Fiscal Note

Rule Citation No. Proposed 15A NCAC 18C .1305

Commission: NC Commission for Public Health

Rule Topic: Standardization of a process to improve emergency and source water protection planning for public water systems treating and furnishing water from surface supplies. The proposed rule is in response to a legislative mandate to protect public drinking water (S.L. 2014-41).

DEQ Division: Division of Water Resources

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Impact Summary:

State government:	Yes
Local government:	Yes
Private entities:	Yes (but limited in scope and number)
Substantial Impact:	No
Federal government:	No

Necessity: Emergency response and source water protection planning serves the public interest by helping to protect public health. This proposed rule sets minimum standards for suppliers of water to assess threats and identify mitigation strategies in response to contamination and/or emergency events.

1. Background

Contamination events that can jeopardize public drinking water supplies are often high-visibility, expensive to mitigate, and they highlight vulnerabilities of public water supply systems. A prime example includes the accidental release of 4-methylcyclohexanemethanol (MCHM) in West Virginia, where approximately 10,000 gallons of MCHM was accidentally released into the Elk River upstream from a water treatment facility. Officials have reported that the spill impacted nearly 83,000 households and resulted in an expense of approximately $17 million (Schade, et. al., 2015). Another example includes the coal ash spill in North Carolina. In a December 2016 filing, Duke Energy's two utility subsidiaries disclosed they have spent a combined $725 million since 2015 to clean up coal ash ponds in the state (Downey, 2016). In May 2014 Duke Energy

agreed to pay EPA $3 million to address this spill and an additional $2 million in past and future response costs associated with the spill (EPA, 2014). Whether by accident, nefarious acts, or natural causes, the release of contamination in or near sources of public drinking water can erode consumer confidence, disrupt service, and/or trigger clean-up protocols that are expensive and complex.

Source water protection planning has long been recognized by US EPA as an effective strategy to help protect sources of drinking water from contamination. The planning exercise includes assessment of potential threats to the source and identification of management strategies designed to reduce or mitigate such threats. Although traditional source water protection plans emphasized proactive activities, emergency preparedness has recently emerged as a necessary component. Emergency response protocols address a subset of issues that often demand reactive and immediate action.

To date, source water protection planning in North Carolina has been approached on a voluntary basis. The legislation and proposed rule will mandate source water protection planning by all public water systems treating and furnishing water from surface supplies. The resulting plans will be standardized to include a set of mandatory elements and required implementation activities designed to increase their effectiveness. Water systems will be required to update the information in their plans on a regular basis.

Every public water system faces unique constraints and challenges when designing activities to protect its source(s). For this reason, source water protection planning is intended to occur at the local level, utilizing local expertise and knowledge to assess potential threats. The state can best assist local efforts by providing technical information that categorizes the type and location of potential contamination, the inherent vulnerability of public drinking water sources, and susceptibility ratings that indicate relative risk to contamination. Tools to provide this information have been developed by the agency and are available online.

This proposed rule will impact 131 public water systems in the state that serve a combined population of approximately 6 million consumers. Draft rule language was refined by a stakeholder team that included public water supply systems, regulatory professionals, nonprofit entities, and other environmental professionals directly involved in the drinking water industry.

The proposed rule is designed to require a comprehensive assessment and planning mechanism, while minimizing compliance burden associated with specific, state-imposed implementation criteria. This approach is supported by two driving factors. First, water utilities are unique and face individualized challenges that are dependent upon local situations. Secondly, water utilities have varying capabilities to address protection strategies. Therefore, once a source water protection plan has been certified as complete, implementation of site-specific strategies is returned to the discretion of the local water utility that developed the plan.

