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Technical Memorandum

Prepared for: Mosaic Fertilizer, LLC

Subject: Triennial Review Comments for Submission to FDEP

Date: November 22, 2019

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Introduction

The Florida Department of Environmental Protection (FDEP) has initiated its Triennial Review of water quality standards. Proposed revisions to several portions of the Florida Administration Code (F.A.C.) including 62-302, F.A.C., 62-303, F.A.C., and the *Implementation of Florida's Numeric Nutrient Standards* document (NNC Implementation Document; FDEP 2019) have been made public for review and comment. This memorandum (memo) details comments developed by Brown and Caldwell (BC) on behalf of Mosaic Fertilizer, LLC (Mosaic) for submission to FDEP. We respectfully request that FDEP considers these comments prior to finalizing revisions to Florida's water quality standards and requesting approval of the changes by the U.S. Environmental Protection Agency (EPA).

Many of the substantive revisions proposed by FDEP center on Florida's numeric nutrient criteria (NNC), and therefore most of our comments also focus on proposed revisions to NNC. Some comments request additional clarification on proposed revisions or additional information on how the proposed revision would be implemented. Where possible, we have suggested rule language we believe will help to clarify, and allow for better understanding of, existing and proposed revisions to water quality standards.

As a general comment, we appreciate the additional detail FDEP has provided to several sections of the NNC Implementation Document (FDEP 2019). Implementation of NNC is challenging for FDEP and affected stakeholders alike, and the additional detail will help regulated entities comply with NNC regulations in an efficient and cost-effective manner.

Our comments focus on adding additional clarity and understanding to Florida's water quality standards implementation to develop a streamlined approach to compliance to the benefit of both FDEP and affected stakeholders.

Comments on Proposed Revisions

1. FDEP needs to provide clarity regarding implementation of the proposed narrative turbidity language.

FDEP is proposing to add language to the current turbidity water quality criterion for Class I, II, and III waters that states "...nor shall turbidity levels be increased to levels that negatively affect designated uses or result in increased sedimentation or reduced light transmission to the point that the normal growth, function, reproduction, or recruitment of aquatic life is impaired" (62-302.530(70)(a), F.A.C). It is unclear what issue FDEP is attempting to solve by adding the narrative language to the turbidity criterion. The threshold value of 29 NTU above natural background is still applicable. Therefore, presumably, the narrative language would apply to waterbodies that demonstrate narrative impairment at turbidities less than the 29 NTU threshold. The application of the narrative language could be viewed as more stringent than the numeric criterion. Thus, the proposed rule change requires a clear understanding of why the narrative language is necessary and how the assessments will be completed. FDEP has not included any information regarding how the assessments would be completed to determine that "normal growth, function, reproduction, or recruitment of aquatic life is impaired." Additionally, FDEP has not stated under what circumstances such a determination is required.

We respectfully request FDEP provide the necessary technical support documentation to justify why the narrative language is necessary, what water quality issue the narrative language aims to address, how the assessments would be completed, and what biological communities are being assessed.



2. Proposed definitions of stream perennality are beneficial but require additional clarification.

FDEP is proposing to better define what constitutes a perennial stream and, therefore, the applicability of NNC. We support FDEP's effort to provide clarity on the perennial definition, as this will help the regulated community and reduce uncertainty in permitting and assessment scenarios. We also support the specific definitions FDEP is proposing to include in the NNC Implementation Document (FDEP 2019) using hydrologic indicators and the HydroBioGeomorphic (HBG) Classification System developed by Dr. John Kiefer in addition to the current biological indicators.

We respectfully request FDEP consider how these indicators will work together when applied in a real-world situation and clarify how determinations of perennality will be made. For example, it is conceivable that not all three indicators will result in the same determination of perennality, leaving uncertainty in whether NNC apply to the waterbody. Will one of the three indicators (hydrologic, biological, or HBG) be preferred over another in making determinations? If so, what scientific basis is being used for the prioritization?

Given the proposed changes in indicators to determine what constitutes a perennial stream, the stream definition in 62-302.200(38), F.A.C. (proposed version) should also be updated to reflect these changes. Currently, the stream definition in 62-302.200(38)(a), F.A.C. reads:

"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, 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." (emphasis added)

This language focuses solely on the biological indicator for the determination of a non-perennial water segment. We recommend FDEP review the stream definition and determine if changes are necessary to address the new methods of determining perennality.

3. Implementation methodology for chlorophyll-a reference stream assessment should be included in the NNC Implementation Document.

