent, timing and relative location of water quality data that must be used in conjunction with biological health assessments to develop a Type III SSAC. Similar to the provision in 62-302.800(3)(a)1.c. above, this provision establishes that the two types of data, i.e., water quality and biological, must be sufficiently temporally and geographically related in order to ensure that water quality criteria protect a biological condition that will maintain or attain the designated use of the water body. This is a scientifically defensible approach for development of SSAC, and this provision is approved by EPA pursuant to section 303(c) of the Act.

The last sentence of 62-302.800(3)(a)2. allows for the exclusion of certain data from the development of a Type III SSAC, including "data associated with extreme climatic conditions, such as floods, droughts, and hurricanes, shall be excluded from the analysis." This provision defines when data will be excluded in the development of a Type III SSAC based on factors related to certain atypical events. This provision relates to the reliability of data but does not establish a new or revised criterion because it does not describe the ambient condition of the water or establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that the State uses to identify water quality limited segments nor does it establish a designated use. This provision does not stipulate that such data will not be used to assess compliance with applicable criteria. Therefore, the last sentence of 62-302.800(3)(a)2.

is not a new or revised water quality standard as that term is used in CWA Section 303(c) or the regulations in 40 CFR Part 131.

Protection of Downstream Waters in Development of Type III SSAC

62-302.800(3)(a)3. provides for two options to demonstrate that a Type III SSAC is protective of the WQS of downstream waters: (1) evaluation that shows downstream waters are attaining water quality standards related to nutrient conditions pursuant to Chapter 62-303, F.A.C.; or (2) if the downstream waters do not attain water quality standards related to nutrient conditions, a demonstration that the nutrients delivered by the waterbody subject to the Type III SSAC meet the allocations of a downstream TMDL or the nutrients delivered by the waterbody are shown to provide for the attainment and maintenance of water quality standards in downstream waters.

Where the downstream water is attaining WQS, 62-302.800(3)(a)3. allows a Type III SSAC to be established if downstream waters are attaining WQS for nutrients during the timeframe that the water quality conditions in the upstream water body, i.e., the water body to which the Type III SSAC apply, are representative of the SSAC.

Where the downstream water is impaired, the loading of nutrients from the upstream water body must either meet the requirements of a TMDL for the downstream water body under the terms, i.e., magnitude, duration and frequency, of the SSAC, or the loading of nutrients from the upstream water body must be demonstrated to provide for the attainment and maintenance of downstream WQS. EPA understands that the required “attainment and maintenance” demonstration could be made for cases where the State has not yet developed a TMDL for the downstream WQS impairment. Each of these outcomes is consistent with the EPA’s requirements for protection of downstream waters in 40 CFR 131.10(b), which states:

In designating the uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the **attainment and maintenance** of downstream waters.
[Emphasis added]

FDEP’s rule at 62-302.800(3)(a)3 clearly requires that a SSAC “take into consideration” downstream waters by ensuring the attainment of downstream WQS both where a downstream water is attaining its nutrient criteria and where a downstream water is impaired. This provision also ensures the continued maintenance of downstream WQS where the downstream WQS currently meets its nutrient criteria. The EPA also notes that, for cases where downstream WQS impairment is a consideration in the development of Type III SSAC, this approach achieves a numeric-based requirement for protection of downstream waters. (See the EPA’s evaluation of 62-303.390(2) for information on additional downstream protection requirements that apply in cases where the downstream waters are attaining their applicable nutrient criteria.) Based on the above, the EPA finds that this provision is consistent with the requirements of 40 CFR section 131.10(b), and is approved by the EPA pursuant to section 303(c) of the Act.

FDEP’s rule at 62-302.800(3)(b) requires that a Type III SSAC be established at a “level representative of nutrient loads or concentrations that have been demonstrated to be protective of the designated use by maintaining balanced, natural populations of aquatic flora and fauna.” This provision’s expression of

SSAC is consistent with the EPA's definition of "criteria" at 40 CFR section 131.3(b) as "elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use." The EPA finds that FDEP's rule at 62-302.800(3)(b) is consistent with the CWA and implementing regulations and is approved by the EPA pursuant to section 303(c) of the Act.

FDEP's rule at 62-302.800(3)(b) also requires that a SSAC take into account natural variability by using the methodologies in the document, *Development of Type III Site Specific Alternative Criteria (SSAC) for Nutrients*. The EPA reviewed the SSAC Development Document to determine whether any provisions in the document constitute new or revised water quality standards (WQS) and determined that none of the provisions of the SSAC Development Document establish or revise designated uses, do not establish or revise previously adopted criterion, and do not modify the state's antidegradation policy. The EPA's review of this document is summarized in Appendix A to this decision document.

Section 62-302.800(6) was revised to include one additional sentence, which provides:

(6) (5) Type II sSite specific alternative criteria apply to the water bodies, or portions of the water bodies, listed below. For dissolved oxygen site specific alternative criteria, normal daily and seasonal fluctuations above the levels listed in the table below shall be maintained. For site specific alternative criteria with seasonal limits, the generally applicable criteria in Rule 62-302.530, F.A.C., apply at other times of the year.

A revision to 62-302.800(6) was needed to reflect that this provision now only applies to Type II SSAC, and does not address Type I SSAC or Type III SSAC. The provision was also revised to acknowledge that certain SSAC apply during defined months or seasons during each year, and additional language was also adopted to clarify that the "statewide" criteria in rule 62-302.530 apply during any part of the year that SSAC do not address. Based on the above, the EPA finds that these revisions and clarifications are consistent with 40 CFR Part 131 and the Clean Water Act and are approved by the EPA pursuant to section 303(c) of the Act.

Overview of Revisions to the Impaired Waters Rule, Chapter 62-303

Chapter 62-303, F.A.C., entitled Identification of Impaired Surface Waters (Impaired Waters Rule or IWR), establishes a methodology for the FDEP to identify waterbodies for inclusion on the list of water quality-limited segments requiring total maximum daily loads (TMDLs) pursuant to section 303(d) of the Act and 40 C.F.R. Part 130. In 2011, FDEP amended the IWR to provide an assessment methodology for the new or revised nutrient water quality standards addressed above.

EPA previously reviewed and approved or disapproved new or revised WQS within the IWR in 2005⁵⁸ and again in 2008⁵⁹, after Florida revised the rule to make substantive and editorial changes to the IWR. In its review and approval or disapproval of the new or revised WQS portions of the 2011 amended IWR

⁵⁸ "Determination on Referral Regarding Florida Administrative Code Chapter 62-303 Identification of Impaired Surface Waters," United States Environmental Protection Agency, July 7, 2005.

⁵⁹ "Determination Upon Review of Amended Florida Administrative Code Chapter 62-303 Identification of Impaired Surface Waters," **Error! Main Document Only.** United States Environmental Protection Agency, February 8, 2008.

(amended IWR), EPA applied the same analytical framework that it used in the 2005 and 2008 Determinations. In its review of the amended IWR, EPA examined only those portions of the rule that were amended in 2011.

For the reasons discussed below, EPA has concluded that several portions of the amended IWR are new or revised water quality standards, but also has concluded that many portions of the amended IWR are not new or revised water quality standards. Specifically, those provisions of the IWR relating to magnitude, duration and frequency of load or concentration exceedances that define or revise the “ambient condition” or “level of protection” that the State affords waters for purposes of making attainment decisions constitute new or revised water quality standards. An attainment decision is one where a State decides what it means to attain or to not attain any “water quality standard applicable to such waters” for purposes of establishing total maximum daily loads (TMDLs) under section 303(d)(1)(A) of the Act, 33 U.S.C. § 1313(d)(1)(A). TMDLs, in turn, serve as the basis for NPDES permit limitations. Provisions that affect attainment decisions made by the State and that define, change, or establish the level of protection to be applied in those attainment decisions have the effect of revising existing standards under section 303(c) of the Act. These provisions constitute new or revised water quality standards subject to EPA review pursuant to the Act. Conversely, provisions that merely describe the sufficiency or reliability of information necessary for the State to make an attainment decision, and do not change a level of protection, are not WQS but are rather methodologies under section 303(d) of the Act. See 40 C.F.R. § 130.7(b)(6). While these provisions are not reviewed by EPA as new or revised water quality standards, they are considered by EPA in reviewing lists of impaired waters submitted by the State pursuant to section 303(d) of the CWA.

For example, several IWR provisions reference data windows that limit the age of data FDEP will consider when assessing whether waterbodies attain water quality standards. Such data windows are not water quality standards because they are not related to the ambient condition in the waterbody, i.e., what level of pollutant (or pollutant indicator) may be in the waterbody before determining that the waterbody is not meeting all applicable water quality standards. Instead, these provisions relate to the information necessary to conduct an attainment decision pursuant to section 303(d) of the Act and 40 C.F.R. § 130.7(b)(5) - (6) (as compared to section 303(c) of the Act) and, as such, they do not constitute water quality standards. EPA notes, however, that bright line cut-offs that result in a state not considering data beyond a certain age result in the state not fulfilling the requirement in 40 CFR § 130.7(b)(5) to consider all existing or readily available information when assessing waters pursuant to section 303(d).⁶⁰ EPA further notes that FDEP has developed a process for including and considering data collected and analyzed outside of data periods established in the IWR methodology. Whether the state has appropriately considered all existing or readily available information when assessing its waters is a factor considered by EPA when reviewing FDEP’s section 303(d) list submittals.

Pursuant to section 303(c) of the CWA, as set forth more fully below, EPA has reviewed and is approving those portions of the amended IWR that the Agency has determined to be new or revised water quality standards.

There were some revisions that were determined to not be a new or revised water quality standard. These provisions which were determined to not be new or revised water quality standards are generally

⁶⁰ Sierra Club et al. v. Leavitt, 488 F.3d 904 (11th Cir. 2007).

discussed within the respective section that addresses the provisions which were determined to be a new or revised water quality standards (for example, two provisions on lakes will be located in the lake nutrient assessment section, although each provision may have received a different conclusion with regard to whether or not it is subject to EPA's review). The following provisions were determined to not be new or revised water quality standards, however, they are listed in this section, because there is not a corresponding related section to include EPA's analyses regarding why the provision was not a new or revised water quality standard within the remainder of this document.

62-303.150:

EPA determined that 62-303.150 only addresses the purpose of the study list and does not affect an attainment decision related to a level of protection afforded by Florida to its ambient waters. Therefore, EPA has determined that this provision does not constitute a new or revised water quality standard.

62-303.310(2) and (3):

EPA determined that 62-303.310(2) and (3) do not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments, nor do they establish designated uses, and therefore, do not constitute a new or revised water quality standard.

62-303.330(5):

A non-substantive change was made to 62-303.330(5). This provision was previously determined to not be a new or revised WQS.

62-303.390(1):

Subsection 62-303.390(1) describes when a water body shall be placed on the study list for an indication of nonattainment of water quality standards, but the Department has not determined the causative pollutant(s). Since this subsection does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments, nor does it establish designated uses, and therefore, does not constitute a new or revised water quality standard.

62-303.390(2)(c):

Subsection 62-303.390(2)(c) is administrative in nature, identifying which portion of the State section 303(d) list will include waters that are impaired for dissolved oxygen where no cause for that impairment has been identified. This provision does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is used to make an attainment decision nor does it establish a designated use. Therefore, subsection 62-303.390(2)(c) does not constitute a new or revised water quality standard.

62-303.390(2)(d)

Subsection 62-303.390(2)(d) is administrative in nature, implementing rule 62-303.600. This provision does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is used to make an attainment decision nor does it establish a designated use. EPA has concluded that subsection 62-303.390(2)(d) does not constitute a new or revised water quality standard.

62-303.390(3) through (5):

Subsection 62-303.390(3) describes the listing process with regard to the status of waters with site specific numeric interpretations, but this process does not result in an attainment decision. Rather, attainment decisions for waters subject to a SSAC will be determined by provisions in section 62-303.450. Subsection 62-303.390(4) describes how the State will determine, for a water that is biologically impaired, the pollutant causing that impairment. Subsection 62-303.390(5) states a goal for when FDEP will undertake certain actions but does not establish requirements for Agency action. None of these subsections establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments, nor do they establish designated uses. Therefore, these provisions do not constitute new or revised water quality standards.

62-303.450(2), (5), and (6):

Subsection 62-303.450(2) simply restates the provisions of 62-303.351(3), .352(2), and .353(3). Subsection 62-303.450(5) just restates FDEP's current expectation for use of SSAC. Subsection 62-303.450(6) establishes requirements regarding data reliability and sufficiency. None of these subsections establish a level of protection related to the magnitude, duration, or frequency of water quality criteria that is then utilized to make an attainment decision to identify water quality limited segments, nor do they establish designated uses. Therefore, these provisions do not constitute new or revised water quality standards.