2. Estimating Economic Impact

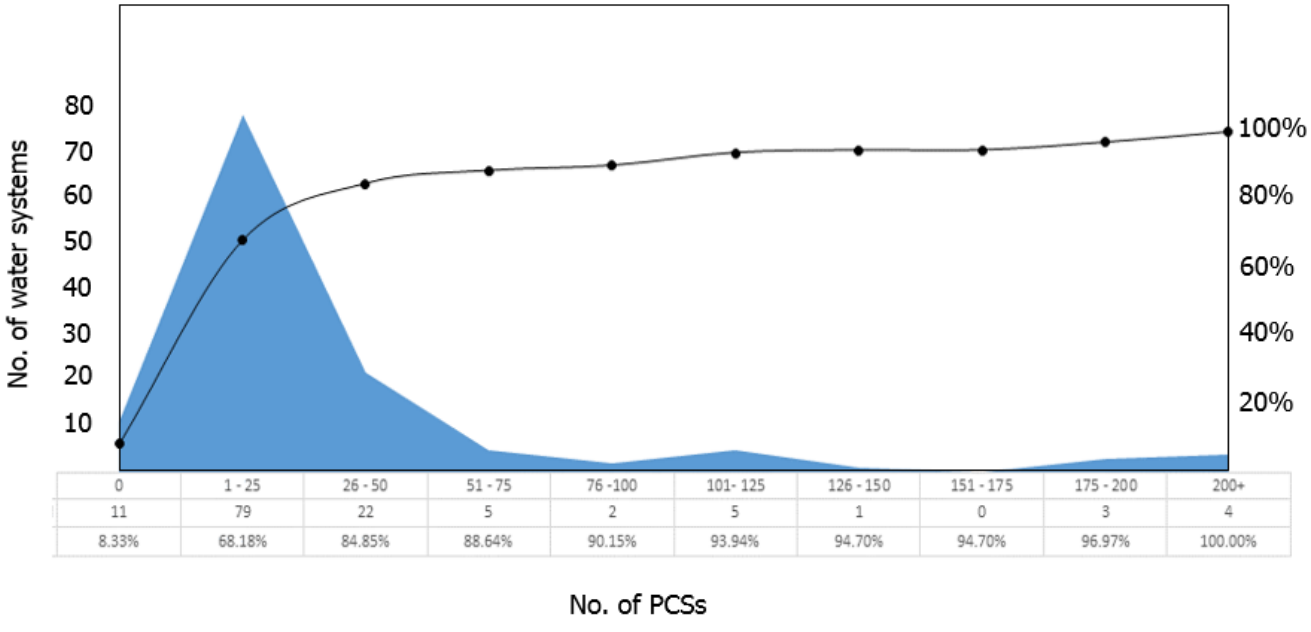
2.1 Costs

Every supplier of water operating a public water system treating and furnishing water from surface supplies is responsible for complying with the proposed rule. There is a total of 131 water systems across the state that fit the regulatory criteria. Of these, the overwhelming majority (126) are categorized as community systems and are owned and operated by a unit of local government. The remaining 5 systems are non-transient non-community water systems and are primarily privately owned.

a) Community Water Systems

The cost for a community water system to develop and implement a source water protection plan varies depending on: (i) the complexity of the plan, which is a function of the potential contaminant sources (PCSs) near the intake, and (ii) the level of internal, in-house expertise. Regarding plan complexity, the Section's analysis shows that most community water systems (90 systems, or approximately 70% of the total) will have 25 or fewer potential contaminant sources to consider (Fig. 1). This suggests that most source water protection plans may be relatively simple and will not induce excessive economic burden, especially if the plan is developed using internal knowledge and/or existing water system employees.

Fig. 1. PCSs as an indicator of plan complexity



Previous outreach with water systems performing a similar exercise (e.g., developing voluntary source water protection plans) provides examples that can be used to estimate cost. In these examples, it was reasonable to expect three employees to expend 24 hours (8 meetings at 3 hours

per meeting) plus another estimated 12 hours reading associated materials outside of the meetings. Creating a written document to reflect the finished process was typically completed by an administrative employee expending approximately 40 hours of effort. Upper management review and revision likely consumed another 20 hours. Therefore, one can approximate plan development costs to include 170 people-hours, implying a cost of $8,500 if one assumes an average labor cost of $50 per hour for all those staff involved (e.g., the "higher salary" scenario). Alternatively, there are many small systems across the state that retain relevant and capable personnel (facility operators, etc.) at a much lower salary. For these systems, if we estimate an average hourly compensation of $30, then the total cost required for plan development would be $5,100 (e.g., the "lower salary" scenario). The agency believes that most water systems can comply with the new regulations at a cost between the higher and lower estimates. Note that in these scenarios, the majority of cost is not necessarily monetary, but more associated with missed opportunity cost of participating staff.

It should be noted that some water systems may prefer to contract plan development to an external vendor, thereby instilling a true monetary cost for services provided. Analogous situations have occurred with NC Rural Water Association developing wellhead protection plans, and the NC Clean Water Management Trust Fund providing funds for drinking water protection plans. Such examples are not an exact match with the proposed rules but provide anectodical evidence to estimate cost. Both agencies funded multiple local plans at a cost of approximately $25,000 per finished plan.

