

The Sisyphean Dilemma: Can Amending the Falls Lake Rules Result in Achieving the Nutrient Water Quality Standards?

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EXECUTIVE SUMMARY

North Carolina has a significant number of water supply sources that are not attaining the Water Quality Standards (“WQS”) for nutrient control, i.e. chlorophyll-*a*, eutrophication, turbidity, pH, and dissolved oxygen. Twenty lakes and reservoirs listed in the most recent biennial report to the U.S Environmental Protection Agency (“EPA”) have no nutrient control strategies in place.¹ Several of the waterbodies are the primary drinking water supply for metropolitan areas where growth is rampant. The ability to support expansion of those water systems can be adversely impacted by nutrients, or similar, water quality problems that have placed the waterbodies on the §303(d) list of impaired waters. The challenges are not only financial, but may also include the substantial staff and programmatic shortfalls in the Department of Environmental Quality (“DEQ”).

Each step of the regulatory scheme to address the amount of nutrient loading involves large time demands for DEQ staff, including the establishment of the allowable nutrient load to attain compliance with the WQS and the adoption of rules to establish the nutrient management system. Initial action to take these steps requires several years of monitoring and modeling in advance of the rule-making for each waterbody. This set of activities is performed by the Division of Water Resources (“DWR”) and formally adopted by the Environmental Management Commission (“EMC”). The process takes several years, if not decades, to complete. Despite more than four decades of nutrient problems in the State, the EMC has adopted the loading budget and implementing rules for only six of the listed water supply sources. DWR is poorly situated to directly implement these programs as the more immediate need is development of the loading allocation and regulatory programs for the additional water supplies on the list.

Recently, DWR cited a provision of the federal Clean Water Act in defending its refusal to issue speculative limits for a proposed new wastewater treatment plant because it would discharge into the Yadkin River, which is designated as a tributary to

¹ Email dated February 24, 2023 from John Huisman, Division of Water Resources, N.C. Department of Environmental Quality to Dan McLawhorn.

High Rock Lake. DWR contended that the proposed project is blocked by 40 CFR §122.4(i) until rules are adopted establishing the nutrient budget for High Rock Lake and the City was granted an allocation adequate to support the facility.² If that policy is applied to all §303(d)³ waters listed for failure to attain nutrient water quality standards (“WQS”) for which there is no nutrient budget and supporting allocations, substantial adverse impacts will result to the environment and to the economy of the State.

The Falls Lake rules were adopted in 2011 to establish the load reductions necessary to demonstrate compliance with the chlorophyll-*a* WQS. Like other such programs, the rules impose huge financial burdens on local governments and can limit or bar the recruitment of industry which discharges nutrients into the Lake in treated waste water. See N.C. Gen. Stat. §143-215.3(a)(8). Based on the scientific examination of Falls Lake since 2011 by the Collaboratory and the Upper Neuse River Basin Association (“UNRBA”), it is abundantly clear that compliance with the current nutrient WQS likely cannot be achieved and, at best, will take decades to remove the Lake from the list of water supplies that do not achieve the WQS as it is now implemented. In the 1971 Environmental Statement for the Falls Lake project, the U.S. Army Corps of Engineers determined the lake “will stimulate algal growth in the upper reaches of the lake during periods of low inflow. These algae growths are not expected to limit or impede the use of the project in any way, since recreation areas are planned to avoid the upper reaches of the project.”⁴

DWR has approved both watershed plans and long-term plans to address pollutants including nutrients. One such plan extends over a period of 30 years. In addition, examples of collaboration between the regulated entities and states to ease the burdens on the state agency with the long-term implementation of nutrient strategies are discussed. Other states with Piedmont impoundments have seldom met with complete success in the control of excess nutrient; however, several states have pursued solutions or policy methods that may provide a long-term strategy without the threat of litigation to enforce multiple regulatory requirements at the same time. Likewise, EPA has entered into Consent Decrees which are based on a long-term strategy for enhancement and restoration of watersheds, including nutrient reductions. The current statutory framework for collaboration can be expanded which will allow the Department of Environmental Quality to focus on other waterbodies with unaddressed nutrient problems. A proposal to make such revisions to the provisions of N.C. Gen. Stat. §143-214.14 is provided.

² See Respondents’ Memorandum in Opposition to Petitioner’s Motion for Summary Judgment, *City of King v. N.C. Dept. of Environmental Quality, Division of Water Resources*, 22 EHR 03853, Office of Administrative Hearings, dated January 13, 2023.

³ 33 U.S.C. §1313(d).

⁴ *Environmental Statement Falls Lake, Neuse River, North Carolina*, 10 February 1971, U.S. Army District Engineer, Wilmington, North Carolina, paragraph 3 “The environmental impact of the proposed action.”, page 3. Exhibit 2, July 2, 1970 letter from the N.C. Department of Water and Air Resources commented: “Since the impoundment of waters in each of the reservoirs [Falls Reservoir and Randleman Reservoir] will provide for more stable stream flows and greatly increased minimum discharges of high quality, the environment will, in fact, be enhanced.”

POLICY ISSUES

The current policies of the State which shape the program for addressing nutrient sensitive waters derive from statutes and regulatory programs established in response to legislation adopted a quarter century ago. At that time, the policy makers relied on expectations that excess loading of nutrients could be addressed in one or two decades. In the intervening years, the time and expense to develop the three critical parts of the regulatory program have expanded, along with the substantial additions to the list of §303(d) waterbodies with nutrient exceedances. With its reduced resources of DWR, the time to establish a full regulatory program now is as much as two decades or more.

The three primary stages to the process are: (1) monitoring to establish the extent of the nutrient loading; (2) modeling to establish a budget to achieve the Water Quality Standards (“WQS”) adversely impacted, including chlorophyll-*a*; and (3) adopting rules to implement the program. The critical allocations are made in the rules to control point sources and non-point sources. Monitoring takes a minimum of three years; modeling takes two to four years; and rule adoption takes two to three years. The next step is the subject of this proposal — the implementation of the adopted program. If a revision occurs in the current manner of implementation, the shift of responsibility from DWR to local governments should provide additional resources to develop the programs.

This examination focuses on a proposal to tailor the authority of a coalition of local governments to implement the Falls Lake rules, as readopted, based on long-term goals with incremental stages of implementation. It will provide for continued oversight by the EMC, through DWR, and EPA. This change is consistent with recently issued policy recommendations by EPA for addressing nutrient problems. It also should afford the local governments an opportunity to plan for expenditures and cooperation to reach the collective goal. The proposal is for amendments to N.C. Gen. Stat. § 143-214.14. It should also be useful for other local governments subject to EMC adopted strategies to address the failure to meet the WQS for chlorophyll-*a*.

The EMC included in the Falls Lake rules a process by which persons outside of the State agency could bring forward information to be considered in the re-adoption of the Falls Lake rules before Stage II of the rules become effective. 15A NCAC 2B .0275(5)(f). The UNRBA collected over 4 years of monitoring data and completed modeling to provide the information described in the rules. The UNRBA has also examined the appropriateness of the current chlorophyll-*a* WQS for Falls Lake, a classic man-made impoundment of a Piedmont river. Modeling shows that even if the entire basin were replanted as forests, the WQS will not be achieved. For that reason, it is likely that a site-specific WQS is appropriate for Falls Lake, consistent with the recent decision to adopt a site-specific WQS for High Rock Lake, another Piedmont impoundment. This proposal does not offer more information on that option.