Section 6.7 of the revised NNC Implementation Document (FDEP 2019) discusses the process of evaluating chlorophyll-a levels for NNC compliance. FDEP states:

"Streams with annual average chlorophyll a values between 3.2 µg/L and 20 µg/L are evaluated on a site specific basis by comparing the values to chlorophyll a values for reference streams in the region. Factors such as upstream sources of chlorophyll a, water residence time, flow, color, climatological conditions, and size of the stream/river (i.e., stream order) are considered when comparing the chlorophyll a values to values for reference streams in the region." (FDEP 2019)

Although FDEP has not proposed any changes to this language from the previous version, the revised NNC Implementation Document does not offer any additional details on how this reference comparison will be completed. Answers to the following questions would help regulated entities understand what to expect in regulatory processes that include NNC compliance demonstration and improve certainty in the permitting process:

- Who is responsible for selecting a reference stream(s) for a particular demonstration, FDEP or the permittee?
- Who is responsible for potential contemporaneous data collection in a selected reference stream?

- What assessment and/or statistics will be used to determine if a subject stream is “similar” or “different” from a reference stream?
- What are the permittee’s options if a reference stream cannot be identified or lacks sufficient data for a comparison?

We recommend FDEP add a discussion and decision key to the NNC Implementation Document describing how the reference stream comparison for chlorophyll-a is expected to be completed. Providing this information and allowing for discussion concerning its applicability will improve certainty for regulated entities as well as transparency in the assessment process.

4. FDEP needs to define the assessment that will be used to “link” a failing Linear Vegetation Survey (LVS) score to anthropogenic nutrient inputs.

The LVS assessment is described in section 6.6 of the revised NNC Implementation Document (FDEP 2019). The document states that streams with failing LVS scores will be placed on the Study List for evaluation to determine if LVS results can be linked to anthropogenic nutrient enrichment. If the evaluation concludes that nutrient enrichment did contribute to the LVS failures, the waterbody will be listed impaired for a floral imbalance. Conversely, if a link to anthropogenic nutrient inputs cannot be identified, the waterbody will be removed from the Study List and the other floral metrics (Rapid Periphyton Survey and chlorophyll-a) will be used in NNC determinations. Therefore, this evaluation is the single pathway for LVS assessments to lead to a floral imbalance for a waterbody. Given the importance of this evaluation, FDEP needs to describe in detail how this evaluation will be done, what types of data are necessary, and what thresholds (and justification for them) will be used to determine whether a “link” is present.

Currently, the NNC Implementation Document (FDEP 2019) lacks any discussion on the LVS assessments and potential links to anthropogenic nutrient enrichment. FDEP needs to clearly define this evaluation and add the description to the NNC Implementation Document allowing for a transparent discussion of its application to NNC with regulated stakeholders. The evaluation to be used to link LVS results to anthropogenic nutrient inputs is a critical component of the floral metrics and needs to be clearly defined in order to ensure a scientifically defensible and consistent application of NNC.

5. Floral assessments should utilize all data available for a WaterBody Identification Unit (WBID) during an assessment period and not rely solely on single station outcomes.

The revised NNC Implementation Document discusses the use of floral assessments in 303(d) listing determinations of NNC (FDEP 2019; Section 10.1). This section states that if any single station within a WBID fails the floral evidentiary thresholds, the WBID will be listed as not meeting the floral NNC metrics and placed on the 303(d) list as impaired for NNC, regardless of whether the failing stations are the most recent results in the WBID. We recommend FDEP reconsider this proposed revision to the NNC Implementation Document and focus on the utilization of all available appropriate data to make a WBID-wide determination of floral health.

It is not clear why FDEP would rely only on available “failing” data to represent a WBID, discounting any “healthy” data. Focusing on failing data from a single location within a WBID undermines the WBID approach to conducting waterbody assessments, for which the purpose is to represent waterbody segments with similar attributes for robust assessments. WBIDs are intended to represent reasonably homogenous segments of a waterbody for the purposes of applying assessment criteria throughout a WBID. All representative data for a given WBID are intended to contribute to the assessment of that waterbody segment for the purposes of determining compliance with water quality standards. Use of only a single

station in any WBID can ignore additional information from the WBID that can be used to more accurately assess the waterbody. For example, if a given WBID has three stations, and two of them indicate passing floral metrics and one indicates failing floral metrics, FDEP would conclude this WBID fails the floral NNC metrics. However, in such a case, this approach ignores a majority of the data for a WBID, ignores data that indicate healthy floral conditions, and results in an impairment determination for a Waterbody segment (WBID) that is intended to represent the overall condition of a WBID and not just a single point within it. During the development of NNC, FDEP emphasized that NNC were being established, and would be implemented, on a WBID-wide basis and not as values to be applied at single points. FDEP's NNC implementation guidance provides instruction on how information is to be interpreted both spatially and temporally to assess a WBID while considering the variability within it.