Additional examples are available from West Virginia. In 2014, West Virginia passed a similar law requiring the development of source water protection plans for surface water systems. According to the West Virginia Department of Health and Human Services, some of the water systems developed the plan in-house while others utilized contractors with a cost of approximately $25,000 per plan. West Virginia staff further indicated that costs varied depending on plan complexity. It was noted that the development of detailed guidance materials and a plan template were key to reducing costs (Toomey, 2017).

Although contracting is an option, the PWS Section believes compliance with the proposed rule can largely be accomplished using local, in-house expertise, and we intend to provide detailed guidance materials and on-site technical assistance to assist the regulated community. In summary, for most community water systems, developing a source water protection plan is estimated to cost between $5,100 and $25,000.

b) Non-Transient Non-Community Water Systems

There are five non-transient non-community (NTNC) water systems in the state. These systems are privately owned and primarily serve industry. The draft rule language provides simplified planning requirements for NTNC systems. This is because: (i) an NTNC system is typically not the only source of water available, and (ii) people can more easily be prevented from consuming the water (e.g., employees can be sent home or bottled water can be provided on a temporary

basis). Due to the reduced requirements, NTNC systems can likely complete their protection plans with much less effort and resources than community systems. The PWS Section intends to introduce a standard template and detailed guidance to further reduce cost to NTNC systems. It is our belief that most plans will be developed using in-house expertise and that approximately 10 people-hours will be required. The Section does not differentiate between a higher and lower cost estimate, and hourly salary estimate for a plan developed in-house is $50. Alternatively, if contracted to an external consultant, the plan is estimated to cost $1,500 (e.g., 10 hours at $150 per hour).

Table 1. Alternative cost summaries to comply with SWP planning requirements

Systems/Scenarios	Number of Systems	Lower Salary Scenario	Higher Salary Scenario	Hiring Consultant
Community Water Systems	126	$5,100	$8,500	$25,000
Non-Transient Non-Community Water Systems	5	$500	$500	$1,500
Total	131	$645,100	$1,073,500	$3,157,500

Note: The salary cost estimates do not include benefits.

Although the estimates above are valuable to define upper and lower limits, it is likely that water systems will be distributed across each cost category. It is difficult to predict this distribution. However, a simplified attempt to refine the total cost estimate includes the following assumptions:

(i) Simple plans (those with 25 PCSs or less) will be managed in-house and not with consulting services. This component includes 90 water systems.

(ii) Of the 90 water systems in (i), there will be an even split between those in the "lower salary" scenario and the "higher salary" scenario.

(iii) More complex plans (those with more than 25 PCSs) will use the consulting alternative. This group includes 36 water systems.

(iv) All NTNC water systems will complete their plan in-house.

Applying the above assumptions suggests the cost for all NC water systems to comply with the new rule will total approximately $1,514,500. This averages out to roughly $0.25 per consumer.

c) State Government

The North Carolina Drinking Water Protection Program will have primary responsibility to implement the proposed new rule, which will significantly change existing program priorities. We estimate the need for one additional FTE (Environmental Program Consultant or

Contributing Engineer) to assist with compliance tracking, to provide technical assistance, and to create guidance documents and other supporting materials. Although this legislative directive (S.L. 2014-41) is an unfunded mandate, the agency should secure approximately $90,000 per year to support the new initiative with salary plus benefits. It is possible to repurpose existing staff to absorb new duties associated with rule implementation. However, current program goals and objectives will need to be deemphasized if financial support for the additional FTE is not available.

2.2 Benefits

a) Public Water Systems and the Consuming Public

The benefits associated with source water protection planning are tangible but difficult to quantify. EPA has often promoted source water protection planning from the context of economic benefit. EPA maintains that the cost to decontaminate or replace a compromised water source far exceeds the cost to protect it, and planning is the first step toward protection (Heberling, et. al., 2015). Also, during a contamination event where service has been suspended, a potential human health cost is incurred that intensifies the longer the outage persists. Most notably, service disruption results in immediate deterioration of sanitary conditions that increase the risk of bacterial and viral born illnesses. Therefore, EPA messaging has long supported protection planning and emergency readiness for the nation's public water supply systems.