A review of the history of nutrient control efforts in the State along with a look at the newest EPA policy on watershed protection prompts the question of whether it is time to revise the State's program for nutrient sensitive drinking water supplies. The overwhelming demands on DEQ created by additional sets of rules to address waters not meeting water quality standards suggests that a need for more local-State cooperation would be beneficial. Otherwise, the State will be unable to meet the needs for water and sewer service for the anticipated growth in population and businesses.⁵ The long-term planning strategies used by the Atlanta region in Georgia, Sanitation District No. 1 in Kentucky, and Philadelphia to address Consent Decrees help to shape a proposal to expand the authorization for local leadership. The Clean Water Act allows limited delegations of such authority with DEQ oversight.

EVOLVING NUTRIENT CONTROL STRATEGY

The State's traumatic experience with excessive nutrient loading impacts on the designated uses of its waters began in the 1970's in the Chowan River and Albemarle Sound and led to the development of a WQS for chlorophyll-a.⁶ Over time, the implementation of the WQS has changed, although the rule setting the WQS has remained unchanged.

Eutrophication was identified as a water quality problem in the Neuse Basin in the late 1970's and early 1980's.⁷ By 1987, the increasing water quality problems caused by nutrients resulted in the adoption of legislation banning the use of phosphates in detergents.⁸ While improvements were observed, the continuing problems in the Neuse and Tar Rivers resulted in a nutrient sensitive waters designation by the early 1990's. Extensive fish kills in 1995 and a legislative study led to a mandate to reduce nitrogen loading as well. A significant legislative response included amendments to the statutes and appropriations to assist with the problems.⁹ The Total Maximum Daily Load ("TMDL") process was used to establish the allowable loading for nutrients with implementing rules.

The rules to implement the Neuse Estuary TMDL were adopted in 1999. Despite over \$500 million in improvements by waste water treatment plants ("WWTPs") resulting in loading reductions substantially exceeding the 30% reduction goal, the collective amount of excess nutrients in the estuary from all sources has not been

⁵ House Bill 600 of the 2023 Session, at Section 15.(a), authorizes a permittee which holds an expansion contract and it within 24 months of its completion to allocate up to 110% of its existing hydraulic capacity if the WWTP is owned by a high growth population and meeting its flow and pollutant discharge limits. The bill does not include any restriction based on whether the WWTP has adequate nutrient allocations to support the expansion. It is unclear if the existing rule which requires Neuse Estuary WWTP, including Falls Lake, permittees to secure approval for an expansion based on that amount of nutrient allocation capacity available to support the expanded facility.

⁶ "Chowan River Basin Water Resources Plan" 2018, Chapter 5, "Chowan NSQ History and Current Conditions," Sec. 5.1 "Historical Review," page 2.

⁷ "Neuse River Basinwide Water Quality Plan" 2009, Summary, page 7.

⁸ Session Law 1987-111.

⁹ Session Laws 1995-626; 1997-458.

reduced. Similarly, the excess nutrient loading in Falls Lake, especially from WWTPs after more than \$85 million in improvements and hundreds of stormwater retrofit projects, has stabilized, but not declined. With the most stringent new development rules in the State, the nutrient impacts in Falls Lake have remained relatively constant after more than a decade. The Falls Lake Nutrient Strategy includes an extended timeline for achievement of the strategy. Stage I reductions in nutrient loading were scheduled to be achieved by 2021. Stage II reductions are scheduled to have resulted in “[a]ttainment of nutrient-related water quality standards throughout Falls Reservoir no later than 2041”.¹⁰

The modeling done by the UNRBA and the Collaboratory show that decades of additional reductions will not achieve the WQS. Nitrogen production by existing sediments in the Lake will make the task impossible for decades. The nutrient response strategy of the EMC and DWR should be examined in light of these implementation challenges. The existing legislative framework for addressing nutrient impacted water bodies provides an alternative which can allow the development of long- term plans reliant on the most likely resource to address the problem — local governments, with State oversight to meet the Clean Water Act requirements for a delegated program. Thus far, this strategy has not been employed.

EPA AND NC NUTRIENT PLAN

EPA has issued a series of policies involving nutrient-caused eutrophication. As a part of its efforts with states, EPA has also sought the promulgation of new WQS for nutrients. Consequent to that effort, the Executive Branch of the State is engaged in a separate policy development process to develop revisions to the WQS for nutrient controls. After prompting by EPA, the State submitted the “North Carolina Nutrient Criteria Development Plan” to Region 4 of EPA in June 2014. The plan was a revision of the 2004 Nutrient Criteria Implementation Plan submitted to EPA by the State. The revised plan established the Science Advisory Council (“SAC”) and a priority for development of nutrient criteria in for High Rock Lake, Albemarle Sound, and the central portion of the Cape Fear River. The 2019 Plan forecasts “development and adoption of nutrient criteria for the three water bodies specified in this plan by 2025” and that “[a]doption of nutrient criteria statewide is anticipated by 2029.”¹¹

The EMC adopted a site-specific WQS for High Rock Lake in July, 2022.¹² In the DWR explanation of its recommendation for the High Rock Lake site-specific WQS, DWR offers a more limited forecast of the outcome of the NCDP: “Based upon lessons learned from these site-specific evaluations, North Carolina will be better positioned to reevaluate nutrient related criteria statewide.”¹³

¹⁰ 15A NCAC 2B .0275(5)(a)(vi).

¹¹ “North Carolina Nutrient Criteria Development Plan” 2019, page 4.

¹² 15A NCAC 2B .0211(1)(4)(a) and (b).

¹³ July 1, 2022 “Overview of High Rock Lake (HRL,) Chlorophyll-*a* Site Specific Standard Proposal” by N.C. Division of Water Resources.

DWR has not announced any decision as to whether a site-specific standard will be proposed for Falls Lake as a part of the rules re-examination. Given there is no history of failure to attain the designated uses of the lake, but the lake remains nutrient sensitive waters due to chlorophyll-*a* monitoring exceedances, the continued use of the current WQS has been questioned.

COOPERATIVE STATE-LOCAL PLANS

The more recent realization that nutrient management strategies will require high cost, long term solutions create a need to allow longer planning and financing systems than the five-year duration of NPDES permits. Absent such a management system, local governments could be at risk of citizen suits or agency enforcement actions to compel more rapid responses. At the same time, new demands for additional environmental issues make it necessary that the local governments have an opportunity to prioritize the multiple expensive improvements with protection against forcing actions. The 1997 legislation provided an opportunity for a coalition of local governments in a basin to enter into an agreement with the State to establish long-term plans for addressing water quality needs. N.C. Gen. Stat. § 143-214.14 “Cooperative State-local coalition water quality protection plans”. The statute is not limited to nutrient impacted waters but includes any reduction strategy for a pollutant resulting in non-attainment of a WQS.

The current statute is described in the next part of this policy analysis as background for comparison to the most recent EPA policy on nutrients as well as the similar law in the State of Georgia. Based on the review, proposals are made to enhance the current statute for the circumstances now confronting local governments like those in the upper Neuse River basin.