Revisions to 62-303.200, Definitions

EPA determined that the revisions to 62-303.200(1), (3), (7), the new text of (9), (12)-(14), (17), (21), (22), (25), (27), (29), (30), (32), (35) and (36) [as numbered in the submitted regulatory changes] do not further modify the provisions⁶¹ of 62-302 (in the case of (3) and (30)) or are restatements of provisions already addressed as part of 62-302 (in the case of all other definitions listed above), and thus do not constitute new or revised WQS. As a result, EPA will not be reviewing those revisions further.

EPA determined that the revisions to 62-303.200(2), (8), the deleted portion of (9), (28), and the deleted definition of "trophic state index," constitute new or revised water quality standards. These revisions are discussed further below.

Subsection 62-303.200(2)

The definition for "BioRecon" was revised as follows:

(2) "BioRecon" shall mean a biological assessment that measures stream health in predominantly freshwaters using benthic macroinvertebrates, performed and calculated using the Standard Operating Procedures (SOP) for the BioRecon in the document titled *BRN 1000: Biological*

⁶¹ By determining that the provision does "not further modify", EPA has determined that a provision does not establish or change an already established level of protection related to the magnitude, duration, or frequency of water quality criteria that are used by the State to identify water quality-limited segments nor does it establish a designated use. Therefore, such a provision is not a new or revised water quality standard as that term is used in CWA Section 303(c) or the regulations in 40 CFR Part 131.

Reconnaissance Field Method (DEP-SOP-003/01 BRN 1000), dated 10-24-11, which is incorporated by reference herein. Copies of the SOP may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. ~~evaluation conducted in accordance with standard operating procedures (SOPs) FT 3000, FS 7410, and LT 7100, as promulgated in Rule 62-160.800 F.A.C.~~

The definition for BioRecon is applied in IWR provision 62-303.330 and .430, which establishes a new biological assessment criterion. This provision, as applied in 62-303.330 and .430, defines a measurement of designated use support for aquatic life and therefore establishes a level of protection that is applied to a water body. The provisions add or further define a new biological assessment criterion to Florida's currently approved water quality criteria contained in 62-302.530(10). EPA has concluded that IWR provision 62-303.200(2) constitutes a new or revised water quality standard because it adds or further defines a new water quality criterion that the State uses when making attainment decisions to identify water quality limited segments.

The BioRecon method is appropriate for Florida waters and aquatic species because the ratings/scores generated using this assessment provide an accurate and scientifically defensible measurement of designated use attainment in streams. This provision is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

The referenced document BRN 1000 is not a new or revised WQS for the purposes of EPA's CWA section 303(c) review, since it only contains the details of analytical procedures that are used to calculate the BioRecon.

Subsection 62-303.200(8)

The definition for "lake" was added and reads as follows:

(8) "Lake" shall mean a lentic fresh waterbody with a relatively long water residence time and an open water area that is free from emergent vegetation under typical hydrologic and climatic conditions. Aquatic plants, as defined in subsection 62-340.200(1), F.A.C., may be present in the open water. Lakes do not include springs, wetlands, or streams (except portions of streams that exhibit lake-like characteristics, such as long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions).

As discussed above in the EPA's review of the definition of "lake" in 62-302.200(16), this provision defines the physical extent that water quality criteria for freshwater lakes apply. The revision to the definition in 62-303.200(8) establishes expectations for certain ambient fresh waters for the purposes of Chapter 62-303. The Chapter 62-302 definition applies only for purposes of implementing nutrient criteria, while the Chapter 62-303 has no such limitation. For the same reasons used by EPA in approving the definition of "lakes" in 62-302.200(16), the EPA agrees that the definition of "lake" in 62-303.200(8) is appropriate to delineate freshwater water bodies in the application of water quality criteria for lakes. This definition is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.200(9)

The definition for “lake vegetation index” was added in place of the previous definition for “lake condition index” and reads as follows:

~~(9)(8)~~ “Lake Vegetation Index (LVI)” shall mean a Biological Health Assessment that measures lake biological health in predominantly freshwaters using aquatic and wetland plants, performed and calculated using the Standard Operating Procedures for the LVI in the document titled *LVI 1000: Lake Vegetation Index Methods* (DEP-SOP-003/11 LVI 1000) and the methodology in *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (DEP-SAS-002/11), both dated 10-24-11, which are incorporated by reference herein. Copies of the documents may be obtained from the Department’s internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. ~~“Lake Condition Index” shall mean the benthic macroinvertebrate component of a biological evaluation conducted following the procedures outlined in “Development of Lake Condition Indexes (LCI) for Florida,” Florida Department of Environmental Protection, July, 2000, which is incorporated by reference.~~

The definition of LVI in 62-303.200(9) replaces the definition of Lake Condition Index (LCI) that was previously adopted by the State as 62-303.200(8). That definition of LCI was approved by the EPA as a new/revised provision of Florida WQS on February 19, 2008. The definition of LVI in 62-303.200(9) is a restatement of the new or revised WQS established at 62-302.200(17). EPA’s review of 62-302.200(17) and approval of that subsection as a new or revised WQS is discussed at page 6 above. Because subsection 62-303.200(9) simply restates 62-302.200(17), EPA has determined that subsection 62-303.200(9) does not constitute a new or revised WQS. Because the LCI is being replaced⁶² with an index that is more responsive to anthropogenic impacts, the deletion of the LCI definition is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.200(28)

The definition for “stream” was revised and now reads as follows:

~~(28) (21)~~ “Stream” shall mean a free-flowing, predominantly fresh surface waterbody ~~water that flows~~ in a defined channel ~~with banks, and includes rivers, creeks, branches, freshwater sloughs, and other similar water bodies.~~ Streams do not include wetlands or portions of streams that

⁶² The LCI measured the macroinvertebrate community of lakes but FDEP determined that it should not be used due to statistical inconsistencies with land use and human disturbance indicators (FDEP. 2007. Evaluation of Benthic Macroinvertebrate Assemblages as Indicators of Lake Condition, Page 14. (http://www.dep.state.fl.us/labs/docs/lake_macro_testing.pdf). FDEP has determined that the LVI, which measures floral components of the lake ecosystem, was highly correlated with the human disturbance gradient and other independent measures of human disturbance. FDEP concluded that the LVI is a reliable indicator of lake condition and has sufficient statistical precision to detect multiple levels of biological condition (FDEP2007. Assessing the Biological Condition of Florida Lakes: Development of the Lake Vegetation Index (LVI). Page 2).

exhibit lake characteristics (e.g., long water residence time, increased width, and predominance of biological taxa typically found in non-flowing conditions).

The revised definition of stream defines the spatial extent to which certain attainment decisions apply for the purposes of Chapter 62-303⁶³. Subsection 62-303.200(28) differs from the definition established in Chapter 62-302. The Chapter 62-302 definition applies only for purposes of interpreting the nutrient criteria in 62-302.530(47)(b) and includes exclusions for certain non-perennial segments and ditches, canals, and other conveyances that are man-made or predominantly channelized or physically altered, while the Chapter 62-303 has no such limitations. Unless stated otherwise in Chapter 62-303, the definition of stream in 62-303.200(28) applies all WQS provisions in Chapter 62-303 to streams meeting the definition in 62-303.200(28). EPA considers 62-303.200(28) a change to water quality standards since it defines where the stream-related attainment decisions are to be made and thus helps set expectations for ambient waters. The revisions to the stream definition are consistent with 40 CFR Part 131 and the CWA and are approved by EPA pursuant to section 303(c) of the Act.

Deleted Subsection 62-303.200(25)

The definition for “trophic state index” was deleted. It previously stated:

~~(25) “Trophic State Index” or “TSI” means the trophic state index for lakes, which is based on lake chlorophyll a, Total Nitrogen, and Total Phosphorus levels, and is calculated following the procedures outlined on pages 86 and 87 of the State’s 1996 305(b) report, which are incorporated by reference.~~

EPA approved the State’s definition of TSI as a new or revised provision of Florida WQS on February 19, 2008. During the State’s 2011 rulemaking, the State deleted the definition of TSI and also adopted the use of the LVI as a new or revised biological health assessment at subsection 62-302.200(17). EPA’s review of 62-302.200(17) and approval of the subsection as a new or revised WQS is discussed at page 6 above. The EPA expects that, in many cases, biological health assessments of freshwater lakes will now be made using the LVI where the TSI may have been historically used by the State, at least in part, to conduct those assessments. EPA also notes that the State has adopted numeric criteria for chlorophyll a, TN, and TP for freshwater lakes based on interpretation of the State’s narrative nutrient criteria in 62-302.530(47)(b), and these numeric criteria will serve many purposes that may have supported previous use of the TSI in making use assessment decisions. The deletion of the TSI definition is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

New and Revised Provisions of the Planning, Study, and Verified Lists for Biological and Nutrient Assessments

Florida’s assessment methodology establishes three categories for waters that have been identified as impaired, or potentially impaired, waters: the planning list, study list, and verified list. Both the study and verified lists will be submitted to EPA as Florida’s CWA section 303(d) list of impaired waters.

⁶³ The previous language from 62-303.200(21) included “canals” among the now deleted list of waterbodies that could comprise streams.

Pursuant to State law, however, FDEP may only develop and establish TMDLs for those waterbodies on the verified list.⁶⁴

Florida has described the bases for placing a waterbody on the planning list in sections 62-303.310, 62-303.330, and 62-303.350 through 62-303.354 of the IWR. Florida has described the bases for placing a waterbody on the study list in section 62-303.390. Florida has described the bases for placing a waterbody on the verified list in provisions 62-303.430 and 62-303.450. The State's verified list process also includes provision 62-303.420, which is described in a later section. Finally, Florida has identified the bases for removing a water body from the verified list in section 62-303.720.

EPA determined that provisions of the amended IWR that affect only the State's decision to include a waterbody on the planning list do not constitute new or revised water quality standards, because placing a water on the planning list does not affect an attainment decision. To the extent that a planning list provision also affects the State's decision to identify a waterbody on the study or verified lists, however, that provision does affect an attainment decision. EPA considered such provisions further to determine whether the provision also defined, changed, or established the level of protection to be applied in those attainment decisions.

The biological assessment provisions will be discussed first, followed by the nutrients assessment provisions. For the nutrients assessment provisions, the discussion will be organized by waterbody type. For both biological and nutrients assessment, the planning, study, and verified lists will be discussed together.

Biological Assessment Provisions

Overview

The provisions of 62-303.330(3) [except for subsections (3)(a) and (3)(c)] and 62-303.330(4) [first sentence only in subsection (4)] and 62-303.430(2) through (4) were determined to be new or revised water quality standards, but 62-303.330(2), 62-303.330(3)(a), 62-303.330(3)(c), 62-303.330(4) [last two sentences of subsection (4)], 62-303.390(2)(b), as well as 62-303.430(1), (5) and (6), were determined not to be new or revised water quality standards.

Subsection 62-303.330(2)

(2) Biological Health Assessments ~~Bioassessments~~ used to evaluate predominantly fresh water ~~assess~~ streams and lakes under this rule shall include BioRecons, the Stream Condition Index (SCI) Indices (SCIs), and the Lake Vegetation Index (LVI), and the Shannon-Weaver Diversity Index. ~~the benthic macroinvertebrate component of the Lake Condition Index (LCI), which only applies to clear lakes with a color less than 20 platinum-cobalt units.~~ BioRecons can also be used to evaluate predominantly fresh water streams under this rule. Because these Biological Health Assessment ~~bioassessment~~ procedures require specific training and expertise, persons conducting a BioRecon, SCI or LVI ~~the bioassessments~~ must comply with the quality assurance requirements of Chapter 62-160, F.A.C. (including adherence to *Sampling and Use of the Stream*

⁶⁴ See Fla. Sta. § 403.067; section 62-303.150, F.A.C.

Condition Index (SCI) for Assessing Flowing Waters: A Primer (DEP-SAS-001/11), which was incorporated by reference in subsection 62-303.200(29), F.A.C., and Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer (DEP-SAS-002/11), which was incorporated by reference in subsection 62-303.200(9), F.A.C.), attend at least eight hours of Department sanctioned field training; and pass a Department sanctioned field audit that verifies the sampler follows the applicable SOPs, as set forth in Chapter 62-160, F.A.C., before their Biological Health Assessment ~~bioassessment~~ data will be considered valid for use under this rule.