It is expected that public water systems will be more prepared for emergencies and potential contamination following the development and implementation of their source water protection plans. It is impossible to accurately quantify the true economic impact of a compromised source based on a hypothetical contamination event. However, the two examples discussed previously provide a context for such analysis. These include the remediation costs associated with both the West Virginia release and the North Carolina coal ash spill. In West Virginia, initial cleanup efforts plus other economic losses have been estimated in the tens of millions of dollars. In NC, clean up for the coal ash spill has exceeded $700 million according to a report by Duke Energy published in December 2016. It should be noted that there are other potential costs following a contamination event that are not related to clean up and are difficult to represent as a dollar value. These costs include litigation, reduction of property values, loss of recreational opportunities, and erosion of consumer confidence. Avoiding such costs suggest multiple benefits may be realized through source water protection planning.

b) General Environment Benefits

Source water protection planning can serve as a catalyst for more general environmental benefits. Our experience working with water systems creating a protection plan demonstrates that interagency cooperation often occurs with programs not directly focused on drinking water. For example, it is not uncommon for professionals from agricultural programs and/or land conservation groups to participate as stakeholders. Projects such as excluding cattle from a

stream or buffer preservation are often discussed and considered, and projects of these types offer environmental benefits that are not limited to just drinking water protection.

2.3 **Summary of Total Economic Impacts and Benefits**

- There are 131 public water systems subject to the proposed rule. For each system, the estimated cost to develop a source water protection plan ranges from of $5,100 (completed with in-house expertise) to $25,000 (completed via external contract). Therefore, the total cost for all NC public water systems to comply with the new rule would range from approximately $645,100 to $1,073,500 if done in-house, and approximately $3,1570,500 if all plans are completed via external contract. Although the estimates above are valuable to define upper and lower limits, it is likely that water systems will be distributed across each cost category. Refining the estimate using logical assumptions suggest a total cost of $1,514,500, and this averages out to roughly $0.25 per consumer.

- The PWS Section will request an additional FTE to assist with outreach, compliance tracking, technical assistance and development of support materials. A minimum cost of $90,000 per year is needed to support the salary plus benefits of this position. The PWS Section will use this position to develop templates and offer direct technical assistance to reduce cost for water systems. This strategy will support compliance and likely empower more water systems to develop plans using in-house expertise, thus lowering their cost.

- Recent examples of contamination events suggest cleanup costs can exceed tens or hundreds of millions of dollars if a major spill does occur. Therefore, the minimized impact of only a few contamination events could offer significant economic benefits for water systems, the consuming public and the state agencies that respond to such events. The cost for the emergency and source water protection planning required by the proposed rule is estimated at $0.25 per customer. Although the benefits of this rule cannot be readily quantified, it seems reasonable that the potential benefits of emergency and source water protection planning are likely to encourage local water utilities to implement site-specific response strategies to protect public health and safety.

- The agency anticipates that general environmental benefits will also result from this rule. In addition to the benefits of human health protection, implementation of this rule could help enhance aquatic biodiversity through protection of aquatic habitats and organisms, help preserve the state's recreational and commercial fishing industries, and enhance interagency cooperation on projects that address multiple environmental objectives.

References

1. Downey, John, Duke Energy Pegs Coal-Ash Cleanup Cost at $725 Million So Far and It Could Ask Customers to Pay, Charlotte Business Journal, December 2016.
2. Schade, Charles P., Nasandra Wright, Rahul Gupta, David A. Latif, Ayan Jha, and John Robinson, Self-Reported Household Impacts of Large-Scale Chemical Contamination of the Public Water Supply, Charleston, West Virginia, 2015.
3. Heberling, M., C. Nietch, H. Thurston, M. Elovitz, K. Birkenhauer, S. Panguluri, B. Ramakrishnan, E. Heiser, and T. Neyer, Comparing drinking water treatment costs to source water protection costs using time series analysis, Water Resources Research. American Geophysical Union, Washington, DC, 51(11):8741-8756, (2015).
4. Toomey, William, interview via phone conversation, August 2017.
5. US EPA Region 3 and 4, NC Coal Ash Spill: Administrative Settlement Agreement and Order on Consent for Removal Action, May 2014, https://www.epa.gov/sites/production/files/2014-06/documents/signed-eden-ash-spill-aoc-04-2014-3762.pdf.

.1305 SOURCE WATER PROTECTION PLANNING

(a) In compliance with G.S. 130A-320, every supplier of water operating a public water system treating and furnishing water from a surface water source shall create and implement a Source Water Protection Plan (SWPP) based upon the following schedule:

(1) Water systems that have a single source of supply and a source susceptibility rating of higher or moderate, as determined by the Deparment, shall create and implement a SWPP by January 1, 2020.