To qualify for the program, the local governments, among other actions, must create a nonprofit cooperation to operate the program. The program is expressly authorized for §303(d) plans to address non-attainment waterbodies.¹⁴The law expands on the potential role of local governments in the development and implementation of water quality protection plans that is set forth in the rule.

Local governments within a basin of a waterbody with pollution problems can create a coalition to present a Water Quality Protection Plan to the EMC. The General Assembly’s Legislative Findings and Goals read as follows:

“(b) Legislative Findings. – This section establishes a framework to encourage State-local pollutant reduction strategies for basins under the supervision and coordination of the Commission. The General Assembly finds that:

¹⁴ See N.C. Gen. Stat. § 143B-282(d).

- (1) Water quality conditions and sources of water contamination may vary from one basin to another.
- (2) Water quality conditions and sources of water contamination may vary within a basin.
- (3) Some local governments have demonstrated greater capacity than others to protect and improve water quality conditions.
- (4) In some areas of the State artificial alteration of watercourses by surface water impoundments or other means may have a significant effect on water quality.
- (5) Imposition of standard basinwide water quality protection requirements and strategies may not equitably address the varying conditions and needs of all areas.
- (6) There is a need to develop distinct approaches to address water quality protection in basins in the State, drawing upon the resources of local governments and the State, under the supervision and coordination of the Commission.”

(c) Legislative Goals and Policies. – It is the goal of the General Assembly that, to the extent practicable, the State shall adopt water quality protection plans that are developed and implemented in cooperation and coordination with local governments and that the State shall adopt water quality protection requirements that are proportional to the relative contributions of pollution from all sources in terms of both the loading and proximity of those sources. Furthermore, it is the goal of the General Assembly to encourage and support State-local partnerships for improved water quality protection through the provision of technical and financial assistance available through the Clean Water Management Trust Fund, the Division of Mitigation Services, the Ecosystem Restoration Fund, water quality planning and project grant programs, the State's revolving loan and grant programs for water and wastewater facilities, other funding sources, and future appropriations. The Commission shall implement these goals in accordance with the standards, procedures, and requirements set out in this section.”

NC Gen. Stat. § 143-214.14(b) and (c).

The Water Quality Management Plan is authorized under federal and state law “as an alternative method of attaining water quality standards in a basin.”¹⁵ To qualify as a local government coalition eligible to present a plan, the plan must be presented “through a nonprofit corporation” incorporated with the Secretary of State with sufficient territorial area in the basin to achieve the water quality restoration. The plan must be approved by the governing body of each coalition member and “provide a viable

¹⁵ See 33 USC §§1313(D); 1315(B); AND 1316. “CATEGORY 4b – CURRENT NATIONAL STATUS AND TRENDS.” Eric Monschein and Shera Reems, Office of Water, Washington DC, US EPA (2009).

alternative method of attaining equivalent compliance with federal and State water quality standards, classifications, and management practices in the affected basin.” The statute imposes the following requirements for each plan:

“(g) A coalition plan shall include all of the following:

- (1) An assessment of water quality and related water quantity management in the affected basin.
- (2) A description of the goals and objectives for protection and improvement of water quality and related water quantity management in the affected basin.
- (3) A workplan that describes proposed water quality protection strategies, including point and nonpoint source programs, for achieving the specified goals and objectives; an implementation strategy including specified tasks, timetables for action, implementation responsibilities of State and local agencies; and sources of funding, where applicable.
- (4) A description of the performance indicators and benchmarks that will be used to measure progress in achieving the specified goals and objectives, and an associated monitoring framework.
- (5) A timetable for reporting to the Commission on progress in implementing the coalition plan.

(h) A coalition plan shall cover a specified period. The coalition plan may provide for the phasing in of specific strategies, tasks, or mechanisms by specified dates within the period covered by the plan. The Commission may approve one or more successive coalition plan periods. The coalition plan may include strategies that vary among the subareas or jurisdictions of the geographic area covered by the coalition plan.”

The statute also includes provisions regarding a local government’s withdrawal from the plan or failure to implement a plan. With EMC approval, coalition members are allowed to “establish and implement a pollutant trading program for specific pollutants between and among point source dischargers and non-point pollution sources.” The Falls Lake rules are not a coalition plan approved under this statute and no such plan has been presented from any basin.

In 2010, the General Assembly authorized the establishment of the Falls Lake Watershed Association.¹⁶ That authorization is more limited than the local government powers set forth in N.C. Gen. Stat. § 143-214.14. In 2011, the General Assembly authorized the establishment of regional water supply planning organizations.¹⁷ The

¹⁶ N.C. Gen. Stat. § 77-140-143.

¹⁷ N.C. Gen. Stat. § 143-355.8.

participating local governments are involved in water supply planning, not in the environmental protection of the water supplies. The Falls Lake Watershed Association does business as the Upper Neuse River Basin Association.

The revision of the EMC/DWR nutrient strategy to include such long-term planning and implementation, as well as local coalitions, is also supported by policies of the U.S. Environmental Protection Agency. This would be a timely and important opportunity for the State, as it addresses the increasing need for implemented nutrient management strategies, to implement a program broad program to address the need for long-term strategies for water quality issues such as those in Falls Lake.¹⁸ The coalition approach also will strengthen the empowerment of the local governments tasked with accomplishing the implementation of the nutrient management strategy while providing them the flexibility to include other issues of water quality in the coming decades.

EPA 2022 NUTRIENT POLICY

The EPA Assistant Administrator for Water Radhika Fox issued a memorandum entitled “Accelerating Nutrient Pollution Reductions in the Nation’s Waters” on April 5, 2022. It is the latest update to EPA’s efforts to formulate a strategy for addressing the impacts of excessive nutrient eutrophication on the Nation’s waters. Despite decades of investment in identifying a solution, EPA and the states continue to seek appropriate policies to balance nutrient management for the benefits of a healthy aquatic environment versus the challenges of excess eutrophication that may result in stimulating ongoing or worsening of the impairment of the designated uses of specific waterbodies. EPA now estimates that 58% of rivers and streams and 45% of lakes have excess levels of phosphorous.

AA Fox calls attention to several approaches to solve eutrophication problems. Her memorandum highlighted the benefits that arise from creating a One Water approach by states for the protection of sources of drinking water sources. The One Water approach differs from the traditional command and control approach of a Total Maximum Daily Load (hereafter “TMDL”) strategy or an alternative §303(d) strategy such as the nutrient sensitive waters strategy in place for Falls Lake. An important difference is the focus on establishing and maintaining a healthy watershed instead of a focus exclusively on the reduction of nutrient loading. Another aspect of the One Water program is the level of responsibility that is established for the local partner by the state in the implementation of a One Water strategy.

