FISCAL NOTE FOR PROPOSED PERMANENT RULES 15A NCAC 18E

WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

Rules:	15A NCAC 18E (adoptions) 15A NCAC 18A Section .1900 (repeals)
Agency:	NC Commission for Public Health
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Impact Summary:	State Government: Yes Local Government: Yes Private Impact: Yes Substantial Impact: Yes
Authority:	N.C.G.S. Chapter 130A, Article 11; 130A-291.1; 130A-291.2; N.C.G.S. Chapters 89C, 89E, 89F, 90A; Session Laws 2013-413; 2014-120; 2015-147; 2019-151; 2019-215
Necessity:	The rules governing on-site wastewater treatment systems have not been updated as a complete package since 1990. The proposed rule changes reflect current knowledge and experience with on-site wastewater treatment systems as well as address technical corrections and legislative changes.

I. SUMMARY

The on-site wastewater treatment system rules (15A NCAC 18A .1900) have not been updated as a complete package since 1990. In the intervening 31 years, the industry has seen many technological advances, terminology has been standardized, and practical knowledge has been enhanced. The proposed rules incorporate current rule interpretations and existing knowledge of advanced technologies as well as previously excluded products and updated and simplified terminology, reflecting significant improvement in consistency and clarity.

Most of the proposed revisions to the rules are a re-organization of the current code and clarification of current language as part of an effort to simplify and streamline the rules. Interpretations that have been in place for many years have been clarified and the rules now better reflect the available options for technology, system design, data collection, operation, maintenance, monitoring, and overall management of on-site wastewater treatment systems.

II. INTRODUCTION AND BACKGROUND

The On-Site Water Protection Branch (OSWP) of the NC Department of Health and Human Services (NCDHHS), Division of Public Health (DPH), Environmental Health Section, oversees the sewage treatment and dispersal rules for on-site wastewater treatment systems. The program is a joint effort among the local health departments (LHDs) and OSWP. OSWP provides statewide regulatory and rincluding developers, builders, land-owners, system installation contractors, certified subsurface operators, professional engineers (PEs), licensed soil scientists (LSSs), professional geologists, environmental health consultants, and others.

On-site wastewater treatment and dispersal systems serve property owners in rural parts of the state and areas not served by a centralized (regional or municipal) wastewater treatment system. Approximately 50% of the homes in North Carolina rely on soil-based on-site wastewater treatment systems and that dependence within our state has remained relatively constant for more than 25 years. These systems are an effective, critical, and permanent component of our wastewater treatment infrastructure.

The primary goal of on-site wastewater treatment systems is the protection of public health and the environment. Wastewater contains bacteria, pathogens, and other contaminants that can have a significant impact on people and their surroundings. If treatment and dispersal is inadequate, for example, a stomach virus from one person can be transmitted through the soil to a drinking water supply and potentially infect others or excess nitrogen discharged to the surface waters can create algal blooms that can kill fish populations by depleting oxygen levels. The rules contain provisions that ensure on-site wastewater treatment systems are properly sited to avoid these public health and environmental concerns.

Ultimately, water follows a specific cycle: the homeowner discharges wastewater down the drain into an on-site wastewater treatment system; the effluent from the treatment system is eventually dispersed into the soil (where it receives final treatment) and then to the groundwater; the groundwater flows to a stream; the stream flows to a water treatment plant; the water treatment plant conveys drinking water to its customers; and the homeowner discharges wastewater down the drain.

Over time, fewer people have contracted illnesses due to inadequate on-site wastewater treatment system discharges. A significant reason for the sustained reduction of illness over the past 40 years is vigilant enforcement of these rules by LHDs and OSWP. As a result, the importance of on-site wastewater treatment system rules has sometimes been forgotten or minimized. People instead tend to focus more on economic development and maximizing buildable lots and less on the potential public health and environmental effect of improper wastewater management.

A study published by Nicholas DeFelice[1], et al, in Environmental Health Perspectives estimated the partial per-incident cost of human illness from microbial contamination of drinking water, which can result from wastewater treatment system malfunctions. The study looked at 122 North Carolina emergency departments and found that from 2007-2013, 29,400 visits for acute gastrointestinal illnesses (diarrhea, vomiting, fever, or abdominal cramps) could be attributed to private drinking water well contamination.

The average treatment cost per emergency room visit in 2013 was $1,357. While it is not possible to determine what proportion of the waterborne illness incidents were caused by wastewater treatment system malfunctions, this study provides a per-incident cost of the illness. This is an underestimate

[1] DeFelice, N. B., Johnston, J. E., MacDonald Gibson, J. (2016, May 20) "Reducing Emergency Department Visits for Acute Gastrointestinal Illnesses in North Carolina by Extending Community Water Service". http://www.ehponline.org

because it does not capture gastrointestinal illnesses treated in other care settings, or secondary effects, such as lost work-days. It also does not capture any environmental effects attributable to microbial contamination.

II. RULE DEVELOPMENT PROCESS

The on-site wastewater treatment system rules were first adopted in 1977 and the last major update was in 1990. Since then, sporadic changes have been made to the current rules resulting in inconsistent terminology and a certain amount of conceptual contradiction. In the late 1990's, OSWP began an effort to update the full set of current rules. Over a period of 10 years, a committee of public and private sector stakeholders reviewed the current rules and proposed language, but the formal rulemaking process did not start for multiple reasons.

The current rulemaking effort began with the distribution of the draft rules from the *previous* effort in the late 1990's to major stakeholder groups (LHDs, product manufacturers, certified subsurface operators, installers, tank manufacturers, LSSs, PEs, North Carolina Septic Tank Association, and other interested parties). Representatives of these groups attended formal meetings in 2014 to provide updated input on the proposed rules. OSWP then distributed an updated (based on stakeholder comments) version of the proposed rules for review by the stakeholders a second time.

After going through the formal rulemaking process, including going out for public comment twice, the 15A NCAC 18E rules were adopted by the Commission for Public Health on August 8, 2018, and approved by the Rules Review Commission, in two parts, on October 18, 2018, and November 15, 2018. Subsequently, 42 of the 99 rules in 15A NCAC 18E received written objections requesting legislative review and, pursuant to G.S. 150B-21.3, were submitted to the legislature for review. The effective dates of the remaining rules were delayed, pending legislative review.

During the legislative session, Session Law 2019-151 was passed. This Session Law disapproved all 99 of the new on-site wastewater rules adopted by the Commission for Public Health in 15A NCAC 18E. It also established a Task Force charged with studying and issuing recommendations on the rules for consideration by the Commission for Public Health. The Task Force released its report on February 1, 2020. A brief overview of the Task Force report was presented to the Commission for Public Health at their February 5, 2020 meeting. The Commission for Public Health then formed a Committee for On-site Wastewater Rules to review the report in more detail and report back to the full Commission. The Committee voted to recommend that the Commission for Public Health accept the Task Force report and modify the draft 15A NCA 18E rules with the Task Force's recommendations. The Commission for Public Health accepted this recommendation at its May 6, 2020 meeting. The current rulemaking effort addresses the Task Force recommendations and other changes made by OSWP in response to stakeholder comments and additional review of the 15A NCAC 18E proposed rules and fiscal note.

III. PURPOSE OF RULE CHANGE

The long-term goal of the 15A NCAC 18E proposed rules is to continue to protect public health and the environment, while trying to give all homeowners the option to develop their piece of land. Not all lots are buildable, but the proposed rules continue to try and strike a balance between development and protection of public health and North Carolina's resources. To that end, the purpose of this rule revision is to:

- reorganize the rules into a more logical order to increase consistency and clarity;
- update and clarify rule language to address current practices;

- include previously excluded products and facilitate further innovation;
- update and standardize terminology using vetted sources; and
- align the rules with changes in law.

Reorganize the Rules in a Logical Format
A key concern noted by stakeholders is the complicated organization of the current rules. Thus, as part of the proposed rules, OSWP is proposing to repeal the current rules, 15A NCAC 18A .1900, and adopt a new Subchapter, 15A NCAC 18E, for the on-site wastewater treatment system rules. This approach allows for a complete re-organization of the on-site wastewater treatment system rules in a logical order which will facilitate future rule revision significantly. This approach ensures that rules are internally consistent and provides end users with a more intuitive and logical structure.

Update and Clarify Rule Language to Address Current Practices
Reorganizing the rules also provides the opportunity to clarify aspects of the rules that have generated questions in the past as well as update aspects of the rules that have diverged with current best practice.

Facilitate Technological Innovation
In the past 31 years, numerous technological changes have occurred with on-site wastewater treatment systems. Based on current knowledge and experience, many individual home sites and larger tracts of land that would have been denied permits 31 years ago are now approved on a regular basis in North Carolina. The rules have not kept pace with the technology needed to facilitate these advances.

Precast reinforced concrete tanks are specifically listed in the current rules, but tanks made of other materials (such as polyethylene and fiberglass) are now commonly available but not addressed in rule. The proposed rules include all currently available tank construction materials (polyethylene, fiberglass, and precast reinforced concrete) and allow for other materials to be proposed for manufacture of tanks. The proposed rules also clearly identify the criteria that must be met by all tanks, regardless of the material used in tank construction.

The same approach held true for pumping systems, media filters, dispersal field trench technologies, drip irrigation technologies, appurtenances such as effluent filters, etc. The 15A NCAC 18E proposed rules will provide the broadest possible benefits from new emerging technologies to the end users of on-site wastewater treatment systems while continuing to protect public health and the environment.

Standardize Terminology
Standard terminology is fundamental to good rules, especially in our unique industry. Piecemeal revisions adopted over the years included inconsistent terms and definitions. During the process, OSWP used terminology from nationally recognized resources to increase consistency at the state level but also encompass bigger picture issues.

Align Rules with Changes in Law
Numerous Session Laws adopted over the past seven years have been issued that preempt aspects of the current rules in 15A NCAC 18A .1900. The new 15A NCAC 18E rules have been updated to align with these Session Laws.[2]

In summary, 15A NCAC 18A .1900 is being repealed and 15A NCAC 18E is being adopted to replace it in order to update, clarify, and align the state's on-site wastewater rules with current practice and law,

[2] S.L. 2013-413, Section 34; S.L. 2014-120, Sections 47 and 53; S.L. 2015-147, Sections 1, 2, and 3; S.L. 2019-151, Sections 13 and 14; and S.L. 2019-215, Section 2.

facilitate innovation, standardize terminology, and improve organization and consistency of application across the state. The full text of the proposed rules are found in Appendices B and C.

IV. ECONOMIC IMPACT SUMMARY

Overall, the proposed rules facilitate the ability of the LHDs and OSWP to maintain and enhance protection of public health and the environment while providing property owners broader options and the private sector clear and well-defined benchmarks. The impact of the quantified 15A NCAC 18E rule changes is estimated at a net cost of $3.4 million over the first four years. A portion of this net cost is already incurred under current practices that are now being codified in rule. In addition, several significant changes have unquantifiable benefits. The Division expects the unquantifiable benefits of the proposed rules to exceed these quantified costs.

Overall, the largest financial impact of the revised 15A NCAC 18E rules will still be on the private sector, the owner (facility owner) and product manufacturers. A certain percentage of the costs incurred by product manufacturers will be passed on to the owner, who, in turn, receives a higher quality system component. Certified subsurface operators will see an increase in the number of systems they may contract to inspect, increasing their bottom line but also protecting the property owner's investment through regular maintenance. Third party certification and verification companies will also see an increase in benefits from required testing, monitoring, and reporting.

The costs associated with plastic and fiberglass tank approvals, and effluent filters, risers, and pipe penetration approvals are included in the proposed rules and this fiscal note. However, these policies are an established part of the approval process for proprietary products and manufacturers are already incurring these costs.

Some of the most significant changes in the proposed rules have an unquantified fiscal impact. These include the ability to develop lots that would previously have been denied permits based upon their design daily flow and the soil and site conditions on the property. Rule revisions include updated requirements for design daily flow and siting criteria when advanced pretreatment is used. Further, manufacturers will have clear targets that must be achieved to gain approval for use of their advanced pretreatment product in North Carolina. The requirements for when a PE is required to design an on-site wastewater treatment system have also been expanded.

The main overarching benefit from the proposed rules are the changes that continue to protect public health and the environment, based on current knowledge and experience with on-site wastewater treatment systems. The requirement to include advanced pretreatment components to treat high strength (stronger than domestic) wastewater is an unquantifiable cost to the owner. But the benefits to everyone, owner included, are also unquantifiable. Many positive changes that are unquantifiable have also been made for the benefit of owners and the manufacturers: clearer targets for submittals, expanded lists of wastewater flows, and more.

Fees are collected by OSWP for review of wastewater systems and components. These fees are identified in G.S. 130A-343(k) and will not change with these rules.

The increase in cost to implement 15A NCAC 18A from the fiscal note approved in August 2018 reflect the changes made to align the rules with the legislative Task Force recommendations.

Table 1 summarizes the costs and benefits of the proposed 15A NCAC 18E rules projected for the first four years.

Table 1. Benefits and Costs Summary, Including Net Present Value

BENEFITS	2021	2022	2023	2024
State Gov't, OSWP				
Wastewater flow reduction from expanded facility list	Unquantified			
Local Gov't, LHDs				
Existing system inspection fees	$48,800	$48,500	$48,000	$47,500
Wastewater flow reduction from expanded facility list	Unquantified			
Engineer design of systems >600gal/day with pressure manifold	Unquantified			
Facility Owner				
AOWE designs	$740,139	$740,139	$740,139	$740,139
Longer system life, avoidance of repair costs	Unquantified			
Earlier identification of malfunctions	Unquantified			
Increase the design flow of Advanced Pretreatment systems	Unquantified			
Wastewater flow reduction from expanded facility list	Unquantified			
Passed-on Manufacturer Benefits	Unquantified			
Manufacturer				
Piggyback control panel revenue	$870,688	$890,880	$906,098	$924,345
Grease Tank Capacity Increase revenue	$270,122	$278,226	$286,573	$295,170
Accepted systems status survey	Unquantified			
Simplified, more flexible approval process for new technologies	Unquantified			
Increase the design flow of Advanced Pretreatment systems	Unquantified			
Drip dispersal system approval criteria	Unquantified			
Wastewater strength requirement for advanced pretreatment	Unquantified			
Private Certifiers, Testers, Inspectors, and Consultants				
Type IIIb and Type IIIh Inspections	$4,935,975	$4,973,400	$5,010,405	$5,047,035
*Plastic and Fiberglass Tank Approvals	$68,100	$76,200	$84,300	$92,400
Structural Verification Test	$36,600	$36,600	$36,600	$36,600
*Risers, filters, and pipe penetrations approvals	$10,000	$10,000	$10,000	$10,000
Engineer design of systems >600gal/day with pressure manifold	Unquantified			
AOWE designs	$425,661	$425,661	$425,661	$425,661
All Parties and General Public				
Fewer system malfunctions (Human health, environmental, and business benefits)	Unquantified			
Total Benefits	**$7,406,085**	**$7,479,606**	**$7,547,776**	**$7,618,850**

COSTS	2021	2022	2023	2024
State Gov't, OSWP				
*Plastic and Fiberglass Tank Approval Time	$1,037	$1,068	$1,100	$1,131
*Risers, filters, and pipe penetrations approvals time	$138	$142	$147	$151
Risers, filters, and pipe penetrations renewals time	$795	$854	$916	$980
RWTS and P&I Renewals Time	$1,901	$1,958	$2,016	$2,074
Local Gov't, LHDs				
Existing system inspection time	$19,130	$19,580	$19,955	$20,318
Structural verification test - stronger enforcement	Unquantified			
Facility Owner				
Existing system inspections fees	$48,800	$48,500	$48,000	$47,500
Type IIIb and Type IIIh Inspections Fees	$4,935,975	$4,973,400	$5,010,405	$5,047,035
Piggyback control panels	$870,688	$890,880	$906,098	$924,345
Grease Tank Capacity Increase	$270,122	$278,226	$286,573	$295,170
Engineer design of systems >600gal/day with pressure manifold	Unquantified			
Additional tank required with grinder pumps	Unquantified			
Wastewater strength requirement for advanced pretreatment	Unquantified			
Passed-on Manufacturing Costs	Unquantified			
Engineer				
AOWE designs	$1,165,800	$1,165,800	$1,165,800	$1,165,800
Manufacturer				
*Plastic and Fiberglass Tank Approvals	$106,200	$122,400	$138,600	$154,800
Structural Verification Test	$36,600	$36,600	$36,600	$36,600
Concrete Tank Design Change	$875,688	$890,010	$899,392	$909,779
*Risers, filters, and pipe penetrations approvals	$10,650	$10,650	$10,650	$10,650
Risers, filters, and pipe penetrations renewals	$6,900	$7,200	$7,500	$7,800
RWTS and P&I Renewals	$33,300	$33,300	$33,300	$33,300
Total Costs	**$8,383,724**	**$8,480,568**	**$8,567,050**	**$8,657,433**

*These line items reflect the benefits and costs of current practice that are being codified in rule. The affected parties will not incur any new costs or benefits.

NET QUANTIFIED IMPACT - Excludes unquantified costs and benefits	2021	2022	2023	2024
State Gov't	($3,871)	($4,022)	($4,178)	($4,337)
Local Gov't	$29,670	$28,920	$28,045	$27,182
Facility Owner	($6,125,585)	($6,191,006)	($6,251,076)	($6,314,050)
Manufacturer	$71,472	$68,946	$66,629	$66,586
Private Certifiers, Testers, and Inspectors	$5,050,675	$5,096,200	$5,141,305	$5,186,035
General Public				
Net Impact	($977,638)	($1,000,962)	($1,019,275)	($1,038,583)
NPV, 2020$	($3,412,322)			

V. ANALYSIS

To determine the fiscal impact of the proposed rules, information was collected from LHDs, OSWP staff, PEs, LSSs, and installers. LHDs were categorized into three groups based upon the number of authorized agents on staff (small LHDs: one or two; mid-size LHDs: three to four; large LHDs: five or more) that permit on-site wastewater treatment systems. The size of the LHD impacts the services offered, on-site wastewater treatment system permits issued, and the fees charged.[3] The smaller LHDs are generally in rural counties, and the larger LHDs are in more urban counties. LHDs from the three physiographic regions (mountains, piedmont, and coastal plain) were identified to capture fiscal impacts across the full range of soil conditions (and thus, system types) seen in the State. The permit projections are included in Appendix A.

The analysis of the proposed rules is broken down into four categories, depending on how different the requirements are from current requirements in 15A NCAC 18A Section .1900:

I. Rules with minor changes or technical corrections;
II. Rules clarified to reflect current practices;
III. Rules with a quantifiable fiscal impact; and
IV. Rules with an unquantifiable fiscal impact.

I. Rules with minor changes or technical corrections

The majority of proposed revisions constitute minor changes or technical corrections that ensure consistency across all the rules. These rules do not represent a change in intent, nor do they pose any additional fiscal impact on industry, State government, or local governments. Although these rules are proposed as new rules, they will replace rules that will be repealed. Sixty-one rules fall into this category and include the following:

Section .0100 - General
- 15A NCAC 18E .0101 – Scope
- 15A NCAC 18E .0102 – Applicability
- 15A NCAC 18E .0103 – Incorporation by Reference
- 15A NCAC 18E .0104 – Abbreviations
- 15A NCAC 18E .0105 – Definitions

Section .0200 – Permits
- 15A NCAC 18E .0201 – General
- 15A NCAC 18E .0202 – Application
- 15A NCAC 18E .0203 – Improvement Permit
- 15A NCAC 18E .0204 – Construction Authorization
- 15A NCAC 18E .0205 – Operation Permit

Section .0300 – Responsibilities
- 15A NCAC 18E .0301 – Owners
- 15A NCAC 18E .0302 – Local Health Department and State
- 15A NCAC 18E .0304 – Submittal Requirements for Plans, Specifications, and Reports Prepared by Licensed Professionals for Systems Over 3,000 Gallons/Day
- 15A NCAC 18E .0305 – Submittal Requirements for Plans, Specifications, and Reports Prepared by Licensed Professionals for Systems Less Than or Equal to 3,000 Gallons/Day

Section .0500 – Soil and Site Evaluation

[3] LHDs may impose fees in accordance with G.S. 130A-39(g).

15A NCAC 18E .0501 – Site Evaluation
15A NCAC 18E .0502 – Topography and Landscape Position
15A NCAC 18E .0503 – Soil Morphology
15A NCAC 18E .0504 – Soil Wetness Conditions
15A NCAC 18E .0505 – Soil Depth to Rock, Saprolite, or Parent Material
15A NCAC 18E .0506 – Saprolite
15A NCAC 18E .0507 – Restrictive Horizons
15A NCAC 18E .0509 – Site Suitability and Classification
15A NCAC 18E .0510 – Special Site Evaluations

Section .0600 – Location of Wastewater Systems
15A NCAC 18E .0602 – Applicability of Setbacks

Section .0700 – Collection Sewers, Raw Sewage Lift Stations, and Pipe Materials
15A NCAC 18E .0701 – Collection Sewers
15A NCAC 18E .0702 – Raw Sewage Lift Stations
15A NCAC 18E .0703 – Pipe Materials

Section .0800 – Tank Capacity, Leak Testing, and Installation Requirements
15A NCAC 18E .0801 – Septic Tank Capacity Requirements
15A NCAC 18E .0802 – Pump Tank Capacity Requirements
15A NCAC 18E .0804 – Siphon Tank Capacity Requirements
15A NCAC 18E .0805 – Tank Leak Testing and Installation Requirements

Section .0900 – Subsurface Disposal
15A NCAC 18E .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems
15A NCAC 18E .0902 – Conventional Wastewater Systems
15A NCAC 18E .0903 – Bed Systems
15A NCAC 18E .0904 – Large Diameter Pipe Systems
15A NCAC 18E .0905 – Prefabricated Permeable Block Panel Systems
15A NCAC 18E .0906 – Sand Lined Trench Systems
15A NCAC 18E .0907 – Low Pressure Pipe Systems
15A NCAC 18E .0909 – Fill Systems
15A NCAC 18E .0910 – Artificial Drainage Systems
15A NCAC 18E .0911 – Privies

Section .1000 – Non-Ground Absorption Systems
15A NCAC 18E .1001 – Alternative Toilets

Section .1100 – System Dosing and Controls
15A NCAC 18E .1101 – General Dosing System Requirements
15A NCAC 18E .1102 – Pump Dosing
15A NCAC 18E .1104 – Siphon Dosing
15A NCAC 18E .1105 – Timed Dosing
15A NCAC 18E .1106 – Pressure Dosed Gravity Distribution Devices

Section .1200 – Advanced Pretreatment Systems Standards, Siting, and Sizing Criteria
15A NCAC 18E .1205 – Advanced Pretreatment Sand Lined Trench Systems
15A NCAC 18E .1206 – Advanced Pretreatment Bed Systems

Section .1300 – Operation and Maintenance
- 15A NCAC 18E .1302 – Operation and Maintenance of Advanced Pretreatment Systems
- 15A NCAC 18E .1303 – Owner Responsibilities for Wastewater System Operation and Maintenance
- 15A NCAC 18E .1304 – Management Entity Responsibilities for Wastewater System Operation and Maintenance
- 15A NCAC 18E .1305 – Local Health Department Responsibilities for Wastewater System Operation and Maintenance
- 15A NCAC 18E .1306 – System Malfunction and Repair
- 15A NCAC 18E .1307 – Wastewater System Abandonment

Section .1400 – Approval of Tanks and Appurtenances
- 15A NCAC 18E .1402 – Tank Design and Construction
- 15A NCAC 18E .1406 – Modification, Suspension, and Revocation of Approvals

Section .1500 – Approval and Use of Residential Wastewater Treatment Systems
- 15A NCAC 18E .1501 – General
- 15A NCAC 18E .1502 – Application
- 15A NCAC 18E .1503 – Design and Construction Standards
- 15A NCAC 18E .1504 – Sampling Requirements for Residential Wastewater Treatment Systems

II. Rules clarified to reflect current practices

In the past, questions have arisen based on the rule language and what that language means exactly. As part of the rule revision, the language has been clarified to reflect the current knowledge base and accepted best practices. Four rules fall into this category:
- 15A NCAC 18E .0508 – Available Space
- 15A NCAC 18E .0901 – Conventional Wastewater Systems
- 15A NCAC 18E .1302 – Operation and Maintenance of Advanced Pretreatment Systems
- 15A NCAC 18E .1710 – Compliance Criteria for Advanced Pretreatment Systems

Rule 15A NCAC 18E .0508 – Available Space

The current 15A NCAC 18A .1900 rule requires repair area for all new on-site wastewater treatment systems permitted. The only exception allowed is for lots or tracts of land that are described in a recorded deed or a recorded plat on or before January 1, 1983. The on-site wastewater treatment system design daily flow shall be less than or equal to 480 gallons/day for the lot or tract of land to receive this exemption.