(2) Water systems that have multiple sources of supply and any source susceptibility rating of higher, as determined by the Department, shall create and implement a SWPP by January 1, 2021.

(3) All other water systems treating and furnishing water from surface water sources shall create and implement an ESWPP by January 1, 2022.

(4) Any public water system that begins treating and furnishing water from a surface water source on or after January 1, 2020 shall create and implement a SWPP that satisfies the requirements of this Rule prior to the commencement of its operations.

(b) Any public water system required to create and implement a SWPP in accordance with this Rule shall review and update their SWPP at three year intervals from the creation deadline specified in Paragraph (a).

(c) Each SWPP shall contain the following elements:

(1) A list of potential contaminant sources (PCSs), both provided by the Department and identified by the water system, located in the following watershed areas as defined in 15A NCAC 2B .0212 - .0218:

(A) within the entire watershed for WS-I watersheds;

(B) within the critical area and 1,000 feet from perennial streambanks, or to the ridge line of the watershed, for WS-II and WS-III watersheds;

(C) within the critical area and 1,000 feet from perennial streambanks, or to the ridge line of the watershed, of the protected area for WS-IV watersheds;

(D) within ½ mile from the normal pool elevation in which the intake is located, or to the ridge line of the watershed, whichever comes first, for a reservoir within a WS-V watershed; and

(E) within ½ mile upstream from and draining to the intake located directly in the stream or river, or to the ridge line of the watershed, whichever comes first, for a direct-stream intake within a WS-V watershed.

(2) For community water systems, a contingency strategy that documents the system's planned response to an emergency event or contamination of its water source(s) that includes the following:

(A) identification and contact information of personnel responsible for emergency management, including water system, local, State, and federal emergency response personnel;

(B) identification of foreseeable natural and human-caused emergency events including water shortages and outages;

(C) description of the emergency response strategies for each identified shortage or outage event and each potential contamination event associated with PCSs identified and listed in Subparagraph (c)(1) of this Rule;

(D) standard operating procedures to close intakes and switch to an alternate intake during a contamination event, including procedures that outline exercises designed to practice closure and switching of the intake(s);

(E) description of public notification procedures; and

(F) identification and evaluation of all facilities and equipment that upon failure would result in a water outage or water quality violations.

(3) For non-transient, non-community water systems, the contingency strategy shall contain the positions and phone numbers of responsible persons to contact in the event of an emergency, including water system, local, State, and federal emergency contacts.

(4) An evaluation of a water system's ability to take the following actions:

(A) close its water intake(s) in the event of contamination, including a determination of the duration of time the water intake(s) can remain closed while maintaining positive water pressure within the distribution system;

(B) isolate or divert contaminated water from its surface water intake(s);

(C) reduce demand by implementing conservation measures during a contamination event; and

(D) meet demand via alternate sources of supply in the event of contamination or loss of its primary water source.

(5) Verification of outreach efforts provided to the owners of the PCSs identified in Subparagraph (c)(1) of this Rule to raise awareness of the proximity of the drinking water intake(s) and provide emergency contact information for use during a contamination event.

(6) A description of proactive activities and management strategies designed to protect the source(s) from contamination, including documentation of any voluntary source water protection activities that have been implemented by the water system.

(7) Description of public awareness communication efforts that include the following:

(A) publication of the emergency and source water protection planning status, the next revision date, and a reference to this Rule in the community water system's annual Consumer Confidence Report, as required by 15A NCAC 18C .1538; and

(B) suppliers shall notify any other public water system to which the system is interconnected of the contingency strategy set forth in Subparagraph (c)(2) of this Rule. A description of this communication shall be maintained in the SWPP.

(d) Each water system shall maintain and verify completion or revision of its SWPP as follows:

(1) A copy of the current SWPP shall remain onsite at each water treatment facility and be made available to personnel responsible for emergency management and operator(s) on duty at all times. The SWPP and all associated documentation regarding its creation and implementation shall be available for review by Section staff upon request.

(2) An authorized representative of the water system shall certify that a SWPP has been created and implemented, and that the water system's governing body has been advised of the SWPP creation and implementation. The certification shall be submitted to the Department by the deadline specified in Paragraph (a) of this Rule.

(3) An authorized representative of the water system shall certify that a SWPP has been revised and that the water system's governing body has been advised of the revision. The certification shall be submitted to the Department by the revision deadline specified in Paragraph (b) of this Rule.

History Note: Authority G.S.130A-315; 130A-320(c);