Subsection 62-303.330(2) identifies the specific indices that are now defined as “biological health assessments.” Except for the inclusion of the BioRecon, the list of specific indices included in this section is a restatement of the indices established in subsection 62-302.200(4).

The use of the BioRecon assessment has been reintroduced as an option for evaluating predominantly streams as part of Chapter 62-303. However, since this provision is used only for planning list purposes, and does not affect attainment decisions, EPA determined that the BioRecon provision does not constitute a new or revised water quality standard. As for the remainder of the indices listed in subsection 62-303.330(2), EPA’s review of subsection 62-302.200(4) and approval of that subsection as a new or revised WQS is discussed on pages 4-5 above. For all of these reasons, EPA has determined that subsection 62-303.330(2) does not constitute a new or revised WQS.

Subsection 62-303.330(3)

~~(3) A water segment shall be included on the planning list if it meets any of the following conditions: Water segments with at least one failed bioassessment or one failure of the biological integrity standard, subsection 62-302.530(11), F.A.C., shall be included on the planning list for assessment of aquatic life use support.~~

~~(a) One of the two most recent Shannon-Weaver Diversity Index (subsection 62-302.530(10), F.A.C.) scores is less than 75 percent of the value from an appropriate control site.~~

~~(b) One of the two most recent Stream Condition Index scores is:~~

~~1. A score of < 35; or~~

~~2. A 20 point reduction from the historic maximum value if the historic maximum value SCI is above 64.~~

~~(c) One of the two most recent BioRecon scores is ≤ 4 .~~

~~(d) One of the two most recent Lake Vegetation Index scores is:~~

~~1. A score < 43; or~~

~~2. A 20 point reduction from the historic maximum value if the historic maximum value LVI is above 78.~~

~~(a) In streams, the bioassessment shall be either an SCI or a BioRecon. Failure of a bioassessment for streams consists of a “poor” or “very poor” rating on the Stream Condition Index, or a “fail” rating on the BioRecon.~~

~~(b) Failure for lakes consists of a “poor” or “very poor” rating on the Lake Condition Index.~~

The deleted portions of 62-303.330(3) that relate to the use of bioassessments, including BioRecon, was previously adopted by the State and approved by the EPA as a new/revised provision of Florida WQS on February 19, 2008. Because these provisions are being replaced with more specific biological health assessments, which are approved elsewhere in this current 303(c) review, the deletion of the older

bioassessment related text is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

EPA has concluded to the extent that IWR provisions 62-303.330(3)(b) and (d) are used to establish the verified list, as referenced at 62-303.430(2)(a), (b), and (c), they constitute new or revised water quality standards because they establish or further define a magnitude for the new biological assessment criterion that the State uses when making attainment decisions to identify water quality-limited segments. With regard to 62-303.330(a) and (c), the provision regarding the Shannon-Weaver Diversity Index merely provides for the continuing use of this previously-approved metric and does not establish a new magnitude and the provision for the BioRecon is used only for planning list purposes, and does not affect attainment decisions. Therefore, provisions 62-303.330(3)(a) and (c) were determined not to be new or revised water quality standards.

The revised water quality standards of subsection 62-303.330(3) establish the following new magnitudes: for the new SCI criterion, a score not less than 35 or no more than a 20 point reduction from the historic maximum if that historic maximum is above 64; and for the new LVI lake criterion, a score not less than 43 or no more than a 20 point reduction from the historic maximum if that historic maximum is above 78. These new bioassessment tools establish quantitative “impairment thresholds” for both of these assessment methods. EPA reviewed the SCI score of 35 as part of its review of 62-302.531(2)(c). That review and EPA’s associated approval of 62-302.531(2)(c) as a new or revised WQS is discussed above on pages 29-43. EPA’s analysis of the historic maximum values for both SCI and LVI is discussed below in the review of 62-303.330(4). EPA’s analysis of the LVI score is discussed immediately below.

The development of the LVI threshold of impairment, a score of 43 is described on pages 33-34 in *FDEP. 2011. Development of Aquatic Life Use Support Attainment Thresholds for Florida’s SCA and LVI*. FDEP developed the LVI threshold using benchmark sites (Note: these sites were referred to as reference waters and benchmark sites interchangeably by FDEP). In general, the threshold was determined by using the 2.5th percentile of reference values of these lakes. The document provided a list of these lakes that have replicate LVI data. FDEP also convened a panel of experts consisting of 20 plant ecologists, botanists, and field lake managers, all with at least five years of experience, to help calibrate the LVI with the biological condition gradient (BCG). The U.S. EPA has outlined a tiered system of aquatic life use designation, along a Biological Condition Gradient (BCG), that illustrates how ecological attributes change in response to increasing levels of human disturbance. The BCG is a conceptual model that assigns the relative health of aquatic communities into one of six categories, from natural to severely changed. It is based in fundamental ecological principles and has been extensively verified by aquatic biologists throughout the U.S. ([Use of Biological Information to Better Define Designated Aquatic Life Uses in State and Tribal WQS: Tiered Aquatic Life Uses \(EPA-822-R-05-001\)](#)). Although there appeared to be a wide range of opinions of where to place various LVI scores on the BCG, FDEP took the responses and, based on statistical analyses of the workshop results, determined that a BCG score of 4 was the threshold of attainment and a LVI score of 44.8 represented the lowest threshold of attainment score LVI (based on the 2007 recalibrated LVI). To determine the relationship between the 2011 LVI scores with the same scores used for the 2007 Biological Condition Gradient (BCG) workshop, the LVI scores used for the BCG workshop were recalculated as described above and regressed against the 2007 BCG scores (Figure 24). After the 2011 recalculations, the same BCG score (4) was now equivalent to an LVI score of 42.3. This reduction of 2.5 points for an equivalent score means that the minimum threshold for meeting a healthy, well balanced plant community should be

adjusted by 2.5 points, and that the new acceptable LVI score, based on the BCG approach, would be 42.3. This is just slightly lower than the reference site threshold of 43 points. This discussion was included on pages 35-37 of *FDEP. 2011. Development of Aquatic Life Use Support Attainment Thresholds for Florida's SCA and LVI*.

These methods are appropriate for Florida waters and aquatic species because the ratings/scores generated using these assessments are an accurate and scientifically defensible measurement of designated use attainment in State waters. The water quality standards changes in 62-303.330(3) are consistent with 40 CFR Part 131 and the Clean Water Act and are approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.330(4)

(4) The “historic maximum value” shall be the highest mean of any three consecutive, temporally independent Stream Condition Index (SCI) scores or Lake Vegetation Index (LVI) scores at the same location that are collected prior to the most recent sample being considered for evaluation with this provision. To qualify as temporally independent samples, each Biological Health Assessment shall be conducted at least three months apart. Biological Health Assessments collected at the same water segment less than three months apart shall be considered one sample, with the mean value used to represent the sampling period.

The first sentence of this subsection defines the term “historic maximum value,” which is used as a baseline to assess SCI and LVI scores, at sites with high quality biological condition, as part of the verified list at subsections 62-303.430(2)(b) & (c). The definition affects the application of the criteria based on a change from the historic maximum value and therefore constitutes a new or revised water quality standard.

The addition of the term “historic maximum value” provides a baseline to assess SCI and LVI scores at sites with high quality biological conditions. The definition provides a process for calculating this value, which is scientifically sound in that it accounts for the temporal variability of the SCI and LVI. This provision is consistent with 40 CFR Part 131 and the Clean Water Act and this provision is approved by EPA pursuant to section 303(c) of the Act.

The term “historic maximum value” is also used in 62-303.330(3)(b)2 and 62-303.330(3)(d)2, but as used in those provisions does not constitute a new or revised water quality standard because it is a planning list provision only. The remaining two sentences of 62-303.330(4) establish the expectation for sampling at temporally independent times.⁶⁵ Because these last two sentences do not modify the underlying criteria in other provisions, the last two sentences are not new or revised water quality standards.

Subsection 62-303.390(2)(b)

(2) A Class I, II, or III water shall be placed on the study list if:

⁶⁵ A parallel provision to 62-303.330(4) is found at 62-302.531(5).

(b) A waterbody segment does not achieve the Biological Health Assessment provisions in Rule 62-303.430, F.A.C., but a cause has not been identified;

Subsection 62-303.390(2)(b) describes the process for determining whether a waterbody goes on the study or verified list section of the state's section 303(d) list. Since the provision relates to an attainment decision that has already been made that the waterbody is biologically impaired, this revision was determined not to be a new or revised water quality standard.

Subsection 62-303.430(1)

(1) All Biological Health Assessments ~~bioassessments~~ used to list a water on the verified list shall be conducted and interpreted in accordance with Chapter 62-160, F.A.C., including Department-approved Standard Operating Procedures and the Department documents, *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11), which was incorporated by reference in subsection 62-303.200(29), F.A.C., and *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (DEP-SAS-002/11), which was incorporated by reference in subsection 62-303.200(9), F.A.C. To be used for placing waters on the verified list, any Biological Health Assessments ~~bioassessments~~ conducted before the adoption of applicable SOPs for such Biological Health Assessments ~~bioassessments~~ as part of Chapter 62-160, F.A.C., shall substantially comply with the subsequent SOPs. Biological Health Assessments conducted during conditions inconsistent with the applicable primer shall be excluded from the assessment.

Although 62-303.430(1) was determined to be a new or revised water quality standard in EPA's February 19, 2008 action, EPA has determined that as revised, subsection 62-303.430(1) simply restates the provisions EPA has approved in subsection 62-302.200(4) and, therefore, does not constitute a new or revised WQS. This provision also references two documents, *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11) and *Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer* (the LVI Primer), which contain the information on how to complete the steps that are necessary to conduct the SCI and the LVI, respectively. Except where stated otherwise in this document with regard to EPA's review of 62-302.531(2)(c), these documents are not new or revised WQS for the purposes of EPA's CWA section 303(c) review, since they only contain the details of analytical procedures that are used to calculate the SCI and LVI.

Subsection 62-303.430(2)

(2) If the water was listed on the planning list based on Biological Health Assessment ~~bioassessment~~ results, the water shall be determined to be biologically impaired if any of the following conditions occur:

(a) The average score of at least two temporally independent Biological Health Assessments is below 40 for the SCI or if either of the two most recent SCI scores is less than 35, or 43 for the LVI. If there are only two Biological Health Assessments and the difference between the two scores is greater than 20 points, then an additional SCI or LVI shall be required and the average of all three scores shall be used.

(b) The historic maximum SCI value, as defined in subsection 62-303.330(4), F.A.C., is above 64 and the average of the two most recent independent SCI scores is 20 or more points below the historic maximum value.

(c) The historic maximum value LVI, as defined in subsection 62-303.330(4), F.A.C., is above 78 and the average of the two most recent independent LVI scores is 20 or more points below the historic maximum value. ~~there were two or more failed bioassessments within the five years preceding the planning list assessment. If there were less than two failed bioassessments during the last five years preceding the planning list assessment, the Department will conduct an additional bioassessment. If the previous failed bioassessment was a BioRecon, then an SCI will be conducted. Failure of this additional bioassessment shall constitute verification that the water is biologically impaired.~~

(d) The average score of at least two temporally independent Shannon-Weaver Diversity Indices is less than 75 percent of the average score from an appropriate control site, pursuant to subsection 62-302.530(10), F.A.C.

The deleted portions of 62-303.430(2) that relate to the use of bioassessments reflect revisions associated with the replacement of more specific biological health assessments. Therefore, the deletion of the older bioassessment related text is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.430(2) now establishes specific biological health assessment expectations as a means of placing waters on the verified list. These new indices establish quantitative “impairment thresholds” for each biological health assessment method against which the State can assess decreasing quality against. Therefore, this subsection is a new or revised water quality standard.

These methods are appropriate for Florida waters and aquatic species because the ratings/scores generated using these assessments are an accurate and scientifically defensible measurement of designated use attainment in State waters. The biological health assessment scores, previously described in other sections of this document in EPA’s review of 62-302.531(2)(c) and 62-303.330(3) and 62-303.330(4), provide the review related to the LVI and SCI, and the associated historic maximum values. Florida elects to place waters on the verified list based on two or more failed bioassessments in this circumstance because of the potential variability associated with biological sampling. Subsection 62-303.430(2) is consistent with 40 CFR Part 131 and the Clean Water Act and this provision is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.430(3)

(3) If the water was listed on the planning list based on BioRecon data, two or more temporally independent SCIs shall be conducted. If the water segment was listed on the planning list based on other information specified in subsection rule 62-303.330(5)(4), F.A.C., indicating biological impairment, two or more temporally independent Biological Health Assessments appropriate for the

waterbody type shall be conducted the Department will conduct a bioassessment in the waterbody segment, conducted in accordance with the methodology in Rule 62-303.330, F.A.C., to verify whether the water is impaired. If available, the Department shall consider other scientifically credible biological assessment methods in predominantly marine waters to verify that the water is biologically impaired. Results from these biological assessments shall be evaluated in accordance

with subsection 62-303.430(2), F.A.C., as applicable. For streams, the bioassessment shall be an SCI. Failure of this bioassessment shall constitute verification that the water is biologically impaired.