When a facility is expanded, such as a house adding a bedroom, the on-site wastewater treatment system must also be expanded for the additional wastewater flow and the repair area must be expanded to account for the additional flow. On a repair exempt lot, when an on-site wastewater treatment system is proposed to be expanded, area to expand the wastewater system must be found. Whether or not repair area needs to be found for the additional flow has been interpreted in two different ways by the LHDs. If the design daily flow does not exceed 480 gallons/day, some LHDs do not require repair area to be found for the additional flow. Other LHDs have specified that the exemption for the repair area was given to the original house, and any expansion is required to have repair area.

The proposed rule clarifies that no repair area is required on repair exempt lots that are proposing to expand if certain requirements are met, such as the expanded design daily flow does not exceed 480 gallons/day, there is sufficient suitable area for the on-site wastewater treatment system to be expanded, etc.

Rule 15A NCAC 18E .0901 – General Design and Installation Criteria for Subsurface Dispersal Systems

The current on-site wastewater treatment system rules require 12 inches of separation between the trench bottom and a limiting soil condition, and as much as 18 inches of separation between the trench bottom and any soil wetness condition in sandy soils (Group I soils). This vertical separation distance is based on peer reviewed research on the minimum soil depth required to protect public health and the environment. The total soil depth required on a site to issue an on-site wastewater treatment system permit has been interpreted differently over time.

For conventional gravel dispersal fields, at least 24 inches of approvable soil below the ground surface is required based upon 12 inches of gravel in the trench and 12 inches of vertical separation to a limiting condition. Other trench products that measure less than 12 inches in height have still been required to have 24 inches of approvable soil on the site. Some past interpretations of the current rules have determined that if a trench height for a proprietary product is 10 inches, only 22 inches of approvable soil is required on the site (12 inches of vertical separation and 10 inches proprietary product height).

The proposed rule change would specify that a 12-inch separation is required for all trench products, except where an 18-inch separation is needed in Group I soils. This would allow all trench products and dispersal systems to be treated equally. The on-site wastewater treatment system design will be dictated by the soil conditions and site features, not the current rule interpretation.

Because this rule change is merely a clarification of the current rules and how this specific requirement has been applied, there is no cost to OSWP or LHDs. This would affect homeowners positively as it would allow them a broader range of options from which to choose when selecting a trench product/dispersal system. Product manufacturers would also see a positive impact from this rule clarification if their product is applicable to more sites and preferred by consumers. Conversely, manufacturers may incur a cost if consumer preferences shift away from their product to a newly applicable product.

Rule 15A NCAC 18E .1302 – Operation and Maintenance of Advanced Pretreatment Systems
Rule 15A NCAC 18E .1710 – Compliance Criteria for Advanced Pretreatment Systems

The current rules provide effluent compliance criteria for performance of advanced pretreatment systems. These criteria include evaluation of effluent sampling results from an advanced pretreatment system to determine whether the sample results meet effluent treatment standards. Evaluation of sampling results determines compliance for:

- initial product approval pursuant to G.S. 130A-343;
- continued product approval or advancement from Provisional to Innovative status; and
- individual site compliance.

The effluent compliance criteria in the current rules applies to a single *site* (such as a single-family home or a business) where advanced pretreatment is used as well as to the *product* approval (all advanced pretreatment systems installed under a given product Provisional and Innovative (P&I) approval).

Use of advanced pretreatment allows OSWP and the LHDs to grant siting concessions (such as decreased horizontal or vertical setbacks or an increase in the soil loading rate) based upon dispersing a higher quality wastewater effluent to the dispersal field. These may result in a slight increased potential risk to public health and the environment, so effluent from these systems is sampled on a regular basis to verify that the system meets the specified parameters.

For most single-family homes, effluent samples are collected once per year. Using the current criteria, if sample results for a single parameter are out of compliance, the site could be deemed out of compliance. Many simple things can cause an effluent sample to be out of compliance, such as a clump of solids in the effluent sample, excessive sample holding time, or improper sampling technique. When a sample result is out of compliance, the protocol includes provisions for resampling (at an additional cost to the owner) to demonstrate compliance.

OSWP engaged in an internal exercise to apply the current criteria to evaluate the performance of an advanced pretreatment system for a product P&I approval. In doing so, OSWP demonstrated clearly that the interpretation of the criteria is not being consistently applied. Currently approved advanced pretreatment systems have difficulty meeting the requirements due in part to these differing interpretations of the current rules. The proposed rules reflect review of real-world data from approved advanced pretreatment systems in North Carolina and will standardize criteria for compliance determination for both an individual site and a specific system P&I approval regardless of who conducts the evaluation. The modified compliance criteria still protect public health and the environment. OSWP may revoke a small number of existing products based on the proposed rules, however, this is expected to be an infrequent occurrence.

The compliance standards for advanced pretreatment systems have also been expanded to be used for new applications for P&I approval. This allows all advanced pretreatment systems to be evaluated based on the same criteria. Advanced pretreatment manufacturers will have a clearer target for showing that their product complies with the rules. OSWP will also be better able to identify advanced pretreatment systems that are out of compliance through consistent evaluation of data.

III. Rules with a quantifiable fiscal impact

The following eleven rules have a quantifiable fiscal impact:

15A NCAC 18E .0206 – Existing System Approvals for Reconnections and Property Additions
15A NCAC 18E .0207 – Alternative Wastewater System Permitting Options
15A NCAC 18E .0803 – Grease Tank Capacity Requirements (included with .1400 Rules in discussion)
15A NCAC 18E .1103 – Control Panels
15A NCAC 18E .1301 – Operation and Maintenance of Wastewater Systems
15A NCAC 18E .1401 – Plans for Prefabricated Tanks
15A NCAC 18E .1403 – Tank Material Requirements
15A NCAC 18E .1404 – Plans for Risers, Effluent Filters, and Pipe Penetrations
15A NCAC 18E .1405 – Risers, Effluent Filters, and Pipe Penetration Approval Renewal
15A NCAC 18E .1505 – Residential Wastewater Treatment System Approval Renewal
15A NCAC 18E .1711 – Provisional and Innovative Approval Renewal

Rule 15A NCAC 18E .0206 – Existing System Approvals for Reconnections and Property Additions

When a new structure, such as a deck, shed, swimming pool, etc., is built on a piece of property with an existing house and on-site wastewater treatment system, that new structure must meet the minimum horizontal setback requirements to the on-site wastewater treatment system and repair area. Many times, structures are built without confirmation that their proposed location meets these minimum horizontal setbacks, and construction may even occur directly over the system or repair area. These problems may not be revealed until the property is conveyed to a new owner or when the on-site wastewater system malfunctions. At that point, solutions may be limited. The existing system may be compromised beyond repair, or the repair area may have been compromised by construction and thus, no longer available. If no additional land is available, the property owner may have no options at all aside of permanent pump and haul.

To prevent these problems, the owner must apply to the LHD prior to the owner beginning construction to ensure that the on-site wastewater treatment system is not affected. The LHD can confirm that the location of the new structure meets setbacks to the on-site wastewater treatment system and provide written confirmation to the county Building Inspections department prior to the release of the building permit. In the event that modifications to the on-site wastewater treatment system would allow the owner to proceed with proposed construction, the LHD can issue the appropriate permits.

The majority (approximately 95%) of LHDs already provide this service to their customers.[4] This service evolved over time without guidance from OSWP, because the LHDs were seeing many on-site wastewater treatment system malfunctions associated with structures placed or built on the on-site wastewater treatment system.

This rule helps clarify the minimum requirements and the process an owner and the LHD must follow in these situations. LHDs that already confirm new structure building permits may choose to modify their current procedures based on the proposed rule. The costs of these modifications are unquantifiable. Tables 2 and 3 show the projected costs to the private sector and the 5% of LHDs that will have to implement new processes for existing system inspections.

These proposals will also prevent delays in real estate transactions resulting from discovery of improperly located structures. If the existing on-site wastewater treatment system is under a structure, swimming pool, or deck, for example, the transaction could be delayed while the buyers and sellers negotiate how the on-site wastewater treatment system issues will be addressed. A problem with the on-site wastewater treatment system may terminate the transaction completely. The integrity of the wastewater system is central to the long-term value of the residence or structure itself.

With these rule revisions in place, appropriate setbacks will be maintained to protect the integrity of the on-site wastewater treatment system. Existing system inspections will have ongoing impacts. LHDs that do not have a program will incur costs to implement one and ongoing costs to maintain the program. The total number of existing system inspections performed by LHDs on an annual basis will vary, as it is based on the owner's decision to build additional structures on their lot. Table 4 summarizes the benefits associated with existing system inspections.

Table 2. Projected Cost Increases and Losses to LHDs for Existing System Inspections, Year One*

Local Health Department Projected Cost Increases	
Average Number of Existing System Inspections	488
Average Application Fees Collected	$100
Total Benefits in Fees Collected	$48,800
Total Cost in Man Hours for Existing System Inspections (Number of Existing System Inspections x 1.0 man hours x Hourly Compensation**)	($19,130)
Net Savings	**$29,670**

*Values are presented in 2021 dollars.
**Calculated based on 2016 government salary information for REHS from NCOSHR and projected growth in NC state and local government wages from IHS Markit, and cost of employee benefits by industry from the US Bureau of Labor Statistics. The mid-range hourly wage rate, including benefits, is expected to be $39.20 in 2021.

[4] Estimate based on consultation with LHD accreditation evaluator.

Table 3. Private Sector Costs Associated with Existing System Inspections, Year One*

Private Sector Projected Cost Increases	
Average Number of Existing System Inspections	488
Average Application Fee Paid to LHD	$100
Total Cost to Private Sector (Number of Existing Systems Inspected x Application Fee)	$48,800
Net Savings (Cost)	**$48,800**

*Values are presented in 2021 dollars.

Table 4. Summary of Benefits from Existing System Inspections

Private Sector Benefits (homeowner, consultants, operators, installers)
Ensures verification of location of existing on-site wastewater treatment system relative to proposed new construction Maintains appropriate setbacks to on-site wastewater treatment system to protect system integrity Reduces number of on-site wastewater treatment system malfunctions Precludes costs to repair malfunctioning on-site wastewater treatment systems Improves ability to sell house or business in the future Protects property owner's investment
Public Sector Benefits (LHD and OSWP)
Fewer wastewater system malfunctions Additional service to provide to their clients

Rule 15A NCAC 18E .0207 – Alternative Wastewater System Permitting Options

In the summer of 2016, the Engineered Option Permit (EOP) became available. The EOP allows a PE in the private sector to write a permit for an on-site wastewater treatment system. The LHD is not involved in the permitting process except to verify that the submittal has all required information and to maintain the files. No technical review for compliance with the laws and rules is done by the LHD.

In the four years that the EOP has been available, almost 2,200 EOPs have been submitted to the LHDs. Of those 2,200, 90% have a design daily flow of 480 gallons/day or less. If permitted by the LHD, none of these systems would be required to be designed by a PE. Due to this trend, legislation was passed that allows an LSS to obtain a certification that will allow the LSS to also design and inspect on-site wastewater systems. The certification allows the LSS to become an authorized on-site wastewater evaluator (AOWE). The AOWE can also permit on-site wastewater treatment systems without LHD involvement.

Since the trend of the EOPs has been towards smaller systems that would not otherwise require engineered design, the AOWE permitting option provides homeowners with another private permitting option that is less expensive than an EOP.

The percentage of EOPs written remains about 3% of the total number of permits issued for on-site wastewater treatment systems.

Session Law 2020-3, Section 4.18, included a provision to allow LSS's to issue permits for on-site wastewater treatment systems to help with the backlog at LHDs due to the COVID-19 pandemic. The

Session Law became effective May 4, 2020 and expired August 1, 2020. Session Law 2020-97, Section 3.19, resurrected the provision that allows LSS's to issue permits for on-site wastewater treatment systems during the COVID-19 pandemic. So far, over 400 LSS COVID-19 permits have been submitted to the LHDs.

LHDs should not see a significant change once the AOWE option is available. The AOWE permitting process is almost identical to the EOP process, so the LHDs will already have the procedures in place to handle the AOWE permits. What will change is that a certain number of EOPs will now be submitted as AOWE permits. Based on the number of EOP permits issued in 2020 from May through November and the number of LSS COVID-19 permits issued in 2020 from May through November, OSWP estimates approximately 55% of EOP permits will now be issued as AOWE permits. Nearly all the permits that will be issued by AOWEs instead of PEs are likely to be smaller systems, 480 gallons/day or less.

The biggest impact will be to the owners. Their costs will be reduced as they will not be paying a PE in addition to the LSS and installer. Table 5 shows the costs to the homeowner for the AOWE permit option. Table 6 summarizes the benefits associated with the AOWE permit option.

Table 5. Private Sector Costs Associated with On-Site Wastewater Treatment Systems Permitted Under the EOP, 2020 dollars*

Private Sector Projected Costs and Benefits			
System Description	360 gallons/day Conventional System (septic tank to gravity dispersal field)	480 gallons/day TS-II Advanced Pretreatment System with Drip Irrigation	2,000 gallons/day Conventional System (septic tank, pump tank, dispersal field)
Current Proportion of EOP Permitted Systems	85%	5%	10%
Average Cost to the Homeowner Permitted under EOP	$3,050	$5,900	$7,750
Average Cost to the Homeowner Permitted under AOWE	$1,034	$3,550	$2,067
Cost Difference Between EOP and AOWE	$2,016	$2,350	$5,683
Proposed Proportion of EOP Permitted Systems Converted to AOWE	60%	60%	1%
Total Permits Converted to AOWE	341	20	1
Annual Savings to Homeowner	**$687,456**	**$47,000**	**$5,683**
EOP Revenue Loss	**$1,040,050**	**$118,000**	**$7,750**
AOWE Revenue Benefit	**$352,594**	**$71,000**	**$2,067**

*All costs include the following: AOWE/PE and construction administration. Installation cost is not included and should be the same for both options.

Table 6. Summary of Benefits from AOWE Permit Option

Private Sector Benefits (homeowner, consultants, operators, installers)

Provides owners with another permitting option to reduce project delays due to LHD backlogs. An AOWE designed permit is typically lower cost than a PE designed permit. Increased revenue for AOWEs and allows AOWEs to provide their clients with an expanded range of services (a revenue loss for PEs)
Public Sector Benefits (LHD and OSWP)
Allows LHDs to give customers another permitting option if there is a backlog

Rule 15A NCAC 18E .1103 – Control Panels

The current rules allow for the use of piggyback controls. The piggyback control is an outdoor electrical outlet with a cover into which the pump is plugged. Piggyback controls have limited functionality aside from turning the pump on and off. It is estimated that over 30,000 on-site wastewater treatment systems use piggyback controls.

Problems associated with piggyback controls include: safety issues when used in a wet environment; cords exposed and subject to deterioration by sunlight or damage during yard maintenance; accessibility (sometimes piggybacks are installed at a very low elevation, at or near the ground surface); alarms not readily visible (device located in a crawl space under the house, in the garage, or an outdoor closet, etc.); corrosion issues; and limited space inside the piggyback control receptacle to house all the wiring and the plug.

The 15A NCAC 18E rules propose to require control panels for all pump systems. Control panels provide many improvements over the piggyback controls. Control panels are NEMA 4X rated, meaning that the enclosure is resistant to water intrusion into the panel and subsequent corrosion. Control panels are larger than an outdoor electrical outlet, allowing for more room for certified subsurface operators to perform work within the enclosure. The visible and audible alarm components are a physical part of the control panel. The certified subsurface operator or LHD can check control panel function when conducting an inspection and operate the pump directly from the panel.

Control panels also provide more precise control and monitoring of the amount of effluent dosed to the dispersal field. The control panel will have elapsed time meters to document the amount of time the pump runs and cycle counters to document the number of times a pump turns on. If the on-site wastewater treatment system malfunctions, the elapsed time meters and cycle counters can assist in diagnosing problems because they document pump operation. This information allows calculation of the volume of effluent pumped to the dispersal field. The pump controls can document excessive water use by the owner. Alternately, the information may help identify leaks that may allow 'extra' water (such as stormwater or groundwater) to infiltrate the system. Either of these conditions can result in malfunction due to hydraulic overload.

The addition of elapsed time meters and cycle counters will allow the certified subsurface operator and LHD to easily trouble shoot malfunctioning systems and provide a history of system operation that is currently non-existent. This will help all parties (operator, LHD, and owner) to maximize the system operation and identify problems before they become malfunctions.

Tables 7 and 8 identify the projected cost increases for the use of control panels in pump systems. The average number of pump systems installed for 2021 was calculated based on the responses from the LHD on the number of pump systems installed in their county over the course of a year and reviewing information from the county monthly activity reports. The western counties see a greater number of

pump systems than the central and eastern counties. Approximately 15% of the on-site wastewater treatment systems installed require a pump and control panel.

Table 7. Projected Cost Increases for use of Control Panels for Pump Systems, Year One*

Facility Owner Projected Cost Increases	
Average Number of Pump Systems Installed	2,576
Average Cost Increase to Install a Control Panel in 2021**	$338
Total Cost	**($870,688)**

*Values are presented in 2021 dollars.
**Assuming a 3% increase in cost per year.

Table 8. Projected Benefits for use of Control Panels for Pump Systems, Year One*

Manufacturer Projected Revenue Increases	
Average Number of Pump Systems Installed	2,576
Average Cost Increase to Install a Control Panel in 2021**	$338
Total Benefits	**$870,688**

*Values are presented in 2021 dollars.
**Assuming a 3% increase in cost per year.

There is an initial cost for the control panel, but after that, there is no additional cost associated with the control panel. As the number of systems installed continues to increase, the number of pump systems using control panels will stay the same or increase with the number of systems. Table 9 shows the projected number of permits issued and the number with pump systems with control panels installed over a five-year period. Table 10 summarizes the benefits associated with using control panels for all pump systems.

Table 9. Projected Number of Permits Issued and Pump Systems with Control Panels

Year	Projected Number of Permits Issued	Projected Number of Pump Systems with Control Panels
2021	17,176	2,576
2022	17,068	2,560
2023	16,871	2,531
2024	16,702	2,505

Table 10. Summary of Benefits from Control Panels

Private and Public Sector Benefits
Increased safety Ability to troubleshoot malfunctions when they do occur Ability to identify problems before they result in a system malfunction Ease of accessibility

Rule 15A NCAC 18E .1301 – Operation and Maintenance of Wastewater Systems

There are two issues addressed with the proposed revisions: the expansion of on-site wastewater treatment system classification types, and LHD compliance inspections of Type IIIb systems.

The on-site wastewater treatment system classifications for operation and maintenance in the current rules have not kept pace with the different systems approved by OSWP. As the on-site wastewater treatment

system increases in size or complexity, the system classification also increases along with the frequency of certified subsurface operator visits and LHD compliance inspections.

In the proposed rules, the list of on-site wastewater treatment system classifications has been expanded to address the range in technologies that have been approved. The system classifications are now described more broadly so that newly approved technologies will fit more readily into the proposed system classification table. The expanded list reflects the current status of on-site wastewater treatment system classifications for operation and maintenance. This makes it easier for LHDs, owners, certified subsurface operators, and consultants to determine the frequency of required certified subsurface operator inspection.

The LHDs are required under the current rules to inspect certain on-site wastewater treatment systems at specified frequencies. These systems include those with pumps (Type IIIb, IVa, and IVb), advanced pretreatment (Type V and VI), drip dispersal (Type V), or with a design daily flow greater than 3,000 gallons/day (Type V). The LHDs compliance inspections verify that the system is operating in compliance with its operation permit and that there is no malfunction.

Not all LHDs conduct compliance inspections. Budget and staff limitations require the LHDs to focus on new on-site wastewater treatment system permits, repair permits, and other limited priorities.

The proposed rules provide the LHDs with two options for compliance inspections required for certain Type III on-site wastewater treatment systems: LHD staff or allow the owner to contract with a private certified subsurface operator.

Owners of systems classified as Type IIIb (on-site wastewater treatment systems with a single pump) or IIIh (gravity groundwater lowering systems) are not required to contract with a private certified subsurface operator for operation and maintenance. However, they are required to have a five-year compliance inspection by the LHD.

As part of the proposed rules, at the LHD's discretion, the owner may engage a private certified subsurface operator to perform the five-year compliance inspection. By providing another option under which these inspections can be performed, there is a greater chance of finding malfunctioning on-site wastewater treatment systems and repairing them.

The LHDs will still be responsible for conducting compliance inspections on all Type IV, V, and VI systems.

Over time, the number of systems to be inspected will increase as more systems are installed. There will be times where, as city sewer expands and is installed, houses will be disconnected from on-site wastewater treatment systems and the number of systems to inspect will decrease, but this will not be a yearly occurrence. This will be very irregular and unpredictable.

It is uncertain how many LHDs will opt to allow owners to hire a private certified subsurface operator to inspect Type IIIb and IIIh systems. LHDs that are not currently conducting compliance inspections will not lose any money since they are currently not collecting any fees for this service. If the LHD has a compliance inspection program in place but elects to offer owners the option to go to the private sector, any staff time savings from this option will be offset by lost inspection fee revenue. Tables 11 and 12 below show the net costs to LHDs and facility owners if 50% of the LHDs allow owners to hire a certified subsurface operator, as well as the net savings for private owners. This is an upper-bounds estimate.

By having owners use a private certified subsurface operator to inspect the system, LHDs that have not been conducting compliance inspections will gain information on the on-site wastewater treatment system and learn about malfunctions that may have occurred for years without any action taken.

For owners who currently do not pay any fees for a LHD compliance inspection, this will be a new cost. Owners who already pay for a LHD compliance inspection could pay more if the LHD chooses to end their compliance inspection program and require certified subsurface operators to inspect the Type IIIb and IIIh systems. OSWP assumes that LHDs are currently optimizing their time according to task priority. Therefore, OSWP assumes that LHDs that currently perform these inspections will continue to do so (since they generate revenue, on net), and those LHDs that currently do not have sufficient staff time to conduct the inspections will authorize private certified subsurface operators to conduct the inspections.

Table 11. Projected Facility Owner Costs Based Upon Using a Certified Subsurface Operator for Type IIIb and IIIh Inspections, Year One*

Facility Owner Projected Additional Costs for Private Inspection, Annualized**	
Average Number of Type IIIb and IIIh Systems Inspected per Year (329,065/5)	65,813
Proportion of Total Inspections Completed by Private Inspectors	50%
Average Fee for Certified Subsurface Operator to Inspect a Type IIIb or IIIh System	$150
Total Costs to Facility Owner	**($4,935,975)**

*Values are presented in 2021 dollars.
**Inspections must occur every 5 years

Table 12. Projected Benefits to Private Certified Subsurface Operators, Year One*

Certified Subsurface Operator Revenue Benefits, Annualized**	
Average Number of Type IIIb and IIIh Systems Inspected Per Year (329,065/5)	65,813
Proportion of Total Inspections Completed by Private Inspectors	50%
Average Fee by Certified Subsurface Operator to Inspect a Type IIIb or IIIh System	$150
Total Benefits to Certified Operator	**$4,935,975**

*Values are presented in 2021 dollars.
**Inspections must occur every 5 years

These will be ongoing impacts, dependent upon LHDs decision to allow owners to hire a certified subsurface operator as well as dependent upon the number of systems installed. Table 13 shows the projected number of Type IIIb and IIIh systems over a four-year period, assuming that Type IIIb and IIIh will account for 15% of all existing systems. Table 14 summarizes the benefits associated with the expansion of wastewater system classification types and a private sector option for Type IIIb and IIIh system inspections.

Table 13. Projected Number of Permitted Type IIIb and IIIh Systems to be Inspected

Year	Type IIIb and IIIh Systems
2021	329,065
2022	331,560
2023	334,027
2024	336,469

Table 14. Summary of Benefits from Expansion of Wastewater System Classification Types and Type IIIb and IIIh Inspections

Private Sector Benefits (homeowner, consultants, operators, installers)
Additional service to provide to their clients Precludes costs to repair malfunctioning on-site wastewater treatment system
Public Sector Benefits (LHD and OSWP)
Fewer on-site wastewater treatment system malfunctions

Rule 15A NCAC 18E .0803 – Grease Tank Capacity Requirements
Rule 15A NCAC 18E .1401 – Plans for Prefabricated Tanks
Rule 15A NCAC 18E .1403 – Tank Material Requirements
Rule 15A NCAC 18E .1404 – Plans for Risers, Effluent Filters, and Pipe Penetrations
Rule 15A NCAC 18E .1405 – Risers, Effluent Filters, and Pipe Penetration Approval Renewal

Tanks are a component of every on-site wastewater treatment system installed in North Carolina. All on-site wastewater treatment systems use a septic tank. Grease tanks are used with on-site wastewater treatment systems that are designed for food service establishments or other facilities expected to have significant amounts of fats, oil, and grease in their waste stream. Pump tanks are used when the effluent from the septic tank cannot flow by gravity to the dispersal field, the total dispersal field line length exceeds 750 linear feet, or the design daily flow is greater than 3,000 gallons/day.

