

UNRBA Special Meeting

Jurisdictional Loads and Options for Stage I

February 27, 2019



Objectives of the Special Meeting of the PFC

- Discuss the status of compliance with Stage I
 - Review the requirements under the Rules
 - Review members' progress in calculation of jurisdictional loads for existing development
 - Discuss reductions in loading from point sources
- Achieve understanding about the different challenges that jurisdictions face
- Consider alternative approaches for compliance
- Develop a unified approach to deal with DWR on compliance
- Discuss ways to have a more effective path forward

Agenda

- Review rule language
 - Scope of the rules
 - Jurisdictional loads
 - Onsite wastewater treatment
- Summarize Stage I progress
 - Major point sources
 - Improved water quality in the lower lake
- Discuss jurisdictional loads
 - Summary of focus group discussion
 - Loading increases relative to wastewater treatment reductions
- Establish path forward
- Summarize recent EPA trading guidance

Stage I Rule Language

- Review language from the Falls Lake Nutrient Management Strategy (the Rules)
- Point out potential contradictions in the Rules
- Discuss recent comments by DWR relative to the Rules and previous statements made to the UNRBA

Falls Nutrient Strategy	
Rules Approved by the RRC on December 16, 2010 <i>Effective Date - January 15, 2011</i>	
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<https://deq.nc.gov/about/divisions/water-resources/water-planning/nonpoint-source-planning/falls-lake-nutrient-strategy>

Issues Related to Interpreting Rule Language

- Evaluating the language as it appears in the Rule
- DWR's efforts to reconcile the language to reflect their understanding and objective
- DWR's consistent statements that methodology is each jurisdiction's decision
- Challenges for jurisdictions in interpreting conflicting parts of the Rule

The Rules: Stage 1 Objectives and Jurisdictional Loads

Rule Language: 15A NCAC 02B .0275

[Purpose and Scope] (3)

- “The objective of Stage I is to, at a minimum, achieve and maintain nutrient-related water quality standards in the Lower Falls Reservoir as soon as possible but no later than 2021 and to improve water quality in the Upper Falls Reservoir.”
- “Lower Falls Reservoir shall mean that portion of the reservoir downstream of State Route 50”
- “Sufficient time is defined as at least two consecutive use support assessments demonstrating compliance with nutrient-related water quality standards in a given segment of Falls Reservoir.”

Rule Language: Jurisdictional Loads

15A NCAC 02B .0278 [Ex Dev] (3a)

- “All local governments subject to this Rule shall develop load-reducing programs...that include:
 - estimates of... nutrient loading increases from lands developed subsequent to the baseline period but prior to implementation of a...new development stormwater program.
 - the current loading rate shall be compared to the loading rate for these lands prior to development
 - the difference shall constitute the load reduction need in annual mass load, in pounds per year
 - Alternatively, a local government may assume uniform pre-development loading rates of 2.89 pounds/acre/year N and 0.63 pounds/acre/year P for these lands.”

Rule Language: Jurisdictional Loads

15A NCAC 02B .0278 [Ex Dev] (7a)

- “The Division shall ... developing this model program, which shall include the following:
 - (ii) Methods to quantify load reduction requirements and resulting load reduction assignments for individual local governments;

Rule Language: Jurisdictional Loads

15A NCAC 02B .0278 [Ex Dev] (7)

- (e)“Annual report shall include accounting of total annual expenditures, including local government funds and any state and federal grants used toward load reductions achieved from existing developed lands.”

