DWR Approval Framework
For Nutrient Load-Reducing Measures

Contents

1. Purpose

The primary purpose of this guidance is to outline a process for the approval of nutrient credit tied to associated design conditions for nutrient load-reducing measures. This document represents interpretive guidance to further implementation of nutrient rules adopted by the NC Environmental Management Commission, particularly those addressing Existing Development. It was reviewed by a legislatively established Nutrient Scientific Advisory Board. Benefits of a defined approval process should include:

- Expediency, consistency and predictability in review of candidate types of measures;
- Incentives for interested parties to identify and pursue development of information to support approval of promising measures, or research to add performance data on measures; and
- Efficient expansion of the set of tools available for regulated parties to cost-effectively achieve load reductions toward Existing Development and other rule requirements.

NOTE: This document is guidance. It is not a regulation and does not impose legally binding requirements on the Division or parties subject to state nutrient rules. The Division may make rule implementation, permitting and approval decisions on a case-by-case basis considering the particular facts and circumstances and consistent with applicable statutes, regulations and case law. The recommendations in this guidance may not be applicable to a particular situation. The Division may modify or rescind this guidance at any time. This guidance does not prevent a party from seeking Division approval of a practice through an alternative process.

2. Nature and Scope of Approval

The Division's approval will involve nutrient crediting tied to design conditions, either by referencing existing design standards established by other programs or by providing new design standards in a practice description, but incorporating all design conditions considered relevant to sustained annual nutrient reduction for the measure's intended credit life. Nutrient credit information can take different forms but shall always provide for estimation of annual mass load reductions of nitrogen or phosphorus achieved by a given unit of practice. Approval will also include assignment of the measure to a confidence tier reflecting the extent of applicable research data and the level of conservatism used in setting credit values.

Measures approved under this process are considered by the Division as available for use in individual applications in meeting nutrient rule requirements pursuant to individual rules. Installed practices will receive the credit in place at the time of installation for the functional lifespan of the practice, regardless of any revisions to practice credit estimates during that time.

A regulated party may seek approval of load reductions for an individual installation of a measure where nutrient research on the measure is lacking. This type of approval requires direct monitoring of annual load reduction. Crediting of such individual installations is covered in *Section 8A*.

Any of the following elements may be included in a final practice credit document, depending on the specific practice:

- ***The Measure***
  - Suitable settings – physiographic, climatic, soils, watershed/landscape position;
  - Type of loading source being reduced;
  - Measure description characterizing design and operation elements (structural measures) or implementation (management measures) parameters having significant bearing on nutrient removal performance;
  - Installation/implementation, operation and maintenance expectations and considerations for ensuring intended level and duration of function;
  - Provisions for reporting/verifying continued function;
  - Areas of design or operation uncertainty, refinement needs;
  - Cost and other benefits of the measure; and
  - References to applicable supporting scientific information.

- ***Nutrient Reduction Estimation Method***
  - A method, formula or set of values for estimating annual mass nutrient load reduced by the practice or before/after differences in conditions at its point of discharge;
  - Value options for input variables not reasonably obtained by user;
  - Identification of site information needed by user;
  - Characterization of load reduction values or ranges to be expected from measure; and
  - Credit estimation method user guidance.

- ***Tier Assignment***
  - Tier assignment based on presence/absence of applicable nutrient research
  - Characterization of relative confidence in, and resulting degree of conservatism potentially incorporated into load reduction estimates

3. Eligible Measures

Any nutrient load-reducing measure may be considered for approval, including, but not limited to, new engineered structures or modifications to existing ones, human or other animal behavioral management activities, pump-and-treat systems, asset operation/maintenance improvements, ecosystem or landscape improvements, and waste management processes.

4. Regulations Supported

This process has been established to support implementation of Existing Development Stormwater rules, however practices approved pursuant to this process can be used toward compliance wherever individual nutrient rules allow it. The following are additional considerations under individual rules.

New Development Stormwater Rules: For stormwater practices suited for new development, the Division of Energy, Mineral and Land Resources has a formal process for establishing design standards. For new practices or practice variations, DWR staff will collaborate with the DEMLR Stormwater Permitting Unit to establish nutrient credit assignments applicable to both new and existing development settings, consistent with DEMLR's rules and practice design manual.

Agriculture Rules: For measures to be implemented by agricultural producers for trading purposes, DWR will collaborate with the Watershed Oversight Committees that implement Jordan and Falls Agriculture rules, 15A NCAC 2B .0264 and .0280 respectively, to establish load reduction credits and practice standards suitable for trading as called for under those rules.

5. Tier Assignment

The Division will assign a measure to one of two tiers reflecting fundamental differences in the nature of applicable nutrient reduction research data. In addition, staff will evaluate the level of confidence associated with estimated load reductions and their sustained achievement based on the research, and based on the confidence evaluation will determine the degree of conservatism to apply to credit estimates.