Grease Tank Capacity Requirement

Greases tanks are used to separate and remove the grease from wastewater generated by food service facilities. The disinfection methods used in commercial kitchen dishwashers (chemicals and high water temperature) keep the grease in suspension in the wastewater for a much longer period of time than typically occurs in a household kitchen. The wastewater needs sufficient time to cool so that the grease can congeal in the grease tank, so grease tanks generally need longer retention times than septic tanks. One way to increase retention time is to add additional tank compartments or tanks in series to the current grease tank size.

Removing the grease from the wastewater reduces the risk of early malfunction for systems serving food service facilities. Food service facilities are at a higher risk for early on-site wastewater treatment system malfunction. If the grease is not removed in the grease tank, septic tank, or pump tank, it will travel to the dispersal field and come out of suspension at the soil interface. The grease will clog the soil and cause premature malfunction of the dispersal field. Grease accumulation in grease tanks, septic tanks, and pump tanks can be removed. Once grease has congealed in the soil, it is almost impossible for the dispersal field to recover. A repair is required in the form of a replacement dispersal field.

The proposed rules require a capacity and configuration change in the grease tank. Currently, a single grease tank is installed as part of the on-site wastewater treatment system for food service facilities. The proposed rules state that for on-site wastewater systems with a required grease tank capacity over 1,500 gallons, two grease tanks in series are required.

On average, 100 to 200 grease tanks a year would be installed with on-site wastewater treatment systems. An average cost to install a second grease tank, including the cost of the tank and the installation charges, would be around $1,600[5]. This is based on a second 1,000 gallon grease tank, which is what would be required at a minimum. The total grease tank capacity is based on the design flow which is project

[5] Based on information from a North Carolina Certified On-site Wastewater Contractor

specific. Tables 15 and 16 project the private sector costs associated with the increase in grease tank capacity.

Table 15. Summary of Costs from Grease Tank Capacity Changes, Year One*

Facility Owner Costs	
Number of additional grease tanks installed	150
Cost per tank and installation in Year One**	$1,801
Public Sector Costs	**($270,150)**

*Values are presented in 2021 dollars.
**Assuming a 3% increase in cost per year.

Table 16. Summary of Benefits from Grease Tank Capacity Changes, Year One*

Tank Manufacturer Benefits	
Number of additional grease tanks sold	150
Cost per tank and installation in Year One**	$1,801
Revenue Benefits to Manufacturers	**$270,150**

*Values are presented in 2021 dollars.
**Assuming a 3% increase in cost per year.

Plans for Prefabricated Tanks

The proposed rules include a structural verification test. This structural verification test shows that the tank is able to withstand the loads acting on the tank (soil depth weight, water table force, people walking over tank, etc.). The structural verification test applies to all new approved tanks. Over the past ten years, the most tank approvals issued in one year was 24. That same number can be projected out over the next five years to provide a determination of the on-going costs associated with the proposed rule. Tables 17 and 18 projects the cost to the private sector for the tank structural verification tests.

Table 17. Private Sector Cost due to Structural Verification Test, Year One

Manufacturers Projected Cost Increases	
Average Number of New Tanks Submitted for Approval	24
Weighted Average Cost of Structural Verification Test ($600 for precast concrete tanks and $8,000 for plastic and fiberglass tanks)	$1,525*
Total Cost to Private Sector (Number of New Tank Approvals x Average Cost)	**($36,600)**

*This number was obtained in the following method: 21 tanks were estimated as precast concrete and three tanks were estimated as plastic or fiberglass. These numbers were based on tank approvals issued over the past ten years.

Table 18. Private Sector Benefits due to Approvals, Year One

Benefits to Third-party Testers and Certifiers	
Average Number of New Tanks Submitted for Approval	24
Initial approval fee	$1,525*
Total Benefits to Testers and Certifiers	**$36,600**

*This number was obtained in the following method: 21 tanks were estimated as precast concrete and three tanks were estimated as plastic or fiberglass. These numbers were based on tank approvals issued over the past ten years.

Concrete tank design has been modified to increase concrete strength from 3,500 psi to 4,000 psi. The increased concrete strength will provide a stronger, better tank. The average cost increase for a concrete tank to increase the tank strength from 3,500 psi to 4,000 psi is $40/1,000 gallon tank. Table 19 shows the private sector costs associated with proposed concrete tank design changes.

Table 19. Private Sector Cost due to Concrete Tank Design Changes, Year One

Private Sector Projected Cost Increases	
Average Number of New Septic Tanks Installed	17,176
Average Number of New Pump Tanks Installed	2,576
Average Number of New Grease Tanks Installed	150
Total Number of New Tanks Installed	**19,902**
Average Cost Increase Based on Concrete Tank Design Changes in 2021*	$44
Cost to Private Sector (Number of New Tank Installed x Average Cost)	**($875,688)**

*Assuming a 3% annual growth in cost.

Tank Material Requirements

The current rules specifically identify the design and construction for concrete tanks. Plans for other tanks are approved on an individual basis and evaluated based on the information provided. The information provided must demonstrate that the tank will provide equivalent treatment and performance to the concrete tanks.

Both concrete and plastic tanks are frequently used across North Carolina in on-site wastewater treatment systems. Fiberglass tanks are occasionally seen on large (over 3,000 gallons/day) systems. Fiberglass tanks cannot compete cost wise in the single-family home market and are more expensive than plastic and concrete tanks. For on-site wastewater treatment systems with a design flow over 3,000 gallons/day, the tank cost is already going to be greater due to the larger tanks. The additional cost for fiberglass tanks will not be as great in these systems.

The proposed rules contain criteria for plastic and fiberglass tanks that are not spelled out in the current rules. However, the proposed rules include the minimum material requirements and any design requirements that differ from concrete tanks. The most significant design difference between plastic and fiberglass tanks and concrete tanks is the wall thickness. Plastic and fiberglass tanks will have a much thinner wall than concrete tanks. This is a material difference.

Tank structural integrity testing is a way to spot check and confirm that the tanks installed meet the minimum rule requirements. OSWP strongly encourages the LHD to routinely spot check concrete tanks for strength. A Schmidt Rebound hammer or equivalent is used by OSWP and LHDs to check concrete strength. Plastic and fiberglass tanks do not have a piece of testing equipment that is relatively inexpensive and easy for LHD staff to use to check material strength. The plastic and fiberglass tank manufacturers will need to be enrolled in a third-party quality assurance and quality control program, which includes unannounced annual audits and materials testing. OSWP expects that most manufacturers are already B66 certified (meeting the requirements of the proposed rule) because such certification is required to be able to sell products in other states. The proposed rules will prevent any post-approval design modifications unless they are specifically approved.

The approximate cost for a manufacturer to obtain approval for a plastic or fiberglass tank under the proposed rules is $30,000. The third-party cost to maintain this national certification on average is $5,400 per year. The initial approval cost is a one-time cost. The cost to maintain the certification is an on-going cost. Over the past ten years, a total of 14 new plastic tanks have been approved. On average, three new plastic or fiberglass tank approvals will be issued per year. Tables 20, 21, 22, 23, and 24 identify the private sector costs associated with plastic or fiberglass tanks obtaining and maintaining approval.

Table 20. Manufacturer Cost due to Plastic or Fiberglass Tank Approvals, Year One*

Manufacturer Projected Cost Increases	
Average Number of New Tanks Submitted for Approval	3
Initial approval cost ($20,000 certifier fee plus staff time to develop submittal)	$30,000
Total Costs	**($90,000)**

*Values are presented in 2021 dollars.

Table 21. Manufacturer Ongoing Cost due to Approvals, Year Two and Beyond

Manufacturer Projected Cost Increases	
Average Number of New Tanks Submitted for Approval	3
Ongoing annual certification costs ($2,700 certifier fee plus staff time to develop submittal)	$5,400
Total Costs	**($16,200)**

Table 22. Private Sector Benefits due to Plastic or Fiberglass Tank Approvals, Year One*

Revenue Benefits to Third-party Testers and Certifiers	
Average Number of New Tanks Submitted for Approval	3
Initial approval fees	$20,000
Total Benefits to Testers and Certifiers	**$60,000**

*Values are presented in 2021 dollars.

Table 23. Private Sector Benefits due to Approvals, Year Two and Beyond

Revenue Benefits to Third-party Testers and Certifiers	
Average Number of New Tanks Submitted for Approval	3
Ongoing annual certification fees	$2,700
Total Benefits to Testers and Certifiers	**$8,100**

Table 24. Public Sector Costs to Review Initial Plastic or Fiberglass Tank Approvals, Year One*

OSWP Review Costs	
Average Number of New Tanks Submitted for OSWP Approval	3
Total Cost in Man Hours for Approval by Engineer (Number of Approvals x 5 man hours x Hourly Compensation)**	**$1,037**

*Values are presented in 2021 dollars.
**Calculated based on 2016 government salary information for Engineers from NCOSHR and projected growth in NC state and local government wages from IHS Markit, and cost of employee benefits by industry from the US Bureau of Labor Statistics. The mid-range hourly wage rate, including benefits, is expected to be $69.12 in 2021.

The current rules also specify that additional reinforcement is required for tanks that are placed deeper than three feet below the finished grade. How much additional reinforcement is not specified, and interpretation of this rule has varied in the past.

The proposed rules require all tanks buried deeper than three feet below finished grade to be designed by a PE for the proposed tank burial depth. The State shall review and approval the additional reinforcement tank designs.

This cost associated with tanks buried deeper than three feet will be unquantifiable. There is no mechanism in place to track the number of tanks that are buried deeper than three feet. The tank design will vary based on the burial depth and current tank design. The PE could propose additional reinforcement, increase in the thickness of the tank lid, increased concrete strength, etc., to modify the tank design for the proposed burial depth. The tank design will be site and project specific.

Plans for Risers, Effluent Filters, and Pipe Penetrations

Risers, effluent filters, and pipe penetrations are all used with tanks. Risers provide access to the tanks for routine operation and maintenance. This includes visual inspection of the tank and its contents, pumping tanks, effluent filter cleaning, maintenance of the pump and control system, etc. Effluent filters are located at the outlet end of septic tanks and grease tanks. They keep the scum layer (stuff that floats on top of the wastewater, such as toilet paper and cooking grease) in the tank and prevent the scum layer from moving on through the system to the dispersal field. Cast-in-place pipe penetrations provide for some flexibility with the pipes that exit the tanks. The tanks and pipes can settle over time since they are set on disturbed earth. By using a flexible pipe penetration, minor settling will not cause breaks in the tank, pipe, or connection.

OSWP has approved risers, effluent filters, and pipe penetrations for use with all State approved tanks for over 15 years. The criteria for these products has never been in the rules before. By including this criteria in the proposed rules, the manufacturers can easily identify the information required when applying to OSWP for review and approval.

The average cost to a manufacturer to apply for and receive approval of an effluent filter, riser, or pipe penetration is $10,750. This cost includes the product certification cost verifying that the product meets the minimum requirements. Over the past 10 years, a total of five new risers and effluent filters (combined) have applied for and received approval from OSWP. Tables 25, 26, and 27 project the fiscal impact to effluent filter, riser, and pipe penetration manufacturers and OSWP for new approvals. Conservatively, OSWP expects applications to increase slightly, averaging one new application submitted per year.

The proposed rules also include a provision that all effluent filter, riser, and pipe penetration approvals will expire every year. The manufacturer will be required to submit a renewal form to OSWP with updated contact information and a notarized statement that the products have not changed from the previous year. This allows OSWP to verify contact information, that the products still meet current material standards, and are performing as anticipated by the product manufacturer.

Tables 28 and 29 project the fiscal impact to effluent filter, riser, and pipe penetration manufacturers and OSWP for approval renewals every year.

Table 30 summarizes the benefits associated with all of the proposed tank rule changes.

Table 25. Projected Private Sector Costs for Effluent Filters, Risers, and Pipe Penetration New Approvals, Year One*

Manufacturer Projected Cost Increases	
Avg Number of Effluent Filter, Riser, or Pipe Penetration Applications	1
Average Private Sector cost to Collect Information and Write Report ($650/application)	$650
Third Party Product Verification Fee ($10,000/application)	$10,000
Total Costs	**($10,650)**

*Values are presented in 2021 dollars.

Table 26. Projected Private Sector Benefits for Effluent Filters, Risers, and Pipe Penetration New Approvals, Year One*

Private Certifiers, Testers, and Inspectors Benefits	
Avg Number of Effluent Filter, Riser, or Pipe Penetration Applications	1
Third Party Product Verification Fee ($10,000/application)	$10,000
Total Benefit to Private Certifiers, Testers, and Inspectors	**$10,000**

*Values are presented in 2021 dollars.

Table 27. Projected OSWP Costs for Effluent Filters, Risers, and Pipe Penetration New Approvals, Year One*

OSWP Staff Projected Fiscal Impacts	
Avg Number of Effluent Filter, Riser, or Pipe Penetrations Applications to Review	1
Total Cost in Man Hours for Approval Renewal by Engineer (Number of Approval Renewals x 2 man hours x Hourly Compensation)**	**($139)**

*Values are presented in 2021 dollars.
**Calculated based on 2016 government salary information for Engineers from NCOSHR and projected growth in NC state and local government wages from IHS Markit, and cost of employee benefits by industry from the US Bureau of Labor Statistics. The mid-range hourly wage rate, including benefits, is expected to be $69.12 in 2021.

Table 28. Projected OSWP Costs for Effluent Filters, Risers, and Pipe Penetration Approval Renewals*

OSWP Staff Projected Fiscal Impacts	
Number of Effluent Filter, Riser, or Pipe Penetration Product Renewals per Year	23
Total Cost in Man Hours for Approval Renewal by Engineer (Number of Approval Renewals x 0.5 man hours x Hourly Compensation**)	($795)
Net Cost to OSWP	**($795)**

*Values are presented in 2021 dollars.
**Calculated based on 2016 government salary information for Engineers from NCOSHR and projected growth in NC state and local government wages from IHS Markit, and cost of employee benefits by industry from the US Bureau of Labor Statistics. The mid-range hourly wage rate, including benefits, is expected to be $69.12 in 2021.

Table 29. Projected Private Sector Costs for Effluent Filters, Risers, and Pipe Penetration Approval Renewals*

Manufacturer Projected Cost Increases	
Number of Effluent Filter, Riser, or Pipe Penetration Product Renewals per Year	23
Average Private Sector Cost to Fill Out Approval Renewal Form (Number of product renewals x $300/renewal)	$6,900
Total Cost to Manufacturer	**($6,900)**

*Values are presented in 2021 dollars.

Table 30. Summary of Benefits from All Tank Rule Improvements

Private Sector Benefits (homeowner, consultants, operators, installers)
Potential reduction in on-site wastewater treatment system repair costs due to grease Quicker review of alternative tank material designs Increased concrete tank strength
Public Sector Benefits (LHD and OSWP)
Potential reductions in system malfunctions due to grease Increased concrete tank strength Up to date contact information from manufacturers to answer questions about the product

Rule 15A NCAC 18E .1505 – Residential Wastewater Treatment System Approval Renewal
Rule 15A NCAC 18E .1711 – Provisional and Innovative Approval Renewal

Currently, once a manufacturer of a residential wastewater treatment system (RWTS) or P&I system has received approval for their product, the manufacturer has that approval forever. OSWP has only revoked two approvals in more than 20 years. One manufacturer had let their required certification lapse; the other manufacturer was determined by OSWP to have failed to disclose a problem with their product that was later discovered in North Carolina installations. A number of these products are used on sites for which a conventional on-site wastewater treatment system cannot be installed. The site has limitations that require a more advanced on-site wastewater treatment system for the lot to be developed.

Under the proposed rules, the RWTS and P&I approvals will expire on December 31 every year. The manufacturer will need to submit a one-page renewal form to OSWP with updated contact information and a notarized statement that the products have not changed from the previous year. This allows OSWP to verify contact information and that the products continue to perform as anticipated by the product manufacturer. Manufacturers with a Provisional approval will also be required to submit an annual report with their one-page renewal form.

Additionally, the LHDs fill out a monthly activity report. This report includes information on the type of system, including RWTS and P&I products, installed. The LHDs submit this report to OSWP monthly. This information will assist OSWP with identifying the number of approved products being installed and product performance.

The costs for completion and review of the renewal form are projected in Tables 31 and 32. The costs and number of approvals should stay relatively consistent with time. Once a manufacturer has received approval, they will not want to lose the approval and re-start the product approval process from the beginning. Over the last five years, the average number of new P&I approvals issued was two per year. This does not include modifications to existing approvals. So, over a five-year period, the total number of product approvals could increase by ten (average of two a year). Table 33 summarizes the benefits associated with approval renewals for RWTS and P&I approvals.

Table 31. Projected OSWP Fiscal Impacts for Residential Wastewater Treatment System and Provisional and Innovative Approval Renewals*

OSWP Staff Projected Fiscal Impacts	
Number of P&I Approval Renewals to Review	45
Number of RWTS Approval Renewals to Review	10
Total Cost in Man Hours for Approval Renewal by Engineer (Number of Approval Renewals x .5 man hours x Hourly Compensation)**	**($1,901)**

*Values are presented in 2021 dollars.
**Calculated based on 2016 government salary information for Engineers from NCOSHR and projected growth in NC state and local government wages from IHS Markit, and cost of employee benefits by industry from the US Bureau of Labor Statistics. The mid-range hourly wage rate, including benefits, is expected to be $69.12 in 2021.

Table 32. Projected Private Sector Fiscal Impacts for Residential Wastewater Treatment System and Provisional and Innovative Approval Renewals*

Private Sector Projected Cost Increases	
Number of Innovative Approval Renewals to Review	31
Number of Provisional Approval Renewals to Review	14
Number of RWTS Approval Renewals to Review	10
Average Private Sector Cost to Fill Out Innovative and RWTS Approval Renewal Form ($300/renewal form)	($12,300)
Average Private Sector Cost to Fill Out Provisional Approval Renewal Form and Annual Report ($1,500/report and renewal form)	($21,000)
Total Cost to Private Sector (Number of Approval Renewals x Report Cost)	**($33,300)**

*Values are presented in 2021 dollars.

Table 33. Summary of Benefits from Product Approval Renewals

Private Sector Benefits (homeowner, consultants, operators, installers)
Updated list of approved products and current contact information Updated product approval that reflects current knowledge
Public Sector Benefits (LHD and OSWP)
Updating list of approved products and current contact information Method to verify that products going in the ground are the same as the products originally approved, including performance

IV. Rules with an unquantifiable fiscal impact

The rules identified in this part have an unquantifiable fiscal impact. There is not enough information to determine how many of these system types are utilized on an annual basis or to quantify the value added to calculate a fiscal impact. The twenty-three rules that fall into this category are as follows:

15A NCAC 18E .0303 – Licensed or Certified Professionals
Section .0400 – Design Daily Flow and Effluent Characteristics
15A NCAC 18E .0601 – Location of Wastewater Systems
15A NCAC 18E .0801 – Septic Tank Capacity Requirements
15A NCAC 18E .0908 – Drip Dispersal Systems (discussed with Rule .1204 and Section .1600)
15A NCAC 18E .1002 – Reclaimed Water Systems
15A NCAC 18E .1201 – Advanced Pretreatment System Standards
15A NCAC 18E .1202 – Siting and Sizing Criteria for Systems with a Design Daily Flow Less Than or Equal to 1,500 Gallons/Day
15A NCAC 18E .1203 – Siting and Sizing Criteria for Systems with a Design Daily Flow Greater Than 1,500 Gallons/Day and Less Than or Equal to 3,000 Gallons/Day

15A NCAC 18E .1204 – Advanced Pretreatment Drip Dispersal Systems
Section .1600 rules – Approval and Use of Pre-Engineered Package Drip Dispersal Systems
Section .1700 rules (except .1710 and .1711, addressed above) – Approval and Permitting of Wastewater Systems, Technologies, Components, or Devices

Rule 15A NCAC .0303 – Licensed or Certified Professionals

As one of the compromises reached by the Task Force when reviewing all the rules, all pressure manifold systems with a design daily flow greater than 600 gallons/day must now be designed by a PE. The North Carolina Board of Examiners for Engineers and Surveyors has determined that these designs meet the definition of engineering. Currently, these systems are designed by the LHD unless the system is designed by an authorized designer or PE.

This will be an increased cost to the owner. If the LHD designed the pressure manifold, there was no additional charge to the owner. This requirement will also be a time savings for the LHD, since they will no longer have to design these systems. The minimum cost for a PE to design a pressure manifold with a design flow greater than 600 gallons/day is $3,000. As the size of the system increases, the cost to design the system will increase.

Section .0400 – Design Daily Flow and Effluent Characteristics
Rule 15A NCAC 18E .0401 – Design Daily Flow
Rule 15A NCAC 18E .0402 – Septic Tank Effluent Characteristics
Rule 15A NCAC 18E .0403 – Adjustments to Design Daily Flow

Section .0400, Design Daily Flow and Wastewater Characteristics, has been updated to reflect an expanded list of facilities, a clarification of domestic strength wastewater, and additional options to facilitate facility flow reductions, including addressing the issue of wastewater strength.

The list of facilities in the current rules has not been updated in over 31 years. Actual wastewater flows are generally less than the daily flows currently listed. Many facilities request, and receive, flow reductions based on actual water use or the use of low-flow fixtures. The reduction in daily flows will result in smaller on-site wastewater treatment systems installed. The smaller on-site wastewater treatment system will cost the facility owner less to install, operate, and maintain. However, lower flows, especially with the use of extreme low-flow fixtures, may result in wastewater strength that is greater than domestic strength, which is clarified in the proposed rules.

The expanded facility list in Rule .0401 will help LHDs calculate design daily flows in a shorter time frame. For facilities that are not currently listed, the LHD consults with OSWP to determine a design flow. Sometimes this can take a couple of days to research (to be consistent with what OSWP has recommended to other LHDs) and provide the LHD with a final answer. The expanded list will ultimately result in permits being issued in a shorter time frame.

The clarification of domestic strength wastewater in Rule .0402 allows the on-site wastewater industry to define up front which facilities generate higher strength wastewater and account for that in the design from the beginning, instead of after the on-site wastewater treatment system is failing. The current rules have different values for what is or is not domestic strength wastewater in different rules. By clearly identifying the wastewater strength with the design flow, OSWP, LHDs, and consultants will be able to educate owners regarding the impacts of the wastewater quality on public health and the environment. This may impact some owners with specific plans for their property. The facilities identified as higher than domestic strength wastewater in Section .0400 have all been previously identified as such by the on-site wastewater industry, but not all owners are aware of the wastewater strength of these facilities.

Some owners or developers may have increased design and construction costs due to the need for advanced pretreatment or additional design work to show that the wastewater quality will not harm public health and the environment. This will impact both new and existing facilities. The existing facilities will be impacted when an owner is expanding their facility and needs to expand their on-site wastewater treatment system. The proposed rules will require that the wastewater be evaluated. This could require the owner to add advanced pretreatment to the on-site wastewater treatment system or hire a consultant to determine the impact on the environment for the facility expansion. This will be site specific and vary based on the type of soil, wastewater characteristics, and site characteristics (wells, lakes, ponds, shallow water table, bedrock, etc.).

Rule .0403, Adjustments to Design Daily Flow, accounts for both hydraulic and organic changes to the design daily flow. The current rules only account for adjusting the design daily flow based on the amount of water used. The increased wastewater strength was not directly addressed, just referenced as "further adjustments shall be made when the wastewater characteristics exceed those of domestic wastewater". The proposed rules require that whenever a flow reduction is requested, the wastewater strength is also evaluated. The evaluation could include advanced pretreatment or a determination of the impact of the increased wastewater strength on the environment.

This rule also identifies how to address flow reductions for systems designed to treat wastewater that has nitrogen concentrations higher than domestic strength. Many schools and RV parks have septic tank effluent concentrations that are very high in nitrogen. Nitrogen is one of the known wastewater constituents that can have a significant impact on public health and the environment. "Blue baby syndrome," or methemoglobinemia, has been attributed in some cases to nitrate contaminated drinking water that is given to infants. The nitrate reduces the oxygen carrying capacity of the infant's blood. High levels of nitrogen in surface water can cause eutrophication, where the algae in the water blooms in excess (due to the increased nitrogen in the water) and reduces the water's oxygen levels. This decrease in oxygen levels impacts fish and other aquatic life. By addressing the potential increase in effluent nitrogen levels, the impact on public health and the environment can be minimized.

The private sector will see the biggest impact financially from Section .0400. While the increased facility list, clarified domestic strength wastewater criteria, and expansion of design daily flow reduction options will help reduce the permitting time requirement and allow for smaller systems, the requirement to take into account wastewater strength will require additional design calculations or advanced pretreatment systems for some sites. Many sites currently being permitted for higher than domestic strength wastewater facilities already have advanced pretreatment in the on-site wastewater treatment system. This is due to the industry's knowledge of the problems with high strength wastewater or other soil and site limitations.

The types of facilities that could be impacted will include the following: restaurants, summer camps, food stands, other food service establishments, meat markets, fish markets, schools, RV parks, rest areas and visitor centers, convenience stores with food service and public restrooms, service stations with public restrooms, rest homes, assisted living homes, nursing homes, day camps, and temporary labor camps. Other facilities could be included in this list in the future if it is determined, with experience, that the wastewater strength exceeds domestic wastewater strength.