The April 5th policy EPA memorandum outlines a variety of resources that will be available through EPA and the USDA to develop these plans and grant resources to assist with implementation. It affirms rulemaking by which “NPDES permits may include conditions allowing market-based approaches, including trading, to meet applicable effluent limits.” It also describes new program actions to support small,

¹⁸ DWR approved a long-term plan for Swearing Creek in Davidson County in 2018.

rural, and disadvantaged communities confronted with nutrient impairment costs. EPA also places an emphasis on state adoption of its recently published “stressor-response based numeric nutrient criteria.” As part of its strategy for “Further Reducing Nutrient Loads for Point Sources,” EPA states that it will support “states to employ a variety of permitting approaches, including watershed-based permitting, integrated planning, adaptive management, and various market-based approaches including trading and offsets. We will encourage states to consider permitting approaches that strengthen upstream/downstream partnerships.” EPA also pledges to assist “states in using water quality standard variances, targeted designated use changes, compliance schedules in NPDES permits, and other flexibilities to make progress.”

This memorandum provides additional policies based on the 2019 amendments to the Clean Water Act. The *Water Infrastructure Improvement Act of 2019* (H.R 7279) incorporated a policy issued by EPA in 2012, the “Integrated Municipal Stormwater and Wastewater Planning Approach Framework.” The legislation ensured the permanent availability of this option to public clean water utilities. The more important changes in the law allow utility access by permit or, in an enforcement context, by consent decree to prioritize and sequence wastewater and stormwater requirements over more than one permit term. The legislation also directed EPA to support the use of green infrastructure. EPA issued two interpretative memoranda. The first was issued by Water Enforcement Division Director Mark Pollins on September 26, 2019. The second was issued by Water Permits Division Acting Director Sally Gutierrez on December 3, 2019 “Implementation of Integrated Planning in Accordance with the 2019 Water Infrastructure Improvement Act (WIIA).”¹⁹ Given the vehicle for these changes is utility specific via the NPDES permits, it is unclear how it can be applied for a coalition of permit holders such as the UNRBA. However, the individual utilities could seek consistent permit provisions and achieve the general benefits by using a watershed plan to identify collective strategies. The approach by EPA is described by National Association of Clean Water Agencies:

Owners and operators of different systems and plants can work together, where appropriate, to develop a single integrated plan to address stormwater or wastewater planning and management concerns on a community-wide basis. For example, EPA has stated that it will consider issuing one permit implementing an integrated plan that addresses MS4 and POTW requirements where the permittee has responsibility for both. Alternatively, communities can work with regulators to coordinate multiple permits to support with the goals and expectations of the community’s integrated plan.

See 2013 FAQs at p. 2

DWR shows ten watershed restoration plans on the webpage entitled “TMDL Alternative,” including the Falls Lake rules. These plans include examples of

¹⁹ Also see “Report to Congress on Integrated Plans to Comply with the Water Infrastructure Improvement Act of 2019” and “Considerations for Using Integrated Planning – What Clean Water Utilities Should Know” National Association of Clean Water Agencies and Barnes & Thornburg LLP. July 2022.

implementation of another EPA policy for addressing §303(d) listed waters, including those listed for nutrient problems. Category 4b demonstration projects were authorized among a broader range of means to address impaired waters in the 2006 Integrated Report Guidance.²⁰ EPA informed states, that 4b demonstrations should address the following six concerns:

1. Identification of segment and statement of problem causing the impairment;
2. Description of pollution controls and how they will achieve water quality standards;
3. An estimate or projection of the time when WQS will be met;
4. Schedule for implementing pollution controls;
5. Monitoring plan to track effectiveness of pollution controls; and
6. Commitment to revise pollution controls, as necessary.

Category 4b demonstrations focus on the restoration of waters in non-attainment by a strategy that is an allowed alternative to a TMDL “within a reasonable time.”²¹ AA Fox issued the *2022-2023 Vision for the Clean Water Act Section 303(d) Program* on September 15, 2022. The “2022 Vision” added four additional themes – Environmental Justice, Climate Change, Tribal Water Quality and Program Development, and Program Capacity Building to the 2013 Long-Term Vision.

“Like the 2013 Vision, the 2022 Vision is intended to encourage flexible and innovative approaches for states, territories, and authorized tribes to implement CWA Section 303(d), as well as to identify ways to best use limited resources to lead to restoration and protection, to leverage partnerships, and to encourage development of solutions to emerging and difficult water quality issues.”

2022 Vision, page 3.

The 2022 Vision also includes the announcement that EPA is developing a metric to serve as a bridge between the 2013 Vision and the 2022 Vision anticipated to be in place starting in FY 2025. This will be another dimension requiring consideration in the re-adoption of the Falls Lake rules as the metric will be in place from FY25-FR-32 to “measure the extent of state, territorial or tribal priority waters addressed by TMDLs and other restoration plans in impaired waters or by protection approaches for healthy waters.” Based on the metric, the implementing governments will “have the flexibility to begin and complete plans over the course of multiple metric reporting cycles.” *2022 Vision*, page 3. A Category 4b plan can include protection goals when the plan also is designed to achieve a restoration goal. “Including protection in and alongside

²⁰ “RECOMMENDED STRUCTURE FOR CATEGORY 4B DEMONSTRATIONS,” attachment to USEPA (2006) *Information Concerning 2008 Clean Water Act Sections 303(d), 305(d), and 314 Integrated Reporting and Listing Decisions*. October 12, 2006.

²¹ “The demonstration should also describe why the time estimate for the controls to achieve WQS is reasonable. EPA will evaluate on a case-specific basis whether the estimated time for WQS attainment is reasonable.” Fn 18 sets forth the source of this information.

restoration planning and implementation contributes to a holistic watershed approach that uses resources efficiently.” 2022 *Vision* page 7.

The “Declaration of public policy” for the Water and Air Resources Article of the General Statutes is embracive of these policies of EPA: “It is the public policy of the State to maintain, protect, and enhance water quality within North Carolina.”²² The earlier sections of the Article focused on a permitting scheme for wastewater treatment and restoration of impaired waterbodies. By 1997, the Legislature recognized a need to enhance the powers of the State to protect water quality when it enacted NC Gen. Stat. § 143-214.14 authorizing the development of water quality management plans by local government coalitions. The key element is a “workplan” is for a defined period of time with task priorities and it may also “provide for the phasing in of specific strategies, tasks, or mechanisms by specified dates within the period covered the plan.” The workplan also must include a “description of the performance indicators and benchmarks that will be used to measure progress in achieving the specified goals and objectives and an associated monitoring framework.” This allows for an approach to achieve and maintain a healthy watershed, not just a watershed with a nutrient management strategy which addresses a current problem.

GEORGIA WATERSHED MANAGEMENT PLAN PROGRAM

Watershed management plans have been adopted and are being implemented in other parts of the country. The significant costs and enforcement cases for combined sewer collection systems made it more efficient for parts of the country with combined sewer collection system, i.e. sewer and stormwater in the same collection system, to move forward by creating a new consolidated utility to address their high costs for separating the sewer system into two separate collection systems. More than 30 years ago, Georgia began to respond to the demand for water supply and conflicts with its neighboring states over lakes and nutrient-related problems. By 1990, the Georgia General Assembly had directed the State to establish individual water quality standards for each lake. Official Code of Georgia Annotated (hereafter “GA. Code”) § 12-5-23.1. The statute includes the following provision:

“(d) The standards for water quality of each lake shall take into account the geographic location of the lake within the state and the location of the lake within its watershed as well as horizontal and vertical variations of hydrological conditions within each lake. The director shall also establish nutrient limits for each of the lakes' major tributary streams, including streams with permitted discharges. Such limits shall be consistent with the requirements of subsection (b) of this Code section and shall be established on the basis of accepted limnological techniques and as necessary in accordance with the legal and technical principles for total maximum daily loads. The nutrient limits for tributary streams shall be established at the same time that the lake water quality standards are established.

