High Rock Lake Nutrient Rules Engagement Process
Stormwater Technical Advisory Group (TAG)
Meeting #3

April 18, 2023 / 1 - 3 pm / virtual via Zoom

Meeting Goals

1. Share updates and learning since last meeting (3/1/23).
2. Discuss & approach consensus around new development rule.
3. Explore nutrient control challenges with local flood control mandates.
4. Learn about DWR investigating hydrologic design improvements.
5. Consider Implementation challenges.
6. Identify next steps.

Participants

TAG members: Kelsie Burgess, Brent Cockrum, Grace Fuchs, Justin Gray, Kevin Haynes, Danica Heflin, Kelway Howard, Keith Huff, Andy McDaniel, Zack McKenzie, Chris Mills, Ben Parker

NC Division of Water Resources Team: Rich Gannon, Joey Hester, Trish D'Arconte, Ellie Rauh

DSC Facilitation Team: Maggie Chotas, Laura Swartz, Paura Heo

Meeting Summary

Agenda Overview

- ❖ Welcome / Introductions & purpose of the meeting
- ❖ Reviewing the agenda, ground rules & the group's definition of consensus
- ❖ Process Updates

- ❖ Exploring nutrient reducing Stormwater Control Measures (SCMs) & flood control
- ❖ Hydrologic design to protect streams – DWR SWMM (modeling project)
- ❖ Considering New Development rule goal options & implementation challenges
- ❖ Identifying next steps

Decisions made in the meeting

1. Brent Cockrum and Kelway Howard will share their examples and information
2. Members will meet in person to continue to discuss goal options as it relates to New Development rules and program applicability.

What's Next / Action Items from this meeting & open items from March 1st meeting.
Items 1-4 are open action items from 3/1/23 reviewed and discussed during this meeting.

1. Scott Leonard (not present at this meeting) will share a map of the Davidson County watershed district with the group.

2. Justin will identify the original start date for post-construction stormwater control permitting in High Point and provide a brief narrative on the subject.

3. Stormwater (SW) TAG members will consider what other communities are developing with zoning restrictions, specifically to manage stormwater/flooding.

4. Danica Heflin would like to identify and rate (poor or fair) the number of Stormwater Control Measures (SCMs), i.e. dry detentions, that exist and could be retrofitted in the watershed.
    - This information is available but would have to be compiled (by Ag TAG members) from largely crowdsourced data.

5. Next meeting to discuss New Development goal options and program applicability and focus on reaching consensus.

Wednesday, June 7, 2023; 1- 3pm
Salem Lake Marina & Fishing Station
815 Salem Lake Road
Winston-Salem, NC 27107

Key Links

- Citrix ShareFile Folder
- Rulemaking Charter

Detailed Meeting Summary

Review of the group's definition of consensus

The group's definition of Consensus, per HRL Engagement Process Charter is as follows:

- Consensus requires the active participation of everyone in the group and an atmosphere where disagreements are respected. When someone disagrees, the goal of the group shall be to discover the reason for the objection and to find a way to work toward meeting that need in a revised agreement. Consensus is being defined as at a minimum, "I can live with and support the decision."
- Andy McDaniel asked if the group's definition was consistent with the Five Systems Method. Maggie Chotas reviewed the (above) Charter definition and shared that the Sense of the Meeting approach would be utilized to check in with the group, as opposed to the Five Systems Method.

Process Updates

The group reviewed open action items.

- Danica Heflin wanted to be able to identify and rate (poor or fair) the number of Stormwater Control Measures (SCMs), i.e. dry detentions, that exist and could be retrofitted in the watershed
    - Joey Hester shared that this would have to come from TAG members because the state does not maintain this information.

Joey Hester provided an overview of the immediate process steps moving forward.

- Stormwater TAG members reach consensus around New Development goals and program and project applicability rules.
- Stormwater TAG provides recommendations to the steering committee
- Receive feedback from steering committee
- Repeat the above steps for Existing Development goals and rule framework.