While the complete universe of potentially affected existing and new facilities is unknown, the number of existing schools and restaurants in the state exceeds 3,000[6] and the number of existing assisted living and nursing homes exceeds 1,000.[7] Only a fraction of these existing facilities utilize on-site wastewater treatment systems and will be affected by the rules in any given year, dependent upon when an owner is expanding their facility and needs to expand their on-site wastewater treatment system and the wastewater characteristics. The addition of advanced pretreatment would cost the owner approximately an additional $26.50/gallon of wastewater treated when compared to a conventional on-site wastewater treatment system without advanced pretreatment.

The private sector could also see some benefits from advanced pretreatment being used with high strength wastewater on-site wastewater treatment systems. The on-site wastewater treatment systems with advanced pretreatment are more likely to have much longer life span. Since the wastewater strength will be lower, the dispersal field will be more likely to have a standard on-site wastewater treatment system life span or even to possibly exceed it.

The advanced pretreatment system may also allow the owner to expand the facility without having to expand or modify the on-site wastewater treatment system. If the water use is lower than the design flow and the advanced pretreatment system is meeting domestic strength limits, more wastewater could be discharged to the system without needing to expand the dispersal field at all.

Overall, the impact to OSWP and LHDs will be offset by rule changes. The time savings from the expanded facility list will be offset by the sites that will have additional design calculations or advanced pretreatment system designs to review. Table 34 summarizes the associated benefits from the proposed changes to design daily flows and effluent characteristics.

Table 34. Summary of Benefits from Changes to Design Daily Flow and Effluent Characteristics Rules

Private Sector Benefits (homeowner, consultants, operators, installers)
Faster permit issuance (due to quicker calculations of design daily flow) Potential longer life of on-site wastewater treatment systems based on consider of wastewater strength Potential future facility expansion without significant on-site wastewater treatment system modifications
Public Sector Benefits (LHD and OSWP)
Quicker calculations of design daily flow Clearer definition of domestic wastewater strength and high strength wastewater

Rule 15A NCAC .0601 – Location of Wastewater Systems

Several changes were made to the current rules to address issues that had been brought up regarding horizontal setbacks from on-site wastewater treatment systems. The changes included adding clarifying language so that the setback could be consistently addressed across the state, working with other regulatory agencies to verify that the setbacks listed in the proposed rules did not conflict with their rules, and reducing setbacks based on years of experience by numerous individuals in both the public and private sectors.

[6] School data provided by NCDPI and Private School Review, accessed at http://www.dpi.state.nc.us/docs/fbs/resources/data/factsfigures/2015-16figures.pdf ; https://www.privateschoolreview.com/north-carolina

[7] This figure includes adult care homes (assisted living) and nursing homes licensed by the NC Division of Health Services Regulation. Data accessed at https://www2.ncdhhs.gov/dhsr/reports.htm

One of several changes made includes the following setback reduction. Under the current rules, an on-site wastewater system must be located a minimum of 100 feet from a private drinking water well on an individual site. That distance may be reduced to 50 feet, but no less than 50 feet, based on space limitations or to repair a failing on-site wastewater system. This reduction in a horizontal setback still protects the public health and the environment but recognizes that space limitations can occur on individual lots. There is one exception to the above allowance, and that is when the on-site wastewater system is installed in saprolite. Saprolite is decomposed weathered rock that is located above bedrock and beneath soil. Saprolite is generally found in the piedmont and mountain regions.

Several comments were received by OSWP suggesting allowing the reduction from 100 feet to 50 feet for on-site wastewater systems installed in saprolite. After reviewing the scientific research conducted by professors at North Carolina State University, OSWP has determined that water primarily moves vertically in saprolite. OSWP agreed that the horizontal setback should be reduced from 100 feet to 50 feet for saprolite systems, similar to what is done for other on-site wastewater systems. This setback reduction can only be done with a variance, since the private drinking water well rules require the 100-foot setback to a saprolite system. The variance is issued by the OSWP staff.

It is impossible to determine the number of sites that will be positively impacted by the reductions in the horizontal setbacks. These sites would have been denied due to a lack of available space for the on-site wastewater treatment system to meet all the current rules. This proposed rule change will allow sites that would have previously been denied or would require a more expensive system to have a conventional on-site wastewater system installed.

Rule 15A NCAC .0801 – Septic Tank Capacity Requirements

Sometimes, the plumbing from the facility exits the building lower than originally planned and the wastewater from the facility cannot flow by gravity to the on-site wastewater treatment system. This occurs most frequently when a homeowner decides to add a bathroom to the basement, and the plumbing is already designed to flow by gravity from the first floor. So, a grinder pump station is installed to bring the wastewater from the basement up to the gravity sewage pipe already installed to flow into the septic tank for the on-site wastewater treatment system. The grinder pump station is permitted by county Building Inspections departments and often the on-site wastewater treatment system is already installed and in use when the grinder pump station is discovered by the LHD.

Grinder pumps do exactly what their name implies. The pump grinds up the solids in the wastewater as part of the pumping process. Septic tanks are designed for a minimum wastewater retention time to allow a significant portion of the solids in the wastewater to settle out. The smaller-sized particles resulting from use of a grinder pump tend to stay in suspension within the septic tank. This can increase the amount of solids and organic matter that is discharged to the dispersal field and can result in premature system failure.

The proposed rules require that the septic tank capacity be doubled whenever a grinder pump station is used to move wastewater from the facility to the on-site wastewater treatment system. By doubling the retention time in the septic tank, a higher percentage of these small solids can be removed from the wastewater before it discharges to the dispersal field.

The homeowner could try to lower the existing septic tank, but that could be a complicated option. If the burial depth of the septic tank is greater than three feet, the septic tank would need to be designed by an PE with additional reinforcement. The original septic tank potentially could not be used. And if the on-site wastewater treatment system is already in use, this complicates the re-location of the existing septic

tank even further. The homeowner could decide to add a second septic tank in a series, forego the renovation, or risk being noncompliant.

It is impossible to determine the number of grinder pump stations that are installed prior to an on-site wastewater treatment system. The LHD will not have a record of the grinder pump station since it is permitted by county Building Inspections departments, not the LHD. If the system has already been installed, the LHD may never be made aware of the grinder pump station until a problem occurs with the on-site wastewater treatment system. If a LHD discovers a grinder pump station when a problem occurs, the best corrective action in most cases will be to install a second septic tank in series. An average cost to install a second septic tank, including the cost of the tank and the installation charges, would be around $1,600[8]. Table 35 summarizes the associated benefits from increasing septic tank capacity when a grinder pump is used.

Table 35. Summary of Benefits from Increases to Septic Tank Capacity Requirements when a Grinder Pump is Used Prior to the Septic Tank

Private Sector Benefits (homeowner, consultants, operators, installers)
Potential longer life of on-site wastewater treatment systems (due to the reduction of effluent solids that will pass through the septic tank and effluent filter)
Public Sector Benefits (LHD and OSWP)
Potential longer life of on-site treatment wastewater systems Clearer definition of what is required when a grinder pump is used prior to an on-site wastewater treatment system

.0908 – Drip Dispersal Systems
.1204 – Advanced Pretreatment Drip Dispersal Systems
Section .1600 – Approval and Use of Pre-Engineered Package Drip Dispersal Systems
.1601 – General
.1602 – Design and Construction Standards
.1603 – Drip Dispersal System Testing

Drip dispersal systems have been in use in North Carolina for on-site wastewater treatment systems since 1993. The siting, design, and installation criteria have been revised and updated over the years to reflect current thinking with the technology. For many years, OSWP's goal has been to include drip dispersal systems in the rules. Drip dispersal systems are currently issued a P&I approval under Rule 15A NCAC 18A .1969. In the proposed 18E rules, Rule .1969 is now Section .1700. The P&I approvals contain the manufacturer specific drip dispersal system information: soil and site evaluation criteria and the minimum siting criteria, system design and installation, and operation and maintenance. The P&I approval helps expedite the permitting process in many ways. The P&I approvals also specify when a licensed professional, such as a PE or LSS, is required.

The LHD can issue a permit based on the information in the drip dispersal P&I approval. Some LHDs may request OSWP assistance, but many can review a drip dispersal system proposal using the P&I approval.

The existing criteria from the P&I approval are being proposed for adoption in these rules. The fiscal impact of adding the drip dispersal system P&I approval information to the proposed rules is a neutral or positive change for drip dispersal system manufacturers. The information and standards the products must meet are now identified in rule, which allows the manufacturers to know the criteria that must be

[8] Based on information from a North Carolina Certified On-site Wastewater Contractor

met prior to making an application for a drip dispersal system. This information has been required to be provided by all manufacturers currently approved for drip dispersal systems. By adding this information to the proposed rules, OSWP is providing transparency to and streamlining the P&I approval process.

The approximate cost for a manufacturer to obtain P&I approval for a drip dispersal system under the proposed rules is unquantifiable. While the current criteria for P&I approval are in the proposed rules, the P&I approval process, and showing that a product or component meets that criteria, is impossible to predict based on the potential product variations in the industry.

Since 1993, when the first drip dispersal P&I approval was issued, a total of six drip dispersal P&I approvals have been issued. At the most, one new application might be received over the next five years for a new drip dispersal P&I approval. Table 36 summarizes the benefits associated with adding drip irrigation to the proposed rules.

Table 36. Summary of Benefits with Adding Drip Irrigation

Private and Public Sector Benefits
Streamlined application and P&I approval process
Clarification of information required for P&I approval
Reduced time from application submittal to P&I approval

Rule 15A NCAC 18E .1002 – Reclaimed Water Systems
Rule 15A NCAC 18E .1201 – Advanced Pretreatment System Standards
Rule 15A NCAC 18E .1202 – Siting and Sizing Criteria for Systems with a Design Daily Flow Less Than or Equal to 1,500 Gallons/Day
Rule 15A NCAC 18E .1203 – Siting and Sizing Criteria for Systems with a Design Daily Flow Greater than 1,500 Gallons/Day and Less Than or Equal to 3,000 Gallons/Day

Advanced pretreatment systems are used on sites with moderate to severe soil and site limitations. The soil depth may be so limited that a conventional on-site wastewater treatment system cannot be installed. A house and on-site wastewater treatment system may not be able to be installed on a site and meet all the horizontal setbacks required.

The use of advanced pretreatment allows for the reduction in some siting and sizing criteria for on-site wastewater treatment systems or an increase in the soil loading rate. The effluent is treated to a much higher quality, so the reduction in siting and sizing criteria or increase in soil loading rate does not increase the risk to public health. Advanced pretreatment systems are required to contract with a certified subsurface operator to visit the system at least twice a year. The operation permit for an advanced pretreatment system expires every five years. These requirements help the LHDs to ensure protection of public health and the environment.

<u>Reclaimed Water Systems</u>
Reclaimed water systems have been added in the proposed rules. Reclaimed water systems are defined as treated wastewater effluent meeting established standards and using the effluent for beneficial reuse. Beneficial reuse means that the water is being used in a beneficial manner and to conserve the State's water resources by reducing the use of potable, surface, and groundwater resources. Some examples of beneficial reuse include toilet flushing and irrigation of lawns or flower beds.

Industry stakeholders advocated the addition of reclaimed water systems to the proposed rules. There is an increased cost associated with treating the wastewater to a higher effluent standard. Reclaimed water systems, though, allow the owner a cost savings with regards to the use of potable water. Golf courses

use a significant amount of water to irrigate the greens. Many times, the water used for irrigation is potable water. Using a reclaimed water system, the owner can reduce the amount of potable water used for irrigation and use reclaimed water to irrigate the greens. Besides saving the owner potable water costs, the use of reclaimed water is conserving water resources.

Due to the cost associated with reclaimed water systems, including long term operation, maintenance, and management, it is unlikely these would be used for single family residences. These will more likely be used for larger systems where the added cost for reclaimed water is not a significant portion of the overall wastewater system cost.

OSWP and LHDs already have the infrastructure in place to deal with review, permitting, and inspection of reclaimed water systems (another type of advanced pretreatment system).

During the last drought, OSWP received many requests about using wastewater effluent for lawn irrigation and other beneficial purposes, to reduce the use of potable water. Although a drought is not currently in progress, OSWP and the on-site wastewater industry recognize that when another drought comes to North Carolina, this is going to be one way to conserve potable water that owners will be asking for. The option to permit these systems needs to be included now, during this rulemaking, so that everyone in the on-site wastewater industry is ready for the next drought.

The ability to conserve potable water, whether during a drought or not, is an unquantifiable fiscal impact that has a net overall positive impact on North Carolina and its water resources.

Advanced Pretreatment System Standards

One change was made to the effluent quality standards in the proposed rules. The total nitrogen limit in the current rules is less than or equal to 20 mg/L or greater than 60% removal. The "60% removal" provision was removed from the proposed rules.

Most advanced pretreatment systems approved for use with on-site wastewater treatment systems in North Carolina recirculate some portion of the effluent back to the septic tank at the beginning of the wastewater system. This is a critical configuration to facilitate nitrogen removal. When the effluent is recirculated back to the septic tank, it blends with incoming wastewater. Since the unreduced concentrations have been diluted, it is difficult to determine the percent removal of total nitrogen. Removal of the 60% standard allows a more straightforward determination of whether or not the on-site wastewater treatment system is in compliance with the effluent standard.

Siting and Sizing Criteria for Systems with a Design Daily Flow Less Than or Equal to 1,500 Gallons/Day

Siting and Sizing Criteria for Systems with a Design Daily Flow Greater than 1,500 Gallons/Day and Less Than or Equal to 3,000 Gallons/Day

The design flow limitation for using advanced pretreatment and the reduction in siting and sizing criteria or an increase in the soil loading rate is currently 1,000 gallons/day for advanced pretreatment systems meeting treatment standards TS-I and TS-II and 1,500 gallons/day for advanced pretreatment systems designed to meet treatment standard NSF-40. The proposed rules will increase that design flow to 1,500 gallons/day. The flow was increased to provide a consistent number across all treatment standards.

This design flow increase could impact at least 100 sites per year. The 100 sites per year is based on the average number of sites that the coastal LHDs determined would be impacted by this rule change. Coastal counties generally have more advanced pretreatment systems in their counties than the rest of the counties in North Carolina. The lots in the coastal counties are typically smaller and the advantages provided by advanced pretreatment allow lots to be developed in accordance with the owner's plans.

Sites that may not meet the siting and sizing requirements in the current rules with a design flow over 1,000 gallons/day would be limited in their options. The owner may need to scale back the plans for what they would like to do or not even develop the site at all. By increasing the design flow limit that can be used with advanced pretreatment and siting and sizing reductions or an increase in the soil loading rate, these sites can now be developed. The benefit to the owner is incalculable but likely significant, as this rule change allows them to develop a site that could have been previously denied for their proposed plans.

Additionally, by increasing the design flow for all treatment standards for all siting and sizing reductions or increase in soil loading rates, it is easier for the LHDs and private consultants to provide land owners with an evaluation of the options available for the property. The risk to public health and the environment will not be increased by this change. Advanced pretreatment technology is approved in North Carolina to treat wastewater to NSF-40, TS-I, and TS-II standards. If the advanced pretreatment technology is proposed for a site with limitations, a special site evaluation has to be performed to show that the on-site wastewater treatment system will not adversely impact surface or groundwaters.

Section .1700 – Approval and Permitting of Wastewater Systems, Technologies, Components, or Devices
.1701 – General
.1702 – Application
.1703 – Department and Commission Application Review
.1704 – Approval Criteria for Provisional Systems
.1705 – Approval Criteria for Innovative Systems
.1706 – Approval Criteria for Accepted Systems
.1707 – Design and Installation Criteria for Provisional, Innovative, and Accepted Approvals
.1708 – Modification, Suspension, and Revocation of Approvals
.1709 – Wastewater Sampling Requirements for Advanced Pretreatment Systems, Including Reduced Sampling Requirements
.1710 –Compliance Criteria for Advanced Pretreatment Systems
*.1711 – Provisional and Innovative Approval Renewal**
.1712 – Authorized Designers, Installers, and Management Entities
.1713 – Local Health Department Responsibilities

Wastewater systems, technologies, components, or devices not specifically listed in the rules can be approved under a separate rule that specifies the minimum requirements needed for P&I approval. This allows new technologies to be approved in North Carolina without requiring any changes to the rules. Manufacturers can also easily modify, adapt, or change their product without having to go through the formal rule making process.

The types of systems not specifically listed in the rules, but approved using this process, can include alternative dispersal field products, advanced pretreatment systems, and other wastewater system components.

There are four different levels of approvals identified in the current rules: experimental, controlled demonstration, innovative, and accepted. Experimental approvals were removed from the General Statutes by Session Law 2015-286, Section 4.15(a). Provisional approvals, previously known as controlled demonstration approvals, are for products that have some data or have been approved by a national testing facility. Wastewater systems approved as innovative have a large amount of data that has been collected about them or have previously received an experimental or provisional approval and met all the criteria in the approval.

Session Law 2019-151, Section 13, gave trench products currently listed in the Rules the ability to apply for Accepted status. Previously, only trench products with an innovative approval could apply for Accepted status. When a product has Accepted status, that product can be substituted for a conventional on-site wastewater treatment system or another product with Accepted status without prior approval of the LHD. The product design and layout must fit in the area approved by the LHD and certain design features, such as the trench depth or the method of distributing effluent to the trenches cannot change. The owner or the installer can choose to make the substitution. When the LHD comes out to conduct the final inspection, they will make a note in the file of the trench product installed if it has changed from what was on the permit.

After applying for Accepted status, a survey must be done on the product to verify that its performance is as good as or better than a conventional trench. The survey is done by a third party hired by the trench product manufacturer. A minimum number of systems must be surveyed during the months of January through April 15th, which is considered to be the wet season and the most stressful time of year for an on-site wastewater treatment system.

Session Law 2015-286 made numerous changes to G.S. 130A-343, which deals with the approval levels and criteria of these systems not specifically listed in the rules. The Session Law also required that the rules be updated to reflect the changes made to G.S. 130-343. The changes simplified the approval level options and expanded the options for a manufacturer to obtain approval, while maintaining a comparable level of rigor in the certification process. When making the changes required by Session Law 2015-286, OSWP staff also made additional changes to clarify the current rule.

The changes Session Law 2015-286 made to G.S. 130A-343 are as follows:

- Changed the definition of accepted systems to apply only to trench products and exclude advanced pretreatment systems.
- Changed the term "controlled demonstration" to "provisional."
- Deleted experimental wastewater system approvals.
- Provided an alternative method for reducing effluent sampling criteria for advanced pretreatment wastewater systems.
- Provided time frames for OSWP review and approval of products.
- Provided alternative criteria for issuing a product a provisional approval.

In addition to updating the rule to reflect the Session Law changes, the current rule does not clearly lay out the requirements for P&I approval, information required to be provided by the applicant or manufacturer, or the criteria the information must meet. The proposed rules reorganize the current rule into a format that makes it easier for a manufacturer to identify the application information needed and the criteria that information must meet.

VI. ALTERNATIVES

Alternative #1: Require leak testing of all tanks installed in on-site wastewater treatment systems.

In the current rules, tanks are only required to be leak tested when the water table is within five feet of the ground surface and a mid-seam pump tank is used, with advanced pretreatment systems, and engineered design systems. OSWP staff looked at requiring every tank installed in an on-site wastewater treatment system to be leak tested, either with a hydrostatic test or a vacuum test.

The cost to implement this would increase the cost of the simplest system (septic tank to gravity dispersal field) by around $1,000 per system (about 20%). As on-site wastewater treatment systems increased in size or complexity, and the cost of the system increased, the percent total of the system cost would decrease for tank leak testing. However, the majority of systems installed in North Carolina are single family residence systems that do not require advanced pretreatment.

This does not include the added cost to the LHDs. LHD staff would need to go back out to the site to verify the leak test results. This would result in at least one additional trip to the site at a minimum. For the small LHDs, this could end up being a significant burden on their limited staff resources.

In summary, the costs for leak testing all tanks impact both public and private sectors significantly. The quality of tanks installed in North Carolina has improved over the past 20 to 30 years and this is not a viable and cost-effective option for moving the tanks to the next level. Additionally, current processes are sufficiently protective of public health and the environment. Other options are available, that are less expensive, to improve tank quality.

Alternative #2: Product re-approvals for compliance with the rules

The proposed rules included a provision for product approvals to expire every five years, with the manufacturer re-applying for approval. The manufacturer would provide documentation to support the re-approval of their product. After reviewing the comments and meeting with stakeholders, a compromise was suggested by one of the stakeholders. Washington State has an annual re-approval process for all their approved products. The re-approval process is just an application with current contact information and a notarized signature under a statement verifying that the product has not changed. This approach, or one very similar to it, was a reasonable compromise. Manufacturers would not have to collect and submit detailed information regarding their product performance and OSWP received current contact information and verification from the manufacturer that the product had not changed. The cost for the scaled down re-approval process would be significantly less to both the public and private sectors.

Alternative #3: Requiring grease tanks to obtain a separate tank approval

In the current rules, grease tank designs are almost identical to septic tank designs. The majority of grease tanks installed are modified septic tanks. OSWP staff looked at requiring grease tanks to have a separate grease tank approval issued by the State.

The cost to implement this would be around $3,500 per tank form and each tank has two forms, a top half form and a bottom half form. The total cost per tank would be $7,000. There are very few problems with the current process. (The main problem being tanks that have never been state approved being installed as a grease tank.) Based on the lack of problems with the current process, and the high cost to tank manufacturers for requiring grease tanks to have an approval number, it did not make fiscal sense to include this in the proposed rules.

VII. UNCERTAINTY AND RISK ANALYSIS

The following items have the greatest uncertainty in this analysis: the number of new building permits, number of grease tanks installed, number of on-site wastewater treatment systems requiring advanced pretreatment due to high strength wastewater, and the impacts to the LHDs from Type IIIb and Type IIIh inspection requirements.

The number of new building permits drives everything. If the number of permits increases, the LHDs and private sector both stay busy keeping up with permitting, installing, and maintaining on-site wastewater treatment systems. If the economy drops, and the number of new building permits drops, everyone sees less work and must come up with new sources of revenue.

Table 37 below shows the net cost of the proposed rules under one alternate scenario: higher than expected septic tank installations (permits) over the next four years. The estimated net cost of the rules would increase by approximately $1.5 million under the high-permit scenario.

There is uncertainty in both the method used to determine the historical number of permits and the projected number of permits. The historical number of permits issued each year was calculated in the following manner: the number of new construction authorization permits issued and the number of LHDs responding were determined from the OSWP County On-Site Activity Reports. Each year was evaluated for the LHDs that did not respond. To provide an estimate of the number of permits issued for the missing values, the median was calculated based on the information for that LHD in the rest of County On-Site Activity Reports. The yearly total was calculated including the median number of permits for the missing LHD records.

The projected number of permits issued was based on statewide building permit projections,[9] weighted by county population growth projections.[10] The total number of projected building permits was multiplied by the percent of households in each county using on-site wastewater treatment systems[11] to estimate the number of new on-site wastewater treatment systems permits for 2019 through 2024. The percent of households in each county using on-site wastewater systems is based on the 1990 U.S. Census Bureau data, the most recent year for this information. See Appendix A for additional information on the permit estimates.

If the economy improves and home construction increases, the LHDs will see an increase in the number of applications received. This, in addition to the requirement for existing system inspections, will increase the LHD workload. Not all LHDs are back to the staffing levels they were at before the recession, and it takes time to hire, train, and have new staff ready to issue permits. Also, if some of the LHDs choose to offer the private inspection option for Type IIIb and IIIh systems, they could lose a revenue stream that will further impact the LHD. How much this will impact the LHDs will depend upon whether or not the LHD is currently conducting compliance inspections for Type IIIb and IIIh. LHDs can choose to continue their current program, implement a program if they do not have a program, or require the owners to hire a certified subsurface operator to inspect the system.

The LHDs have many priorities that they must attend to daily. Compliance inspections may fall further down on the priority list based on the current staffing needs and priorities. It is unknown how many LHDs will choose to offer the private option to owners as that will be a very county specific decision based on their specific needs. OSWP assumes that LHDs are currently optimizing their time according to task priority. Therefore, OSWP assumes that LHDs which currently perform these inspections will continue to do so (since the inspections generate revenue for LHDs, on net), and those LHDs that currently do not have sufficient staff time to conduct the inspections will authorize private inspectors.

[9] IHS Connect (September 2016). *State Analysis: Forecast Data: Annual Data – North Carolina.* Accessed at https://www.ihs.com/index.html.
[10] NC Office of State Budget and Management (2016). *Annual County Population Totals 2017-2021*. Accessed at http://www.osbm.nc.gov/demog/county-projections.
[11] U.S. Census Bureau (1990). *1990 Census of Population and Housing – Sewage Disposal*. Accessed at https://www.census.gov/mp/www/cat/decennial_census_1990/1990_census_of_population_and_housing_summary_tape_file_3a.html

OSWP's best estimate of the proportion of compliance inspections currently performed by LHDs is 50%. The net cost of the rule over the next five years, including all affected parties, would be lower than estimated if LHDs choose to decrease the proportion of inspections they perform. On the other hand, if LHDs decide to perform more than 50% of the inspections, the net cost of the proposed rules would be higher than estimated (see Table 37 below).