²² NC Gen. Stat. § 143-211(b).

The Atlanta metro area provides a good example of this approach both for water supply issues as well as water quality nutrient issues in southeastern Piedmont lakes. Atlanta had a combined sewer system in its downtown that was 11 miles long. By 1998, the City had entered into 2 federal consent orders to address its water quality problems. In response, Atlanta repaired and rehabilitated 373 miles of sewers. The installation of 18 miles of sewer tunnels for the Nancy Creek and West Area Combined Sewer Overflow manages excess flow during major rain events. Those improvements plus the incorporation of green infrastructure to reduce flooding resulted in a finding that the City met the first consent decree deadline in 2008.

The Georgia General Assembly created the Metropolitan North Georgia Water Planning District in 2001.²³ Its purpose is to preserve and protect water resources in the 15-county metropolitan area of Atlanta. The legislation created a governing board charged with adoption of a comprehensive plan to promote inter-governmental coordination of water issues from a regional perspective. The plan combines water supply and water conservation, wastewater management, stormwater management, and management activities to protect and enhance the watershed. The initial plans were adopted in 2003 and the most recent update was adopted in 2017. The plan includes water resources in 5 river basins. Seven authorities provide water, wastewater and/or stormwater services within the Metropolitan North Georgia Water Planning District.

Georgia expanded on this concept in 2008 when it adopted legislation creating ten additional regional water planning organizations for the remainder of the state. The state agency charged with environmental protection in Georgia is the Department of Natural Resources Environmental Protection Division. The Division is organized into 3 branches. The Watershed Protection Branch is charged with the protection and restoration of Georgia's water resources. The Watershed Protection Branch oversees permitting for wastewater; drinking water; water withdrawal; stormwater; and erosion and sedimentation as well as regulating dam safety; water well standards; drought; water efficiency and water loss; and fats, oils, and grease. The Branch includes the Watershed Planning and Monitoring Program.

As a part of its re-examination of the prior piecemeal efforts at water management, Georgia also mandated the development of a state water plan. Its plan was adopted by the General Assembly in January 2008. Ga. Code § 12-5-522. The law includes the following:

- “(b)** The following principles shall guide the work of the division in developing a comprehensive state-wide water management plan:
- (1)** Effective water resources management protects public health and the safety and welfare of Georgia's citizens;
 - (2)** Water resources are to be managed in a sustainable manner so that current and future generations have access to adequate supplies of quality water that support both human needs and natural systems;

²³ GA. Code § 12-5-572.

- (3) All citizens have a stewardship responsibility to conserve and protect the water resources of Georgia;
- (4) Water resources management efforts must have a sound scientific foundation and recognize that economic prosperity and environmental quality are interdependent;
- (5) Water quality and quantity and surface and ground water are interrelated and require integrated planning as well as reasonable and efficient use;
- (6) A comprehensive and accessible data base must be developed to provide sound scientific and economic information upon which effective water resources management decisions can be based;
- (7) Water resources management encourages local and regional innovation, implementation, adaptability, and responsibility for watershed and river basin management;
- (8) Sound water resources management involves meaningful participation, coordination, and cooperation among interested and affected stakeholders and citizens as well as all levels of governmental and other entities managing or utilizing water; and
- (9) Periodic revisions of the comprehensive state-wide water management plan may be required to accommodate new scientific and policy insights as well as changing social, economic, cultural, and environmental factors.

Ga. Code § 12-5-522

In addition, the law set out the enforcement means for the State-wide Comprehensive Plan.

“The division shall make all water withdrawal permitting decisions in accordance with this chapter, the comprehensive state-wide water management plan that has been approved or enacted by the General Assembly as provided by this article, and any applicable regional water development and conservation plan, including, but not limited to, restrictions, if any, on diversion from or reduction of flows in other watercourses. Any political subdivision or local water authority that is not in compliance with the plan shall be ineligible for state grants or loans for water projects, except for those projects designed to bring such political subdivision or local water authority into compliance with the plan.”

GA. Code § 12-522 e.

The law and the Comprehensive Statewide Management Plan were the foundation for the development of the regional water plans. The enabling legislation for the Comprehensive State-wide Water Management Plan required that it be approved by a resolution of the General Assembly before it was effective. The scope of the plan was set forth in legislation and is described in the Plan as follows:

“The comprehensive state plan hinges on development of regional water plans. Regional forecasts of future needs for water and wastewater will be completed. Then, regional plans will be developed to identify the management practices to be employed, following state policy and guidance, to ensure that the anticipated demands can be met. Once the regional plans have been developed and approved, the state and the regions must partner to implement the plans. Regional plans primarily will be implemented by the various water users in the region, with state permitting and financial assistance as consistent with the regional plan.

“Looking toward a future with increasing demands on water resources, it is clear that coordinated water planning will be an on-going need. The Comprehensive Statewide Water Management Plan provides a framework to measure water resources, to forecast how much water supply and assimilative capacity will be needed to support future growth, and to identify regional solutions to water needs.”

Georgia Comprehensive State-wide Water Management Plan, page 5 (2008)

The Regional Plans are developed consistent with rules adopted by the Environmental Protection Division.²⁴ The regional planning councils that develop the plans are managed by local officials and other appointees. The regional water planning councils enter into a memorandum of agreement with the environmental state agency and the agricultural state agency to establish and operate the council consistent with the State-wide Water Management Plan.²⁵ After a review by the Environmental Protection Division and a determination that a plan is consistent with the guidance adopted by the state agency, the plan is adopted by the state agency. Once adopted, the plan will be implemented by the water users in the water planning users in the region. The state agency makes water permitting decision based on the plan. While the Regional Plans share some attributes with the North Carolina River Basin plans, the Georgia Regional Plans act as a template for long term implementation of the plans with the ability to stagger the costs over a substantial period of time. The expansion of the NC basin plans to include water resources, in particular groundwater, assisted in bringing the basin plans closer to the scope of the Georgia regional water plans. However, the N.C. basin plans have limited local engagement, only address the next 10-year period, and provide no regulatory protection for local governments.²⁶

The NC Water Quality Protection Plan (WQPP) statute, while not specific on the time blocks of planning, allows a similar plan as that used in GA. Much of the demographic information for a WQPP is available in the NC basin plans. The GA plans include forecasts of population expectations, water demands, wastewater returns, land surface types and distribution, and employment characteristics for 10-, 20-, 30-, and 40- years. See page 37, State-wide Plan at Implementation Action (7) c.v. In the same part of the Plan, the regional plan must establish water quality and quality management

²⁴ See Chapter 391-3-32 of the Department’s rules.

²⁵ See page 35 of the State-wide Plan at Implementation Action (3)f.