The deleted portions of 62-303.430(3) that relate to the use of bioassessments reflect revisions associated with the replacement of more specific biological health assessments. Therefore, the deletion of the older bioassessment related text is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.430(3) establishes which specific biological health assessment should be used when the water was placed on the planning list for not having an acceptable BioRecon assessment or based on other information specified in 62-303.330(5). Furthermore, when these other assessments are conducted, the threshold associated with the respective index is expected to be evaluated consistent with 62-303.430(2). Lastly, the State has specified that “other scientifically credible biological assessment methods” shall be considered for predominantly marine waters. These revisions set processes and thresholds for attainment decisions made by the State. Therefore, this entire subsection is a new or revised water quality standard.

These revisions clarify the processes and associated thresholds for attainment decisions made by the State. Subsection 62-303.430(3) is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.430(4)

(4) If a waterbody was listed on the planning list based on failure of the Shannon-Weaver Diversity Index under subsection 62-302.530(10), F.A.C., a minimum of two Biological Health Assessments shall be conducted in accordance with the methodology in Rule 62-303.330, F.A.C., to verify whether the water is impaired. If an SCI or LVI is not applicable for the waterbody type, then the Biological Health Assessment shall be the Shannon-Weaver Diversity Index or other scientifically credible method.

Subsection 62-303.430(4) establishes that either an LVI or SCI should be used to verify biological impairment when the water was placed on the planning list for not having acceptable Shannon-Weaver Diversity Index scores. However if the LVI or SCI are not applicable for the waterbody type, then the Shannon-Weaver Diversity Index or “other scientifically credible method” shall be used. These revisions set processes and associated thresholds for attainment decisions made by the State. The Shannon-Weaver diversity was approved by EPA as a water quality standard in April 2003. This revision does not modify the previously approved standard; it merely describes its use in the absence of other information.

These revisions clarify the processes and associated thresholds for attainment decisions made by the State. Subsection 62-303.430(4) is consistent with 40 CFR Part 131 and the Clean Water Act and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.430(5)

(5) (4) Following verification that a waterbody is biologically impaired, a waterbody ~~water~~ shall be included on the verified list for biological impairment if:

(a) through (b)1. No change.

2. If there is not a numeric criterion for the specified pollutant(s) in Chapter 62-302, F.A.C., an identification of the specific factors that reasonably demonstrate how the particular pollutant(s) are associated with the observed biological effect. If the numeric interpretation of the narrative nutrient criterion in paragraph 62-302.531(2)(c), F.A.C., is exceeded, then nutrients shall be identified as the causative pollutant unless a stressor identification study links the adverse biological effects to causal factor(s) other than nutrients.

Subsection 62-303.430(5) describes the method to link a causal pollutant to the observed biological effects for determining 303(d) listing. Since the provision relates to an attainment decision that has already been made that the waterbody is biologically impaired, the additional language in this revision relating to determining or identifying the causative pollutant was determined not to be a new or revised water quality standard.

Subsection 62-303.430(6)

(6) If a waterbody is verified as biologically impaired, but a causative pollutant has not been identified, the waterbody shall be included on the study list.

Subsection 62-303.430(6) provides that a waterbody that is verified as biologically impaired will be included on the the study list portion of the state section 303(d) list, rather than the verified list portion, when a causative pollutant for the biological impairment has not been identified. This provision does not change whether a waterbody will be identified as impaired based on the biological attainment decision but clarifies where the waterbody will be listed on the state section 303(d) list, based on information about causation. Because this provision does not affect an attainment decision, EPA has determined subsection 62-303.430(6) does not constitute a new or revised water quality standard.

Nutrient Assessment Provisions

In addition to those provisions that EPA has determined to be new or revised water quality standards, Chapter 62-303 sections .350, .351, .352, .353, .354, .390, and .450 establish a number of other provisions that EPA has determined not to be new or revised standards. Those provisions associated with assessing specific waterbody types that EPA determined are not new or revised water quality standards are discussed by waterbody type below.

Before describing the nutrient assessment decisions by waterbody type, it is important to describe the listing process more generally. In Chapter 62-303 sections .350, .351, .352, .353, .354, .390, and .450 of the IWR, the State established a process for considering different amounts and types of information when making attainment decisions based on nutrients. As set out more fully below, waters will be included as water quality limited segments (WQLSs) on the study or verified list, or identified as potential problems requiring additional study on the planning list, based on the State's level of certainty of nutrient impairment.

The streams nutrient criteria established in 62-302 requires a suite of information to determine that a waterbody is definitively meeting its designated use. Where the State has sufficient information to determine that a waterbody is not meeting its designated use according to one of the four verified list bases set out below, the waterbody is identified as impaired on the verified list section of the State's 303(d) list. Where the available information indicates that a waterbody is not meeting its designated use according to one of the two study list bases set out below, but additional information could clarify whether the use is in fact impaired, the waterbody is identified as impaired on the study list section of the State's 303(d) list. Where the available information indicates that a waterbody might not be meeting its designated use according to one of the three planning list bases set out below, but additional information is necessary to determine whether the use is actually impaired, the waterbody is included on the planning list, which is not part of the State's section 303(d) list.

The following outline shows how the three lists address nutrient assessments for streams, based on varying levels of available information.

Verified List (303d list)

Streams will be placed on the Verified List for nutrient impairment based on any of the following scenarios:

1. Exceeding chlorophyll *a* thresholds more than once in three consecutive years, considering verified list data requirements, or
2. Information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, or changes in algal species composition indicates there are imbalances in flora or fauna, or
3. The average score of at least two temporally independent SCIs performed at representative locations and times is less than 40, with neither of the two most recent SCI scores less than 35⁶⁶, or
4. Adverse trend in response variables, where impairment is expected within 5 years.

Study List (303d list)

Streams will be placed on the Study List for nutrient impairment based on either of the following scenarios:

1. Exceeding nutrient thresholds, considering study list data requirements, where there is insufficient information to assess biology, or
2. Adverse trend in TN, TP, nitrate-nitrite, or chlorophyll *a* where impairment is expected within 10 years.

Planning List (not included on State 303d list)

Streams will be placed on the Planning List for nutrient impairment based on any of the following scenarios:

⁶⁶ Where a waterbody has two SCI scores averaging less than 40 but does not exceed the nutrient thresholds, the waterbody is included on the Study List for biological impairment. FDEP will then do a stressor identification study to determine the cause of the biological impairment.

1. Exceeding nutrient thresholds, considering planning list data requirement, where there is insufficient information to assess biology, or
2. Exceeding chlorophyll *a* thresholds, considering planning list data requirements, with no requirement for more than one exceedence in a three year period, or
3. Adverse trend in TN, TP, nitrate-nitrite, or chlorophyll *a*, with no projected impaired date required.

General Nutrient Assessment Provisions

Rule 62-303.350

(1) The nutrient impairment thresholds identified in Rules 62-303.351 through 62-303.354, F.A.C., Trophic state indices (TSIs) and annual mean chlorophyll *a* values shall be the primary means for assessing whether a water should be assessed further for nutrient impairment. Other information indicating an imbalance in flora or fauna due to nutrient enrichment, such as including, but not limited to, algal blooms or mats, excessive nuisance macrophyte growth, decrease in the distribution (either in density or areal coverage) of submerged aquatic vegetation, adverse changes in algal species composition richness, and excessive diel oxygen swings, shall also be considered for placing waters on the planning list.

(2) To be used to determine whether a waterbody should be assessed further for nutrient enrichment,

(a) Data must meet the requirements of subsections (2)-(4), (7), and (8) in Rule 62-303.320, F.A.C.;

(b) To calculate an annual geometric mean for TN, TP or chlorophyll *a*, there shall be at least four temporally-independent samples per year with at least one sample collected between May 1 and September 30 and at least one sample collected during the other months of the calendar year. To be treated as temporally-independent, samples must be collected at least one week apart; and At least one sample from each season shall be required in any given year to calculate a Trophic State Index (TSI) or an annual mean chlorophyll *a* value for that year (for purposes of this chapter, the four seasons shall be January 1 through March 31, April 1 through June 30, July 1 through September 30, October 1 through December 31);

~~(c) If there are multiple chlorophyll *a* or TSI values within a season, the average value for that season shall be calculated from the individual values and the four quarterly values shall be averaged to calculate the annual mean for that calendar year;~~

~~(d) For data collected after the effective date of this rule, individual TSI values shall only be calculated when the nitrogen, phosphorus, and chlorophyll data were collected at the same time and location;~~

~~(e) If there are insufficient data used to calculate a TSI or an annual mean chlorophyll *a* value in the planning period, but there are data from at least four consecutive seasons, the mean TSI or mean chlorophyll *a* value for the consecutive seasons shall be used to assess the waterbody;~~

~~(f) There must be annual means from at least four years when evaluating the change in TSI over time pursuant to subsection 62-303.352(3), F.A.C., and~~

(c) (g) To be assessed under this chapter rule, except for data used to establish historical chlorophyll *a* levels, chlorophyll *a* data shall be determined using Department-approved methods as measured according to the DEP document titled, "Applicability of Chlorophyll *a* Methods" (DEP-SAS-002/10), dated October 24, 2011, incorporated by reference herein. Copies of the chlorophyll *a* document may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of

Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. Chlorophyll *a* data shall be corrected for or free from the interference of pheophytin. chlorophyll *a* data collected after the effective date of this rule shall be corrected chlorophyll *a*, except for data used to establish historical chlorophyll *a* levels. Corrected chlorophyll *a* is the calculated concentration of chlorophyll *a* remaining after the chlorophyll degradation product, phaeophytin *a*, has been subtracted from the uncorrected chlorophyll *a* measurement.

~~(3) When comparing changes in chlorophyll *a* or TSI values to historical levels, historical levels shall be based on the lowest five year average for the period of record. To calculate a five year average, there must be annual means from at least three years of the five year period.~~

The only provisions of 62-303.350 that were determined to be new or revised water quality standards were two deletions: 1) deletion of paragraph (c) in subsection (2), as previously adopted, and 2) the deletion of subsection (3) as previously adopted. All other revisions to 62-303.350 were determined not to be new or revised water quality standards.

Paragraph 62-303.350(2)(c) [as previously adopted]

Because 62-303.350(2)(c) was previously determined to be a new or revised water quality standard, EPA reviewed the deletion of the paragraph. Old paragraph (c) references seasonal averaging and how those averages should be handled to calculate the annual mean. However, the State's 2011 rulemaking revisions no longer utilize the chlorophyll *a* and TSI information previously adopted by the State so this change is consistent with other revisions made to reflect newer scientific processes to be used by the State. Therefore, EPA is approving the deletions within this subsection pursuant to section 303(c) of the Act as consistent with other approval actions taken throughout this decision document.

Subsection 62-303.350(3) [as previously adopted]

Because 62-303.350(3) was previously determined to be a new or revised water quality standard, EPA will review the deletion of the subsection. Old subsection (3) established a magnitude component of a translator procedure for a narrative criterion that executes an attainment decision. As part of the State's 2011 rulemaking revisions, the State deleted its use of the TSI and the change in historical chlorophyll *a* level provisions, and replaced the provisions with other criteria, such as the trend provisions of Rule 62-303. Therefore, EPA is approving the deletions within this subsection pursuant to section 303(c) of the Act. EPA's review of the trend provisions, adopted as part of the State's 2011 rulemaking, is provided as part of the planning, study, and verified list provisions in Rule 62-303 and also in discussions of downstream protection starting on page 44.

Nutrient Assessment Provisions for Streams

Overview

As set out more fully below, EPA determined that the provisions of 62-303.351(3), (4), and (5) [except the phrase "over the planning period"], 62-303.390(2)(a), 62-303.450(1) and (4) constitute new or revised water quality standards. EPA determined that the provisions of 62-303.351(1), (2) and (5) [only the phrase "over the planning period"], 62-303.390(2)(e), and 62-303.450(3) do not constitute new or revised water quality standards.