The Rules and Accounting for Onsite Wastewater Systems

Rule Language: Onsite Systems

15A NCAC 02B .0275 [Purpose] (1)

- “The scope of these rules is limited to the reduction of nutrient **loads to surface waters**”

Rule Language: Onsite Systems

15A NCAC 02B .0277 [New D] 5(a)

- “At such time as data quantifying nutrient loads from onsite wastewater systems is made available, the new development nutrient export accounting tool shall be revised to require accounting for nutrient loading from onsite wastewater from newly developed lands that use such systems.”
 - The loading tool developed by the Division as required by the rules has not yet been updated to account for this loading from New Development

Rule Language: Onsite Systems

15A NCAC 02B .0278 [Ex Dev] (4)

- (a) “Jurisdictions in the Eno River and Little River subwatersheds shall, as a part of their Stage I load reduction programs, begin and continuously implement a program to reduce loading from discharging sand filters and malfunctioning septic systems discharging into waters of the State within those jurisdictions and subwatersheds.”
- (c) “The total amount of nutrient loading reductions in Stage I is not increased for local jurisdictions by the requirements to add specific program components to address loading from malfunctioning septic systems and discharging sand filters or high nutrient loading levels pursuant to Sub-Items (4)(a) and (b) of this Rule.”

Rule Language: Onsite Systems

15A NCAC 02B .0278 [Ex Dev]

- 4(g) “Nitrogen and phosphorus loading from existing developed lands, including loading from onsite wastewater treatment systems to the extent that accounting methods allow, shall be calculated by applying the accounting tool described in Sub-Item (7)(a) and shall quantify baseline loads of nitrogen and phosphorus to surface waters in the local government’s jurisdiction as well as loading changes post-baseline. ”
- 7(a)iii: “Methods to account for discharging sand filters, malfunctioning septic systems, and leaking collection systems”
 - Normally functioning systems are not directly or indirectly referenced in these parts

Stage I Progress

Stage I Wasteload Allocations

- From 15A NCAC 02B .0279 [Wastewater] (4)(a)

Stage I nitrogen and phosphorus allocations for dischargers with permitted flows of 0.1 MGD or greater are as follows:

<u>Facility Name</u>	<u>NPDES No.</u>	<u>Mass Allocations (pounds/year)</u>	
		<u>Total Nitrogen</u>	<u>Total Phosphorus</u>
<u>North Durham</u>	<u>NC0023841</u>	<u>97,665</u>	<u>10,631</u>
<u>SGWASA</u>	<u>NC0026824</u>	<u>22,420</u>	<u>2,486</u>
<u>Hillsborough</u>	<u>NC0026433</u>	<u>10,422</u>	<u>1,352</u>

Comparison of Nitrogen Allocations to 2006 and 2017 Loading

Plant	2006 (lb-N/yr)	Stage I Allocation (lb-N/yr)	2017 (lb-N/yr)	Credit* (lb-N/ac/yr)	Neuse Estuary TMDL Allocation (lb-N/yr)
NDWRF	92,441	97,665	60,913	31,528	334,851
SGWASA	31,076	22,420	14,145	8,275	58,559
Hillsborough	28,482	10,422	5,496	4,926	57,309
Total	151,999	130,507	80,554	49,953	450,719

*The potential credit is the difference between the Falls Lake Stage I Allocation and the loading reported in 2017.

Comparison of Phosphorus Allocations to 2006 and 2017 Loading

Plant	2006 (lb-P/yr)	Stage I Allocation (lb-P/yr)	2017 (lb-P/yr)	Credit* (lb-P/ac/yr)
NDWRF	9,968	10,631	3,252	7,379
SGWASA	11,476	2,486	692	1,794
Hillsborough	4,804	1,352	813	539
Total	26,248	14,469	4,757	9,712