The number of grease tanks installed will vary greatly per year. It is based on the number of restaurants, food stands, schools, nursing homes, dining halls, and other food service facilities that are built. The numbers of these facilities increase and decrease over the years, in no particular pattern, so it is difficult to project a number of new installations per year. If the economy continues to increase and commercial businesses also increase, the number of grease tanks installed could increase as people decide to open restaurants or food stands. OSWP assumes that 150 grease tanks a year (within a range of 100-200) would be installed with on-site wastewater treatment systems, on average, based on numbers from the Food Protection Facilities Branch and the requirement to increase grease tank capacity by installing two grease tanks. Because the additional cost to the facility owner for installing a second grease tank is an equivalent benefit to the manufacturer, the number of grease tank installations has a neutral effect on the net impact of the rule from a statewide perspective.

The number of systems that will be required to have advanced pretreatment because the wastewater strength is higher than domestic is almost impossible to predict. It is very dependent on facility type and proposed wastewater flow. The cost per system will also vary greatly because it will be very project specific. For some facilities, like restaurants or food stands, the primary contaminants of concern, grease and organic load, will be relatively straight forward to remove. High levels of nitrogen can be more complex to reduce, and systems designed to reduce nitrogen can require more operational flexibility so that the system can be operated to meet the required limits.

The on-site wastewater treatment system cost is very site specific. Most of the on-site wastewater treatment systems installed in North Carolina are still conventional wastewater treatment systems, without a pump. However, for limited sites there are options if a homeowner wants to build. The proposed on-site wastewater treatment system, such as advanced pretreatment and drip dispersal field, is more expensive than the conventional system, but still allows the homeowner the option to build on their land.

In the Sensitivity Analyses, the overall Net Impact over five years has decreased since the overall cost to implement the rules has decreased compared to the original rule proposal. The difference from the model for Annual Type IIIb and IIIh inspections stayed the same, but the overall Net Impact decreased from the previous fiscal note. The difference from the model changed for the annual number of new septic tanks based primarily on the reduction in tank material cost. That reduced the overall impact on implementing the rules.

Table 37 shows the impact of the sensitivity analysis on the Net Present Value for 15A NCAC 18E.

Table 37. Sensitivity Analysis on Net Economic Impact (Net Present Value)

SENSITIVITY ANALYSES

Annual New Septic Tank Permits	2021	2022	2023	2024
High Range	25,693	25,531	25,237	24,984
Modeled Range	17,176	17,068	16,871	16,702

Annual New Septic Tank Permits	Net Impact, 5 yrs	Difference from Model
High Range	($4,933,601)	($1,521,279)
Modeled Range	($3,412,322)	$0

Annual Type IIIb and IIIh Inspections - LHD Completion Rate	Net Impact, 5 yrs	Difference from Model
10%	($1,569,838)	$1,842,484
30%	($2,491,080)	$921,242
50%	($3,412,322)	$0
70%	($4,333,564)	($921,242)
90%	($5,254,806)	($1,842,484)

APPENDIX A: Projected New Construction Authorization Permits

The analysis below indicates that the number of permits issued per year will slowly decrease between 2018 and 2024.

1. Wastewater Treatment System Permit Projections

Table 38 shows the approximate number of new construction authorization permits issued per year by the LHDs from 2002 to 2018.[12] The OSWP has information up through 2018. Information for years after 2018 is still being collected.

Table 38. Approximate Number of On-site Wastewater Treatment System New Construction Authorization Permits Issued

Year	Approximate Number of New Construction Authorization Permits Issued	Change in Number of Construction Authorization Permits Issued
Historical Data		
2002	43,529	
2003	39,200	-10%
2004	39,901	2%
2005	*	*
2006	39,653	**
2007	33,590	-15%
2008	23,090	-31%
2009	15,897	-31%
2010	14,293	-10%
2011	12,726	-11%
2012	14,018	10%
2013	15,140	8%
2014	14,752	-3%
2015	14,939	1%
2016	16,173	8%
2017	17,794	10%
2018	18,367	3%
Projections		
2019	17,899	-3%
2020	17,368	-3%
2021	17,176	-1%
2022	17,068	-.6%
2023	16,871	-1%
2024	16,702	-1%

*Data collected were a statistical anomaly and not included in this analysis.
**Percent change could not be calculated.

[12] NC On-Site Water Protection Branch (2002-2018). "County Monthly Activity Reports." Accessed at http://ehs.ncpublichealth.com/oswp/resources.htm.

The number of permits issued began to level off in 2013 and 2014. The worst effects of the recession appear to be over as the percent change in permits issued is in single digits as compared to double digits in the previous years. Based on the OSWP's estimates, 2015 showed a significant increase in the number of permits issued, and then levels off around 2018 and shows a small downtown through 2024. However, the number of permits issued depends on the current status of the housing market and the economy, so it can vary from year to year.

Figure 1 shows the relationship between the number of new construction authorization permits issued and the total number of housing permits with on-site wastewater treatment systems. The majority of on-site wastewater treatment system permits issued each year are for single family homes.

Figure 1. New Construction Authorization Permit Projections in the Thousands by Year

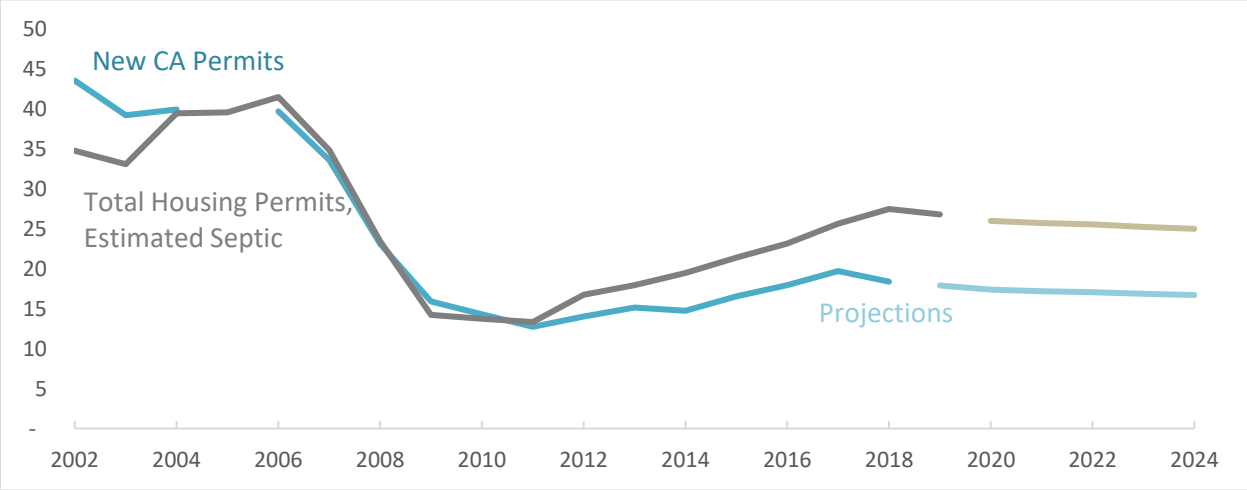

Table 39 shows the projected number of new construction authorization permits issued from 2019 to 2024.

Table 39. Projected Number of Permits Issued

Year	Total Number of Permits Issued*
2019	17,899
2020	17,368
2021	17,176
2022	17,068
2023	16,871
2024	16,702

*For a description of how these figures were estimated, see Table 38.

Based on OSWP County On-Site Activity Reports, approximately .5% of all permits issued utilizes advanced pretreatment or drip irrigation. Advanced pretreatment and drip irrigation are more likely to be used on sites with limitations that prohibit the installation of a conventional on-site wastewater treatment system.

APPENDIX B: Proposed Adoptions (15A NCAC 18E)

15A NCAC 18E .0101 is proposed for adoption as follows:

CHAPTER 18 – ENVIRONMENTAL HEALTH

SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

15A NCAC 18E .0101 SCOPE
The Rules contained in this Subchapter shall govern wastewater treatment and dispersal from wastewater systems, as defined in G.S. 130A-334(15), serving single or multiple-family residences, places of business, or places of public assembly. The wastewater system shall be designed to prevent the discharge of effluent to the land surface, surface waters, or into groundwater, except as allowed when used in conjunction with an RCW system as set forth in Rule .1002 of this Subchapter.

History Note: Authority G.S. 130A-333; 130A-334(15); 130A-335(a), (b), and (e);

15A NCAC 18E .0102 is proposed for adoption as follows:

15A NCAC 18E .0102 APPLICABILITY
(a) The Rules of this Subchapter shall not apply to wastewater systems in use prior to July 1, 1977, unless the DDF or wastewater strength increases.
(b) Prior to any increase in DDF or wastewater strength for an existing facility, the owner shall submit an application in accordance with Rule .0202 of this Subchapter.
(c) Notwithstanding Paragraph (a) of this Rule, all wastewater systems shall comply with Section .1300 of this Subchapter.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0103 is proposed for adoption as follows:

15A NCAC 18E .0103 INCORPORATION BY REFERENCE
For this Subchapter, the following rules, standards, and other materials are hereby incorporated by reference, including any subsequent amendments and editions. Table I lists the agency, document title, contact information, and terms for access to referenced documents.

Table I: Rules, standards, and other materials incorporated by reference

USDA-NRCS	
Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/
Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/
Field Book for Describing and Sampling Soils	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/copy or U. S. Government Publishing Office, P. O. Box 979050, St. Louis, MO, 63197-9000
Guide to Soil Texture by Feel, Journal of Agronomic Education	Available at no charge at:

	http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054311
National Engineering Handbook, Part 624 (Drainage), Chapter 10 (Water Table Control); Part 630 (Hydrology), Chapter 18; Part 650 (Engineering Field Handbook), Chapter 14 (Water Management, Drainage)	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mi/technical/engineering
National Electrical Manufacturers Association 1300 North 17th Street, Suite 900, Arlington, VA 22209 www.nema.org	
Standard 250 – Enclosures for Electrical Equipment	One hundred twenty four dollars ($124.00)
U. S. Environmental Protection Agency (EPA) U. S. EPA/NSCEP P. O. Box 42419, Cincinnati, OH 45242-0419	
Method 9080 – Cation Exchange Capacity of Soils	Available at no charge at: https://www.epa.gov/hw-sw846/sw-846-test-method-9080-cation-exchange-capacity-soils-ammonium-acetate
ASTM International 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19438-2959 http://www.astm.org	
C564 – Standard Specifications for Rubber Gaskets for Cast Iron Soil Pipe and Fittings	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
C890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
C923 – Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
C990 – Standard Specifications for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
C1644 – Standard Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
D1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
D1785 – Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120	Fifty eight dollars ($58.00) plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling

D2466 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings	Fifty eight dollars ($58.00) plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D6913 – Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis	Seventy five dollars ($75.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
D7928 – Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis	Seventy five dollars ($75.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
F667 – Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings	Fifty two dollars ($52.00) each plus fourteen dollars and seventy one cents ($14.71) shipping and handling
F810 – Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields	Forty six dollars ($46.00) each plus seven dollars and forty four cents ($7.44) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O – Environmental Health	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2001%20-%20departmental%20rules/subchapter%20o/subchapter%20o%20rules.html
15A NCAC 02B – Surface Water and Wetland Standards	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20b/subchapter%20b%20rules.pdf
15A NCAC 02C – Well Construction Standards	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20c/subchapter%20c%20rules.pdf
15A NCAC 02H – Procedures for Permits: Approvals	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20h/15a%20ncac%2002h%20.0101.pdf

15A NCAC 02L – Groundwater Classification and Standards	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20l/subchapter%20l%20rules.pdf
15A NCAC 02T – Waste Not Discharged to Surface Waters	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20t/subchapter%20t%20rules.pdf
15A NCAC 02U – Reclaimed Water	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20u/subchapter%20u%20rules.pdf
15A NCAC 08G – Authority: Organization: Structure: Definitions	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2008%20-%20water%20pollution%20control%20system%20operators%20certification%20commission/subchapter%20g/subchapter%20g%20rules.pdf
15A NCAC 13B – Solid Waste Management	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2013%20-%20solid%20waste%20management/subchapter%20b/subchapter%20b%20rules.pdf
15A NCAC 18A – Sanitation	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2018%20-%20environmental%20health/subchapter%20a/subchapter%20a%20rules.pdf
15A NCAC 18C – Water Supplies	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2018%20-%20environmental%20health/subchapter%20c/subchapter%20c%20rules.pdf
NSF International PO Box 130140, Ann Arbor, MI 48105 http://www.nsf.org/	
Standard 40 – Residential Wastewater Systems	One hundred five dollars ($105.00) each plus shipping and handling

Standard 41 – Non-Liquid Saturated Treatment Systems	One hundred five dollars ($105.00) each plus shipping and handling
Standard 46 – Evaluation of Components and Devices Used in Wastewater Treatment Systems	One hundred five dollars ($105.00) each plus shipping and handling
Standard 245 – Wastewater Treatment Systems – Nitrogen Reduction	One hundred five dollars ($105.00) each plus shipping and handling
Standard 350 – Onsite Residential and Commercial Water Reuse Treatment	One hundred five dollars ($105.00) each plus shipping and handling
IAPMO 4755 E Philadelphia St, Ontario, CA 91761 http://www.iapmo.org/Pages/IAPMOgroup.aspx	
IAPMO/ANSI Z1000 – Prefabricated Septic Tanks	One hundred dollars ($100.00) each
CSA 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66 – Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
2012 North Carolina Plumbing Code	
	Available at no charge at: https://codes.iccsafe.org/public/collections/nc
2015 North Carolina Building Code	
	Available at no charge at: https://codes.iccsafe.org/public/collections/nc
North Carolina Food Code Manual	
	Available at no charge at: http://ehs.ncpublichealth.com/faf/docs/foodprot/NC-FoodCodeManual-2009-FINAL.pdf
U.S. Government Publishing Office 732 North Capitol St, NW, Washington, DC 20401-0001 https://bookstore.gpo.gov/	
40 CFR 136	Sixty seven dollars ($67.00) each
Forestry Suppliers, Inc PO Box 8397 Jackson, MS 39284-8397 https://www.forestry-suppliers.com/	
Munsell® Soil Color Book	One hundred ninety five dollars ($195.00) each plus shipping and handling
National Technical Information Service 5301 Shawnee Rd Alexandria, VA 22312 https://www.ntis.gov/	
DRAINMOD User's Guide	Available at no charge at: https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB96112438.xhtml

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0104 is proposed for adoption as follows:

15A NCAC 18E .0104 ABBREVIATIONS

For the purpose of this Subchapter, the following abbreviations refer to:

(1) ABS: Acrylonitrile-Butadiene-Styrene;

(2) ACEC: Apparent Cation Exchange Capacity;

(3) ANSI: American National Standards Institute;

(4) AOWE: Authorized On-Site Wastewater Evaluator;

(5) ASTM: American Society for Testing and Materials;

(6) ATO: Authorization to Operate;

(7) BOD_5: Five Day Biochemical Oxygen Demand;

(8) CA: Construction Authorization;

(9) CBOD: Carbonaceous Biochemical Oxygen Demand;

(10) cmol/kg: centimoles per kilogram;

(11) CFR: Code of Federal Regulations;

(12) CSA: Canadian Standards Association;

(13) DDF: Design Daily Flow;

(14) DEQ: Department of Environmental Quality;

(15) DIP: Ductile Iron Pipe;

(16) DO: Dissolved Oxygen;

(17) DOT: Department of Transportation;

(18) DSE: Domestic Strength Effluent;

(19) EOP: Engineered Option Permit;

(20) FE: Iron;

(21) FOG: Fats, Oil, and Grease;

(22) gal: gallons

(23) gpd: Gallons per Day;

(24) gpd/ft^2: Gallons per Day per Square Foot;

(25) HSE: High Strength Effluent;

(26) IAPMO: International Association of Plumbing and Mechanical Officials;

(27) IP: Improvement Permit;

(28) IPWW: Industrial Process Wastewater;

(29) LC: Limiting Condition;

(30) LDP: Large Diameter Pipe;

(31) LG: Licensed Geologist;

(32) LHD: Local Health Department;

(33) LPP: Low Pressure Pipe;

(34) LSS: Licensed Soil Scientist;

(35) LTAR: Long Term Acceptance Rate;

(36) meq/100 g: Milliequivalents per 100 grams;

(37) mg/L: Milligrams/Liter;

(38) NEMA: National Electrical Manufacturers Association;

(39) NH_3: Total Ammonia Nitrogen;

(40) NOI: Notice of Intent to Construct;

(41) NOV: Notice of Violation;

(42) NSF: NSF International;

(43) OP: Operation Permit;

(44) PE: Professional Engineer;

(45) PIA: Provisional, Innovative, and Accepted;

(46) PPBPS: Prefabricated Permeable Block Panel System;

(47) psi: Pounds per Square Inch;

(48) PVC: Polyvinyl Chloride;

(49) RCW: Reclaimed Water;

(50) RV: Recreational Vehicle;

(51) RWTS: Residential Wastewater Treatment System;

(52) SCO: State Climate Office of North Carolina;

(53) SDR: Standard Dimension Ratio;

(54) SPI: Standard Precipitation Index;

(55) STEP: Septic Tank Effluent Pump;

(56) SWC: Soil Wetness Condition;

(57) TKN: Total Kjeldahl Nitrogen;

(58) TL: Trench Length;

(59) TN: Total Nitrogen;

(60) TSS: Total Suspended Solids;

(61) TW: Trench Width;

(62) USDA-NRCS: United States Department of Agriculture – Natural Resources Conservation Service;

(63) VIP: Visual Inspection Protocol; and

(64) WS: Water Supply Class.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0105 is proposed for adoption as follows:

15A NCAC 18E .0105 DEFINITIONS

In addition to the definitions set forth in G.S. 130A-334, the following shall apply to the Rules in this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material of a specific size or grade. An example of aggregate is clean, washed gravel or crushed stone which is graded or sized in accordance with size numbers 4, 5, or 6 of ASTM D448.

(2) "Apparent Cation Exchange Capacity" means the sum of exchangeable bases plus total soil acidity at a pH of 7.0. ACEC is expressed in milliequivalents per 100 grams (meq/100g) of soil or centimoles per kilogram (cmol/kg) of soil. The soil ACEC is calculated by determining the ACEC using the neutral normal ammonium acetate method, pH of 7.0 neutral normal, dividing by the percent clay as determined by particle size distribution using the pipette method, and then multiplying by 100, as described in USDA-NRCS Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45 and Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42, page 229, or EPA Method 9080.

(3) "Approved" means that which the Department or LHD has determined is in accordance with this Subchapter and G.S. 130A, Article 11.

(4) "Artificial drainage" means any man-made structure or device designed to overcome a SWC or intercept lateral flowing ground or surface water. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(5) "Authorized agent" means a person who has been authorized by the Department in accordance with G.S. 130A, Article 4 and 15A NCAC 01O .0100 to permit wastewater systems.

(6) "Authorized designer" means a service provider authorized by the manufacturer who creates plans for the installation, expansion, or repair of a proprietary wastewater system.

(7) "Authorized On-Site Wastewater Evaluator" means a person licensed in accordance with G.S. 90A, Article 5 and meeting the certification requirements in G.S. 130A-336.2(a) and 21 NCAC 39.

(8) "Backfill" means the soil that is placed in a trench or bed that surrounds or is on top of the dispersal media within the excavation up to the naturally occurring soil surface.

(9) "Bed" means an excavation with a width greater than three feet containing dispersal media and one or more laterals.

(10) "Bedroom" means any room defined as a sleeping room in the North Carolina Building Code.

(11) "Building drain" means the lowest piping of a drainage system that receives the discharge from waste pipes inside the design unit and extends to 10 ft beyond the walls of the building or five feet for a building with a foundation and conveys the sewage to a building sewer.

(12) "Building sewer" means the part of a drainage system that extends from the end of the building drain and conveys the discharge to a wastewater system.

(13) "Certified Inspector" means a person authorized to inspect a wastewater system in accordance with G.S. 90A, Article 5, and applicable rules of the North Carolina On-Site Wastewater Contractors and Inspectors Certification Board.

(14) "Coastal region" means Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Cumberland, Currituck, Dare, Duplin, Edgecombe, Gates, Greene, Halifax, Harnett, Hertford, Hoke, Hyde, Johnston, Jones, Lenoir, Martin, New Hanover, Northampton, Onslow, Pamlico, Pender, Pasquotank, Perquimans, Pitt, Richmond, Robeson, Sampson, Scotland, Tyrrell, Washington, Wayne, and Wilson counties.

(15) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all appurtenances used for conveying wastes from the building drain or building sewer to and within a wastewater system. A collection system is a collection sewer.

(16) "Complete data set" means analytical results for all required influent and effluent constituents as specified in the effluent standard for a specific site on a specific date. A data set may include other constituents specified in an RWTS or PIA Approval, permit, or other document.

(17) "Component" means a part of a wastewater system. The component may be any part of the wastewater system, such as a collection sewer, pretreatment, dispersal field, etc.

(18) "Composite sample" means commingled individual samples collected from the same point at different times. Samples may be of equal volume or may be proportional to the flow at time of sampling.

(19) "Control system" means either conventional or accepted systems that are surveyed as part of a survey protocol identified in Rule .1706 of this Subchapter.

(20) "Cover" means the soil that is placed at or above the naturally occurring soil surface to cover the wastewater system.

(21) "Demand dosing" means a configuration in which a specific volume of effluent is delivered to a component based upon patterns of wastewater generation from the source and liquid level detection device settings.

(22) "Department" means the North Carolina Department of Health and Human Services, as defined in G.S. 130A-334(1f). The mailing address for the Department is as follows: NCDHHS, Division of Public Health, On-Site Water Protection Branch, 1642 Mail Service Center, Raleigh, North Carolina 27699-1642.

(23) "Design daily flow" means the unadjusted quantity of wastewater a facility is projected to produce in a 24-hour period upon which wastewater system sizing and design are based as determined in Section .0400 of this Subchapter.

(24) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater DDF is based. Multiple design units may comprise a facility.

(25) "Dispersal field" means the physical location where final treatment and dispersal of effluent occurs in the soil.

(26) "Dispersal media" means the media used to provide void space through which effluent flows and may be stored prior to infiltration, such as washed gravel or crushed stone, products referenced in Section .0900 of this Subchapter, products approved pursuant to Section .1700 of this Subchapter, etc.

(27) "Dispersal system" means the dispersal field and associated components that distribute effluent to and within the dispersal field. This includes a pump, pump tank, pressure manifold, distribution box, drip box, lateral, dispersal media, etc.

(28) "Dose volume" means an amount of effluent delivered during a dosing event as determined by the liquid level detection device settings in a demand dosing system or by a timer in a timed dosing system.

(29) "Dwelling unit" means any room or group of rooms located within a structure and forming a single, habitable unit with facilities which are used or intended to be used for living, sleeping, bathing, toilet usage, cooking, and eating.

(30) "Effluent" means the liquid discharge from a pretreatment process, component, or system.

(31) "Facility" means one or more design units located on a single or multiple lot(s) or tract(s) of land and served by a wastewater system comprised of one or more wastewater systems.

(32) "Finished grade" means the final elevation of the land over the wastewater system after installation.

(33) "Flow equalization" means a system configuration that includes sufficient storage capacity to allow for uniform flow to a subsequent component despite variable flow from the source.

(34) "Full kitchen" means the appliances meet the requirements of North Carolina Food Code, Chapters 4-1 and 4-2.

(35) "Grab sample" means a discrete sample collected at a specific time and location.

(36) "Grease tank" means the tank located outside the facility that is used to reduce the amount of grease discharged to a wastewater system.

(37) "Grease trap" means a device used inside the facility to reduce the amount of grease discharged to a wastewater system.

(38) "Gravity distribution" means gravity flow of effluent to and within each lateral.

(39) "Groundwater lowering system" means a type of artificial drainage system designed to lower the water table by gravity or, in conjunction with a pump, to maintain the vertical separation beneath a dispersal field.

(40) "Horizon" means a layer of soil, parallel to the surface that has distinct physical, chemical, and biological properties or characteristics such as color, structure, texture, consistence, kinds and number of organisms present, degree of acidity or alkalinity, etc., resulting from soil forming processes.

(41) "Infiltrative surface" means the designated interface where effluent moves from dispersal media or a distribution device into treatment media, naturally occurring soil, or fill.

(42) "Influent" means the sewage discharged to a pretreatment component.

(43) "Installer" means a person authorized to construct, install, or repair a wastewater system in accordance with G.S. 90A, Article 5 and applicable rules of the North Carolina On-Site Wastewater Contractors and Inspectors Certification Board.

(44) "Interceptor drain" means a type of artificial drainage designed to intercept and divert lateral moving groundwater or perched water away from the dispersal field or other system component to an effective outlet.