- ***Tier 1*** applies to innovative types of practices that lack supporting research, but for which independent, third-party expert evaluation establishes appropriately conservative, presumptive load reduction values. Tier 1 inherently reflects a lower level of confidence in estimated reductions. Expert evaluation may be based on review of available data and associated documentation that has not received independent review, or on knowledge and judgments regarding the practice's component processes, for example, on performance of similar, studied measures. Third party status is premised on the absence of conflicts of interest for the reviewer. For a given practice, Tier 1 is preferentially used as a short-term designation; upon the emergence of applicable research data, credit values will be revised accordingly and the practice will be promoted to Tier 2. DWR staff will revisit the knowledge base for any Tier 1 practice in place for 5 years, but a shorter interval may be used if appropriate data become available.

- ***Tier 2*** applies to practices with applicable, published research data that may or may not have received independent review. Tier 2 reflects a greater level of confidence based on directly applicable research.

6. Review Process for Candidate Measures

The process outlined here is a guide for what has to be a flexible review approach recognizing the wide range of circumstances regarding available information and necessary parties to the review. While establishment of presumptive load reduction values for novel practice designs merits thoughtful consideration, deliberation must be balanced with expediency. Documentation for candidate measures may be developed by the Division or provided by others. In either case, the Division will seek to include certain elements in its reviews: (1) use of state agency or independent subject matter experts to develop or review draft products; (2) vetting of draft products through the NSAB; and (3) a review and comment period for all interested parties. Depending on circumstances, the following steps or parts may overlap, or steps may be repeated:

- Development of credit specifications or completeness review of others' work. Staff may utilize subject matter expertise from within DENR or from other state agencies or universities to assist in content development or to review completed practice descriptions.

- Review of draft credit specifications by the NSAB.

- Informal public comment, default time period of 30 days.

- Final credit specifications approved by signature of the Director* and posted on DWR's website.

* Following public comment and final staff revisions, credit specifications will be routed for approval through the DWR Planning Section Chief and a comparable agency authority over any staff utilized for subject matter expertise, then to the Director of DWR for signature.

Various factors could affect the length of the approval process, including:

- In developing practice specifications, wherever possible the Division will capitalize on advances made by other states and authorities.
- Where no directly applicable research exists, practice proponents may expedite the process by obtaining necessary judgments from third party experts prior to seeking Division review.
- Use of significant undisclosed processes could present impediments to expedient approval. Proprietary stormwater treatment systems intended for new development post-construction applications are required to obtain approval from NC DEMLR pursuant to their established review process and standards.

7. Confidence Evaluation Factors

Staff will weigh confidence level associated with credit estimates to determine the need for incorporating conservatism into final credit assignments. As detailed below, confidence evaluation will focus mainly on the studies behind estimates, but also on the estimation methods themselves.

Studies Factors: The following matrix may help staff evaluate confidence in the available science. It is intended to lend structure to a qualitative process and should not be over-interpreted or suggest a time-consuming evaluation. For a given measure, factors will be more or less relevant. Lack of information or a low-confidence result for a factor does not connote disapproval. The matrix is intended to add consistency to the evaluation process.

Table. Studies Confidence Matrix for Practice Credit Assignment

Individual Study Factors	Confidence Level		
	High	**Medium**	**Low**
Applicability			
Setting	Study done within a regulated geography; or climate, physiography, soils, & biology match a regulatory setting well	Reasonable degree of study site match or similarity to a regulated geography across site attributes	Significant differences between more than one aspect of study setting and the regulated geography
Loading source, dynamics	'Natural' vs. simulated, range of expected conditions captured	Some artificiality vs. expected conditions but reasonably similar	Entirely simulated design, partial to poor similarity to expected
Practice type	Well-described design that matches proposed nutrient design features	Some design differences from proposed nutrient conditions; learning-stage design; or details unclear but reasonably similar	Significant design differences studied from proposed here
Nutrient measurement	Reports TN, TP annual mass load changes to surface water	Some assumptions required to determine TN, TP load changes or regarding delivery	Limited N, P species, concentrations only; or delivery uncertainties
Data Scope and Depth			
Sampling frequency and project timespan	Robust characterization of events, > 1 annual cycle, varied meteorology &/or source management	Captures an annual cycle, reasonable intra-event representation and total *n*	< 1 annual cycle; or low sample frequency and total *n*
Sampling scheme	Fully captures of effects via pre/post, up/down, paired watershed	Adequate capture of practice effects; some data limitations	Partial capture of practice effects; incomplete picture

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Table (continued). Studies Confidence Matrix for Practice Credit Assignment