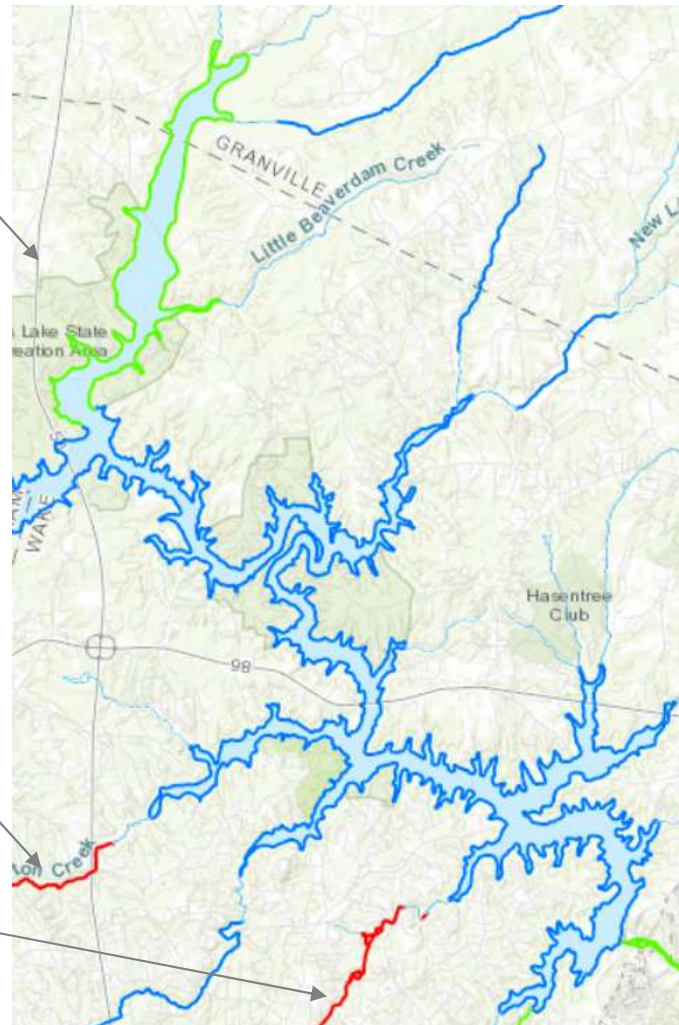
*The potential credit is the difference between the Falls Lake Stage I Allocation and the loading reported in 2017.

Progress Toward Stage I – Lower Lake 2014 Use Assessment:

Highway 50

Barton Creek
(benthos)

Cedar Creek
(benthos)



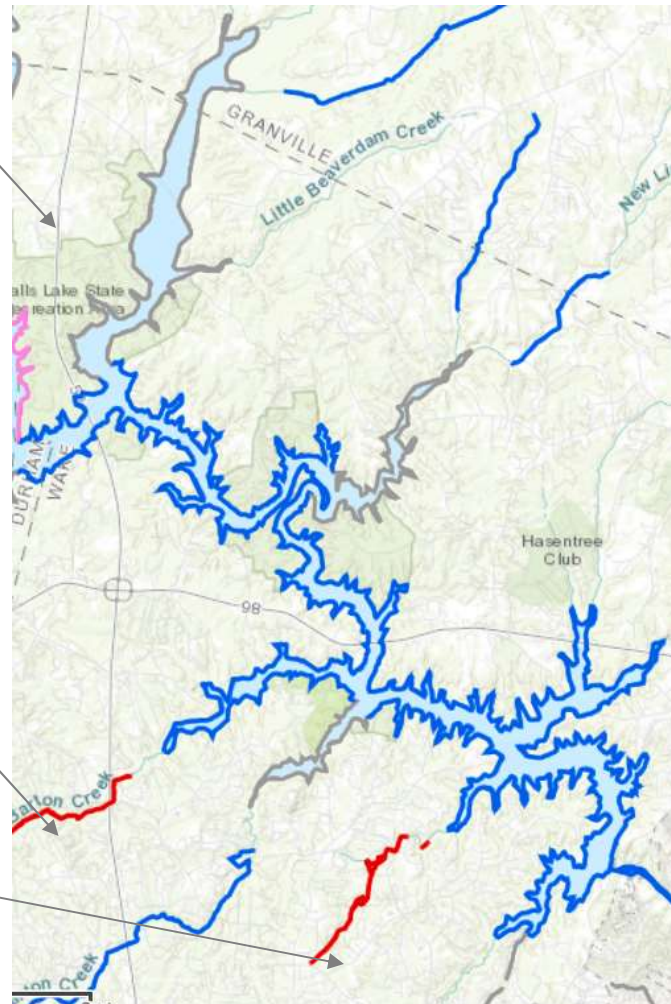
2014 Integrated Report

- 2 - Supporting except for statewide fish tissue mercury
- 3 - Insufficient data
- 4 - Impaired - has TMDL or alternative plan
- 5 - Impaired (303(d) list) - needs TMDL or alternative plan

Other than the statewide fish tissue mercury impairment, Falls Lake below Highway 50 was supporting its uses.