Section 10.1 of the revised NNC Implementation Document (FDEP 2019) is specific to floral metrics and does not include faunal metrics. FDEP has not provided any language regarding why it is important for floral metrics to be assessed station by station, but faunal metrics are to be averaged across a WBID. Stream Condition Index (SCI) scores are routinely averaged from multiple stations in a WBID to determine the overall macroinvertebrate health of a homogenous segment of a waterbody. In fact, the Impaired Waters Rule (IWR) requires averaging of SCI scores from multiple assessments and stations to determine if the overall WBID score satisfies the threshold requirement (62-303.430, F.A.C.). Given this approach for faunal data, it is surprising that FDEP would seek to change the WBID-wide approach for a floral metric in the opposite direction. FDEP has not offered any evidence or documentation to suggest why floral metrics cannot or should not be handled in a similar manner to fauna. The purpose of both floral and faunal biological assessments is to determine if nutrient concentrations within a WBID are causing or contributing to an imbalance, but FDEP has provided no evidence that nutrients affect floral communities in a manner that would require a different spatial interpretation than faunal metrics throughout a WBID.

The application of a single site assessment approach could also be particularly problematic for chlorophyll-a assessments within a WBID. As one example, BC is currently participating in the development of NNC in North Carolina, where the Division of Water Resources has been repeatedly criticized for using chlorophyll-a data from single monitoring locations to make impairment determinations, when data from other portions of the same waterbody do not show the same chlorophyll-a levels. In one case, a reservoir has gone from having less than five spatial assessment units to more than a dozen over the past several 303(b) assessment periods, although water quality in the reservoir has not changed appreciably and nutrient loading has actually declined. Florida should strive to avoid this situation by retaining its focus on treating WBIDs as holistic assessment units, rather than allowing some metrics to be extrapolated from a single location to an entire WBID when other data could be used to more fully characterize the WBID.

In light of the discussion presented above, we recommend the FDEP revise section 10.1 of the NNC Implementation Document (FDEP 2019) to exclude floral assessments on a site by site basis within a WBID. Instead,

6. Reliance on only the two (or three) most recent floral metrics in different hydrologic seasons is confusing, ignores useful long-term data, and doesn't correspond to the intent of the assessment.

FDEP made significant revisions to the floral assessment methodology in Sections 6.3 through 6.8 of the revised NNC Implementation Document (FDEP 2019). These changes include a requirement for assessments to be conducted in differing hydrologic seasons, new methods for assessing waterbodies with differing assessment results (i.e. one pass and one fail), and a revised understanding of how LVS assessments are to be treated when one metric passes and the other fails within the same assessment. We understand FDEP's intent was to make assessments of waterbodies easier for IWR purposes; however, the result of the changes taken together has the opposite effect. This is especially true when attempting to apply

the revised floral assessment methodology to waterbodies with long-term data sets (or at least more than a couple assessments) available. Our concerns are best explained using an example of a waterbody with long-term data available and attempting to apply the revised assessment floral methodology.

The table below (Table 1) presents LVS data for a single station in Horse Creek (WBID 1787A) from October 2012 through March 2016. These are not all the available data for this WBID but are sufficient to represent the issues with the assessment methodology.

Date	Season	Vegetation <2sqm	LVS-%FLEPPC	LVS-CofC	Result (FDEP 2019)
3/17/2016	Oct-Apr		50	1.06	Fail
12/15/2015	Oct-Apr	Y			Pass
10/27/2015	Oct-Apr	Y			Pass
4/3/2015	Oct-Apr		9	2	Inconclusive
11/10/2014	Oct-Apr		40	1.5	Fail
9/3/2014	May-Sep		22	2.86	Pass
3/18/2014	Oct-Apr		6	3.06	Pass
12/16/2013	Oct-Apr		44	1.46	Fail
10/28/2013	Oct-Apr		89	0.63	Fail
3/20/2013	Oct-Apr	Y			Pass
12/12/2012	Oct-Apr	Y			Pass
10/26/2012	Oct-Apr		57	1.49	Fail

Given the proposed assessment methodology presented in sections 6.3 through 6.8 of the NNC Implementation Document (FDEP 2019), this station in WBID 1787A would be assessed in the following manner:

- The two most recent assessments in differing hydrologic seasons are March 17, 2016 and September 3, 2014.
- They have differing results: March 2016 – Fail; September 2014 – Pass
- The next most recent assessment is December 2015 which resulted in a Pass score
- Therefore, this station within WBID 1787A would be assessed as passing the LVS metric (two out of three assessments pass).