Exploring nutrient reducing Stormwater Control Measures (SCMs) & flood control

Previous groups discussions regarding infiltration pointed to potential conflicts for communities utilizing nutrient focused systems and communities utilizing volume focused systems.

Brent Cockrum and Kelway Howard present examples of projects and rules explaining stormwater detention and how it relates to the watershed. Current research findings and additional points are presented by Joey Hester and Rich Gannon of NC Division of Water Resources.

Brent Cockrum uses the **Village of Clemons Ordinance** to demonstrate certain watershed rules and exemptions since the village is within the HRL watershed.

- If the development does not meet the definitions of a subdivision, then it is not required to follow the watershed regulations (or SCMs)
- Multiple exemptions for development (or re-development) that does not cumulatively disturb less than 1 acre and is not part of a large common plan of development or sale.
  - This protects individual, single-family residential development
- There is already an ordinance in place that has exemptions that nutrient rules could be applied, or to which new nutrient rules could be addended.

Kelway Howard provides examples of various types of projects from the Falls Lake Watershed to demonstrate opportunities for (new) nutrient rulemaking to apply to controls for nitrogen and phosphorous loading. The table below summarizes his findings.

	Parcel Size (Ac.)	Lots	Disturbed Area (Ac.)	% BUA	Post-Dev N Loading (lbs/ac/yr)	Post-Dev P Loading (lbs/ac/yr)	Compliance Method	Notes
Small Single Family	1.53	1	1.53	10.2%	1.89	0.28	Dry Pond	Silverleaf - Peak Management Only
Medium Single Family	10.99	2	0.80	2.8%	1.42	0.52	LID No SCM	Cox Property - Subdividing a single parcel into 2 Lots
Large Single Family	53.21	1	27.64	10.1%	2.16	0.57	LID No SCM	Lawrence Brother Farm
Small Subdivision	8.45	3	0.92	9.8%	1.83	0.33	Dry Pond	Saunders Subdivision
Large Subdivision	73.20	45	31.39	11.3%	1.22	0.2	2-Biocells	Hugh Davis - 45 Lots
Small Commercial	13.27	1	3.95	17.2%	1.78	0.32	Wet Pond	Tractor Supply

None of the projects above would comply using an alternate volume matching compliance method.

- In the Falls Lake Basin, some projects that would have been otherwise exempt from SCM by way of watershed regulation are captured by the "less than ½ acre Disturbed
- Area limit" nutrient rule.
- Exempt thresholds opportunities:
  - Less than 1 acre, which is NC's threshold for a Disturbed Area
  - Below a certain %BUA
  - Below a loading rate
  - Project obtains pre-/post-volume match
    → **requires** infiltration
- Small projects routinely triggered for review while some medium and large projects are approved via LID, chapter 2 manual, which is an alternate compliance method
  - Notice that the loading rates for the larger projects are above the 1-acre disturbed area thresholds.
  - There will be small, single-family projects that could require SCM in more rural areas.
- The amount of volume storage and release rate will present a challenge with stream and buffer erosion (peak management).

Joey Hester from DWR presents additional **key points**;

- Nutrient loading rate targets applied at a BUA (impervious cover) threshold greater than 10% do **not** protect receiving waters (streams) from becoming nutrient sources
  - Research shows that at a watershed scale when 10% threshold is surpassed, then the receiving waters and the whole system becomes a nutrient source.
  - 10% is a reasonable baseline for when conditions are poor.
  - 6% is a reasonable baseline under normal circumstances.
- Detention and multi-day discharge do not protect streams from becoming nutrient sources.
  - Sustained/multi-day discharge in the 3-5 day period, leads to poor outflow where streams become dead zones and nutrient sources.
- Wet pond detention is easy and requires relatively little space
  - provides limited nutrient treatment, prolongs erosive flow
  - can create algal toxicity risks
- Infiltration is needed however it takes up a lot of space, is expensive and prone to failure.
  - Slow filtration discharge can serve the same purpose but with a smaller footprint
  - An undersized bioretention cell designed to treat a smaller amount of runoff can outperform a properly sized wet pond
- "Water Quality Volume" ideally captures and treats 90% of annual storm events (i.e. the 90th percentile storm)
  1. Treating one inch of rain equates to an 80th percentile storm in the piedmont;
     - if you want to get to a 90th percentile storm than you will need to treat above the 1-inch threshold.
     - This threshold may change with precipitation changes in the future
- Existing green footprint (medians, gardens, open space) can aid in infiltration.
- Existing development has created and continues to contribute to issues around flooding and nutrient buildup.