Progress Toward Stage I – Lower Lake 2016 Use Assessment:

Highway 50



Barton Creek
(benthos)

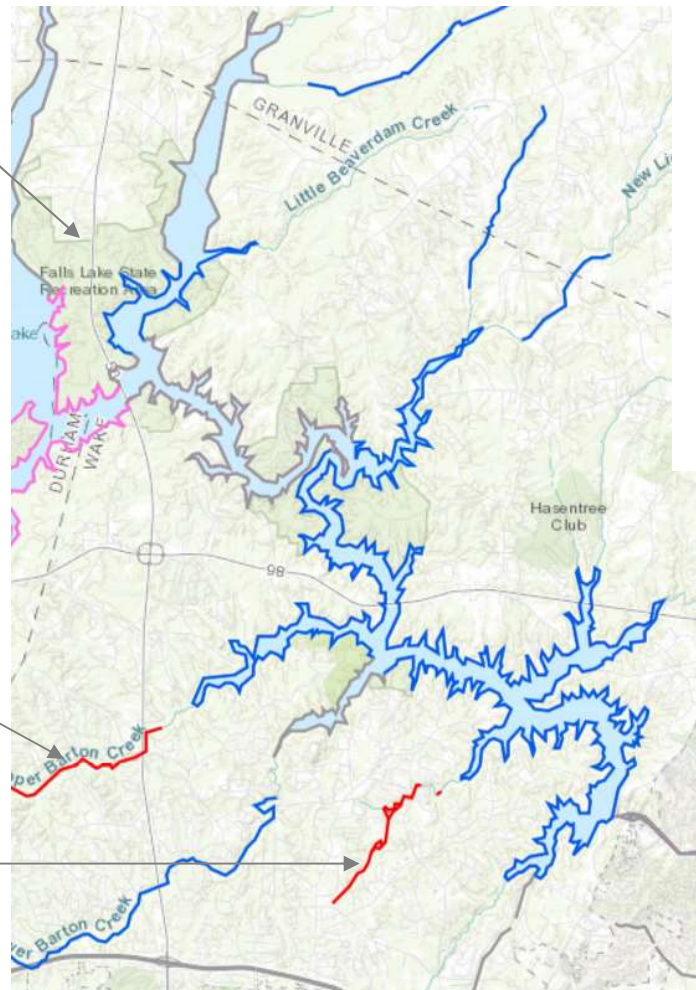
Cedar Creek
(benthos)

- 2 - Supporting except for statewide fish tissue mercury
- 3 - Insufficient data
- 4 - Impaired - has TMDL or alternative plan
- 5 - Impaired (303(d) list) - needs TMDL or alternative plan

Other than the statewide fish tissue mercury impairment, Falls Lake below Highway 50 was supporting its uses.

Progress Toward Stage I – Lower Lake 2018 Draft Use Assessment:

Highway 50



Barton Creek

Cedar Creek

- 2 - Supporting except for statewide fish tissue mercury
- 3 - Insufficient data
- 4 - Impaired - has TMDL or alternative plan
- 5 - Impaired (303(d) list) - needs TMDL or alternative plan

Other than the statewide fish tissue mercury impairment, Falls Lake below Highway 50 was supporting its uses or the data were inclusive.