²⁶ N.C. Gen. Stat. § 143-215.8B.

objection for 10-, 20-, 30-, and 40- year time horizons. The regional plan must also set benchmarks for assessment of plan effectiveness and identification of required revisions and action required by the state to support objectives for in the recommended water development and conservation plan. The Georgia State Plan also includes a requirement for review and revision of the regional plans on a five-year basis.²⁷

The Regional Water Planning rules of the GA Department of Natural Resources were adopted to implement the State-wide Water Management Plan. The rules follow closely the Implementation Actions as set forth in the Plan. The Regional Plans are defined to include the full scope of activities as set forth in the enabling legislation²⁸ The Regional Water Planning Councils become operative when the Director of the Environmental Protection Division issues a letter of delegation providing notice of delegation of duties and notice to proceed with preparation of a plan. ²⁹To obtain a delegation, a Regional Water Planning Council first must enter into a memorandum of agreement with the Division and the Department of Community Affairs to carry out its duties as set forth in the enabling legislation, the rules, and the Comprehensive State-wide Water Management Plan.

In NC, the WQPP must be approved by the governing bodies of the participating local governments and the EMC to become effective. The NC statute recognizes that the coalition plans may need to vary among subareas or jurisdictions of the geographic area covered by the coalition plan. ³⁰

The GA statute varies from NC's WQPP statute regarding the withdrawal of a member local government from the plan. NC allows the plan to be withdrawn if the remaining coalition members fail to provide an acceptable alternative. It is silent as to consequences for a member local government which fails to implement the plan. In Georgia, failure to implement a regional plan has two specific consequences; (1) additional permit conditions to conform to the Comprehensive State-wide Water Management Plan and (2) the loss of state grants or loans except for projects designed to bring the political subdivision or local water authority into compliance with the Plan.³¹

2022 Metropolitan North Georgia Water Planning District Plan

The most recent iteration of the Metropolitan North Georgia Water Planning District ("Metro North GA") demonstrates the breadth of such plans and illustrates the value this process provides for addressing systemic and long-term water quality problems. While the enabling legislation for the 2022 "Water Resources Development Plan" adopted by the Metro North GA is more detailed than the legislation for other regional plans, the State-wide plan imposes a similar level of detail for the other

²⁷ See page 38, Implementation Action (9).

²⁸ See GA. Code §§12-5-31(h) and 12-5-96(e).

²⁹ GA. Rule 391-3-32(4).

³⁰ N.C. Gen. Stat. §143-214.14(h).

³¹ GA. Rule 391-3-32(7).

regional plans. In particular, the linkage between the permits to operate water treatment and wastewater treatment plants determines the permit conditions for each five-year permit cycle.³² The second notable provision is the direction on stormwater. Model ordinances were authorized with a directive that “if appropriate, to provide additional measures to improve storm-water run-off, including without limitation, requirements to retrofit or modify existing development in order to improve storm-water run-off quality.”³³ The Director of the Division of Environmental Protection was authorized to modify NPDES MS4 Permits to make them consistent with the Metro North GA Plan.

Despite 20 years working on the issues, North GA Metro has not taken on the issue of retrofit of existing development.

The 2022 Plan also shows in Appendix B the county level summaries for the 2040 forecast demand for both water and wastewater treatment facilities.³⁴ The summary of wastewater treatment improvements is in Section 5.3.3 “Wastewater Management Action Items.”³⁵

“5.3.3 Wastewater Treatment Standards

“Higher levels of treatment with advanced technologies at wastewater treatment facilities will most likely be required during the planning horizon where current limits may not be sufficient to protect water quality standards. Some reasons to anticipate more stringent wastewater treatment standards include:

- *Total Maximum Daily Loads (TMDLs)*: As the causes of impairments of surface water uses are identified in TMDL plans, more restrictive discharge limits may be imposed on some wastewater treatment facilities. These limits will be specific to the cause of the impairment, such as excessive nutrients or inadequate dissolved oxygen. Most of the TMDL challenges in the Metro Water District are related to nonpoint source pollution, which will be mitigated by implementation of the Watershed Management Action Items in Section 5.4.
- *In-stream nutrient standards*: Georgia EPD is developing standards and implementation strategies for nutrients (including ammonia) in various water bodies. When these are finalized, nutrients in the flow discharged by wastewater treatment facilities may need to be reduced below current levels with higher levels of treatment. At this time, Lake Lanier and Allatoona Lake have limits on the discharge of phosphorus from wastewater treatment facilities.³⁶

³²GA Code § 12-5-583(e).

³³ GA Code § 12-5-582 (b)(7).

³⁴ In the 2017 edition of the Plan, the summaries showed projected needs through 2050.

³⁵ 2022 Metro North GA Plan, pp 5-75 to 5-97.

³⁶ The same language appears in this section from the 2017 Plan.

- *Increasing volumes of wastewater:* Growth in the Water District will lead to increasing volumes of wastewater for treatment and discharge. As the volume of discharges increases, the level of treatment must increase correspondingly in order to provide the same level of protection for surface water quality.

“While this Plan is designed to protect water quality, the determination of specific facility-level wastewater treatment limits that will protect water quality is the responsibility of Georgia EPD. When this Plan uses the term “highly treated wastewater,” it means water meeting the facility-level treatment limits as determined by Georgia EPD. The Plan does not presuppose or require any specific level of treatment, including tertiary treatment. Local wastewater providers should not assume that assimilative capacity is available in a receiving body even if a projected plant capacity is listed in the tables of Appendix B. It is the responsibility of each local wastewater provider to coordinate with Georgia EPD to assess the assimilative capacity of receiving waters as a first step when planning for an expansion or new discharge.”

This plan illustrates the benefits of an agreement for staged implementation of the actions to address all aspects of the watershed’s WQS and the protection afforded by allowing for improvements over a sustained period with gradual impact on the financial capabilities of the local governments.

“6.2 Implementation Schedule

Some Action Items include specific dates and deadlines for required activities for compliance. Some Action Items list long-term dates for compliance of certain sub-tasks more than five years from the date of this Plan. Most Action Items do not include specific dates and deadlines and, therefore, activities are expected to be continuous throughout the planning period for these Action Items. The activities of regional and state agencies, described above, are ongoing, and therefore, are not detailed in a schedule. Instead, these activities are expected to be continuous throughout the planning period. Utilities and local governments are expected to begin implementing these Actions Items within as short of a period as practicable following adoption of this Plan.”

2022 Metro North GA Plan, p 6-2.

The 2022 Plan represents a next iteration in the continuous planning process by the Metro North GA Planning District. The 2017 Plan combined water supply needs and wastewater needs. The 2022 Plan expanded to include provisions on Watershed Management Action Items. The Plan speaks to this broader scope in Section 1.2 Integrated Regional Water Resources Planning.

“Integrated planning and management decisions consider the entire system and long-term impacts, because ‘decisions based on only a single point or component in the water management cycle can have unexpected consequences elsewhere’ (Patwardhan

et al., 2007). Integrated water resources planning supports sustainable management that ‘facilitates long-term planning, promotes consistency and efficiency, optimizes uses of the water system, encourages and facilitates regional planning, provides flexible solutions and enhances communication and community support’ (Freas et al., 2008).

...