Subsection 62-303.351(1)

A stream or stream segment shall be included on the planning list for nutrients if: ~~the following biological imbalances are observed:~~

(1) The applicable numeric interpretation of the narrative nutrient criterion established in subsection 62-302.531(2), F.A.C., is exceeded;

EPA has determined that while subsection 62-303.351(1) may affect attainment decisions pursuant to section 62-303.450, subsection 62-303.351(1) simply implements the new or revised water quality standards that EPA has approved in the corresponding parts of subsection 62-302.531(2) above, without modifying those provisions. Therefore, subsection 62-303.351(1) does not constitute a new or revised WQS.

Subsection 62-303.351(2)

A stream or stream segment shall be included on the planning list for nutrients if: ~~the following biological imbalances are observed:~~

(2) For streams meeting the definition in subsection 62-302.200(36), F.A.C., the nutrient thresholds in subparagraph 62-302.531(2)(c)2., F.A.C., are exceeded and insufficient Biological Health Assessment data are available to fully assess achievement of the nutrient provisions in subparagraph 62-302.531(2)(c)1., F.A.C.;

Subsection 62-303.351(2) does not affect an attainment decision pursuant to chapter 62-303. EPA has determined that subsection 62-303.351(2) is not a new or revised water quality standard.

Subsection 62-303.351(3)

A stream or stream segment shall be included on the planning list for nutrients if: ~~the following biological imbalances are observed:~~

(3) ~~(1)~~ Algal mats or blooms are present in sufficient quantities to pose a nuisance or hinder reproduction of a threatened or endangered species;

Subsection 62-303.351(3) has been amended to provide for consideration of whether algal blooms in streams, in addition to algal mats, create a problem for threatened or endangered species. This provision may affect attainment decisions pursuant to section 62-303.450 and provides additional clarification of the level of protection provided by FDEP's narrative nutrient criterion that is not provided in chapter 62-302. Therefore, EPA has determined that subsection 62-303.351(3) constitutes a new or revised water quality standard.

For the same reasons outlined in the more comprehensive addition of this text on page 106, the rationale for approval of 62-303.352(2), this provision is consistent with 40 CFR section 131.11(a)(1) as it expands the State's narrative nutrient criteria to contain sufficient parameters or constituents to further protect the designated uses of waters that contain listed species, and the EPA is approving this provision pursuant to section 303(c) of the Act.

Subsection 62-303.351(4)

A stream or stream segment shall be included on the planning list for nutrients if: ~~the following biological imbalances are observed:~~

~~(4) (2) Annual geometric mean chlorophyll a concentrations are greater than 20 ug/l; or if data indicate annual mean chlorophyll a values have increased by more than 50 percent over historical values for at least two consecutive years.~~

62-303.450 refers back to subsection 62-303.351(4), which does not restate a provision contained in 62-302. Therefore, this provision affects an attainment decision and EPA determined that this provision is a new or revised water quality standards.

In EPA's review of the 2007 amendments to the IWR, EPA approved the chlorophyll a level of 20 µg/L for streams, calculated as an annual mean, as a "one-sided" WQS. EPA concluded in its February 19, 2008 decision that the adopted level reflected an impaired status and it was unknown what levels below that threshold were protective. The addition of the modifier "geometric" serves to clarify the type of average utilized for this metric. EPA discusses the rationale for using the geometric mean as a nutrient criteria duration in the preamble to the December 2010 final rule (page 75776). FDEP also discusses this issue in its Technical Support Document for Lakes, Spring Vents and Streams (page 201).

The State also deleted the part of subsection 62-303.351(4) that required an analysis of increases in ambient chlorophyll a levels over historical levels. FDEP has replaced criteria based on increases over historical levels with the chlorophyll a criteria established at 62-302.531(2)(b)1 and 62-302.531(2)(c). Increasing trends of chlorophyll a, in relation to those criteria, are addressed in the discussion of the trend analysis provisions starting on page 48.

Subsection 62-303.351(4) is consistent with 40 CFR section 131.11(a)(1) and section 303(c) of the Act and EPA is approving this subsection as a new or revised water quality standard.

Subsection 62-303.351(5)

A stream or stream segment shall be included on the planning list for nutrients if: ~~the following biological imbalances are observed:~~

(5) There is a statistically significant increasing trend in the annual geometric means at the 95 percent confidence level in TN, TP or chlorophyll a over the planning period using a Mann's one-sided, upper-tail test for trend, as described in Nonparametric Statistical Methods by M. Hollander and D. Wolfe (1999 ed.), pages 376 and 724, which are incorporated by reference herein. Copies of these pages may be obtained from the Department's internet site at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm> or by writing to the Florida Department of Environmental Protection, Standards and Assessment Section, 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400.

Paragraph 62-303.390(2)(a) refers back to this provision when assessing waters for an increasing trend in TN, TP or chlorophyll a. Paragraph 62-303.390(2)(a) does not rely on the thresholds established in subsection 62-303.351(5) to affect an attainment decision. However, subsection 62-303.351(5) also specifies that Mann's one-sided, upper-tail test for trend must be used to demonstrate an increasing trend. Because subsection 62-303.351(5) affects an attainment decision by specifying the applicable

analytical method to be used in that assessment, this provision is a new or revised WQS that is subject to EPA's review under CWA section 303(c) authorities.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.531(4). For the reasons outlined in that discussion, subsection 62-303.351(5), with the exception of the phrase "over the planning period," is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

As discussed more fully on page 83 above, EPA has further determined that the phrase "over the planning period," which establishes an age window for consideration of data under subsection 62-303.351(5), is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

Paragraph 62-303.390(2)(a)

(2) A Class I, II, or III water shall be placed on the study list if:

(a) For waters with a statistically-significant increasing trend in TN, TP, nitrate-nitrite, or chlorophyll *a* pursuant to subsections 62-303.351(5), 62-303.352(3), 62-303.353(4), or 62-303.354(3), F.A.C., the Department confirms there is:

1. A statistically-significant (at the 95 percent confidence level) temporal trend in the annual geometric means after controlling for or removing the effects of confounding variables, such as climatic and hydrologic cycles, seasonality, quality assurance issues, and changes in analytical methods or method detection limits; and
2. A reasonable expectation that the water will become impaired within 10 years, taking into consideration the current concentrations of nutrients or nutrient response variables and the slope of the trend.

Paragraph 62-303.390(2)(a) requires that waters be included on the study list based on a demonstration of an increasing trend in TN, TP, nitrate-nitrite, or chlorophyll *a*, where that trend is statistically significant and there is a reasonable expectation that the water will be become impaired within ten years. This provision affects an attainment decision and establishes a level of protection to be used in making that attainment decision. Therefore, EPA has determined that this provision is a new or revised water quality standards.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.531(4). For the reasons outlined in that discussion, paragraph 62-303.390(2)(a) is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Paragraph 62-303.390(2)(e)

(2) A Class I, II, or III water shall be placed on the study list if:

(e) For streams meeting the definition in subsection 62-302.200(36), F.A.C., the nutrient thresholds in subparagraph 62-302.531(2)(c)2., F.A.C., are exceeded based on data from the last 7.5 years and insufficient Biological Health Assessment, chlorophyll *a*, or other response variable data are available to fully assess achievement of the nutrient provisions in paragraph 62-302.531(2)(c).

F.A.C. A TMDL shall not be established for the waterbody prior to the collection of additional response variable data and the conclusion of the next assessment cycle.

Paragraph 62-303.390(2)(e) affects attainment decisions based on the nutrient thresholds that EPA has approved in subsection 62-302.531(2)(c) above. However, paragraph 62-303.390(2)(e) simply implements those nutrient thresholds without modifying the thresholds. Therefore, paragraph 62-303.390(2)(e) does not constitute a new or revised WQS.

As discussed more fully on page 83 above, EPA has further determined that the 7.5 year data window established in paragraph 62-303.390(2)(e) is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

This provision is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.450(1)

(1) A stream or estuary ~~A water~~ shall be placed on the verified list for impairment due to nutrients if it exceeds the chlorophyll *a* thresholds in subsection 62-303.351(4), F.A.C., or subsection 62-303.353(1), F.A.C., more than once in any consecutive three year period, and there are sufficient data from the last 7.5 five years preceding the planning list assessment, combined with historical data (if needed to establish historical chlorophyll *a* levels or historical TSIs), to meet the data sufficiency requirements of subsection 62-303.350(2), F.A.C. If there are insufficient data, additional data shall be collected as needed to meet the requirements. Once these additional data are collected, the Department shall determine if there is sufficient information, including paleoecological data, to develop a site-specific chlorophyll *a* threshold that better reflects conditions beyond which an imbalance in flora or fauna occurs in the water segment. If there is sufficient information, the Department shall re-evaluate the data using the site-specific thresholds. If there is insufficient information, the Department shall re-evaluate the data using the thresholds provided in subsections Rules 62-303.351(4) and 62-303.353(1) -353, F.A.C., for streams, ~~lakes,~~ and estuaries and verify impairment if there is more than one exceedance in any consecutive three year period ; respectively. In any case, the Department shall limit its analysis to the use of data collected during the last 7.5 five years preceding the planning list assessment and the additional data collected in the second phase. If alternative thresholds are used for the analysis, the Department shall provide the thresholds for the record and document how the alternative threshold better represents conditions beyond which an imbalance in flora or fauna is expected to occur.

Subsection 62-303.450(1) revises the frequency of the chlorophyll *a* thresholds for streams in subsection 62-303.351(4) and estuaries in subsection 62-303.353(1) to allow one exceedance of the chlorophyll *a* concentration every three years.

As discussed more fully below, subsection 62-303.450(1) revises the one-sided impairment threshold of 20 µg/l chlorophyll *a* for streams, which is established in subsection 62-303.351(4). Subsection 62-303.450(1) also references subsection 62-303.353(1), which is not the provision which establishes the one-sided impairment threshold of 11 µg/l chlorophyll *a* for estuaries. Subsection 62-303.353(1) simply implements the new or revised water quality standards that EPA has approved in its review of the respective parts of subsection 62-302.532(1) above, without modifying those provisions. EPA notes that

FDEP apparently intended for this provision to cite subsection 62-303.353(2), which does refer to the estuarine impairment threshold, rather than 62-303.353(1). FDEP has noted this error on page 29 of FDEP's Q&A Document and states that the citation error will be corrected in the next state triennial review. EPA will review the corrected provision when it is submitted to EPA.

As to the revision to the frequency component in the chlorophyll a impairment threshold for streams, FDEP has provided an explanation for the one in three years exceedance frequency on page 27 of FDEP's Q&A Document. In addition FDEP has indicated in its Nutrient Standards Implementation Document that streams with chlorophyll a concentrations between 3.2 µg/L and 20 µg/L will be considered impaired or inconclusive for phytoplankton community health. Streams with inconclusive phytoplankton community health and with TN or TP concentrations above the thresholds established in paragraph 62-302.531(2)(c) will be placed on the study list. Subsection 62-303.450(1) is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.450(3)

(3) If the waterbody was listed on the planning list based on subsections 62-303.351(1), 62-303.352(1), 62-303.353(1), or 62-303.354(1), F.A.C., upon confirming the imbalance of flora or fauna based on the last 7.5 years of data, the Department shall place the waterbody on the verified list for exceedances of the narrative nutrient criteria in paragraph 62-302.530(47)(b), F.A.C.

Subsection 62-303.450(3) covers four waterbody types: streams, lakes, estuaries, and springs, providing that waterbodies exceeding the magnitude, duration, and frequency of the criteria established in Rule 62-302 and referenced in 62-303.351(1), .352(1), .353(1), and .354(1) will be placed on the verified list.

Subsection 62-303.450(3) is described in additional detail in FDEP's Nutrient Standards Implementation Document. In reference to the phrase "upon confirming the imbalance in flora or fauna based on the last 7.5 years of data," the State clarifies that the "only confirmation required is that nutrient criteria have been exceeded within the last 7.5 years, and no additional biological information is required." Implementation Document at page 24. This clarification makes it clear that 62-303.450(3) is specifically referencing the applicable total phosphorus, total nitrogen, chlorophyll a, and/or nitrate+nitrite concentrations contained in 62-302.531 and .532.

Since subsection 62-303.450(3) simply restates the requirements found at in rule 62-302.531 and .532, EPA has determined that subsection 62-303.450(3) does not constitute a new or revised water quality standard subject to EPA's review under CWA section 303(c). Also, as discussed more fully on page 83 above, EPA has further determined that the 7.5 year data window established in subsection 62-303.450(3) is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

Subsection 62-303.450(4)

(4) If the waterbody was listed on the study list for an adverse trend in nutrient response variables pursuant to paragraph 62-303.390(2)(a), F.A.C., the Department shall analyze the potential risk of nonattainment of the narrative nutrient criteria at paragraph 62-302.530(47)(b), F.A.C. This analysis shall take into consideration the current concentrations of nutrient response variables, the slope of the trend, and the potential sources of nutrients (natural and anthropogenic). If there is a reasonable

expectation that the waterbody will become impaired within 5 years, the Department shall place the waterbody on the verified list to develop a TMDL that establishes a numeric interpretation pursuant to paragraph 62-302.531(2)(a), F.A.C.