Summary of Jurisdictional Loads Focus Group Discussion

Focus Group Participants (2/15/2019)

- Ryan Eaves and McKenzie Gentry – Durham Co.
- Terry Hackett, Town of Hillsborough
- Sandi Wilbur, City of Durham
- Howard Fleming, Tom Davis, Michael Harvey, Wesley Poole – Orange Co.
- Melinda Clark and Barney Blackburn, Wake Co.
- Katie Cromwell – Granville and Person Counties, Creedmoor, Butner, and Stem

Discussion Topics from Focus Group

- Methods for estimated nutrient loading
 - Pre and post development
- Assumptions
 - What development was included?
 - If permit based, which permits?
 - Did you include lots that would not have triggered new development rules?
 - Did you account for onsite wastewater systems?
 - How did you account for streets?
- Predominant land use before development
- Predominant development type
- Results
 - Summarized by method
 - Summarized by development type
- Key questions for moving forward



Predominant Type of Development

- Mostly residential ranging from
 - Large lots in counties
 - Infill development
 - Individual single family
 - Subdivisions
- Limited commercial and industrial

Methods for Determining Pre-Development Loading Rates

- Most participants used a calculation tool
 - SNAP (2)
 - JFSLAT (2)
 - Neuse and Tar-Pam Tools (1)
- Upper jurisdictions used the rule-allowed loading rates (5)
 - 2.89 lb-N/ac/yr
 - 0.63 lb-P/ac/yr

Methods for Determining Post-Development Loading Rates

- All participants used a calculation tool to represent development
 - SNAP (2)
 - JFSLAT (7)
 - Neuse and Tar-Pam Tools (1)

Consistencies in Methods and Assumptions (as provided at meeting)

- Most pre-development land use was forest
- All participants addressed new streets as part of the subdivisions
- All accounted for buy down credits purchased and subtracted those out of the Stage I loads
- All were meeting the Neuse Rule requirement (2007) for development not to exceed 3.6 lb-N/ac/yr
 - In 2010, the City of Durham added a voluntary P limit of 0.5 lb-P/ac/yr and decreased the N limit to 2.2 lb-N/ac/yr
- Those within a water supply overlay were also meeting the 85% removal of TSS (e.g., wet ponds)
- During the interim period, some level of stormwater control was required across the watershed

Discrepancies in Methods and Assumptions

- Start date
 - 1/1/2007 (9); consistent with Rules
 - 1/1/2006 (1); this jurisdiction plans to modify
- Permits included
 - All: stormwater, building, E&SC, and zoning compliance permits (9)
 - Stormwater permit only (1); jurisdiction lacks data and resources to account for other development (captured most development for this jurisdiction)
- Some performed calculations on the entire parcel, while others focused on the built-upon/disturbed area
- Most jurisdictions assumed that development was built out when permitted (did not address lot by lot development); except (1)

Discrepancies in Methods and Assumptions, Continued

- Some included parcels that would not be triggered by the new development rules
 - Some included lots that disturbed less than $\frac{1}{2}$ acre
 - Previous lot size triggers were different under the Neuse Rules
 - Jurisdictions were allowed (guidance from DWR) to lump developments that did not have stormwater permits into one large development for their calculations
 - Difficult to determine if some developments would have been lower than new D threshold in terms of lot size or loading targets
- Focus group recommended that discrepancies in assumptions need to be addressed consistently

Discrepancies in Accounting for Onsite Wastewater Treatment Systems

- Some jurisdictions did not account for this source (5)
- Some accounted for this source (5) using the following information:
 - Local government inventories and failure rate studies
 - Loading rates based on NC Piedmont Nutrient Loading Measures Technical Report (Tetra Tech 2013)

Preliminary Results by Method

Jurisdiction	Interim Area (ac)	Increase lb-N/yr	Increase lb-P/yr	Increase lb-N/ac/yr	Increase lb-P/ac/yr	Method Pre D	Method Post D
Granville Co.	4,280.6*	0	0.0	0.00	0.00	Rule allowed	JFSLAT+OWWS
Person Co.	2,464.4*	0	0.0	0.00	0.00	Rule allowed	JFSLAT+OWWS
Durham Co.	736.1	270.8	94.4	0.41	0.13	JFSLAT	JFSLAT
Wake Co.	258.5	187.0	48.0	0.72	0.19	JFSLAT	JFSLAT
City – Durham	3,390.0	2,859.0	297.0	0.84	0.09	Neuse/Tar-Pam	Neuse/Tar-Pam
Orange Co.	551.0	994.3	76.1	1.02	0.25	SNAP	SNAP
Butner	283.6*	436.5	34.9	1.54	0.12	Rule allowed	JFSLAT
Hillsborough	528.0	868.5	166.9	1.64	0.32	SNAP	SNAP
Stem	52.2*	120.6	47.8	2.31	0.92	Rule allowed	JFSLAT
Creedmoor	30.3*	184.9	56.7	6.10	1.87	Rule allowed	JFSLAT