The result of this assessment is not as important as the methodology of how the assessment was conducted. The proposed assessment methodology utilizes only two or three of the available 11 assessments in the Horse Creek example. Similar to our comment 5 above, this assessment methodology does not allow for long-term data sets to represent the overall vascular plant community at a station, or within a WBID. As implementation of NNC assessments continues throughout Florida, more and more locations and WBIDs will accumulate long-term data sets that can be used to assess waterbodies. The assessment methodology should not ignore these data.

The proposed assessment methodology is confusing and raises questions regarding its applicability to demonstrations of nutrient health in a waterbody. Aside from ignoring the majority of the available data for the assessment, it is unclear how the assessment methodology is meant to characterize and ultimately assess nutrient health. How are assessments in differing hydrologic seasons meant to reflect nutrient

regimes that would purportedly change LVS assessment results? What if wet season sampling conditions on a waterbody prevent floral sampling during the May – September season? Why is a “best two out of three” assessment approach sufficient to determine the nutrient health of a stream, in the absence of any evaluation of nutrient concentrations? The assessment methodology does not match the intent of the assessment to characterize how nutrient concentrations affect vascular plant communities in streams. FDEP needs to better define how the assessment methodology is connected to intent of the assessment.

7. LVS assessments are not a reliable indicator of nutrient effects on floral communities and should be removed from the NNC Implementation Document.

Previous comments presented here regarding application of the LVS and its metrics notwithstanding, the LVS lacks scientific justification or a cause and effect relationship to warrant inclusion as an NNC metric. FDEP has previously concluded that such a relationship was not able to be statistically identified:

“During NNC development, the Department, in coordination with EPA, conducted a series of comprehensive statistical analyses to identify relationships between human disturbance (such as nutrient enrichment) and floral responses (such as adverse changes to algal taxonomic composition, algal and vascular plant abundance, and chlorophyll a) using an extensive data set collected in Florida streams. The relationships were statistically weak, and neither the Department nor EPA could identify floral health/impairment thresholds for streams associated with human disturbance or nutrient concentrations or loads” (FDEP 2019, pp. 12-13).

FDEP also states that invasive exotic or tolerant species can occur in the absence of anthropogenic nutrient enrichment (FDEP 2019), leading to significant uncertainty in the application of the LVS for demonstrations of compliance with nutrient water quality standards. The comments above illustrate inadequacies in the LVS assessment methodology that render its application insufficient to detect nutrient impairments or health. An example of these inadequacies is apparent in FDEP’s requirement for failing LVS results to be linked to anthropogenic nutrient enrichment via a separate undefined assessment. The LVS is included in the NNC rule as an assessment meant to identify nutrient health of a waterbody. As such, the LVS is the assessment that should be able to determine when nutrient enrichment causes a vascular plant community imbalance. By requiring a separate assessment to determine if the LVS is linked to nutrients, FDEP is admitting the LVS by itself is not sufficient to detect nutrient impairments or identify vascular plant community health with respect to nutrients. In short, if a separate assessment is necessary to link the LVS to nutrients, then the LVS is not fulfilling its intended role for NNC.

FDEP needs to provide the scientific justification for a defensible connection between anthropogenic nutrient inputs and proliferation of invasive, exotic vascular plant communities that would result in the need for this evaluation in NNC compliance demonstrations. Without such justification, the LVS cannot be relied upon for assessments of nutrient health in Florida streams.

We respectfully suggest FDEP consider removing the LVS from the NNC as a metric for determining floral community health. The chlorophyll-a and RPS assessments are sufficient for demonstrating nutrient health in streams. We suggest an open dialogue between FDEP, the United States Environmental Protection Agency (EPA), and regulated stakeholders regarding the value of the LVS as an NNC floral metric and potential for future removal of the metric from consideration of nutrient effects on waterbodies.

Closing

We appreciate the opportunity to provide these comments and participate in the Triennial Review process. We look forward to continued coordination and collaboration with FDEP to ensure Florida’s water quality standards reflect the best available science and provide protections for our most valuable natural resource.

References

Florida Department of Environmental Protection, 2019, Implementation of Florida's Numeric Nutrient Standards, Division of Environmental Assessment and Restoration, October 2019.