Subsection 62-303.450(4) covers four waterbody types: streams, lakes, estuaries, and springs. Subsection 62-303.450(4) requires that waters be included on the verified list based on a demonstration of an increasing trend in chlorophyll a, where that trend is statistically significant and there is a reasonable expectation that the water will be become impaired within five years. This provision affects an attainment decision and establishes a level of protection to be used in making that attainment decision. Therefore, EPA has determined that subsection 62-303.450(4) is a new or revised water quality standard.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.531(4). For the reasons outlined in that discussion, subsection 62-303.450(4) is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Nutrient Assessment Provisions for Lakes

Overview

The provisions of 62-303.352(2) and (3) [except the phrase “over the planning period”], 62-303.390(2)(a), and 62-303.450(4) were determined to be new or revised water quality standards, but 62-303.352(1) and (3) [only the phrase “over the planning period”] and 62-303.450(3) were determined not to be new or revised water quality standards. Sections 62-303.390(2)(a) and 62-303.450(3) and (4) are discussed on pages 102-105.

Subsection 62-303.352(1)

Lakes or lake segments shall be included on the planning list for nutrients if:

(1) The numeric interpretation of the narrative nutrient criterion established in subsection 62-302.531(2), F.A.C., is exceeded; For lakes with a mean color greater than 40 platinum cobalt units, the annual mean TSI for the lake exceeds 60, unless paleolimnological information indicates the lake was naturally greater than 60, or

Although 62-303.450 refers back to subsection 62-303.352(1), EPA has determined that subsection 62-303.352(1) simply implements the new or revised water quality standards that EPA has approved in its review of the respective parts of subsection 62-302.531(2) above, without modifying those provisions. This subsection also deletes use of the TSI as an assessment methodology, consistent with revisions to section 62-303.200. EPA’s review of FDEP’s deletion of the TSI and approval of that deletion as a new or revised WQS is discussed above. Therefore, subsection 62-303.352(1) does not constitute a new or revised WQS.

Subsection 62-303.352(2)

Lakes or lake segments shall be included on the planning list for nutrients if:

~~(2) Algal mats or blooms are present in sufficient quantities to pose a nuisance or hinder reproduction of a threatened or endangered species; or For lakes with a mean color less than or equal to 40 platinum cobalt units, the annual mean TSI for the lake exceeds 40, unless paleolimnological information indicates the lake was naturally greater than 40, or~~

Subsection 62-303.352(2) has been amended to provide for consideration of whether algal mats or blooms in lakes create a problem for threatened or endangered species. This provision may affect attainment decisions pursuant to section 62-303.450 and provides additional clarification of the level of protection provided by FDEP's narrative nutrient criterion that is not provided in chapter 62-302. Therefore, EPA has determined that subsection 62-303.352(2) constitutes a new or revised water quality standard.

This provision provides for an aspect of protection of the State's narrative criteria for nutrients that is not part of Florida WQS in Chapter 62-302. Therefore, this provision affects a use attainment decision and EPA determined that this provision is a new or revised WQS.

This provision was revised to state that the presence of sufficient quantities of algal mats or blooms in freshwater lakes that pose a nuisance or hinder reproduction of a threatened or endangered species would require listing of an affected water body on the State's planning list for nutrients. This provision provides an aspect of protection of the State's narrative criteria for nutrients that is not part of Florida WQS in Chapter 62-302. The effects on listed species adopted in this provision - to "pose a nuisance or hinder reproduction" of listed species - are similar to the definition of "take" in section 3(19) of the Endangered Species Act (ESA), which is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The protection of federally listed species is not required in the adoption of state WQS, but such explicit protections adopted by a state facilitate the EPA's ESA section 7 consultations on EPA's CWA section 303(c) review of state-adopted WQS. This provision is consistent with 40 CFR section 131.11(a)(1) as it expands the State's narrative nutrient criteria to contain sufficient parameters or constituents to protect the designated uses of waters that contain listed species, and the EPA is approving this provision pursuant to section 303(c) of the Act.

This subsection also deletes use of the TSI as an assessment methodology, consistent with revisions to section 62-303.200, as discussed above.

Subsection 62-303.352(3)

Lakes or lake segments shall be included on the planning list for nutrients if:

~~(3) There is a statistically significant increasing trend in the annual geometric means at the 95 percent confidence level in TN, TP, or chlorophyll *a* over the planning period using a Mann's one-sided, upper-tail test for trend, as described in Nonparametric Statistical Methods by M. Hollander and D. Wolfe (1999 ed.), pages 376 and 724, which were incorporated by reference in subsection 62-303.351, F.A.C. For any lake, data indicate that annual mean TSIs have increased over the assessment period, as indicated by a positive slope in the means plotted versus time, or the annual mean TSI has increased by more than 10 units over historical values. When evaluating the slope of mean TSIs over time, the Department shall require at least a five unit increase in TSI over the assessment period and use a Mann's one-sided, upper tail test for trend, as described in Nonparametric Statistical Methods by M. Hollander and D. Wolfe (1999 ed.), pages 376 and 724 (which are incorporated by reference), with a 95 percent confidence level.~~

Paragraph 62-303.390(2)(a) refers back to this provision when assessing waters for an increasing trend in TN, TP or chlorophyll *a*. Paragraph 62-303.390(2)(a) does not rely on the thresholds established in subsection 62-303.352(3) to affect an attainment decision. However, subsection 62-303.352(3) also specifies that Mann's one-sided, upper-tail test for trend must be used to demonstrate an increasing trend. Because subsection 62-303.352(3) affects an attainment decision by specifying the applicable analytical method to be used in that assessment, this provision is a new or revised WQS that is subject to EPA's review under CWA section 303(c) authorities.

Similar to the deletion of the TSI provisions in subsections 62-303.352(1) and (2), the TSI increasing trend test was deleted from this provision, which is consistent with the State's deletion of the use of the TSI in Rule 62-303.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.531(4). For the reasons outlined in that discussion, paragraph 62-303.352(3), with the exception of the phrase "over the planning period," is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

As discussed more fully on page 83 above, EPA has further determined that the phrase "over the planning period," which establishes an age window for consideration of data under subsection 62-303.352(3), is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

Nutrient Assessment Provisions for Estuaries

Overview

The provisions of 62-303.353(2), (3), and (4) [except the phrase "over the planning period"], 62-303.390(2)(a), 62-303.450(1) and (4) were determined to be new or revised water quality standards, but 62-303.353(1) and (4) [only the phrase "over the planning period"] was determined not to be a change to water quality standards. Subsections 62-303.390(2)(a) and 62-303.450(1), (3), and (4) are discussed on pages 102-105.

Rationale for Conclusion of WQS and non-WQS

Subsection 62-303.353(1)

Estuaries, estuary segments, or open coastal waters shall be included on the planning list for nutrients if:

(1) The numeric interpretation of the narrative nutrient criterion established in subsection 62-302.531(2), F.A.C., is exceeded;

Although rule 62-303.450 refers back to subsection 62-303.353(1), EPA has determined that subsection 62-303.353(1) simply implements the new or revised water quality standards that EPA has approved in its analysis of subsection 62-302.532(1) above, without modifying those provisions. Therefore, subsection 62-303.352(1) does not constitute a new or revised WQS.

Subsection 62-303.353(2)

Estuaries, estuary segments, or open coastal waters shall be included on the planning list for nutrients if:

~~(2) Their annual geometric mean chlorophyll *a* for any year is greater than 11 ug/l, or if data indicate annual mean chlorophyll *a* values have increased by more than 50 percent over historical values for at least two consecutive years.~~

Rule 62-303.390(2)(a) refers back to this provision, which does not restate a provision contained in 62-302. Therefore, subsection 62-303.353(2) affects an attainment decision, and EPA determined that this provision is a new or revised water quality standard.

In EPA's review of the 2007 amendments to the IWR, EPA approved the chlorophyll *a* level of 11 µg/L for estuaries, calculated as an annual mean, as a "one-sided" WQS. In EPA's February 2008 action on the IWR revisions, EPA concluded the adopted level reflected an impaired status and it was unknown what levels below that threshold were protective. The addition of the modifier "geometric" serves to clarify the type of average utilized for this metric. EPA discusses the rationale for using geometric mean as a nutrient criteria duration in the preamble to the December 2010 final rule. (Page 75776).

The State also deleted the part of subsection 62-303.353(2) that required an analysis of increases in ambient chlorophyll *a* levels over historical levels. FDEP has replaced criteria based on increases over historical levels with the chlorophyll *a* criteria established at 62-302.531(2)(b)1 and 62-302.531(2)(c). Increasing trends of chlorophyll *a*, in relation to those criteria, are addressed in the discussion of the trend analysis provisions starting on page 48.

Subsection 62-303.353(2) is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Subsection 62-303.353(3)

Estuaries, estuary segments, or open coastal waters shall be included on the planning list for nutrients if:

(3) Algal mats or blooms are present in sufficient quantities to pose a nuisance or hinder reproduction of a threatened or endangered species

Subsection 62-303.353(3) provides for consideration of whether algal mats or blooms in estuaries create a problem for threatened or endangered species. This provision may affect attainment decisions pursuant to section 62-303.450 and provides additional clarification of the level of protection provided by FDEP's narrative nutrient criterion that is not provided in chapter 62-302. Therefore, EPA has determined that subsection 62-303.353(3) constitutes a new or revised water quality standard.

This provision provides an aspect of protection of the State's narrative criteria for nutrients that is not part of Florida WQS in Chapter 62-302. Therefore, this provision affects an attainment decision and EPA determined that this provision is a new or revised water quality standards.

For the same reasons outlined in the more comprehensive addition of this text on page 106, the rationale for approval of 62-303.352(2), this provision is consistent with 40 CFR section 131.11(a)(1) as it

expands the State's narrative nutrient criteria to contain sufficient parameters or constituents to further protect the designated uses of waters that contain listed species, and the EPA is approving this provision pursuant to section 303(c) of the Act.

Subsection 62-303.353(4)

Estuaries, estuary segments, or open coastal waters shall be included on the planning list for nutrients if:

(4) There is a statistically significant increasing trend in the annual geometric means at the 95 percent confidence level in TN, TP, or chlorophyll *a* over the planning period using a Mann's one-sided, upper-tail test for trend as described in Nonparametric Statistical Methods by M. Hollander and D. Wolfe (1999 ed.), pages 376 and 724, which were incorporated by reference in subsection 62-303.351(5), F.A.C.

Paragraph 62-303.390(2)(a) refers back to this provision when assessing waters for an increasing trend in TN, TP or chlorophyll *a*. Paragraph 62-303.390(2)(a) does not rely on the thresholds established in subsection 62-303.353(4) to affect an attainment decision. However, subsection 62-303.353(4) also specifies that Mann's one-sided, upper-tail test for trend must be used to demonstrate an increasing trend. Because subsection 62-303.353(4) affects an attainment decision by specifying the applicable analytical method to be used in that assessment, this provision is a new or revised WQS that is subject to EPA's review under CWA section 303(c) authorities.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.531(4). For the reasons outlined in that discussion, subsection 62-303.353(4), with the exception of the phrase "over the planning period," is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

As discussed more fully on page 83 above, EPA has further determined that the phrase "over the planning period," which establishes an age window for consideration of data under subsection 62-303.353(4), is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

Nutrient Assessment Provisions for Springs

Overview

The provisions of 62-303.354(3) [except the phrase "over the planning period"], 62-303.390(2)(a), and 62-303.450(4) were determined to be new or revised water quality standards, but 62-303.354(1), (2), and (3) [only the phrase "over the planning period"] were determined not to be new or revised water quality standards. Sections 62-303.390(2)(a) and 62-303.450 (3) and (4) are discussed on pages 102-105.

Rationale for Conclusion of WQS and non-WQS

Subsection 62-303.354(1)

A spring vent in predominantly fresh waters shall be included on the planning list for nitrate-nitrite if:

(1) The numeric interpretation of the narrative nutrient criterion established in subsection 62-302.531(2), F.A.C., is exceeded;

Although rule 62-303.450 refers back to subsection 62-303.354(1), EPA has determined that subsection 62-303.354(1) simply implements the new or revised water quality standards that EPA has approved in its analysis of the respective part of subsection 62-302.531(2)(b)2. above, without modifying those provisions. Therefore, subsection 62-303.354(1) does not constitute a new or revised WQS.