(45) "Invert" means the lowest elevation of the internal cross-section of a pipe, fitting, or component.

(46) "Jurisdictional wetland" means an area subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers or DEQ.

(47) "Ksat" or saturated hydraulic conductivity, means the rate of water flow through a unit cross sectional area of soil under saturated conditions. In-situ Ksat is measured in the field using clean water. Results of in-situ Ksat are used to simulate movement of effluent through the soil and may be used to field verify LTAR.

(48) "Lateral water movement" means the movement of subsurface water downslope often associated with a less permeable horizon. Lateral water movement can be observed in a bore hole, excavation, or monitoring well on sloping sites.

(49) "Lateral" means any pipe, tubing, or other device used to convey and distribute effluent in a dispersal field.

(50) "Limiting condition" means soil conditions or site features that determine wastewater system design options. Soil conditions are morphology, depth, restrictive horizons, soil wetness, or organic matter content. Site features are topography, slope, landscape position, or available space.

(51) "Lithochromic feature" means soil mottle or matrix associated with variations of color due to weathering of parent materials.

(52) "Long Term Acceptance Rate" means the rate of effluent absorption by the soil, existing fill, or saprolite in a wastewater system after long-term use. The LTAR, in units of gpd/ft^2, is assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type, and is used to determine the dispersal field sizing requirements, in accordance with applicable rules of this Subchapter.

(53) "Local health department" means any county, district, or other health department authorized to be organized under the General Statutes of North Carolina.

(54) "Management Entity" means the person, entity, company, or firm designated by the owner of the wastewater system who has primary responsibility for the operation of a wastewater system in accordance with this Subchapter, G.S. 90A, Article 3, and applicable rules of the Water Pollution Control System Operators Certification Commission. The Management Entity may be the owner, a public Management Entity, a certified operator, a management company, or an entity that employs certified operators. The Management Entity is or employs the operator in responsible charge for the wastewater system.

(55) "Mass loading" means the total mass of one or more organic or inorganic effluent constituents delivered to the wastewater system over a specified period. It is computed by multiplying the total volume of flow during the specified period by the flow-weighted average constituent concentration in the same period. Units of measurement are pounds per day.

(56) "Matrix" means a volume of soil equivalent to 50 percent or greater of the total volume of a horizon.

(57) "Mean high-water mark" means, for coastal waters having six inches or more lunar tidal influence, the average height of the high-water over a 19-year period as may be ascertained from National

Ocean Survey, U.S. Army Corps of Engineers tide stations data, or as otherwise determined under the provisions of the Coastal Area Management Act. The highest high-water mark as reported by the three agencies shall be applied.

(58) "Media" means a solid material that can be described by shape, dimensions, surface area, void space, and application.

(59) "Media filter" means a device that uses materials designed to treat effluent by reducing BOD_5 and removing TSS in an unsaturated environment. Biological treatment is facilitated via microbial growth on the surface of the treatment media.

(60) "Mottle" means subordinate color of a differing Munsell color system notation in a soil horizon.

(61) "Mountain region" means Alleghany, Ashe, Avery, Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Swain, Transylvania, Watauga, and Yancey counties.

(62) "Naturally occurring soil" means soil formed in place due to natural formation processes that is unaltered by filling, removal, or other artificial modification other than tillage.

(63) "NEMA 4X" means an enclosure for an electrical control panel or junction box that meets standards for protection of equipment due to the ingress of water, including rain and hose-directed water, and an additional level of protection against corrosion, as set forth in NEMA Standard 250.

(64) "NSF-40 systems" means individual RWTS that are approved and listed in accordance with the standards adopted by NSF International for Class I residential wastewater treatment systems under NSF-ANSI Standard 40 and approved for use in accordance with G.S. 130A-342 and the Rules of this Subchapter.

(65) "Non-ground absorption system" means a system for waste treatment designed not to discharge to the soil, land surface, or surface waters, including approved vault privies, incinerating toilets, mechanical toilets, composting toilets, chemical toilets, and recycling systems.

(66) "Normal water level" means the term as defined in 15A NCAC 02B .0610(28).

(67) "Off-site system" means a wastewater system where any system component is located on property other than the lot where the facility is located.

(68) "Ordinary high-water mark" means the line on the shore established by the fluctuations of water and indicated by physical characteristics such as: a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that reflect the characteristics of the surrounding areas.

(69) "Organic soils" means those organic mucks and peats consisting of more than 20 percent organic matter, by dry weight, and greater than or equal to 18 inches in thickness.

(70) "Owner" means a person holding legal title to the facility, wastewater system, or property or his or her representative. The owner's representative is a person who holds power of attorney to act on an owner’s behalf or an agent designated by letter or contract to act on the owner's behalf.

(71) "Parallel distribution" means the distribution of effluent that proportionally loads multiple sections of a dispersal field at one time.

(72) "Parent material" means the mineral and organic matter that is in its present position through rock decomposition or deposition by water, wind, or gravity.

(73) "Ped" means a unit of soil structure, such as blocky, granular, prismatic, or platy formed by natural processes, in contrast to a clod, which is a compact, coherent, mass of soil produced by digging, plowing, or other human land manipulation.

(74) "Perched water table" means a zone of saturation held above the main groundwater body by a less permeable layer, impermeable rock, or sediment, which may or may not exhibit redoximorphic features.

(75) "Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, or unit of local government.

(76) "Piedmont region" means Alamance, Alexander, Anson, Burke, Cabarrus, Caldwell, Caswell, Catawba, Chatham, Cleveland, Davidson, Davie, Durham, Forsyth, Franklin, Gaston, Granville, Guilford, Iredell, Lee, Lincoln, Mecklenburg, Montgomery, Moore, Nash, Orange, Person, Polk, Randolph, Rockingham, Rowan, Rutherford, Stanly, Stokes, Surry, Union, Vance, Wake, Warren, Wilkes, and Yadkin counties.

(77) "Pressure dispersal" means a system utilizing an effluent pump or siphon to distribute effluent uniformly to the infiltrative surface in the dispersal field through a pressurized pipe network.

(78) "Pressure dosed gravity distribution" means pressure delivery of effluent to a manifold, distribution box, or other splitter with subsequent gravity distribution within one or more laterals to the infiltrative surface.

(79) "Public management entity" means a public entity legally authorized to operate and maintain wastewater systems, including a city pursuant to G.S. 160A, Article 16, a county pursuant to G.S. 153A, Article 15, an interlocal contract pursuant to G.S. 160A, Article 20, a joint management agency pursuant to G.S. 160A, Article 20, a county service district pursuant to G.S. 153A, Article 16, a county water and sewer district pursuant to G.S. 162A, Article 6, a sanitary district pursuant to G.S. 130A, Article 2, Part 2, a water and sewer authority pursuant to G.S. 162A, Article 1, a metropolitan water district pursuant to G.S. 162A, Article 4, a metropolitan sewerage district pursuant to G.S. 162A, Article 5A, a public utility pursuant to G.S. 62, Article 1, a county or district health department pursuant to G.S. 130A, Article 2, or any other public entity legally authorized to operate and maintain wastewater systems.

(80) "Raw sewage lift stations" means a dosing system that is designed to move untreated sewage from a lower elevation to a higher elevation. Raw sewage lift stations are installed prior to any wastewater treatment.

(81) "RCW systems" means advanced pretreatment systems approved by the Department in accordance with Section .1700 of this Subchapter that meet RCW effluent standards in Rule .1002 of this Subchapter.

(82) "Redoximorphic features" means a color pattern of a horizon due to a depletion or concentration of pigment compared to the matrix color, formed by oxidation and reduction of Fe coupled with its removal, translocation, or accrual, or a soil matrix color controlled by the presence of Fe^{+2}. Redox depletions are a type of redoximorphic feature.

(83) "Repair area" means an area that has been classified suitable consistent with the Rules in this Subchapter that is reserved for the extension, alteration, wastewater system relocation, or replacement of part or all of the initial wastewater system. The repair area shall be available to be used in the event of a malfunction or if a wastewater system is partially or totally destroyed.

(84) "Residential Wastewater Treatment Systems" means approved individual advanced pretreatment systems that are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable Rules in this Subchapter.

(85) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent and that is brittle and strongly compacted or strongly cemented with iron, aluminum, silica, organic matter, or other compounds. Restrictive horizons may occur as fragipans, iron pans, or organic pans, and are recognized by their resistance in excavation or in using a soil auger.

(86) "Rock" means the body of consolidated or partially consolidated material composed of minerals at or below the land surface. Rock includes bedrock and partially weathered rock that is hard and cannot be dug with hand tools. The upper boundary of rock is saprolite, soil, or the land surface.

(87) "Saprolite" means the body of porous material formed in place by weathering of rock that has a massive, rock-controlled structure and retains the arrangement of minerals of its parent rock in a minimum of 50 percent of its volume. Saprolite can be dug with hand tools. The lower limit of saprolite is rock and its upper limit is soil or the land surface.

(88) "Septic tank" means a structurally sound, water-tight, covered receptacle, approved in accordance with Section .1400 of this Subchapter. A septic tank is designed for primary treatment of wastewater and is constructed to:

(a) receive the discharge of wastewater from a building;

(b) separate settleable and floating solids from the liquid;

(c) digest organic matter by anaerobic bacterial action;

(d) store digested solids through a period of detention; and

(e) allow effluent to discharge for additional treatment and final dispersal.

(89) "Septic tank effluent pump" means a collection system that uses a septic tank to separate solids and incorporates a pump vault, pump, and associated devices to convey effluent under pressure to a subsequent component.

(90) "Sequential distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a drop box or relief device to the succeeding trench at a lower elevation. All trenches are fed from the same side.

(91) "Setback" means the minimum horizontal separation distance between the wastewater system and features listed in Section .0600 of this Subchapter.

(92) "Settling tank" means a septic tank designed for use in conjunction with a RWTS. A settling tank is not required to meet the design requirements of a septic tank.

(93) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a pipe to the succeeding trench at a lower elevation.

(94) "Site" means the area in which the wastewater system is located, including the repair area.

(95) "Soil" means the naturally occurring body of unconsolidated mineral and organic materials on the land surface. Soil is composed of sand-, silt-, and clay-sized particles that are mixed with varying amounts of larger fragments and some organic material. Soil contains less than 50 percent of its volume as rock, saprolite, or coarse-earth fraction. The coarse-earth fraction are mineral particles greater than 2.0 millimeters. The upper limit of the soil is the land surface, and its lower limit is rock, saprolite, or other parent materials.

(96) "Soil consistence" means the degree and kind of cohesion and adhesion that a soil exhibits.

(97) "Soil series" means an official series name established by USDA-NRCS.

(98) "Soil structure" means the arrangement of primary soil particles into compound particles, peds, or clusters that are separated by natural planes of weakness from adjoining units.

(99) "Soil textural classes" means soil classification based upon size distribution of mineral particles in the fine-earth fraction less than two millimeters in diameter. The fine-earth fraction includes sand, silt, and clay particles. Sand particles are 0.05 – 2.0 mm in size, silt particles are 0.002 – 0.05 mm in size, and clay particles are less than 0.002 mm in size.

(100) "Stream" means a body of concentrated flowing water in a natural low area or natural or manmade channel on the land surface. This includes ephemeral, intermittent, and perennial streams as defined by DEQ, as well as streams which have been modified by channeling, culvert installation, or relocation.

(101) "Structurally sound" means a tank that has been installed in accordance with the tank manufacturer's requirements and is able to withstand a minimum uniform live loading of 150 pounds per square foot in addition to all loads to which an underground tank is normally subjected, such as dead weight of the material and soil over the tank, active soil pressure on tank walls, and the uplifting force of groundwater.

(102) "Surface water diversion" means a natural or constructed drainage feature used to divert surface water, collect runoff, and direct it to an effective outlet. Surface water diversions include waterways, berms, swales, and ditches. Surface water diversions are a type of artificial drainage.

(103) "TS-I systems" means advanced pretreatment systems approved by the Department in accordance with Section .1700 of this Subchapter that meet TS-I effluent standards in Table XXV of Rule .1201(a) of this Subchapter.

(104) "TS-II systems" means advanced pretreatment systems approved by the Department in accordance with Section .1700 of this Subchapter that meet TS-II effluent standards in Table XXV of Rule .1201(a) of this Subchapter.

(105) "Telemetry" means the ability to contact by phone, email, or another electronic medium. The telemetry unit shall continue alarm notifications to the designated party until the alarm condition is remedied or the telemetry unit is physically turned off.

(106) "Test system" means the dispersal system proposed for accepted status as part of a survey protocol identified in Rule .1706 of this Subchapter.

(107) "Third-party" means a person or entity engaged in testing or evaluation that may be compensated for their work product that is independent of the parties for whom testing or evaluation is performed and does not otherwise benefit regardless of the outcome. The third-party person or entity has knowledge of the subject area based upon relevant training and experience.

(108) "Timed dosing" means a configuration in which a specific volume of effluent is delivered to a component based upon a prescribed interval, regardless of facility water use variation over time.

(109) "Treatment media" means the media used for physical, chemical, and biological treatment in a wastewater treatment component.

(110) "Trench" means an excavation with a width less than or equal to three feet containing dispersal media and one or more laterals.

(111) "Unstable slopes" means areas showing indications of mass downslope movement such as debris flows, landslides, and rock falls.

(112) "Vertical separation" means the depth beneath the dispersal field infiltrative surface to a LC.

(113) "Warming kitchen" means a kitchen that does not meet the requirements of North Carolina Food Code, Chapters 4-1 and 4-2.

(114) "Water main standards" means design criteria for pipe and pipe joints and associated installation procedures used in potable water systems and that have been approved by North Carolina DEQ Public Water Supply Section in accordance with 15A NCAC 18C.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0201 is proposed for adoption as follows:

SECTION .0200 - PERMITS

15A NCAC 18E .0201 GENERAL

(a) All wastewater in any facility containing water-using fixtures connected to a water supply source shall discharge to a wastewater system approved by the Department in accordance with the Rules of this Subchapter.

(b) In order for a wastewater system to be approved:

(1) the owner shall submit an application in accordance with Rule .0202 of this Section;

(2) an IP shall be issued in accordance with Rule .0203 of this Section;

(3) a CA shall be issued in accordance with Rule .0204 of this Section; and

(4) the authorized agent shall inspect the installation and issue an OP in accordance with Rule .0205 of this Section.

(c) Upon issuance of the CA, the owner may obtain a building permit in accordance with G.S. 130A-338.

(d) Notwithstanding Paragraph (b) of this Rule, an owner may choose to have a wastewater system approved under the provisions of G.S. 130A-336.1 or G.S. 130A-336.2 and in accordance with Rule .0207 of this Section.

(e) All documentation related to a wastewater system shall be maintained by the LHD in the county where the permit is issued, and the property taxes are paid.

(f) Holding tanks shall not be considered an acceptable wastewater treatment and dispersal system. An IP shall not be issued for a holding tank for new construction or to serve a permanent facility.

History Note: *Authority G.S. 130A-335; 130A-336; 130A-336.1; 130A-336.2; 130A-337; 130A-338;*

15A NCAC 18E .0202 is proposed for adoption as follows:

15A NCAC 18E .0202 APPLICATION

(a) An application for an IP, CA, and existing system authorization shall be submitted to the LHD, and approved in accordance with these Rules, for each site prior to the construction, location, or relocation of a residence, place of business, or place of public assembly.

(b) Prior to the repair of a wastewater system, an application for a CA shall be submitted to the LHD.

(c) A pending application for an IP, CA, or existing system authorization for which the LHD is awaiting action by the owner shall expire 12 months from the date of application.

(d) When an IP, CA, or existing system authorization expires or is revoked, or an application for an IP or CA expires, a new application is required.

(e) For a Type V or VI system as specified in Table XXXII of Rule .1301(b) of this Subchapter, a new application shall be submitted at least 30 days prior to the OP expiring.

(f) An owner may choose to contract with an LSS to conduct a soil and site evaluation in accordance with G.S. 130A-335(a2). The soil and site evaluation shall be submitted to the LHD as part of the application process.

(g) The application for an IP shall contain the following information:

(1) owner's name, mailing address, and phone number;

(2) type of permit requested:

(A) new;

(B) change of use;

(C) expansion or increase in DDF; or

(D) wastewater system relocation;

(3) site plan or plat indicating the locations of the following:

(A) existing and proposed facilities, structures, appurtenances, and wastewater systems;

(B) proposed wastewater system showing setbacks to property line(s) or other fixed reference point(s);

(C) existing and proposed vehicular traffic areas;

(D) existing and proposed water supplies, wells, springs, and water lines; and

(E) surface water, drainage features, and all existing and proposed artificial drainage, as applicable;

(4) location, parcel identification number, other property identification, 911 address if known, acreage, and general directions to the property;

(5) description of existing and proposed facilities and wastewater systems;

(6) information needed to determine DDF and effluent strength of the facility(s) served, including number and function of individual design units, number of bedrooms and occupants per bedroom, or number of occupants;

(7) whether wastewater other than DSE will be generated;

(8) notification if the property includes, or is subject to, any of the following:

(A) previously identified jurisdictional wetlands;

(B) existing or proposed easements, rights-of-way, encroachments, or other areas subject to legal restrictions; or

(C) approval by other public agencies; and

(9) signature of owner.

(h) The application for a CA shall contain:

(1) the information required in Paragraph (g) of this Rule. A site plan or plat shall not be required with the application to repair a permitted wastewater system when the repairs will be accomplished on property owned and controlled by the owner and for which property lines are identifiable in the field;

(2) identification of the proposed use of a grinder pump or sewage pump; and

(3) the type of the proposed wastewater system specified by the owner.

(i) The application for an existing system authorization shall contain:

(1) the owner's name, mailing address, and phone number;

(2) a site plan or plat indicating the locations of the existing and proposed facilities, existing wastewater systems and repair areas, existing and proposed water supplies, easements, rights-of-way, encroachments, artificial drainage, and all appurtenances;

(3) location, parcel identification number, other property identification, 911 address if known, acreage, and directions to the property;

(4) for reconnections, information needed to determine DDF of the facility served, including number and function of individual design units, number of bedrooms and occupants per bedroom, or number of occupants; and

(5) signature of owner(s).

(j) Submittal of a signed application shall constitute right of entry to the property by an authorized agent.

History Note: *Authority G.S. 130A-335; 130A-336; 130A-337; 130A-338;*

15A NCAC 18E .0203 is proposed for adoption as follows:

15A NCAC 18E .0203 IMPROVEMENT PERMIT

(a) Upon receipt of a complete application for an IP, an authorized agent shall evaluate the site to determine whether the site is suitable or unsuitable for the installation of a wastewater system in accordance with Section .0500 of this Subchapter. If the site is classified suitable, an IP shall be issued in accordance with this Subchapter. The authorized agent shall prepare dated, written documentation of the soil and site conditions required to be evaluated in Section .0500 of this Subchapter.

(b) When the site is classified suitable an authorized agent shall issue an IP for the site that includes the items contained in G.S. 130A-336(a)(1) through (6) and the following information:

(1) DDF, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(2) required effluent standard - DSE, HSE, NSF-40, TS-I, TS-II, or RCW in accordance with Table III of Rule .0402(a), Table XXV of Rule .1201(a), or Rule .1002, of this Subchapter;

(3) all applicable setbacks and requirements in accordance with Section .0600 of this Subchapter;

(4) description of the facility, structures, vehicular traffic areas, and other proposed improvements;

(5) description of existing and proposed public or private water supplies, including private drinking water wells and springs and associated water lines;

(6) a site plan or plat as defined in G.S. 130A-334 showing the existing and proposed property lines with dimensions, the location of the facility and appurtenances, the site for the proposed wastewater system and repair area, and the location of water supplies and surface water;
(7) the proposed initial wastewater system and repair system areas and types, including LTARs for each system; and
(8) permit conditions, such as site-specific site modifications, installation requirements, maintenance of the groundwater lowering system, etc.

(c) When the site is classified unsuitable, a signed, written report shall be provided to the owner describing the unsuitable site characteristics and citing the applicable rule(s). If modifications or alternatives are available to support site reclassification to suitable this information shall be included in the report.

(d) The period of validity for the permit in accordance with G.S. 130A-335(f) shall be stated on the IP.

(e) The IP shall be transferable subject to the conditions set forth in G.S. 130A-336(a).

(f) An IP shall be suspended or revoked if:
(1) the information submitted in the application is found to be incomplete, false, or incorrect;
(2) the site is altered and the permitted system cannot be installed or operated as permitted;
(3) conditions of the IP or the Rules of this Subchapter cannot be met;
(4) a new IP is issued for the same design unit on the same property; or
(5) an NOI is issued in accordance with G.S. 130A-336.1(b) or G.S. 130A-336.2(b) for the same design unit on the same property.

(g) An IP shall be applicable to both initial and repair dispersal field areas identified and approved on the IP and only a CA shall be issued if wastewater system repairs are necessary.

History Note: *Authority G.S. 130A-335; 130A-336;*

15A NCAC 18E .0204 is proposed for adoption as follows:

15A NCAC 18E .0204 CONSTRUCTION AUTHORIZATION

(a) The owner shall obtain a CA after an IP has been issued and prior to the construction, location, or relocation of a facility, or the construction or repair of a wastewater system.

(b) Conditions of an IP shall be completed prior to the issuance of a CA. A CA shall be issued by an authorized agent for wastewater system installation when it is found that the IP conditions and Rules of this Subchapter are met.

(c) A CA may be issued at the same time as the IP if no conditions on the IP are required to be completed prior to CA issuance.

(d) Any necessary easements, rights-of-way, or encroachment agreements shall be obtained prior to the issuance of a CA.

(e) The CA shall specify the following:
(1) all information required in Rule .0203(b) of this Section;
(2) the initial wastewater system type and layout, location of all initial wastewater system components, and design details and specifications for the following, as applicable;
(A) tanks;
(B) collection sewers;
(C) pump requirements;
(D) advanced pretreatment;
(E) distribution devices; and
(F) trench width, length, and depth on the downslope side of the trench;
(3) the nature of the Management Entity required and the minimum operation and maintenance requirements in accordance with Section .1300 of this Subchapter; and
(4) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

(f) A CA shall be issued for each wastewater system serving a facility. Separate CAs may be issued for individual components. A building permit shall not be issued for a design unit until CAs for all components of the wastewater system serving that design unit have been issued.

(g) Prior to the issuance of a CA for a system where all or part of the system will be under common or joint control, a draft multi-party agreement between the developer and an incorporated owners' association shall be submitted to and its conditions approved by the LHD. The draft multi-party agreement shall include and address the following, as applicable:

(1) ownership;
(2) transfer of ownership;
(3) maintenance;
(4) operation;
(5) wastewater system repairs; and
(6) designation of fiscal responsibility for the continued satisfactory performance of the wastewater system and repair or replacement of collection, treatment, dispersal, and other components.

(h) Systems or components under common or joint control include the following:

(1) wastewater system serving a condominium or other multiple-ownership development; or
(2) off-site systems serving two or more facilities where any components are under common or joint ownership or control.

(i) The CA shall be valid for a period equal to the period of validity of the IP and stated on the permit.
(j) The CA shall be transferable subject to the conditions set forth in G.S. 130A-336(a).
(k) A CA shall be suspended or revoked if:

(1) the information submitted in the application is found to be incomplete, false, or incorrect;
(2) the site is altered and the permitted system cannot be installed or operated as permitted;
(3) conditions of the CA or the Rules of this Subchapter cannot be met;
(4) a new CA is issued for the same design unit on the same property; or
(5) an NOI is issued in accordance with G.S. 130A-336.1(b) or G.S. 130A-336.2(b) for the same design unit on the same property.

History Note: *Authority G.S. 130A-335; 130A-336; 130A-338;*

15A NCAC 18E .0205 is proposed for adoption as follows:

15A NCAC 18E .0205 OPERATION PERMIT

(a) The owner shall obtain an OP after the wastewater system has been installed or repaired and the authorized agent has inspected the system. The inspection shall occur prior to the system being covered. The authorized agent shall determine that the system has been installed in accordance with this Subchapter and any conditions of the IP and CA.
(b) During the wastewater system inspection, the authorized agent shall notify the installer of items that do not meet the Rules of this Subchapter and conditions described in the IP and CA. Corrections shall be made to bring the system into compliance with this Subchapter by the installer. If corrections cannot be made, an authorized agent shall not issue an OP and the system shall not be placed into use. The authorized agent making the determination shall prepare a written report referencing deficiencies in the system installation, citing the applicable rule(s) and IP and CA conditions, and include a letter of Intent to Suspend or Revoke the IP and CA or the CA. A copy of the report shall be provided to the owner and the installer.
(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXII of Rule .1301(b) of this Subchapter and the unique code assigned under Rule .1713(10) of this Subchapter;
(2) facility description including number of bedrooms and maximum occupancy, maximum number of occupants or people served, DDF, and wastewater strength;
(3) a site plan or plat as defined in G.S. 130A-334 showing the property lines with dimensions, the location of the facility and appurtenances, the site for the wastewater system and repair area including location and dimensions, and the location of water supplies and surface water;
(4) dispersal field design including trench or bed length, width, depth, and location;
(5) the tank(s) location, capacity, and ID numbers;
(6) groundwater monitoring well locations, sampling frequency, and characteristics sampled, as applicable;
(7) conditions for system performance, operation, monitoring, influent and effluent sampling requirements, and reporting, including the requirement for a contract with a Management Entity, as applicable;

(8) a statement specifying that best professional judgement was used to repair the malfunctioning wastewater system, if applicable; and

(9) approved engineered plans, specifications, and record drawings if required in Rule .0303(g) of this Subchapter.