Key Considerations

- New development rules must prevent the situation from worsening.
- Infiltration devices under closed-top systems (i.e., parking lots) are even riskier
  - The only option for resolution for a failed infiltration device in a closed top system is to dig up (the structure and) the device.
- Bioretention or wet ponds are much more predictable because the design community have been designing them for a long time, successfully. However, they do not protect the watershed against nutrients.
- Biocells and wet detention ponds treat 85% TSS (total suspended solids) and they treat volume.
  - They are very common and low maintenance.
  - Maintenance of these systems is typically passed on to the homeowner or HOA.
- Clear, precise, and consistent language will need to be provided in the rules for objective review and consistent enforcement
- Much of the basin is within rural jurisdictions that currently do not have water quality programs.

- If these programs are not able to perform the reviews and would require State-level review, extended review timeframes could be problematic.

Key Questions

Andy wanted to know more about the risks of infiltration devices. He notes that the presentation helps provide context for some of the reasons why SCMs are (/not) being required per local government ordinances. He asks:

- Can you elaborate on the concepts of risk, risk aversion, and surety pertaining to infiltration devices?

Below, Mr. Howard shares a brief explanation of risks from various perspectives. For the following roles:

- *The Reviewer*: In review of another Lake's nutrient rules, the words, "site," "parcel," and "development" are used and interchanged in the first two sentences. Because those words are not explicitly defined, it is unclear whether the rule refers to the parcel, just the disturbed area, or the BUA. There is a strong need for operational clarity and consistency to be able to understand and apply the rule objectively
- *The Consultant/Engineer:* We have designed a few infiltration designs over the years and most of them have been Infiltration basins. These are dry ponds that infiltrate. They are a challenge in the piedmont: some devices have taken on water in less than a year; some devices work well, then fail, abruptly. And the sites where the device is installed have high infiltration rates prior to construction. There is professional (and liability) risk involved when a device is constructed that does not function within the expected lifespan
- *The Homeowner*: the risk is a loss of a return on an investment.
- *The Contractor*: the risk is a professional loss on an investment and there could also be a surety that is awaiting certification.

Andy McDaniel posed another question:

- Do the infiltration challenges in this area deter the volume matching approach or the LID approach; is there any hesitation when deciding to control for volume?

- *Kelway Howard:* No, it is not a deterrent. But again, the construction of infiltration devices will pose a risk.

The risk is for potential failure. And the risk is substantial if a volume matching device is takes on water when an annual inspection is due. When it is no longer infiltrating that volume, the options are for a full evaluation, requiring a removal/inspection of the device and potentially a soil improvement (underneath the device), or a conversion to another SCM; all of which are costly and time-consuming processes.

Rich Gannon asks Brent Cockrum for clarification around his presentation of exemptions in the Village of Clemmons Ordinances.
Rich Gannon: I think you said it is a good thing. It is helpful. I want to understand in what way it is helpful.

- *Brent Cockrum:* It helps the single family residential a lot based on the data. If you're doing something commercial, or residential, but you're part of a larger development, then you're going to be subject to SCMs anyway.

Rich Gannon shares that current research (one-year in and ongoing that demonstrates that bioretention for smaller areas can be as effective at infiltration). He poses a hypothetical question to Mr. Cockrum and Mr. Howard.