Subsection 62-303.354(2)

A spring vent in predominantly fresh waters shall be included on the planning list for nitrate-nitrite if:

(2) Algal mats or blooms are present in sufficient quantities to pose a nuisance or hinder reproduction of a threatened or endangered species;

Neither the study list or verified list provisions refer back to this provision and it does not modify any WQS in 302. Since this provision applies solely to the planning list and is not used in attainment decisions, EPA determined this provision is not a new or revised water quality standard.

Subsection 62-303.354(3)

A spring vent in predominantly fresh waters shall be included on the planning list for nitrate-nitrite if:

(3) There is a statistically significant increasing trend in the annual geometric means at the 95 percent confidence level in nitrate-nitrite over the planning period using a Mann's one-sided, upper-tail test for trend.

Paragraph 62-303.390(2)(a) refers back to this provision when assessing waters for an increasing trend in TN, TP or chlorophyll *a*. Paragraph 62-303.390(2)(a) does not rely on the thresholds established in subsection 62-303.354(3) to affect an attainment decision. However, subsection 62-303.353(4) also specifies that Mann's one-sided, upper-tail test for trend must be used to demonstrate an increasing trend. Because subsection 62-303.354(3) affects an attainment decision by specifying the applicable analytical method to be used in that assessment, this provision is a new or revised WQS that is subject to EPA's review under CWA section 303(c) authorities.

A detailed discussion of the trend analysis is set out beginning on page 48 above, as part of the discussion of the downstream protection provisions established at subsection 62-302.534(3). For the reasons outlined in that discussion, subsection 62-303.354(3), with the exception of the phrase "over the planning period," is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

As discussed more fully on page 83 above, EPA has further determined that the phrase "over the planning period," which establishes an age window for consideration of data under subsection 62-303.354(3), is not a water quality standard but is an assessment methodology for purposes of identifying water quality limited segments.

Revisions to 62-303.420

The majority of the changes to provisions in this section are in 62-303.420(1)(b). Other provisions included editorial revisions to the term “waterbody” or had no changes at all. These types of changes were not reviewed by the EPA. The revisions to 62-303.420(1)(b) are described below the specific text now adopted by the State.

(1)(b) If the Department has information suggesting that the values not meeting the dissolved oxygen (DO) criterion are due to natural background conditions, ~~including information about the in-stream concentrations of TN, TP, and BOD relative to comparable reference waters for waterbodies with values below the DO criterion,~~ it is the Department’s intent to support that conclusion through the use of Biological Health Assessments ~~bioassessment~~ procedures referenced in Rule 62-303.330, F.A.C. The ~~waterbody~~ water body or segment shall not be included on the verified list for DO ~~the parameter of concern~~ if two or more temporally independent Biological Health Assessments ~~bioassessments~~ indicate the waterbody supports the protection and maintenance of a healthy, well-balanced population of fish and wildlife. ~~are conducted and no failures are reported.~~ In addition, the Biological Health Assessments shall be conducted in the same waterbody segment, or for streams, in the adjacent downstream waterbody segment where the water quality samples were taken. These Biological Health Assessments shall be conducted on the same day or after the water quality samples were collected. ~~To be treated as independent bioassessments, they must be conducted at least two months apart, within the assessed segment downstream of where the samples were measured, and after the samples were measured.~~

Subsection 62-303.420(1)(b) describes how FDEP will consider whether ambient DO values that do not meet the State’s water quality criterion are due to natural background conditions. The revisions to subsection 62-303.420(1)(b) do not modify the definition of natural background condition, found in section 62-302.200(19), including the requirement that man-induced alterations not cause or contribute to the values which are not meeting DO. Subsection 62-303.420(1)(b) no longer provides that FDEP’s conclusions may be supported by reference water information, and the revisions to this subsection incorporate the newly adopted Biological Health Assessments (BHAs) as support for FDEP’s conclusion that a waterbody should not be included on the verified list, pursuant to 62-303.330. EPA notes that the BHAs developed by FDEP are not intended to represent natural conditions, but are intended to act as thresholds of impairment, above which the State has determined that designated uses are supported. Since designated use support is not equivalent to a natural condition, the BHA values may not be used as the basis for FDEP’s conclusion that DO values are due to natural conditions. Rather, those scores may only be used as supporting information as to the relative health of the waterbody, as opposed to establishing whether the waterbody is affected by man-induced alterations. As provided on page 30 of FDEP’s Q&A Document, FDEP still plans to “document for the record the basis for its conclusion that the DO exceedances are due to natural background conditions, and this demonstration will include comparison of the waterbody’s nutrient and BOD levels to reference conditions and evaluation of potential anthropogenic sources of nutrients or BOD in the watershed.”

As applied in rules 62-302.200(19) and 62-303.420(1)(b) to interpret natural background for assessment purposes, and clarified above, this provision is protective of the designated use and is consistent with the requirements of 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

Revisions to 62-303.710

The only revision to this section was to add the following sentence:

(3) For waters impaired for dissolved oxygen, the Department shall identify the pollutants causing or contributing to the impairment and list both the pollutant and dissolved oxygen on the verified list. If the factor(s) causing the impairment cannot be identified, the water shall be placed on the study list.

Subsection 62-303.710(3) is administrative in nature and describes the methodology FDEP is to use to develop verified lists and what specific information verified lists should contain. Placing waters impaired for dissolved oxygen on the study list until the factor causing the impairment is identified does not establish a level of protection related to the magnitude, duration, or frequency of water quality criteria. By placing these waters on the study list, FDEP is recognizing that the waters are not attaining the state's dissolved oxygen criteria. EPA has concluded that IWR provision 62-303.710 does not constitute a new or revised water quality standard.

Revisions to 62-303.720

The majority of the substantive changes to provisions in this section are in 62-303.720(2). Other changes included editorial revisions to the term "water" or inclusion of references to the study list. These types of changes were not reviewed by the EPA. The revisions to 62-303.720(2) below provide the specific text now adopted by the State.

(2) Waterbody segments shall be removed from the State's verified list only after adoption completion of a TMDL, a Department determination that pollution control programs provide reasonable assurance that water quality standards will be attained pursuant to Rule 62-303.600 F.A.C., for all pollutants causing impairment of the segment or upon demonstration that the waterbody meets the water quality standard that was previously established as not being met.

(a) No change.

(b) For waters listed due to failure to meet aquatic life use support based on biological data, the waterbody shall be delisted when the two most recent independent Biological Health Assessments indicate the waterbody is no longer impaired pursuant to subsection 62-303.430(2), F.A.C. the segment passes two independent follow-up bioassessments and there have been no failed bioassessments for at least one year. The follow-up tests must meet the following requirements:

1. For streams, the new data must be ~~may be two BioRecons or any combination of BioRecons and SCIs unless the SCI is not appropriate for the waterbody type, in which case the new data shall consist of the Shannon-Weaver Diversity Index.~~

2. The Biological Health Assessments bioassessments must be conducted during similar conditions (same seasons and general flow conditions) under which the previous Biological Health Assessments bioassessments used to determine impairment were collected.

3. through (i) No change.

(j) For waters listed based on nutrient impairment, the waterbody shall be delisted if it does not meet the listing thresholds in Rule 62-303.450, F.A.C., for three consecutive years, or it is demonstrated to not exceed the narrative nutrient criteria at paragraph 62-302.530(47)(b), F.A.C., pursuant to the provisions of subsection 62-303.450(3), F.A.C.

(k) No change.

(l) For waters listed based on paragraph 62-303.420(7)(b), F.A.C., or subsection 62-303.470(3), F.A.C., the waterbody shall be delisted if the Department determines the waterbody is no longer impaired, based on scientifically credible and compelling information comparable in quantity and quality to the information used to make the initial listing decision. Any determinations to delist waters based on this provision shall be documented, and the documentation shall include the basis for the decision.

Table 4. No change.

(m) No change.

(n) For waterbodies listed on the verified list, the water shall be delisted from the verified list and added to the study list when subsequent analysis demonstrates that the cause of the impairment was incorrect or otherwise demonstrates that a TMDL is not appropriate.

Paragraphs 62-303.720(2)(b) and (j) were determined to be new or revised WQS, and the remainder of the revisions to Section 62-303.720 are not new or revised WQS.

EPA has concluded that the revisions to 62-303.720(2)(b) constitute new or revised WQS because they revise the process that the State may use to remove waters from the verified list and utilize biological assessment criteria contained in 62-303.430(2) to make delisting decisions for previous non-attainment decisions that identified water quality limited segments. This provision now allows the use of Biological Health Assessments, specifically the SCI or the Shannon-Weaver Diversity Index, to remove waters from the verified list. EPA discusses the SCI on pages 38-40 of this document and the Shannon-Weaver Diversity Index on page 91. The requirement that the two most recent independent Biological Health Assessments indicate the waterbody is no longer impaired is a reasonable and protective provision for removing a water from the verified list. The SCI and Shannon-Weaver Diversity Index are reasonable biological indices for this purpose.

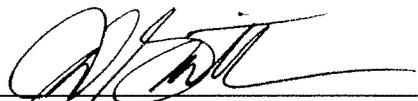
Several of the deletions in 62-303-720(2)(b) remove more general language regarding the biological assessments, replaced the use of BioRecons with the SCI and replaced the term “bioassessment” with “Biological Health Assessment.” These changes result from the State’s adoption of new and revised specific biological assessment tools which will provide information regarding the condition of the water. An additional deletion removes the condition that there be no failed bioassessments for at least one year. The revised requirement regarding the two most recent biological assessments makes this condition unnecessary.

Therefore, these revisions to 62-303-720(2)(b) are consistent with 40 CFR Part 131 and the CWA and are approved by EPA pursuant to section 303(c) of the Act.

The revision to paragraph 62-303-720(2)(j) adds a provision that waters be delisted if they are demonstrated to not exceed the narrative nutrient criteria at paragraph 62-302.530(47)(b) pursuant to 62-303.450(3). EPA has concluded that the revision to provision 62-303.720(2)(j) constitutes a new or revised water quality standard because it further defines the use of biological assessment data in making delisting decisions for previous non-attainment decisions that identified water quality limited segments. This revision to 62-303-720(2)(b) is consistent with 40 CFR Part 131 and the CWA and is approved by EPA pursuant to section 303(c) of the Act.

NOV 30 2012

Date



James D. Giattina
Director, Water Management Division

Appendix A

EPA Review of Development of Type III Site Specific Alternative Criteria for Nutrients

The document, *Development of Type III Site Specific Alternative Criteria for Nutrients*, FDEP Bureau of Assessment and Restoration Support, October 24, 2011, (SSAC Development Document) is referenced in 62-302.800(3)(a)2. and (3)(b) in Florida's Nutrient Rule:

62-302.800(3)(a)2. The Department shall establish a Type III SSAC if all of the following conditions are met: ... The petitioner provides sufficient data to characterize water quality conditions, including temporal variability, that are representative of the biological data used to support the SSAC. The water quality data shall be collected in the same waterbody segment as the biological monitoring stations and at a frequency and duration consistent with the study design concepts described in the document titled *Development of Type III Site Specific Alternative Criteria (SSAC) for Nutrients (DEP-SAS-004/11)*, dated October 24, 2011, which is incorporated by reference herein.

62-302.800(3)(b) The SSAC shall be established at a level representative of nutrient loads or concentrations that have been demonstrated to be protective of the designated use by maintaining balance, natural populations of aquatic flora and fauna. This demonstration shall take into account natural variability by using statistical methods appropriate to the data set, as described in *Development of Type III Site Specific Alternative Criteria for Nutrients (DEP-SAS-004/11)*.

The EPA reviewed the SSAC Development Document to determine whether any provisions in the document constitute new or revised water quality standards (WQS). Provisions that describe the sufficiency or reliability of information necessary to support the FDEP decisions are not WQS because they are not a designated use, do not establish a criterion, and do not modify the state's antidegradation policy. The EPA interprets Clean Water Act (CWA) section 303(c)(2)(A), and its implementing regulations at 40 C.F.R. Part 131, not to include such a provision as a WQS as that term is used in section 303(c)(2)(A) of the CWA and its implementing regulations at 40 C.F.R. §§ 131.3(b), 131.3(i), 131.5(a)(2), 131.6(c), 131.11, and 131.20. Unless otherwise stated, a provision of the SSAC Development Document is not a WQS that is subject to review by the EPA under its CWA section 303(c) authorities. However, each Type III SSAC adopted by the State in the future pursuant to the provisions of the SSAC Development Document will be reviewed by the EPA as a new or revised WQS under CWA § 303(c) authorities on the merits of the information and demonstrations required under 40 C.F.R. § 131.11.