“To integrate water resources planning in the District, the District combines the plans for Water Supply and Water Conservation, Wastewater Management and Watershed Management into one integrated Plan. It emphasizes the connections in management approaches and reduces redundancy. It considers the interrelationships among its strategies and their impacts, and it supports collaborative implementation that broadens traditional organizational roles. With the integrated Plan, the District can also comprehensively implement shared strategies for public education, technical assistance for member jurisdictions and plan evaluation.”³⁷

SANITATION DISTRICT NO. 1 AND INTEGRATED PLANNING PURSUANT TO THE CWA

Sanitation District No. 1 (“SD1”) is located in northern Kentucky with the Ohio River separating it from adjacent states. SD1 was established in 1946. It encompasses 176 square miles within three counties. Its metropolitan areas include the cities of Covington, Newport, and Bellevue as well as more recently developed suburban areas. The older municipalities had combined sewer. In April, 2007, SD1 entered a Consent Decree with US EPA and the Kentucky Energy and Environment Cabinet. The Consent Decree was designed to address by CSOs and SSOs. EPA identifies it as the first Consent Decree to use the watershed-based approach in the planning process that allows for consideration of pollution sources beyond sewer overflows. The Consent Decree is credited with being “essentially the start of the development of EPA’s Integrated Planning Framework” by the Water Environment Federation.

Consistent with the Consent Decree, SD1 presented a Watershed Plan in 2009 to address the requirements of the CD for both its CSOs and SSOs. The proposal was negotiated over several years and the technical portion of a final plan was approved in 2014. The proposed plan was developed using the Integrated Plan process set forth in EPA policy. The Integrated Plan was deemed appropriate as sewer overflows were not the sole sources of impairment in the streams and rivers of Northern Kentucky and the recognition that streams and rivers cross the jurisdictional boundaries resulting in polluted runoff impacting downstream cities. The Integrated Plan also opened the opportunity to compare gray and green infrastructure benefits, as opposed to the traditional approach in CDs of focusing on gray infrastructure only.

³⁷ 2022 *Water Resources Management Plan*, p 1-5.

The watershed approach is based on the characteristics of the individual 16 sub-watersheds and considers sources of pollutants other than the sewer lines including runoff and dry weather sources. The resulting Watershed plan followed EPA's Integrated Plan process and included the following components:

- “Characterizes water quality impacts, sources and sensitive areas;
- “Prioritizes overflows based on public health and sensitive areas;
- “Recognizes other pollutant sources and their relative impact and puts CSOs and SSOs into context with those sources;
- “Provides a process to address and control highest regional priorities first to offset controls on CSOs, with a focus on implementation of green infrastructure;
- “Uses an integrated approach of controls that will address both wet and dry weather sources of pollution, eliminate SSOs, comply with the CSO Control Policy and lead to a greater improvement in water quality and public health;
- “Provides additional benefits to the community such as air quality, wildlife habitat, urban beautification, and economic development; and
- “Directs funds to projects that provide the greatest benefits.”³⁸

Based on the Affordability Assessment, EPA agreed that the timeframe for compliance with the original Consent Decree should be modified as the original Consent Decree schedule was unaffordable for the ratepayers.³⁹ In addition, SD1 showed that the benefits from selected gray infrastructure projects for smaller levels of control were inefficient uses of funds when compared to additional green infrastructure. The 2014 “Watershed Plans for Northern Kentucky” described the advantages of the watershed approach as follows:

“The SD1 Consent Decree, developed in partnership with state and federal regulatory agencies, represents a paradigm shift in wet weather control programs. The watershed approach is one of the U.S. Environmental Protection Agency’s ‘Four Pillars’ for sustaining water infrastructure (EPA, 2006). Under the watershed approach, priorities and solutions that provide the largest overall environmental impact are developed based on current information considering watershed-based, cost-effective alternatives as well as traditional gray-only infrastructure solutions. This process recognizes the need to consider environmental progress, make wise use of public resources, and direct funds towards the most significant problems first.”

³⁸ “Executive Summary” for “Watershed Plans for Northern Kentucky”, dated March 14, 2014, page ES-4.

³⁹ The projected rate increase for the average residential monthly sewer bill of 500% in a 15 year period. 2014 Executive Summary, page ES-26.

2014 Executive Summary, page ES-39.

The resulting amended Consent Decree was entered in 2019. The Amended Consent Decree allowed for subsequent updates to the Watershed Plans and set specific goals with timelines. As a part of this adaptive management framework, the requirements in the first 10-year period are more specific on actions to achieve the overflow reduction milestones. The requirements for the second 10-year period are described in preliminary plans which are subject to refinements and even significant changes in the next set of watershed plans as conditions and technologies evolve. The Watershed Plan milestones for reduction of CSOs and SSOs are spread from 2023 to 2040. SD1 anticipates that it will achieve the goals of the Amended Consent Decree by 2040.⁴⁰

In 2009, SD1 estimated the total costs for compliance with the Consent Decree would be from \$1.9 Billion to \$3.2 Billion using a gray-only solution concept.⁴¹ After implementing the watershed approach with incremental planning stages and adaptive management, the total costs for compliance with the ACD is estimated to be \$1.23 Billion.⁴²

PHILADELPHIA WATER DEPARTMENT PLAN

Other examples of long-term plans are found in the Consent Orders that numerous utilities have entered with EPA to resolve ongoing violations.⁴³ These agreements increasingly have focused not only on the resolution of the reasons for non-attainment of WQS, but also on a strategy to protect the watershed from a return to a status of non-attainment. A useful example, because of its focus on stormwater from impervious surface, is the City of Philadelphia's long term plan for meeting its CWA obligations.

Like the Metro North GA Plan, it was developed in response to a Consent Order to resolve violations of the CWA. The crux of the problem in Philadelphia was stormwater discharges and combined sewer overflows. The primary issues for attention centered on separation of the combined sewers, control of stormwater, and improvement of the treatment capacity of its wastewater treatment plants. The Philadelphia plan is called "Green City, Clean Waters." It was submitted to the Commonwealth for approval. The most recent increment of the plan was adopted on May 30, 2022. It is a 10- year evaluation and adaption plan. The first version of the *Combined Sewer Overflow Long Term Control Plan Update* was approved on June 1, 2011. Pursuant to the Consent Order & Agreement, the City was required to construct and place in operation the controls necessary to achieve the elimination of the mass of pollutants that would otherwise be removed by the capture of 85% by volume of the

⁴⁰ "Executive Summary" for "Updated Watershed for Northern Kentucky, Final Draft Report", May 13, 2012.

⁴¹ 2014 Executive Summary, page ES-13

⁴² 2021 Executive Summary, page 11.

⁴³ See <https://www.epa.gov/npdes/integrated-planning-municipality-integrated-plans> and <https://www.nacwa.org/advocacy-analysis/campaigns/water-infrastructure-flexibility-act>

combined sewage collected in the combined sewer system during precipitation events on a system-wide annual average basis. The Consent Order & Agreement required the first Evaluation and Adaptation Plan within 5 years and a second plan at the end of 10 years.

1.2 Adaptive Management Process

The *Green City, Clean Waters* program is predicated on an adaptive management framework, described in the LTCPU, and affirmed in the COA. An adaptive management approach enables flexibility and periodic program assessments throughout the program lifecycle. The *Green City, Clean Waters* program adaptive management structure has been formalized through the incorporation of WQBEL Performance Standards in the COA and assessments of progress toward those 5-year benchmarks within EAPs. This structure enables programmatic re-evaluation and/or revision if or when needed. At the close of Year 10 of the program, PWD is not proposing any significant programmatic changes.