- *Rich Gannon*: How much better would you feel about runoff reduction if a bioretention treated discharge were considered equivalent to infiltration? If we were to make it part of the criteria, and bioretention treated discharge disappeared for purposes of compliance, how much would that opens things up?
- *Brent Cockrum:* We need to consider the option of paying into a bank. Is there a bank available in this watershed?
- *Rich Gannon*: Not yet…
- *Kelway Howard:* If the discharge from a biocell could be considered equivalent to volume matching, then it would open the doors fairly wide. I like bio cells. They don't do pre-/post- well for larger storms but they are #2 on the list.
- Rich Gannon clarifies for Andy McDaniel and the group that Bill Hunt has made the case for discharge from a biocell being equal to an infiltration device in volume-matching.

Kelway Howard describes further context for implementation. Biocells tend to be used for sites that are fairly well-maintained. If there were a lot of biocells in subdivisions, there might be a concern over how well the basin would be retained. In the piedmont, we use an open top sand filter in those cases. We found it works well and it is cheaper than a wet pond. (But if you got a few miles east, there are none).

Introduction of New Development rule goal options

Joey Hester briefly introduces the framework for New Development rule: goals, and program and project applicability.

- Options posed for New Development rule **goal**:
  1. **Meet strategy % goals on a project basis**
     - Applies strategy (%) reduction goals to an average predevelopment loading rate; then, determine a new target that represents the strategy reductions goals on a project basis.
     - This strategy is used in other watersheds
     - Presents challenges scientifically difficult to implement and enforce.
  2. **No net nutrient loading increase from predevelopment (to protect receiving streams)**
     - DWR's recommended goal statement

PROGRAM

The components of the goal include the follow **program** rule options:

- **Program applicability**
  - All local governments
  - Only those governments showing certain growth levels
- **Local program requirements**
  - Post-construction treatment (SWMM); ongoing SCM maintenance; ensure project compliance for life
  - Education; mapping; illicit discharge detection and elimination (propose moving to Existing Development rule).

PROJECT

The components of the goal include the follow **project** rule options and exemptions:

- **Project applicability**
  - Disturbance thresholds: 1 acre
  - Exempt: individual, single family lot development <5% BUA
  - Existing development, redevelopment regulated per statue, agriculture rule activities
- **Project requirements (current Neuse/Tar-Pamlico)**
  - Meet unit-area loading rate target OR do annual runoff volume match
  - 24% BUA treatment threshold, 1-inch design storm, primary SCM offset option allowed for remainder
  - Road-only or sidewalk only projects can do entirely offset acquisition

Key Considerations

- When considering project applicability, TAG members will need to think of the project that falls outside of our current system
  - Think about inclusions and exclusions, too!
- DWR team emphasizes that the first goal option has presented challenges. The science makes the goal makes it difficult to implement.
- Grace Fuchs of Yadkin River Keepers can support the 2nd bullet point goal of "no net increase" as an overall goal.
- Andy McDaniel notes that the first goal option would not be ideal.
- But Andy McDaniel is not comfortable with the no net increase goal option either.
  - Offers up this as a goal: "to protect designated uses of High Rock Lake"
    - As a goal, this is deemed too broad since the overall project objective is to recover use (including designated uses) of High Rock Lake.
  - Unclear about "protecting receiving waters." Protecting receiving waters from what? Erosion?
  - Concerned about the definition of predevelopment offered by DWR which noted that predevelopment referred a return to a pasture state.
  - Feels that the technical work accomplished, and the progress made is not captured by a "no net increase" goal.
  - Wants to see an option for a one-water approach included.
    - Recognizes that this will take time and will not likely fit in the current timeframe for this rules process.

Key Questions

- What is the definition of predevelopment?

  Regarding this rule, predevelopment would mean a return to an undeveloped pasture-land condition, rather than a return to the site predevelopment condition.