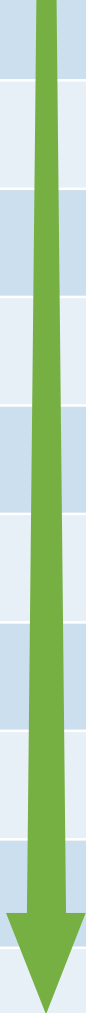
*These areas reflect the entire parcel area and are not limited to the disturbed area.

Comparison of Results by Method

- The method applied was not strongly correlated with per acre loading rate increases when comparing across jurisdictions
 - The rule-allowed pre development loading rates resulted in the **lowest** per acre load increases (i.e., 0) and the **highest** per acre load increases
 - Calculation tools generated results in the middle of the per acre loading rate increases

Preliminary Results by Development Type

Jurisdiction	Interim Area (ac)	Increase lb-N/yr	Increase lb-P/yr	Increase lb-N/ac/yr	Increase lb-P/ac/yr	Development Type
Granville Co.	4,280.6*	0	0.0	0.00	0.00	Large lot residential
Person Co.	2,464.4*	0	0.0	0.00	0.00	Large lot residential
Durham Co.	736.1	270.8	94.4	0.41	0.13	Mostly residential with some industrial and commercial
Wake Co.	258.5	187.0	48.0	0.72	0.19	Low density and large lot residential
City - Durham	3,390.0	2,859.0	297.0	0.84	0.09	Residential and commercial
Orange Co.	551.0	994.3	76.1	1.02	0.25	Residential and institutional
Butner	283.6*	436.5	34.9	1.54	0.12	Residential (subdivisions) and commercial
Hillsborough	528.0	868.5	166.9	1.64	0.32	Residential (subdivisions and infill)
Stem	52.2*	120.6	47.8	2.31	0.92	Residential (subdivisions)
Creedmoor	30.3*	184.9	56.7	6.10	1.87	Residential (subdivisions)



*These areas reflect the entire parcel area and are not limited to the disturbed area.

Comparison of Results by Development Type

- Development type was more consistent in the amount of per acre loading rate increases
 - Large lot residential had low to zero per acre increases
 - These types of developments have usually not required stormwater controls under the new D requirements
 - Granville and Person Counties were 85% to 95% developed as large lot residential
 - Per acre increases were higher with the addition of some industrial and commercial
 - High density subdivisions had the greatest per acre loading rate increases

Outstanding Issues

- Different assumptions
 - Not everyone is accounting for the same sources
 - Onsite wastewater treatment
 - Types of permits included
 - Vested projects that were permitted but not built prior to cut off
 - Most participants assumed fully built out, some accounted for lots as they were developed
- Different methods were applied for calculations

Additional Questions

- How should interim development be treated relative to new D requirements?
 - Which sites should be included?
 - Only those that would be triggered under new D rule in terms of disturbed area, or
 - Any amount of development?
 - If site loading rates are less than or equal to the new D targets, should those require reductions under Stage I?
 - Why require reductions for interim development that would not have required reductions under new D rules?