(d) Prior to the issuance of an OP for a system requiring a multi-party agreement, the multi-party agreement shall be executed between the developer and an incorporated owners' association and filed with the local register of deeds.

(e) When a wastewater system is required to be designed by an authorized designer or PE, the PE or authorized designer shall provide a written statement to the owner and authorized agent specifying that construction is complete and in accordance with approved plans, specifications, and modifications. The written statement shall be provided prior to issuance of the OP.

(f) An OP shall be valid and remain in effect for a system provided:

(1) wastewater strength and DDF remain unchanged;

(2) the system is operated and maintained in accordance with this Subchapter;

(3) no malfunction is found as defined in Rule .1303(a)(1) and (2) of this Subchapter;

(4) the system has not been abandoned in accordance with Rule .1307 of this Subchapter;

(5) the system complies with the condition(s) of the OP; and

(6) the OP has not expired or been revoked.

(g) For a Type V or VI system as specified in Table XXXII of Rule .1301(b) of this Subchapter, the OP shall expire five years after being issued.

(h) An authorized agent shall modify, suspend, or revoke the OP or seek other remedies under G.S. 130A, Article 2, if it is determined that the system is not being operated and maintained in accordance with this Subchapter and all conditions imposed by the OP.

(i) When an OP expires in accordance with Paragraph (g) of this Rule a new application shall be required prior to issuance of a new OP to confirm that the previously approved facility has not changed and that the system remains in compliance with permit conditions.

(j) When an OP is revoked due to facility non-compliance, such as additional wastewater flow or increased wastewater strength, a new application shall be required prior to evaluation for a new IP, CA, and OP.

(k) An OP shall be revoked prior to an ATO being issued for the same design unit on the same property.

History Note: Authority G.S. 130A-335; 130A-337; 130A-338;

15A NCAC 18E .0206 is proposed for adoption as follows:

15A NCAC 18E .0206 EXISTING SYSTEM APPROVALS FOR RECONNECTIONS AND PROPERTY ADDITIONS

(a) Approval by an authorized agent shall be issued prior to any of the following:

(1) a facility being reconnected to an existing system; or

(2) other site modifications as described in Paragraph (c) of this Rule.

(b) Approvals for reconnecting a facility shall be issued by an authorized agent upon determination of the following:

(1) the site complies with its OP or the wastewater system was in use prior to July 1, 1977;

(2) there is no current or past uncorrected malfunction of the system as described in Rule .1303(a)(1) and (2) of this Subchapter;

(3) the DDF and wastewater strength for the proposed facility do not exceed that of the existing system;

(4) the facility meets the setbacks in Section .0600 of this Subchapter; and

(5) the existing system is being operated and maintained as specified in G.S. 130A, Article 11, this Subchapter, and permit conditions.

(c) Prior to construction, relocation of a structure, the expansion of an existing facility's footprint, or other site modifications that require the issuance of a building permit, but that do not increase DDF or wastewater strength, an approval shall be issued by an authorized agent upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.

(d) For approvals issued in accordance with this Rule the authorized agent shall provide written documentation of the approval to the owner. The written documentation of the approval shall describe the site modification, system use, DDF, wastewater strength, number of bedrooms, and number of occupants, and shall include a site plan showing the location, dimensions, and setbacks of existing and proposed structures to the existing system and repair area.

History Note: *Authority G.S. 130A-335; 130A-337(c) and (d);*

15A NCAC 18E .0207 is proposed for adoption as follows:

15A NCAC 18E .0207 ALTERNATIVE WASTEWATER SYSTEM PERMITTING OPTIONS

(a) An owner may choose to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 or an AOWE in accordance with G.S. 130A-336.2. The EOP shall be used if the wastewater system design requires a PE in accordance with Rule .0303(a) of this Subchapter.

(b) Prior to the submittal of an NOI for an EOP or an AOWE system as required by G.S. 130A-336.1(b) or G.S. 130A-336.2(b), respectively, a soil and site evaluation shall be conducted in accordance these Statutes and the Rules of this Subchapter.

(c) The NOI for an EOP or AOWE system shall be submitted to the LHD in the county where the facility is located by the owner, PE authorized as the legal representative of the owner, or AOWE authorized as the legal representative of the owner. The NOI shall be submitted on the common form for EOP or the common form for AOWE provided by the Department. The common forms are available by accessing the Department's website at https://ehs.ncpublichealth.com/oswp/. The forms shall include all the information specified in G.S. 130A-336.1(b) or 130A-336.2(b) and the following:

(1) the LSS's, and LG's name, license number, address, e-mail address, and telephone number, as applicable. The installer's name, license number, address, e-mail address, and telephone number shall be provided on the EOP common form;

(2) information required in Rule .0202 of this Section for IP and CA applications;

(3) identification and location on the site plan of existing or proposed potable water supplies, geothermal heating and cooling wells, and groundwater monitoring wells for the proposed site. The PE or AOWE shall reference any existing permit issued for a private drinking water well, public water system as defined in G.S. 130A-313(10), or a wastewater system on both the subject and adjoining properties to provide documentation of compliance with setback requirements in Section .0600 of this Subchapter; and

(4) proof of insurance for the PE, LSS, and LG, as applicable. Proof of insurance for the installer shall be provided with the NOI.

(d) The PE or AOWE design shall incorporate findings and recommendations on soil and site conditions, limitations, site modifications, and geologic and hydrogeologic conditions specified by the LSS or LG, as applicable, and in accordance with G.S. 130A-336.1(b)(8) or G.S. 130A-336.2(b)(9), respectively. For an EOP, when the PE chooses to employ pretreatment technologies not approved in this State, the engineering report shall specify the proposed technology and the associated siting, installation, operation, maintenance, and monitoring requirements, including written manufacturer's endorsement of the proposed use.

(e) The PE or AOWE shall allow for the use of Accepted Systems in accordance with G.S. 130A-336.1(e)(5) or G.S. 130A-336.2(d)(5), respectively.

(f) No building permit for construction, location, or relocation shall be issued until after a decision of completeness of the NOI is made by the LHD. If the LHD fails to act within 15 business days for an EOP or within five business days for an AOWE, the common form is deemed complete.

(g) If there are any changes in the site plan that can impact the wastewater system, such as moving the house or driveway, site alterations, or if the owner chooses to change the DDF or the wastewater strength prior to wastewater system construction, a new NOI shall be submitted to the LHD. The owner shall request in writing that the PE or AOWE invalidate the prior NOI with a signed and sealed letter sent to the owner and LHD.

(h) Construction of the wastewater system shall not commence until the system design plans and specifications have been provided to the installer and the signed and dated statement by the installer is provided to the owner as required by G.S. 130A-.336.1(e)(4)(b) or G.S. 130A-336.2(e)(3). The owner shall be responsible for preventing modifications or alterations of the site for the wastewater system and the system repair area before, during, and after any construction activities for the facility, unless approved by the licensed professionals.

(i) Prior to the LHD providing written confirmation on the common form for the ATO completeness, the owner, PE, or AOWE shall submit the following to the LHD:

(1) documentation that all reporting requirements identified in G.S. 130A-336.1(l) or 130A-336.2(l) have been met;

(2) information set forth in Rule .0301(d) of this Subchapter;

(3) system start-up documentation, including applicable baseline operating parameters for all components;
(4) documentation by the owner that all necessary legal agreements, including easements, encroachments, multi-party agreements, and other documents have been prepared, executed, and recorded in accordance with Rule .0301(b) and (c) of this Subchapter;
(5) installer's name, license number, address, e-mail address, telephone number, and proof of insurance for AOWE only; and
(6) record drawings.

(j) The owner of a wastewater system approved in accordance with this Rule shall be responsible for maintaining the wastewater system in accordance with the written operation and management program required in G.S. 130A-336.1(i)(1) or 130A-336.2(i)(1) and Section .1300 of this Subchapter.

(k) For repair of a malfunctioning EOP or AOWE system, an NOI shall be submitted in accordance with this Rule. Rule .1306 of this Subchapter shall be followed for repair of a malfunctioning system. The Management Entity shall notify the LHD within 48 hours of the system malfunction.

(l) The owner of an EOP or AOWE system who proposes to change the use of the facility shall contact the licensed professionals on the NOI to determine whether the current system would continue to comply with the Rules of this Subchapter for the proposed change of use. The licensed professionals shall determine what, if any, modifications shall be necessary for the wastewater system to continue to comply with the Rules of this Subchapter following the proposed change of use. An NOI reflecting the change of use and any required modifications to the system shall be submitted to the LHD. The permitting process set forth in this Rule shall be followed.

(m) For EOP and AOWE systems, the LHD shall:

(1) file all EOP and AOWE documentation consistent with current permit filing procedures at the LHD;
(2) revoke an IP or CA for a wastewater system prior to issuing written confirmation of the NOI for the same design unit on the same property, if applicable;
(3) revoke an OP for a wastewater system prior to issuing written confirmation of an ATO for the same design unit on the same property, if applicable;
(4) submit a copy to the Department of the common form indicating written confirmation of NOI and ATO completeness;
(5) participate in a post-construction conference in accordance with G.S. 130A-336.1(j) or G.S. 130A-336.2(j);
(6) review the performance and operation reports submitted and perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(c) and Table XXXII of Rule .1301(b) of this Subchapter;
(7) investigate complaints regarding EOP and AOWE systems;
(8) issue a NOV for systems determined to be malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter. The LHD shall direct the owner to contact the PE, LSS, LG, and installer, as applicable, for determination of the reason of the malfunction and development of an NOI for repairs; and
(9) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

(n) The owner may contract with different licensed professionals than those originally identified on the initial NOI to complete an EOP or AOWE project. When the owner contracts with different licensed professionals, a revised NOI reflecting the new licensed professionals and proof of insurance shall be submitted to the LHD.

(o) The owner and all licensed professionals shall comply with all applicable federal, State, and local laws, rules, and ordinances.

History Note: *Authority G.S. 130A-335; 130A-336.1; 130A-336.2; S.L. 2019-151, s.14;*

15A NCAC 18E .0301 is proposed for adoption as follows:

SECTION .0300 - RESPONSIBILITIES

15A NCAC 18E .0301 OWNERS

(a) The owner of a wastewater system shall:

(1) apply in accordance with Section .0200 of this Subchapter;
(2) comply with G.S. 130A, Article 11, the Rules of this Subchapter, and permit conditions regarding wastewater system location, including repair area;
(3) identify property lines and fixed reference points in the field prior to the LHD site evaluation;
(4) make the site accessible for the site evaluation described in Rule .0501 of this Subchapter;
(5) field stake or otherwise mark the proposed facility location and all associated appurtenances, such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.;
(6) provide for pits with excavated steps or a ramp in the pit that allow for ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the Department in accordance with Rule .0501 of this Subchapter;
(7) provide for system operation, maintenance, monitoring, and reporting, including access for system maintenance;
(8) maintain artificial drainage systems, as applicable;
(9) prevent encroachment on the initial wastewater system and repair area by utilities, structures, vehicular traffic areas, etc.;
(10) provide documentation supporting an exemption from the minimum setback requirements in Rule .0601(a) of this Subchapter to the LHD, as applicable;
(11) establish and maintain site-specific vegetation over the dispersal field and repair area; and
(12) repair a malfunctioning system as necessary in accordance with this Subchapter.

(b) The entire initial wastewater system and repair area shall be on property owned or controlled by the wastewater system owner. An easement or encroachment agreement shall be required for the permitting of any of the following installations:

(1) any part of the wastewater system is located in a common area with other wastewater systems;
(2) any part of the wastewater system is located in an area with multiple or third-party ownership or control;
(3) any part of the wastewater system is proposed to be in an off-site area; or
(4) any part of the wastewater system and the facility are located on different lots or tracts of land and cross a property line or right-of-way.

(c) Any necessary easements, rights-of-way, or encroachment agreements shall be obtained prior to the issuance of a CA. The easement, right-of-way, or encroachment agreement shall meet the following conditions:

(1) be appurtenant to specifically described property and run with the land;
(2) not be affected by change of ownership or control;
(3) remain valid for as long as the wastewater system is required for the facility that it is designed to serve;
(4) include a description of the uses being granted and shall include ingress, egress, and regress, system installation, operation, maintenance, monitoring, and repairs and any other activity required to remain in compliance with this Subchapter, including that the easement, right-of-way, or encroachment remain free of structures, landscaping, or any other activities that would interfere with the use of the easement or encroachment for its intended purpose;
(5) specify in a deed by metes and bounds description the area or site required for the wastewater system and repair area, including collection sewers, tanks, raw sewage lift stations, distribution devices, and dispersal fields; and
(6) be recorded with the register of deeds in the county where the system and facility are located.

(d) Prior to OP issuance for a system required to be designed by an authorized designer or PE, the owner shall submit to the LHD a statement signed by the authorized designer or PE specifying that the system has been installed in accordance with the permitted design. For systems designed by a PE, the statement shall be affixed with the PE seal.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .0302 is proposed for adoption as follows:

15A NCAC 18E .0302 LOCAL HEALTH DEPARTMENT AND DEPARTMENT

(a) The permitting of a wastewater system shall be the responsibility of agents authorized by the Department in accordance with G.S. 130A, Article 4 and 15A NCAC 01O .0100, and registered with the North Carolina State Board

of Environmental Health Specialist Examiners, as required in G.S. 90A, Article 4, unless the permit is issued in accordance with G.S. 130A-336.1 or G.S. 130A-336.2 and Rule .0207 of this Subchapter.

(b) When the wastewater system crosses county lines or the facility is in one county and the wastewater system is in another county, the LHD in the county that assesses property taxes on the facility shall implement the requirements of this Subchapter.

(c) The LHD shall issue an NOV to the owner in the following situations:

(1) the wastewater system is malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter;

(2) the wastewater system creates or has created a public health hazard or nuisance by effluent surfacing, or effluent discharging into groundwater or surface waters;

(3) the wastewater system is partially or totally destroyed, such as components that are crushed, broken, damaged, or otherwise rendered unusable or ineffective so that the component will not function as designed;

(4) the owner does not meet the ownership and control requirements of Rule .0301(b) of this Section;

(5) the wastewater system was installed without a permit issued in accordance with Section .0200 of this Subchapter; or

(6) the facility was expanded without a permit issued in accordance with Section .0200 of this Subchapter.

(d) The authorized agent shall issue a written notice of non-compliance to the owner when the wastewater system is non-compliant with G.S. 130A, Article 11, the Rules of this Subchapter, or the performance standards or conditions in the OP or ATO.

(e) The Department shall review and approve the wastewater system, including design, layout, plans, and specifications for all wastewater systems that serve a facility with a cumulative DDF greater than 3,000 gpd, as determined in Section .0400 of this Subchapter. The Department shall also review and approve plans and specifications for the following:

(1) IPWW systems required by this Section to be designed by a PE unless the wastewater has been determined to not be IPWW in accordance with Rule .0303(a)(17) of this Section;

(2) advanced pretreatment or drip dispersal systems not previously approved by the Department; and

(3) any other system so specified by the authorized agent.

(f) Department review shall not be required when the cumulative DDF for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and:

(1) the wastewater system is made up of an individual wastewater system that serves an individual dwelling unit or several individual wastewater systems, each serving an individual dwelling unit; or

(2) the wastewater system meets the following criteria:

(A) the individual wastewater system(s) serves individual design units with a DDF less than or equal to 1,500 gpd;

(B) the initial and repair dispersal fields for each individual wastewater system(s) is, at a minimum, 20 feet from any other individual wastewater system;

(C) the total DDF for all dispersal fields is less than or equal to 1,500 gpd per acre based on the portion of the land containing the dispersal fields; and

(D) the wastewater is not HSE as identified in Section .0400 of this Subchapter.

(g) Department review shall not be required when a PE calculates the proposed DDF to be less than or equal to 3,000 gpd based on engineering design utilizing low-flow fixtures and low-flow technologies in accordance with Rule .0403(e) of this Subchapter. Pursuant to S.L. 2013-413, s.34, as revised by S.L. 2014-120, s.53, neither the Department nor any LHD shall be liable for a system approved or permitted in accordance with this Paragraph.

(h) For systems that require Department review and approval, an IP shall not be issued by the LHD until the site plan or plat and system layout, including details for any proposed site modifications, are approved by the Department. A CA shall not be issued by the LHD until plans and specifications, submitted in accordance with Rule .0304 of this Section, are approved by the Department in accordance with these Rules and engineering practices.

(i) The Department shall provide technical assistance to the LHD as needed for interpretation of this Subchapter, in accordance with the recognized principles and practices of soil science, geology, engineering, and public health.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .0303 is proposed for adoption as follows:

15A NCAC 18E .0303 LICENSED OR CERTIFIED PROFESSIONALS

(a) Any wastewater system that meets one or more of the following conditions shall be designed by a PE if required in G.S. 89C:

(1) the system has a DDF greater than 3,000 gpd, as determined in Section .0400 of this Subchapter, except where the system is limited to an individual wastewater system serving an individual dwelling unit or multiple individual wastewater systems, each serving an individual dwelling unit;

(2) the system requires advanced pretreatment or drip dispersal and is not a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) pressure dispersal systems that require pumping more than 500 feet horizontally or more than 50 feet of net elevation head;

(4) pressure dosed gravity distribution systems that require pumping more than 1,000 feet horizontally or more than 100 feet of net elevation head;

(5) dosing systems or force mains that have one or more intermediate high points greater than five feet;

(6) the system requires pumping downhill to a pressure dosed gravity or pressure dispersal field where the volume of the supply line that could drain to the dispersal field between doses exceeds 25 percent of the required dose volume;

(7) pressure dispersal systems and pressure dosed gravity systems with a DDF greater than 600 gpd serving a single design unit;

(8) pressure dispersal systems where there is more than 15 percent variation in line length. The 15 percent variation shall be measured by comparing the longest line length to the shortest line length in any dispersal field;

(9) two or more septic tanks or advanced pretreatment units, each serving a separate design unit, and served by a common dosing tank;

(10) a STEP system with a pressure sewer or other pressure sewer system receiving effluent from two or more pump tanks;

(11) an adjusted DDF is proposed based on the use of low-flow fixtures or low-flow technologies in accordance with Rule .0403(e) of this Subchapter;

(12) the system requires use of sewage pumps prior to the septic tank or other pretreatment system, except for systems governed by the North Carolina Plumbing Code or which consist of grinder pumps and associated pump basins that are approved and listed in accordance with standards adopted by NSF International;

(13) an individual system is required to use more than one pump or siphon in a single pump tank. Examples include dual pumps as set forth in Rule .1101(b) of this Subchapter;

(14) the system includes a collection sewer prior to the septic tank or other pretreatment system serving two or more design units, except for systems governed by the North Carolina Plumbing Code;

(15) the wastewater system includes structures that have not been pre-engineered;

(16) the proposed pump model is not listed by a third-party electrical testing and listing agency;

(17) the system is designed for the collection, treatment, and dispersal of IPWW, except under the following circumstances:

(A) the Department has determined that the wastewater generated by the proposed facility has a pollutant strength that is lower than or equal to DSE and does not require specialized treatment or management. This determination shall be made based on a review of the wastewater generating process, wastewater characteristic data, and material safety data sheets, as compared to DSE; or

(B) the Department has approved a treatment system or process and management method proposed by the facility owner that generates effluent with a pollutant strength which is lower than or equal to DSE. This approval shall be based on a review of documentation provided in conjunction with prior project specific reviews or a PIA approval. This approval shall be based on data from other facilities, management practices, and other information provided by the owner;

(18) the wastewater system is designed for RCW;
(19) any wastewater system designed by a licensed professional that has been determined to be within the practice of engineering in accordance with G.S. 89C-3(6) by the North Carolina Board of Examiners for Engineers and Surveyors;
(20) any wastewater system approved in accordance with Sections .1500, .1600, and .1700 of this Subchapter that requires in the RWTS or PIA Approval that the system be designed by a PE;
(21) any system or system component where the Rules of this Subchapter provide for an engineer to propose alternative materials, capacity determination, or performance requirements; and
(22) any other system so specified by the LHD, based on wastewater system complexity and LHD's experience with the proposed system type.

(b) A PE, in accordance with G.S. 89C, may propose an alternative design for a facility projected to generate HSE in accordance with Rule .0401(h) of this Subchapter. The alternative design shall include supporting documentation showing that the proposed system design will meet DSE in Table III of Rule .0402(a) of this Subchapter. The alternative design shall be reviewed and approved by the Department unless the system has been approved in accordance with Section .1700 of this Subchapter.

(c) Plans and specifications for the use of a groundwater lowering system to comply with the vertical separation to a SWC shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F. Prior to the issuance of an IP or CA, the plans and specifications shall be reviewed and approved by the authorized agent if the plans and specifications meet the requirements of Rules .0504 and .0910 of this Subchapter and accepted design practices.

(d) An installer shall construct, install, or repair wastewater systems as required by G.S. 90A, Article 5. The installer shall be responsible for the following:

(1) certification at the required level according to the system design specifications as required by G.S. 90A, Article 5;
(2) notification to the LHD upon completion of the system installation and each stage requiring inspection as conditioned on a CA;
(3) participation in a preconstruction conference when specified in the CA or by the RWTS or PIA Approval;
(4) participation during the inspection of the wastewater system by the authorized agent;
(5) participation during the post-construction conference and all other requirements when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter and G.S. 130A-336.1 or G.S. 130A-336.2; and
(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(e) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system from the Water Pollution Control Systems Operators Certification Commission. Nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

(f) Nothing in this Rule shall be construed as allowing any licensed professional to provide services for which he or she has neither the educational background, expertise, or license to perform, or is beyond his or her scope of work and the applicable statues for their respective professions.

(g) The PE or authorized designer shall provide a written statement to the owner specifying that construction is complete and in accordance with approved plans, specifications, and modifications. This statement shall be based on periodic observations of construction and a final inspection for design compliance. Record drawings shall be provided to the owner and LHD when any change has been made to the wastewater system installation from the approved plans.

History Note: *Authority G.S. 89C; 89E; 89F; 90A; 130A-335;*

15A NCAC 18E .0304 is proposed for adoption as follows:

15A NCAC 18E .0304 SUBMITTAL REQUIREMENTS FOR PLANS, SPECIFICATIONS, AND REPORTS PREPARED BY LICENSED PROFESSIONALS FOR SYSTEMS OVER 3,000 GALLONS/DAY

All wastewater systems with a DDF greater than 3,000 gpd shall be designed by a PE, with site evaluation by an LSS, and LG, as applicable, in accordance with G.S. 89C, 89E, and 89F. The wastewater system plans, specifications, and reports shall contain the information necessary for construction of the wastewater system. Plans, specifications, and reports shall include the following information:

(1) Applicant information and DDF determination:
  (A) the seal, signature, and the date on all plans, specifications, and reports prepared by the PE, LSS, and any other licensed or registered professionals who contributed to the plans, specifications, or reports;
  (B) name, address, and phone number for the owner and all licensed professionals who have prepared plans, specifications, and reports for the wastewater system; and
  (C) DDF and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed DDF and wastewater strength.
(2) Special site evaluation in accordance with Rule .0510 of this Subchapter, including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:
  (A) soil and site evaluation report, written by the LSS, on the field evaluation of the soil conditions and site features within the proposed initial and repair dispersal field areas including the following:
    (i) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;
    (ii) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;
    (iii) soil and site-based criteria for dispersal field design and site modifications;
    (iv) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(c) of this Subchapter; and
    (v) recommended effluent standard for proposed initial and repair dispersal field areas with justification; and
  (B) hydraulic assessment reports on site-specific field information that shall include:
    (i) in-situ Ksat measurements at the proposed infiltrative surface elevation where possible and at each distinct horizon within and beneath the treatment zone to a depth of 48 inches below the ground surface or to a depth referenced in an associated hydraulic assessment, such as groundwater mounding analysis or lateral flow analysis;
    (ii) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;
    (iii) groundwater mounding for level sites or lateral flow analysis for sloping sites in accordance with Rule .0510(e) of this Subchapter, as applicable; and
    (iv) contaminant transport analysis showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property, as applicable;
(3) Site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the following information:
  (A) site topography, proposed site modifications, location of existing and proposed site features listed in Rule .0601 of this Subchapter, proposed facility location, location of proposed initial and repair dispersal field areas and types, and location of LSS soil pits, hand auger borings, deep borings, and in-situ Kats tests, as applicable;
  (B) existing and proposed public wells or water supply sources on the property or within 500 feet of any proposed initial and repair dispersal field areas;
  (C) existing and proposed private wells or water supply sources within 200 feet of existing or proposed system component locations;

(D) other existing and proposed wells, existing and proposed water lines including fire protection, irrigation, etc., within the property boundaries and within 10 feet of any projected system component;

(E) surface waters with water quality classification, jurisdictional wetlands, and existing and proposed stormwater management drainage features and groundwater drainage systems;

(F) topographic map with two-foot contour intervals or spot elevations when there is less than a two-foot elevation difference across the site identifying areas evaluated for initial and repair dispersal field areas, proposed location of trenches, and pits and soil borings labeled to facilitate field identification;

(G) location of tanks and advanced pretreatment components, including means of access for pumping and maintenance; and

(H) any site modifications and site and slope stabilization plans.