- What does protecting receiving waters mean? From what?

  Protecting receiving waters from being held or retained and consequently developing nutrients.

SWMM (Investigating model for hydrologic design improvement)

Stormwater Management Model was developed to help support local and state objectives to reduce runoff through infiltration and retention and help to reduce discharges that cause impairment of waterbodies.

Key Points

Here in NC, we are seeing that our stormwater practices (treating and releasing runoff control from 1" rainfall) is not protecting receiving streams.

- DWR has been working with the Sally Hoyt from the City of Raleigh and several associates from McAdams to develop, a working model to protect receiving streams.
- The modeling study:
  - Uses historical rainfall data and climate change predictions
  - Evaluates a range of development scenarios
  - Tests SCM alternative designs for hydrologic capture and fate
  - Identifies SCN alternative designs for runoff reduction toolbox

Key Considerations

- DWR would like to work towards reducing runoff to predevelopment rates.
- A scope of the model will be finalized as soon as possible.
  - The modeling study is expected to be completed in about a year.
- Potential alternative designs could be added to program rules/requirements

Key Questions

Andy McDaniel asks about the definition for pre-development (in this context).

Rich Gannon states that it may be better to consider a no net increase from an undeveloped condition as opposed to a site developed predevelopment condition.

Discussing New Development rule goal to approach consensus

Mr. McDaniel's question leads to a more involved discussion about New Development goal options, and program and project applicability. Maggie Chotas checks with the group about their consensus decision.

Key Points

GOALS

- Options posed for New Development rule **goal**:
  1. **Meet strategy % goals on a project basis**
     - Applies strategy (%) reduction goals to an average predevelopment loading rate; then, determine a new target that represents the strategy reductions goals on a project basis.
     - This strategy is used in other watersheds
     - Presents scientific challenges that make it difficult to implement and enforce.
  2. **No net nutrient loading increase from predevelopment (to protect receiving streams)**
     - DWR's recommended goal statement
     - Predevelopment – refers to pasture conditions before development

Members of the TAG offer these opinions goal option 2. **No net nutrient loading increase from predevelopment (to protect receiving streams).**

- Danica Heflin emphasizes the importance of selecting a goal that is manageable for the staff. She expresses discomfort with supporting a goal that would place an unreasonable burden on local government staff.

- Joey Hester responds that the complexity for local governments would lie at the program level of the rule, not at this higher level (for the goal). He shares that the goal is what the rule is designed to do, not who does what and how.

- Kelway Howard asks if "predevelopment" refers to the site or the average field/condition for that area of basin. Sharing from one of his examples the predeveloped rate for phosphorous for a small commercial project was .09; postconstruction .41; and with SCM .32. That was mostly forested with some pervious landscaping for a small commercial with 17% BUA. It would be very difficult to return to a predevelopment rate of .09.

- Rich Gannon states that it may be better to consider a no net increase from an undeveloped condition as opposed to a site developed predevelopment condition. And, that there is a potential to adjust the predevelopment rate to a curved number based on current, ongoing research. In addition , he shares that if DWR's SWMM can produce a sufficient runoff reduction scenario that adequately addresses nutrient development, then a specific calculation to demonstrate compliance may not be necessary.

The following points are made about New Development Program rule options.

PROGRAM

The components of the goal include the follow **program** rule options:

- **Program applicability**
  - All local governments
  - Only those governments showing certain growth levels
- **Local program requirements**
  - Post-construction treatment (SWMM); ongoing SCM maintenance; ensure project compliance for life

- Education; mapping; illicit discharge detection and elimination (propose moving to Existing Development rule).

DWR Joey Hester and Rich Gannon share the following information.

Having the program rule apply to all local governments will present a challenge for some smaller communities and governments. However, it equalizes the field of development when all communities have the same stormwater controls

When program rules are applied to only those local government showing certain growth levels, there are real administrative challenges to selectively implement and enforce those rules. This would provide flexibility to those smaller governments.