Comparison of Jurisdictional Loading Increases to Stage I Progress

- Based on the data compiled from the focus group, the increase in loading due to interim development is much lower than the potential credit associated with wastewater treatment (increase in loading << Stage 1 WW Credit)
 - Nitrogen: 5,994 lb-N/yr << 49,953 lb-N/yr
 - Phosphorus: 831 lb-P/yr << 9,712 lb-P/yr
- The lower lake has met the chlorophyll a criterion, or the data is insufficient to make a determination otherwise, for the past three assessment cycles

Options for Stage 1 Implementation

Option 1. Rely on Jurisdictional Loading Estimates for Implementation

- Calculate the loading increase associated with interim development and require jurisdictions to reduce accordingly
 - Issues/constraints
 - Given the number of potential credits available through wastewater plant reductions and the pending re-examination, local governments may feel unduly burdened by Stage I requirements,
 - Equity and fairness
 - Data availability
 - Methods applied
 - Sources of loading
 - Inconsistencies in rule language
- Likely the most expensive of the three options

Option 2. Hold Stage I Existing Development Implementation Until Re-examination is Complete

- Rely on the wastewater credits available and the improvements seen in the lower lake until the re-examination is complete
- Communities can continue to implement projects and bank credits for future use
- Wastewater plants would not expand to the point of using the full Stage I allocation in the next several years
- Issues/constraints
 - May send a poor message to other stakeholders that the UNRBA is “not doing anything”
 - Jurisdictions with wastewater treatment plants or who have already begun implementing projects for Stage I may feel unfairly burdened
- Likely the least expensive option (in terms of capital)


Option 3. Project-Based Implementation

- Collaborative effort to continue actions to further reduce nutrient loading until a revised strategy is put in place
- Wastewater credits and improvements in lower lake water quality supports this voluntary alternative
- Demonstrates to stakeholders that the UNRBA is committed to continued progress
- Allows flexibility in terms of costs, collaboration, and funding sources (including grants)
- EPA policy shift supports this type of approach
- Issue/constraints
 - Schedule with respect to DWR model program
 - Establishing the framework to select and implement projects and account for previous projects
 - Will likely require legislative action

EPA 2019 Guidance on Trading

EPA 2019 Guidance on Trading

- Removes administrative burden
- Shifts focus from uncertainty/trading factors to adaptive management
- Allows more flexibility in implementation, program operation, and financial resources




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 6 2019

OFFICE OF WATER

MEMORANDUM

SUBJECT: Updating the Environmental Protection Agency's (EPA) Water Quality Trading Policy to Promote Market-Based Mechanisms for Improving Water Quality

FROM: David P. Ross
Assistant Administrator 

TO: Regional Administrators, Region 1-10

Key Changes to the Policy

- Not requiring equal precision between point sources and non point sources, or uncertainty factors to account
- Not requiring 3rd party verification of credits if the cost is too burdensome to be sustainable
- Allowing for use of models rather than trading ratios
- Simplifying requirements for establishing the baseline for minimum practices before credits can be earned
- Allowing a single project to generate and trade credits across multiple types of markets
- Allowing grants and bonds to be used to finance projects



Additional Discussion

Calculation of Pre-Development Loading Rates Allowed in Rules and New D Loading Targets

Land Use	Pre-Reduction N export rate* (lb-N/ac/yr)	40% Reduction in N Rate	Proportion of Buildable Area	Pre-reduction Export Rate Area (lb-N/ac/yr)	Reduced Rate Area (lb-N/ac/yr)
Row Crop	13.4	8.0	0.02	0.268	0.1608
Pasture	5.7	3.4	0.26	1.482	0.8892
Forest	1.6	Not required	0.72	1.152	1.152
Alternative Pre-Development Load Rate and New D Target:				2.89	2.2

*These loading rates are based on the 2003 Jordan Lake watershed modeling developed for the Jordan Lake TMDL.

Calculation of Pre-Development Loading Rates Allowed in Rules and New D Loading Targets

Land Use	Pre-Reduction P export rate* (lb-P/ac/yr)	77% Reduction in P Rate	Proportion of Buildable Area	Pre-reduction Export Rate Area (lb-P/ac/yr)	Reduced Rate Area (lb-P/ac/yr)
Row Crop	5.3	1.2	0.02	0.106	0.0244
Pasture	1.1	0.3	0.26	0.286	0.065
Forest	0.33	Not required	0.72	0.2376	0.2376
Alternative Pre-Development Load Rate and New D Target:				0.63	0.33

*These loading rates are based on the 2003 Jordan Lake watershed modeling developed for the Jordan Lake TMDL.