Individual Study Factors	Confidence Level		
	High	**Medium**	**Low**
Data Quality			
Field methods / lab analysis	Approved state or federal methods used; or certified lab	Other well-documented protocol and methods	Unapproved methods; or inconclusive documentation
Data analysis	Methods sound, relevant; conclusions well-supported by statistics	Methods sound, conclusions plausible but not fully supported by data; moderate unexplained variability	Methods not the most relevant, inconclusive; insufficient evidence, substantial uncertainty
Peer review	Published in peer-reviewed journal	Published/reported with some level of professional or expert review	Minimal or no critical review

Set of Studies Factors	Confidence Level		
	High	**Medium**	**Low**
Number, diversity of studies	Good body of literature	Small number of studies, some diversity captured	One or two studies, significant gaps in range of conditions
Variability across studies	Variability well-understood, defensible	Some unexplained variability	Range of unexplained variability; poorly understood function

Credit Estimation Method: In evaluating confidence in credit estimates, along with the assessment of science above, staff may weigh the following factors regarding the credit methods used.

- Complexity of processes involved in practice, extent of knowledge on processes
- Comparative complexity of estimation method
- Extent of use/validation of estimation method, including in NC settings

8. Related Issues

A. Nutrient Credit for Individual Measures

Where a practice's nutrient performance is insufficiently documented to support a Tier 1 or 2 rating, a regulated party may seek credit for load reductions from an ***individual installation*** of that measure. This option requires direct monitoring of annual load reduction. Possible examples are larger-scale, capital-intensive, actively operated technologies that are largely untested at scale by parties unaffiliated with the manufacturer.

A party proposing an individual measure should develop a framework, (1) identifying monitoring timeframes to support establishment of presumptive lifetime credit values for the measure, including a proposal for cessation or reduction of monitoring, and (2) proposing design standards and credit values. A five year monitoring period is a reasonable default timespan. Factors that could bear on the agreement's monitoring timespan may include the complexity of the practice, the nutrient processes involved, and the intensity of human operation required. A key factor informing a decision to end or extend monitoring is the reliability of the installation's performance in achieving predicted nutrient removals.

During the trial period, credit award would be annual and retroactive, based on DWR acceptance of monitoring results for the preceding year. To better assure the maximum degree of credit, any party considering the individual measure option is advised, prior to initiating a project, to engage DWR for input on, and review of, draft monitoring plans. A monitoring plan and quality assurance project plan is recommended in advance of the project to allow DWR to judge the sufficiency and quality of monitoring data.

B. Approval of Proprietary Measures

A measure that utilizes proprietary technologies and that is proposed for use under rules other than New Development stormwater will generally be evaluated based on the same considerations as any measure under this process. However, nondisclosure of proprietary technologies, to the extent it presents barriers to understanding nutrient removal processes, to articulating design standards or to assuring subsequent conformance to those standards in individual applications, could present impediments to credit assignment.

Proprietary stormwater measures proposed for New Development stormwater applications will be reviewed by the Stormwater Permitting Unit of the NC Division of Energy, Mineral and Land Resources according to the review process and standards set forth in their rules and guidance.

C. Appeal of Approval Decisions

An affected party may appeal any practice credit approval decision. A party shall submit an appeal request in writing to the Director, stating the basis for objecting to the decision. The Director shall review the appeal and may request staff revisions to address the objections or may provide recommendations to the Environmental Management Commission. The Commission shall consider the appeal at a regularly scheduled meeting, which may include further input from the appellant, and shall render a judgment. Appeal of a Commission decision is subject to review as provided in G.S. 150B Articles 3 and 4.

D. Practices Available for Existing Development

BMPs included in the NC Stormwater BMP Manual and identified in the *Model Program for Existing Development Stormwater for Jordan and Falls Watersheds, July 2013*, are considered to be approved Tier 2 practices for Existing Development compliance purposes. These BMPs include undersized or oversized variations of practices as provided for in the Jordan/Falls stormwater accounting tool.

In addition, nutrient BMPs included in the NCDOT-JLSLAT stormwater accounting tool approved by the EMC in July 2012 are also considered to be approved Tier 2 practices for NCDOT Existing Development compliance purposes.

E. Retroactive Credit

A regulated party may receive retroactive credit for measures installed prior to approval of the measure, assuming such installations are shown to be in substantial conformance with the associated design conditions provided they meet other applicable rule requirements. Existing measures not well-aligned with approved design conditions may still obtain credit on a case-by-case basis. For the Falls Lake watershed, Section 1.(b) of S.L. 2009-486 directs the Environmental Management Commission to encourage, and to provide credit for early implementation of nutrient practices in the Falls Lake watershed, authorizing such retroactive credit allowances in that watershed.

F. Limitations on Trading of Credit

Any limitations on trading of credits based on a practice's tier status would be established through rulemaking.