A major is con however is clear research showing correlation between strict stormwater controls and a shifting of development to the fringe of those areas where the controls are enforced. We see this in the Neuse, Tar-Pamlico Basin, creating an uneven playing field when it comes to economic development between cities and counties. Stormwater controls push development to the fringes and contributes to sprawl.

Keith Larrick shares: We have seen that sprawl. It is about a 35/65 split, with 65 belonging to the county. Because we have higher demands with stormwater controls within city limit, the development has moved outside of the city. More uniform regulation would balance development and growth. And, it would advance the effort of protecting the watershed.

Ben Parker: Yes. I agree as well. We are seeing a lot of developments going up as well. And we are pushing hard to control it. It is very simple when you look at it from our standpoint.

Joey Hester to Danica Heflin: I hope this speaks more to your concern, Danica. There are local administrative problems that we are well aware of. But since this is a watershed strategy, consistent rules for everyone tends to balance development. But, yes, it will come with significant challenges for some of the smaller communities.

Keith Larrick: For non-NPDS communities, what is the state's regulatory mechanism for them? Yes, they are dischargers but how will these communities be regulated?

Rich Gannon: We are relying on state regulatory means, not the federal permitting system. The mechanisms would be the (State) statues; what we put in the rules. The program that local government put in place to enforce the rules would drive enforcement. We know it would take a long time to roll communities into the program.

And, local governments could set up [the program] as a permitting system.

Keith Larrick: That clarifies how unregulated communities are brought into the program. Then, to Danica's point, the local government would have to complete a financial statement. Afterwards, they'd determine administrative and staffing needs.

Rich Gannon & Joey Hester: Yes.

APPLICABILITY THRESHOLDS

The goal and associated rules would apply the below threshold options:

- Applicability thresholds (minimum requirements to run the SNAP tool)
    1. Land disturbance: would require enforcement and pose an administrative challenge for smaller communities

2. Impervious cover (BUA) percentage
    - Challenging to define project area (that 24% we've proposed for higher levels of SCM treatment).
3. Impervious cover (BUA) total square footage
    - Proposed exemption: single, family lot <5% BUA
    - Supersedes disturbance threshold.

Key Considerations

- Rich Gannon from the DWR Team states that the goal is a high-level objective serving as a value statement. Strategies and objectives for the rules to work towards the goal will be very involved and require feedback, insights, and further discussion. He asks: "What is not to like about this as a goal?

- Joey Hester adds that reaching consensus is difficult but essential. At the goal level, he shares that the group should be ready to agree to a value statement.

- Andy McDaniel notes that clarifying the purpose of the goal would be helpful. He understood Rich Gannon's comments around the (New Development) goal to mean that the goal would be aspirational; then, became confused when he understood that there would also be operational rules tied to the goal.

- Maggie Chotas makes the following suggestions to help move the group towards a continuation of the conversation.
    - Provide Stormwater TAG members with New Development rule goal options and program applicability rules.
    - Meet in person to further discuss New Development rule goal options and program rules & approach consensus with the discussion & approach towards consensus as the sole agenda items.

The group agrees to both of the above suggestions and the details for an in-person meeting are set and shared.

Key Questions

- *Mr. McDaniel*, also, asked: Is the expectation that there will be different goals for each set of rules?
- *Joey Hester*: The nutrient strategy goals will be overarching. For the first bulleted option, the steering committee will let us know we need an X% (for example, 40%) reduction in a nutrient. This goal should tell us whether that applies to a specific project or if the reduction is approached from a different angle.
- *Rich Gannon*: To answer the question, specifically, yes. This is intended to be a rule-specific goal.
- *Joey Hester*: Yes. There are two levels of goals. The overall strategy goal is where the nutrient strategy goal gets to over time, and the new development goal will aim to do that via "*x*, *y*, *z*." So this New Development goal acts as a subset goal.