Green City, Clean Waters Year 10 Evaluation and Adaption Plan, pp 1-3.

The full plan for Philadelphia requires achievement of the Water Quality Based Effluent Limitation targets in 15 years.

The plan required the creation of 2,196 greened acres by 2022, upgrades of wastewater treatment plants, improvements for the collection system, 7.5 miles of lined interceptors, overflow volume reduction of 2.044 MG, and significant improvements of its models and monitoring. The Greened Acres used a variety of actions to exceed its 10-year goal. The results from its three strategies were similar: 700 acres from (re)development; 690 acres from public investment; and 806 acres from incentivized retrofits. Like the North GA Metro Plan, the 15-year duration of the agreement allows Philadelphia to have a known set of goals, an opportunity for revision on a periodic basis, and permits based on the goals set in the plan.

CONCLUSIONS

The substantial research done for the re-examination of the Falls Lake rules illustrates and highlights the complexity of addressing nutrient overload-enrichments in Piedmont reservoirs. The reductions achieved during Stage I of the rules have removed from the potential inventory of sources most of the load reductions that can be achieved by 2041, the current deadline for accomplishment of the nutrient management strategy. The more recent research has established the importance of the significant amounts of “legacy” nutrients stored in the sediments in the reservoirs, in streambanks, and in groundwater, whether from the overuse of fertilizer or onsite septic system loading of groundwaters. The time for natural processes to address the legacy nutrients push the projected date for achievement of the goals of the nutrient management strategy substantially beyond 2041.

Two other important sources of nutrients are atmospheric deposition on impervious surfaces, a source of nitrogen, and sediment in runoff, a source of phosphorous. As EPA research shows, stormwater flows are a significant source of nutrient loading that is particularly challenging to resolve in North Carolina. These sources of nutrient loading are outside the ability of the local governments to control. Likewise, loading caused by large storm events such as tropical storms or heavy rainfall is not controlled by the stormwater measures required under the Falls rules. Collectively, these sources of nutrients make it readily apparent that nutrient impairments cannot be resolved by 2041, but instead will take decades to resolve even as new sources of loading are added to the basins.

The Falls Rules anticipated an extended time for recovery and divided the remedial efforts into two Stages. The research based on more extensive monitoring and modeling confirm that the remedial efforts will be needed for many years to come, and that few remedial actions can address “legacy” nutrients. The current control efforts have focused on new development, nutrient reductions at the WWTPs using current technology, and agricultural reductions. The existing development loading has had limited reductions, however that source of reductions can be enlarged with the addition of nutrient reduction values for more economically effective technologies and the implementation of the innovative approach to reduction of loading from existing development known as the Interim Adaptive Management Approach. Given the importance of legacy nutrient loading sources and the Legislative barriers to local governments achieving reductions from re-developed properties, the needed reductions to achieve an attainment status for the current nutrient WQS will extend long after 2041.

Since the Falls Rules were adopted in 2011, the regulatory challenges for utilities have changed significantly, especially with the emergence of “forever chemicals” such as Gen-X and other per- and polyfluoroalkyl substances, as known as PFOAs and POAs. Addressing those issues could add another source of significant expense for the water and sewer utilities that will be added to the cost to repair aging infrastructure and the increased volumes of stormwater resulting from more intense storms associated with climate change. The requirement to address multiple expensive improvements to CWA regulated utilities make it important to establish a regulatory scheme that provides for advance planning and State and local cooperation on setting reasonable schedules to achieve the expensive upkeep and improvement of the utilities.

RECOMMENDATIONS

The adaptive management strategy for the next increment of progress on the achievement of an attainment status for Falls Lake for nutrients provides an excellent opportunity to North Carolina to implement a water quality protection plan consistent with the vision set forth by EPA Assistant Administrator for Water Fox in in her April 2022 memorandum. The fundamental structure is already in place from N.C. Gen.

Stat. § 143-214.14. With modest changes, the statute can be revised to take into account elements of the Georgia legislation and the Integrated Plan framework of EPA.

The impacted local governments have developed a remarkable record of cooperation in their monitoring and modeling efforts as well as the implementation of Stage I controls. At the same time, it is apparent that they also seek more certainty in developing appropriate, scientifically supportable and achievable goals for the future and reliable forecasts of the cost to implement the program. The chance to promote local government support and to achieve a successful nutrient management plan is through a cooperative voluntary program, instead of by a court ordered program. This approach can open a new dimension in the clean water programs for North Carolina. The following changes are recommended for the statutes, in particular N.C. Gen. Stat. § 143-214.14.

1. Amend N.C. Gen. Stat. § 143-214.14 to require that the nonprofit corporation to establish a coalition of local governments is subject to the Open Meetings Law and the Public Records Act.
2. Amend N.C. Gen. Stat. § 143-214.14 to protect coalition members from enforcement actions so long as the WQPP is implemented as provided.
3. Amend N.C. Gen. Stat. § 143-214.14 to require that permits issued by the Department of Environmental Quality be consistent with the schedule of improvements in an approved WQPP, including as the WQPP is later amended.
4. Amend N.C. Gen. Stat. § 143-214.14 to require that a WQPP establish the date certain for attainment of designated uses and set forth the actions to be taken in 5-year time blocks until the projected date of attainment, or in the alternative, establish actions to be taken in 5-year time blocks if the projected date of attainment is longer than 20 years after the date the WQPP is submitted to the EMC.
6. Amend N.C. Gen. Stat. § 143-214.14 to provide for notice and comment on a proposed WQPP presented to the EMC and to provide for contested case review of EMC decisions on proposed coalition plans, review of determinations that a local government coalition member should be removed from a coalition plan for failure to implement the plan, and review of the Commission's decision to suspend or revoke an approved plan. Provide that coalitions plans are not rules subject to the adoption requirements of the Administrative Procedure Act. Clarify that a local government coalition member which fails to implement an approved plan may be subject to penalties in accordance with Article 21 of Chapter 143.
7. Amend N.C. Gen. Stat. § 143-214.14 to impose consequences for local governments which fail to abide by the coalition agreement approved by

the EMC. Provide DEQ permits are amended automatically to enforce requirements otherwise in place for the basin in place of WQPP provisions and bar the local government from access of state grants or loans except for projects designed to bring the political subdivision or local water authority into compliance with the basin requirements.

8. Amend N.C. Gen. Stat. § 143-214.14 to require that when a WQPP implements a site specific WQS that the methodology for determining attainment of the WQS be consistent with the methodology set forth in the approved WQPP.

9. Amend N.C. Gen. Stat. § 143-214.7 to authorize local governments to require stormwater controls for the total impervious surface of redevelopment sites, notwithstanding N.C. Gen. Stat. § 143-214.7, to the extent the approved WQPP relies on stormwater reductions from the entire impervious surface of redevelopment sites.

10. Amend N.C. Gen. Stat. § 77-141(c) to add another purpose of proposing and entering into a WQPP pursuant to N.C. Gen. Stat. § 143-214.14 with the EMC.