The provisions of the SSAC Development Document (1) describe the types of data and information, as well as the sufficiency and reliability of the data and information that the FDEP needs to make a decision on a Type III SSAC pursuant to the Florida Nutrient Rule, (2) provide information on the applicability of quality assurance protocols and statistical considerations to ensure that a Type III SSAC is supported by sound science, (3) establish guidance for the derivation and expression of Type III SSAC, including the magnitude, duration and frequency components of a SSAC, and (4) include examples of analytical or assessment methodologies and other recommendations for developing Type III SSAC that can be used to comply with the regulatory requirements in the Rule. These provisions clarify the circumstances that must exist for the FDEP to make a SSAC decision in the first instance and

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contain policy choices about the types of data that are best suited for that purpose, and the reliability of those data.

Section 1 of the SSAC Development Document, entitled *Purpose of Document*, states that the purpose of the document is to “provide information about data requirements and studies needed to support the establishment of Type III SSAC for nutrients as described in Rule 62-302.800, Florida Administrative Code,” and also states that “the **guidance** provided in this document is also intended to ensure that data submitted to the DEP are consistent with the requirements of DEP rules.” (emphasis added)

Section 2.1 of the SSAC Document, entitled *SSAC Background*, restates the requirements of 62-302.800(3) for adoption of Type III SSAC, stating that a Type III SSAC must:

- Fully protect the designated use (pursuant to 62-302.800(3)(b));
- Demonstrate support of the narrative nutrient criterion in subparagraph 62-302.530(47)(b) (pursuant to 62-302.800(3)(a)1.);
- Be based on a sound, scientific rationale (pursuant to 62-302.800(3)(a) and (b)); and
- Protect downstream waters (pursuant to 62-302.800(3)(a)3.).

The provisions of Sections 1 and 2.1 are intended to provide clarification to the public about the regulatory provisions in Rules 62-302 and 62-303 that are discussed in the SSAC Document, and these provisions of the SSAC Document do not constitute new or revised WQS.

Section 2.2 of the SSAC Document, entitled *Study Design for Type III SSACs*, states that water chemistry, biological data and physical information are needed to evaluate whether a waterbody achieves the narrative criterion for nutrients. This section states, “Because of the complexity associated with nutrient enrichment effects, no single assessment tool is adequate to evaluate all potential impacts, and instead, a weight-of-evidence evaluation must be conducted.” This section also refers to another FDEP document, *Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer* (DEP-SAS-001/11). The EPA’s conclusions regarding that document are summarized in the EPA’s review of subsection 62-302.200(37) in the EPA’s Review of Amendments to Florida Rules 62-302 and 62-303.

Section 2.2 restates the requirements of 62-302.531(2)(c)1. and 2., which provide for interpretation of the narrative nutrient criterion using nutrient thresholds in conjunction with biological information. Section 2.2 also includes a discussion of the number of stations that should be sampled in the evaluation of a SSAC and states that SSAC may be established for multiple stream segments if those segments “have homogeneous nutrient concentrations.” These provisions of the SSAC Document do not provide additional regulatory detail beyond that included in the Rule. Such provisions are intended to provide clarification to the public about the regulatory provisions in Rules 62-302 and 62-303 that are discussed in the SSAC Document, and these provisions of the SSAC Document do not constitute new or revised WQS.

This section also restates the SCI sampling requirements of 62-302.800(3)(a)1.a.ii., and specifies that SCI assessment scores at the same location at an interval of less than three months apart “are considered to be one sample, with the mean value used to represent the sampling period.” Section 2.2 also provides clarification in regard to the water quality sampling required in a SSAC evaluation under 62 -

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303.800(3)(a)2, which states that a petitioner for a SSAC demonstration must provide “sufficient data to characterize water quality conditions, including temporal variability, that are representative of the biological data used to support the SSAC.” Section 2.2 requires that bioassessment data “must be collected within the same years as the water quality data that is used to establish the SSAC. Section 2.2 also includes other provisions that provide recommendations and guidance for conducting biological, water quality and physical assessments in support of a Type III SSAC, including choosing sampling sites that are representative of the stream segment, the sufficiency of water quality data (including frequency and duration of the sampling efforts), the location of sampling sites, and the exclusion of certain data during certain “extreme climatic or hydrologic conditions.” The guidance outlined in these provisions does not change or refine the requirements in 62-302.800(3) that a Type III SSAC must fully protect the designated use of the waterbody to which the SSAC applies and the waterbody achieves the narrative nutrient criterion in 62-302.530(47)(b) , and do not establish or revise the magnitude, duration, or frequency of a water quality criterion. Rather, these provisions relate to the data distribution requirements or simply describe the sufficiency or reliability of data and information the FDEP needs to make these findings. Therefore, these provisions are not new or revised WQS for the purposes of the EPA’s CWA section 303(c) review.

Section 2.2 also restates the options available to a Type III SSAC petitioner to show that a Type III SSAC is protective of downstream waters. This section states that the first step that a petitioner should take in determining downstream protection is to review DEP’s website to determine if any downstream waters are on the State’s Verified List as impaired for nutrients, and states, “If the downstream waters attain water quality standards related to nutrient conditions, protection of downstream waters has been demonstrated.” Downstream nutrient standards include the water quality criteria established for these waters, as well as any other provisions of nutrient WQS that the EPA has determined to be a new or revised WQS pursuant to CWA section 303(c), e.g., WQS provisions of the increasing trend analyses in 62-303.351(5) 62-303.352(3), 62-303.353(4) and 62-303.354(3) for the Planning List, 62-303.390(2)(a) for the Study List, 62-303.450(4) for the Verified List which apply to the evaluation of increasing trends of ambient levels of chl a, TN, and TP, and to a lesser degree by the provisions of 62-303.330(3)(d)2., 62-303.430(2)(c) relating to evaluation of changes to LCI values.

If downstream waters are reported as not attaining nutrient standards, the petitioner must demonstrate:

... the nutrient levels established by the Type III SSAC, when delivered to downstream waters, either: a. meet the allocations of a downstream TMDL; or b. provide for the attainment and maintenance of water quality standards, using water quality models or other scientifically defensible methods.

This part of Section 2.2 does not provide any additional requirements or restrictions on how downstream WQS protection is demonstrated, and these provisions are not new or revised WQS for the purposes of the EPA’s CWA section 303(c) review.

Section 2.3 of the SSAC Development Document, entitled, *Statistical Consideration for Developing Type III SSACs*, provides guidance for data sufficiency requirements and for the derivation and expression of Type III SSAC, in relation to data variability and statistical analyses. Section 2.3 states:

When developing numeric criteria (NNC) to protect and maintain a healthy, well-balanced community, it is important to account for natural variability in both the nutrient regime and in the biological communities, as well as other influences on the ecosystem. Derivation of nutrient criteria must be based on a sound scientific rationale, which requires adherence to the DEP’s QA

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Rule (Chapter 62-160, F.A.A.) and identification of a reasonable ecological linkage between nutrients and protection of the designated use. The criteria should also account for and manage confounding factors during derivation, and control for Type I errors (incorrectly concluding that a system is healthy, when it is actually impaired [a “false negative”]). Statistical techniques should be selected to manage errors and explain variability.

Section 2.3 includes a discussion of these issues, stating that data should be collected to estimate the variability of nutrients and chlorophyll a levels, in order to sufficiently define the magnitude, frequency and duration of SSAC, and states:

For Type III SSACs, the magnitude shall be set at a level that maintains the current data distribution of a healthy existing condition, accounting for natural temporal variability. The magnitude component **can be** set maintain the long-term central tendency (e.g., geometric mean) of the distribution, while the frequency and duration components describe how often, and by how much, the nutrient concentrations can be above the central tendency while still being consistent with the baseline distribution. (emphasis added)

This section also includes the following list of factors to be considered in developing sufficient data in support of a Type III SSAC:

The quality of the data to be used;

The spatial and temporal variability of the water quality constituent;

Measurement errors associated with sampling and testing;

The appropriateness of statistical treatment of the data and the rationale for its selection, including the handling of values less than the detection limit (generally, one half the detection limits is a good estimate if detection limits are consistent); and

That data were collected at suitable sites and during appropriate conditions to evaluate the parameter of concern.

This section also discusses factors that affect the ability to accurately characterize a distribution of samples: sample size, variability, level of significance, power, and minimum detectable effect.

All of the above provisions of Section 2.3 describe the types of data and information, or the sufficiency or reliability of data and information, which can be used in derivation of a Type III SSAC for an individual waterbody, and do not constitute a new or revised WQS.

Section 2.3 also provides guidance regarding the application of statistical attributes of a data set in the establishment of the magnitude, frequency and duration of a Type III SSAC. This section discusses acceptable error rates which can be used to establish the magnitude of a Type III SSAC and acceptable excursion frequencies of a Type III SSAC. Although the State recommends the use of a 10% Type 1 error rate, Section 2.3 states “DEP will consider lower Type 1 errors on a case by case basis in situations when the variance of nutrient is well qualified, such as a long data record (e.g., monthly for 10 to 20 years) or when an independent variable (e.g., color, salinity) can be used to explain a large portion of the variability in the nutrient parameter ...”

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This section also discusses allowable excursion frequencies, stating “Although DEP will consider alternative frequency and duration expressions for SSACs, DEP recommends establishing alternative criteria at either the 80th or 90th percentile to be expressed as either an annual geometric mean not be exceeded more than one in a three-year period or more than once in a five-year period, respectively.” Table 2 of Section 2.3 is a list of percentile targets to achieve acceptable exceedance frequencies for annual geometric mean concentration assessment periods from three to five years that would be expected to have a Type 1 error rate of 10% or 5%. Therefore this section does not require expression of SSAC using a certain exceedance frequency.

Section 2.3 also states:

The statistical methods described in the previous paragraphs are approaches that DEP has used in the past to derive nutrient thresholds and are consistent with the methods used to develop the Nutrient Watershed Region Nutrient Thresholds in Rule 62-302.531, F.A.C. However, an entity has the option of petition for a SSAC derived using alternative statistical methods as long as the petition describes the statistical assumptions as well as how the proposed threshold is consistent with a Type 1 error rate of not greater than 10%.

Given the caveats regarding the use of alternative methods, and the range of choices in the expression of a SSAC, including DEP’s allowance of different Type 1 error rates “on a case by case basis,” the EPA has determined that these provisions of Section 2.3 are not WQS provisions, because they do not require that SSAC be expressed based on specific statistical attributes or a specific exceedance frequency.

Section 2.3 also discusses factors that relate to the sufficiency of data that can be used in the development of a Type III SSAC. For the reasons outlined above in the EPA’s review of Section 2.2, those provisions are not WQS that are subject to the EPA’s review authorities under CWA section 303(c).

Section 2.3 also includes a discussion of how these statistical considerations are applied through the use of equations and statistical techniques. This section also describes the acceptability of data that can be used in the statistical analysis. For example, on page 14:

This alternative is based on the logical argument that if concentrations during the SSAC study are protective of healthy biology and nutrient concentrations have not changed over the period of record, then the historic concentrations must have been protective of healthy biology. However, if nutrient concentrations have decreased and there are no biological data to demonstrate that the previous high nutrient levels were associated with healthy biology, it cannot be assumed that the waterbody supported healthy biology during the entire period of record. Consequently, the SSAC must be derived using only data from the study period.

These types of statements provide guidance on the type of data that can be used, but do not definitively establish qualifying criteria that must be used, to judge the acceptability of individual measurements in a Type III SSAC evaluation. These statements are not provisions that are subject to the EPA’s CWA section 303(c) review.

Section 3 of the Type III SSAC Development Document, entitled *Applicability of Quality Assurance (QA) to Type III SSACs*, includes a discussion of the sufficiency and reliability of data and staff qualification criteria that are needed to ensure the data for a waterbody under consideration for a Type

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III SSAC are appropriate for nutrient study objectives. Therefore, these provisions are not new or revised WQS for the purposes of the EPA's CWA section 303(c) review.

Section 4, entitled *Example Type III SSACs*, includes two examples that the State has determined would be appropriate for Type III SSAC. However, these examples do not establish any additional requirements or restrictions on the development of Type III SSAC, and do not provide additional regulatory detail beyond the WQS adopted in Rules 62-302 or 62-303, or provisions of the Type III SSAC Development Document that the EPA has determined to be WQS. This section is intended to provide clarification to the public about the regulatory provisions discussed, including providing examples of how the provisions could be implemented, and do not constitute a new or revised WQS.