(4) System components design, installation, operation, and maintenance information:

(A) collection systems and sewers:

(i) plan and profile drawings, including location, pipe diameter, invert and ground surface elevations of manholes and cleanouts;

(ii) proximity to utilities and site features listed in Rule .0601 of this Subchapter;

(iii) drawings of service connections, manholes, cleanouts, valves and other appurtenances, aerial crossings, road crossings, water lines, stormwater management drainage features, streams, or ditches; and

(iv) installation and testing procedures and pass or fail criteria;

(B) tank information:

(i) plan and profile drawings of all tanks, including tank dimensions and all elevations;

(ii) access riser, manhole, chamber interconnection, effluent filter, and inlet and outlet details;

(iii) construction details for built-in-place tanks, including dimensions, reinforcement details and calculations, and construction methods;

(iv) identification number for Department approved tanks;

(v) installation criteria and water tightness testing procedures with pass or fail criteria; and

(vi) anti-buoyancy calculations and provisions;

(C) pump stations, including raw sewage lift stations and pump tanks:

(i) information required in Subparagraph (4)(B) of this Rule;

(ii) specifications for pumps, discharge piping, pump removal system, and all related appurtenances;

(iii) dosing system total dynamic head calculations, pump specifications, pump curves and expected operating conditions, including dosing, flushing, etc.;

(iv) control panel, floats and settings, high-water alarm components, location, and operational description under normal and high-water conditions;

(v) emergency storage capacity calculations, timer control settings, and provisions for stand-by power; and

(vi) lighting, ventilation, if applicable, wash-down water supply with back siphon protection, and protective fencing;

(D) advanced pretreatment systems:

(i) information required in Subparagraphs (4)(B) and (C) of this Rule;

(ii) drawings and details showing all advanced pretreatment units and appurtenances such as pumps, valves, floats, etc., size and type of piping, disinfection unit, blowers if needed, location of control panels, height of control panels, etc; and

(iii) documentation from the manufacturer supporting the proposed design and use of the advanced pretreatment system to achieve specified effluent standards if not otherwise approved by the Department in accordance with Section .1700 of this Subchapter;

(E) dispersal field plans and specifications with design and construction details:

(i) final field layout, including ground elevations based on field measurements at a maximum of two-foot intervals or spot elevations when there is less than a two-foot elevation difference across the site;

(ii) trench plan and profile drawings, including cross sectional details, length, spacing, connection details, cleanouts, etc., and invert elevations for each lateral;

(iii) manifolds, supply lines, pipe sizes, cleanouts and interconnection details, and invert elevations;

(iv) flow distribution device design;

(v) artificial drainage system locations, elevations, discharge points, and design details, as applicable;

(vi) site preparation procedures;

(vii) construction phasing and wastewater system testing; and

(viii) final landscaping and compliance with erosion control requirements, such as site stabilization procedures and drainage;

(F) materials specification for all materials to be used, methods of construction, means for assuring the quality and integrity of the finished product; and

(G) operation and maintenance procedures for the Management Entity, inspection schedules, and maintenance specifications for mechanical components and dispersal field vegetative cover; and

(5) any other information determined to be applicable by the LHD or the Department, such as the impact of projected wastewater constituents on the trench and receiving soil.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .0305 is proposed for adoption as follows:

15A NCAC 18E .0305 SUBMITTAL REQUIREMENTS FOR PLANS, SPECIFICATIONS, AND REPORTS PREPARED BY LICENSED PROFESSIONALS FOR SYSTEMS LESS THAN OR EQUAL TO 3,000 GALLONS/DAY

Plans, specifications, and reports for wastewater systems with a DDF less than or equal to 3,000 gpd that are required to be prepared by an LSS or PE, if required in G.S. 89C or 89E, shall include the information required by the following:

(1) Rule .0304(1) of this Section;

(2) Rule .0304(2) of this Section for special site evaluations and submittals prepared under Rule .0510 of this Subchapter; and

(3) Rule .0304(4) of this Section for advanced pretreatment and IPWW.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .0401 is proposed for adoption as follows:

SECTION .0400 – DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum DDF for dwelling units shall be based on:

(1) 175 gpd for a one bedroom dwelling unit with no more than two occupants and 400 square feet of living space or less; or

(2) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit or 60 gpd per person when occupancy exceeds two persons per bedroom, whichever is greater.

(b) DDF for facilities other than dwelling units shall be in accordance with Table II as follows:

TABLE II. Design daily flow for Facilities

Facility type	**Design daily flow**
Commercial	
Airports, railroad stations, bus and ferry terminals, etc.	5 gal/traveler, food preparation not included
Barber shops	50 gal/chair
Bars, cocktail lounges∞	20 gal/seat, food preparation not included
Beauty shops, style shops, hair salons	125 gal/chair
Bed and breakfast homes and inns	Dwelling unit DDF based on Paragraph (a) of this Rule plus 120 gal/rented room which includes the following: Meals served to overnight guests Laundry for linens 150 gal/room with cooking facilities in individual rooms
Event Center∞	5 gal/person with toilets and hand sinks up to 4 hrs 10 gal/person with toilets and hand sinks up to 8 hrs 15 gal/person with toilets and hand sinks greater than 8 hrs Add 5 gal/person with full kitchen
Markets open less than four days/week, such as a flea market or farmers market	30 gal/stall or vendor, food preparation not included
Marinas with no holding tank discharge included	30 gal/boat slip, with bathhouse 10 gal/boat slip, wet slips or slips on dock 5 gal/boat slip, dry storage or warehouse
Motels/hotels	120 gal/room includes the following: No cooking facilities in individual rooms other than a microwave or other similar devices No food service or limited food service establishment Laundry for linens

	150 gal/room with cooking facilities in individual rooms
Offices and factories with no IPWW included	12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift Add 10 gal/employee for showers
Stores, shopping centers, and malls	100 gal/1,000 ft^2 of retail sales area, food preparation not included
Warehouse that are not retail sales warehouses	100 gal/loading bay or 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Storage warehouse including self-storage facilities and does not include caretaker residence	12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Alcoholic beverage tasting areas with no process wastewater included	200 gal/1,000 ft^2 of tasting area floor space and includes glass washing equipment Food preparation and food clean up not included 12 gal/employee/≤ 8 hr shift
Camps/Campgrounds	
Summer camps with overnight stays*	60 gal/person, applied as follows: 15 gal/person/food preparation 20 gal/person/toilet facilities 10 gal/person/bathing facilities 15 gal/person/laundry facilities
Day camps not inclusive of swimming area bathhouse*	20 gal/person and 5 gal/meal served with multiuse service or 3 gal/meal served with single-service articles
Temporary Labor Camp or Migrant Housing Camp with overnight stays*	60 gal/person, applied as follows: 15 gal/person/food preparation 20 gal/person/toilet facilities 10 gal/person/bathing facilities 15 gal/person/laundry facilities
Travel trailer or RV in an RV park*	100 gal/space
Recreational Park Trailer or Park Model Trailer 400 ft^2 or less in an RV park*	150 gal/space
Bathhouse for campsites and RV park sites with no water and sewer hook ups with a maximum of four people per campsite	70 gal/campsite
Food preparation facilities	
Food Establishments with multiuse articles*	25 gal/seat or 25 gal/15 ft^2 of floor space open 6 hrs/day or less 40 gal/seat or 40 gal/15 ft^2 of floor space open 6 to 16 hrs/day

	Add 4 gpd/seat for every additional hour open beyond 16 hrs
Food Establishments with single service articles*	20 gal/seat or 20 gal/15 ft^2 of floor space open 6 hrs/day or less 30 gal/seat or 30 gal/15 ft^2 of floor space open 6 to 16 hrs/day Add 3 gpd/seat for every additional hour open beyond 16 hrs
Food stand with up to eight seats, mobile food units, and commissary kitchens*	50 gal/100 ft^2 of food stand, food unit, or food prep floor space and 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Other food service facilities*	5 gal/meal served with multiuse articles 3 gal/meal served with single service articles
Meat markets or fish markets with no process wastewater included*	50 gal/100 ft^2 of floor space and 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Health care and other care institutions	
Hospitals*	300 gal/bed
Rest homes, assisted living homes, and nursing homes*	150 gal/bed with laundry 75 gal/bed without laundry Add 60 gal/resident employee with laundry
Day care facilities	15 gal/person open ≤ 12 hr shift without laundry Add 1 gal/person/hr open for more than 12 hrs per day Add 5 gal/person with full kitchen
Group homes, drug rehabilitation, mental health, and other care institutions	75 gal/person with laundry
Orphanages	60 gal/student or resident employee with laundry
Public access restrooms	
Convenience store, service station, truck stop*	250 gal/toilet or urinal meeting the following: Open less than 16 hrs/day Food preparation not included Retail space not included

	325 gal/toilet or urinal meeting the following: Open 16 to 24 hrs/day Food preparation not included Retail space not included
Highway rest areas and visitor centers*	325 gal/toilet or urinal or 10 gal/parking space, whichever is greater
Recreational facilities	
Bowling center	50 gal/lane, food preparation not included
Community center, gym∞	5 gal/person plus 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift or 50 gal/100 ft^2, whichever is greater
Country club or golf course	10 gal/person 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift 3 gal/person for convenience stations Food preparation not included
Fairground	250 gal/toilet or urinal
Fitness center, spas, karate, dance, exercise∞	50 gal/100 ft^2 of floor space used by clientele Food preparation not included
Recreational park, State park, county park, and other similar facilities with no sports facilities	10 gal/parking space
Outdoor sports facilities, mini golf, batting cages, driving ranges, motocross, athletic park, ball fields, stadium, and other similar facilities	250 gal/toilet or urinal, 5 gal/seat, or 10 gal/parking space, whichever is greater Food preparation not included
Auditorium, theater, amphitheater, drive-in theater	2 gal/seat or 10 gal/parking space, whichever is greater Food preparation not included
Swimming pools and bathhouses	5 gal/person domestic waste only, bathing load of pool may be used as an alternative method of sizing
Sports facilities courts or other similar facilities	250 gal/toilet or urinal or 50 gal/court, whichever is greater
Institutions	

Church or other religious institution*	2 gal/seat sanctuary only 3 gal/seat with warming kitchen in same structure as sanctuary 5 gal/seat with full kitchen in same structure as sanctuary
Public or private assembly halls used for recreation, regularly scheduled meetings, events, or amusement∞* For churches, flow shall be in addition to sanctuary structure flow	2 gal/person with toilets and hand sinks 3 gal/person with addition of a warming kitchen 5 gal/person with full kitchen
Schools	
Day schools*	6 gal/student with no cafeteria or gymnasium 9 gal/student with cafeteria only 12 gal/student with cafeteria and gymnasium
After school program	5 gal/student in addition to flow for regular school day
Boarding schools	60 gal/student and resident employee with laundry

* Facility has potential to generate HSE.
∞Designer shall use the maximum building occupancy assigned by the local fire marshal in calculating DDF unless another method for determining DDF is proposed, including the justification for not using the maximum building occupancy.

(c) The minimum DDF from any facility other than a dwelling unit shall be 100 gpd. For facilities with multiple design units, the minimum DDF shall be 100 gpd per design unit. The DDF of the facility shall be the sum of all design unit flows.
(d) DDF determination for wastewater systems with facilities not identified in this Rule shall be determined using available water use data, capacity of water-using fixtures, occupancy or operation patterns, and other measured data from the facility itself or a comparable facility.
(e) Where laundry is not specified for a facility in Table II, but is proposed to be provided, the DDF shall be adjusted to account for the proposed usage and machine water capacity. The owner shall provide cut-sheets for laundry machines proposed for use in facilities.
(f) HVAC unit or ice machine condensate, gutter or sump pump discharge, water treatment system back flush lines, or similar incidental flows shall not discharge to the wastewater system, unless a PE designs the wastewater system for these flows.
(g) Unless otherwise noted in Table II, the DDF per unit includes employees.
(h) Food service facilities and other facilities that are projected to generate wastewater with constituent levels greater than DSE, as defined in Rule .0402 of this Section, are identified in Table II with a single asterisk (*) as HSE. Any facility that has a food service component that contributes 50 percent or more of the DDF shall be considered to generate HSE. Determination of wastewater strength shall be based on projected or measured levels of one or more of the following: BOD, TSS, FOG, or TN. Table III of Rule .0402(a) of this Section identifies the constituent limits for DSE.
(i) Wastewater with constituents other than those listed in Table III of Rule .0402(a) of this Section may be classified as IPWW as defined in G.S. 130A-334(2a) on a site-specific basis.
(j) A request for an adjusted DDF shall be made in accordance with Rule .0403 of this Section.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0402 is proposed for adoption as follows:

15A NCAC 18E .0402 SEPTIC TANK EFFLUENT CHARACTERISTICS

(a) Septic tank effluent standards for DSE shall be as set forth in Table III of this Paragraph. Effluent that exceeds these standards for any constituent shall be considered HSE. When measured, effluent characteristics shall be based on at least two effluent samples collected during normal or above-normal operating periods. A normal period is when the occupancy, operation, or use of the facility is average when compared to the occupancy, operation, or use over a time frame of a minimum of one year. The samples shall be taken from the existing or a comparable facility on non-consecutive days of operation. A comparable facility is based on documentation showing that the hours of operation, floor plan, water use practices, water-using fixtures, location, etc., are similar to the facility listed in the application. The samples shall be analyzed for a minimum of BOD_5, TSS, TN, and FOG.

Table III. Septic tank effluent standards for DSE

Constituent	**Maximum DSE mg/L**
BOD	≤ 350
TSS	≤ 100
TN*	≤ 100
FOG	≤ 30

*TN is the sum of TKN, nitrate nitrogen, and nitrite nitrogen

(b) Designs for facilities that generate HSE or when an adjusted DDF is proposed in accordance with Rule .0403 shall address the issue of wastewater strength in accordance with one of the following:

(1) Wastewater systems that meet one of the following criteria shall utilize advanced pretreatment, designed in accordance with Rule .1201(b) of this Subchapter, to produce DSE or better prior to dispersal:

(A) DDF greater than 1,500 gpd and HSE;

(B) any proposed flow reduction in accordance with Rule .0403 of this Section where the DDF is greater than 1,500 gpd; or

(C) any proposed flow reduction in accordance with Rule .0403 of this Section with projected or measured effluent characteristics that exceed DSE as set forth in Table III of this Rule; or

(2) A licensed professional, in accordance with G.S. 89C, 89E, or 89F, may justify not using advanced pretreatment by providing the following, as applicable:

(A) the system design is determined based upon a mass loading adjusted LTAR calculated using site-specific LTAR and projected or measured BOD_5 and TSS values. The adjusted LTAR calculations shall be done as follows:

MLAF = 300/(BOD_5 + TSS) or one, whichever is smaller

ALTAR = MLAF x LTAR

Where MLAF = mass loading LTAR adjustment factor

BOD_5 = measured or projected

TSS = measured or projected

LTAR = LTAR assigned by the authorized agent for DSE in accordance with this Subchapter

ALTAR = adjusted LTAR

(B) site-specific nitrogen migration analysis when projected or measured effluent total nitrogen levels are greater than 100 mg/L. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L; and

(C) additional pretreatment to reduce FOG to less than or equal to 30 mg/L, including justification for the proposed pretreatment method.

(c) The requirements of Paragraph (b) shall not apply if the effluent for a specific facility identified in Rule .0401 of this Section as HSE has been measured in accordance with Paragraph (a) of this Rule and shown to be DSE.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0403 is proposed for adoption as follows:

15A NCAC 18E .0403 ADJUSTMENTS TO DESIGN DAILY FLOW

(a) The authorized agent or the Department shall approve an adjusted DDF relative to the values in Table II of Rule .0401(b) of this Section for new or existing facilities in accordance with this Rule. The water use information provided to support the proposed adjusted DDF shall meet the requirements of Paragraphs (b) or (c) of this Rule and may be provided by the owner, designer, or PE. All adjustments to DDF shall meet the requirements of Paragraph (d) of this Rule.

(b) Adjustments to DDF based on documented data from the facility or a comparable facility, as described in Rule .0402(a) of this Section, shall meet one of the following criteria:

(1) the submitted data shall consist of a minimum of 12 consecutive monthly total water consumption readings, and 30 consecutive daily water consumption readings taken during a projected normal or above normal wastewater flow month. A normal or above normal month is when the average flow equals or exceeds the mean of the 12 consecutive monthly total water consumption readings. The following calculations shall be done with the submitted data:
   (A) a hydraulic peaking factor shall be calculated by dividing the highest monthly flow of the 12 monthly readings by the sum of the 30 consecutive daily water consumption readings. The hydraulic peaking factor shall not be less than one; and
   (B) the adjusted DDF shall be calculated by multiplying the numerical average of the greatest 10 percent of the daily readings by the hydraulic peaking factor; or
(2) the adjusted DDF shall be calculated by multiplying the highest of the 12 monthly readings by 1.5 and then dividing by the number of days in the month.

(c) Adjustments to DDF based on the proposed use of extreme water-conserving fixtures, which use less water that the fixtures required by the North Carolina Plumbing Code, shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from their use in the proposed facility. Cut sheets of the proposed fixtures shall be provided to the LHD and the Department, as applicable.

(d) The proposed adjusted DDF shall account for projected increased constituent concentrations due to the reduction in water use. Calculations shall be provided to verify that the criteria in Rules .0402 and .1201 of this Subchapter are met.

(e) Pursuant to S.L. 2013-413, s.34, as revised by S.L. 2014-120, s.53, a PE may propose an adjusted DDF for new or existing dwelling units or facilities identified in Table II of Rule .0401(b) of this Section in accordance with the following:

(1) DDF less than those listed in Rule .0401 of this Section that are achieved through engineering design that utilizes low-flow fixtures and low-flow technologies;
(2) comparison of flow from proposed fixtures and technologies to flow from conventional fixtures and technologies;
(3) the signed and sealed proposal shall account for the site-specific impact on the wastewater system based on projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;
(4) inspection of the existing wastewater system and verification that the system meets the Rules of this Subchapter and can accept the increase in constituent loading, as applicable;
(5) proposed adjusted DDF for wastewater systems determined to be less than or equal to 3,000 gpd shall not require Department review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and
(6) neither the Department nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE may propose, and the Department shall approve an adjusted DDF for a facility made up of individual dwelling units in accordance with this Rule when the following criteria are met:

(1) DDF calculated in accordance with this Section is greater than 3,000 gpd;

(2) adjusted DDF is based on information in Paragraphs (b) or (c) of this Rule; and

(3) increase in wastewater strength is accounted for in accordance with Paragraph (d) of this Rule.

(g) Adjusted DDF based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The DDF set forth in Rule .0401 of this Section shall be used to determine minimum tank and advanced pretreatment component capacities.

History Note: *Authority G.S. 130A-335(e); S.L. 2013-413, s.53; S.L. 2014-120, s.34;*

15A NCAC 18E .0501 is proposed for adoption as follows:

SECTION .0500 – SOIL AND SITE EVALUATION

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site in accordance with this Section to determine whether the site is suitable or unsuitable for the installation of a wastewater system. The field investigation shall include the evaluation of the following soil and site features with written field descriptions including:

(1) topography, slope, and landscape position;

(2) soil morphology:

(A) depth of horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) SWC;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability for each profile description;

(7) LTAR; and

(8) available space.

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation, and described to reflect variations in soil and site characteristics across both initial and repair areas.

(c) Soil profiles shall be evaluated and described to the following minimum depths:

(1) 48 inches from the ground surface; or

(2) to a LC determined in accordance with this Section.

(d) Owners may be required to provide pits when necessary for evaluation of the site as determined by the authorized agent, such as for evaluation of saprolite or soil structure.

(e) Based on the evaluation of the soil conditions and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable or unsuitable. The authorized agent shall specify the overall site suitability and classification in accordance with Rule .0509 of this Section.

(f) The authorized agent shall specify the LTAR in accordance with Section .0900 of this Subchapter for sites classified suitable in accordance with Rule .0509 of this Section.

(g) A LC initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(b) or (c) of this Section are met.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0502 is proposed for adoption as follows:

15A NCAC 18E .0502 TOPOGRAPHY AND LANDSCAPE POSITION

(a) Uniform stable slopes less than or equal to 65 percent shall be suitable with respect to topography.

(b) The following shall be unsuitable with respect to topography:

(1) slopes greater than 65 percent; and

(2) areas subject to surface water convergence. The site shall be considered suitable when the surface water can be diverted from the site with berms or other surface water diversion devices;

(c) The following shall be unsuitable with respect to landscape position:

(1) depressions, except when with site modifications in accordance with Rule .0910 of this Subchapter, the site complies with the requirements of this Section;

(2) a jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ; and

(3) complex slope patterns, such as areas affected by erosion which have rills or evidence of drainage, and slopes dissected by gullies that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system.

(d) For all sites, except where a drip dispersal system is proposed, additional required soil depth based on slope correction shall be calculated using the following formula to determine site suitability for soil depth in accordance with Rule .0505 of this Section:

SD = MSD + (TW x S)

Where SD = soil depth required with slope correction, in inches

MSD = minimum soil depth, in inches

TW = proposed trench width, in inches

S = percent slope, in decimal form

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0503 is proposed for adoption as follows:

15A NCAC 18E .0503 SOIL MORPHOLOGY

The soil morphology shall be evaluated in accordance with the following:

(1) Texture – The texture of each soil horizon in a profile shall be classified into 12 soil textural classes based upon the relative proportions of sand, silt, and clay sized mineral particles. The soil textural class shall be determined in the field by hand texturing samples of each soil horizon in the soil profile in accordance with the criteria in Guide to Soil Texture by Feel, Journal of Agronomic Education, USDA, NRCS. Table IV identifies the Soil Groups that shall be suitable with respect to texture.

Table IV. Soil Groups that are suitable with respect to texture

Soil Group	USDA Soil Textural Class	
I	Sands	Sand
		Loamy Sand
II	Coarse Loams	Sandy Loam
		Loam
III	Fine Loams	Silt
		Silt Loam
		Sandy Clay Loam
		Clay Loam

		Silty Clay Loam
IV	Clays	Sandy Clay
		Silty Clay
		Clay

Laboratory testing of the soil textural class may be substituted for field testing when the laboratory testing is conducted in accordance with ASTM D6913 and D7928. When laboratory testing of soil texture is proposed, the LHD shall be notified a minimum of 48 hours before samples are to be taken by the licensed professional, if required by G.S. 89C, 89E, or 89F. The authorized agent and the licensed professional shall be present when the samples are collected. Samples shall be representative of the soil horizon being evaluated for texture. Split samples shall be made available to the LHD when requested. The licensed professional shall document chain of custody and seal, sign, and date the first page of the report.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified and suitability determined in accordance with Table V. If an authorized agent determines that the soil structure cannot be determined from auger borings, pits shall be required.

Table V. Soil structure and associated suitability classification

Structure	**Diameter**	**Classification**
Granular	N/A	suitable
Blocky	≤ 1 inch or 2.5 cm	suitable
	> 1 inch or 2.5 cm	unsuitable
Platy	N/A	unsuitable
Prismatic	≤ 2 inches or 5 cm	suitable
	> 2 inches or 5 cm	unsuitable
Absence of structure: Single Grain	N/A	suitable
Absence of Structure: Massive - no structural peds	N/A	unsuitable

(3) Clay Mineralogy – Clay mineralogy shall be determined in the field by evaluation of moist and wet soil consistence in accordance with the USDA-NRCS Field Book for Describing and Sampling Soils. The clay mineralogy shall be classified and suitability determined in accordance with Table VI.

Table VI. Clay mineralogy field method results, associated mineralogy, and suitability classification

Soil Consistence	**Mineralogy**	**Classification**
Moist		
Loose, very friable	Slightly expansive	suitable
Friable, firm	Slightly expansive	suitable
Very firm or extremely firm	Expansive	unsuitable*
Wet		
Nonsticky, slightly sticky Nonplastic, slightly plastic	Slightly expansive	suitable
Moderately sticky Moderately plastic	Slightly expansive	suitable

Very sticky or very plastic	Expansive	unsuitable*

*If either the moist consistence or wet consistence is unsuitable then clay mineralogy is classified unsuitable.

(a) Laboratory testing of ACEC may be substituted for field testing to determine clay mineralogy. The laboratory testing shall be conducted in accordance with USDA-NRCS Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45, and Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42, page 229, or EPA Method 9080. Table VII shall be used to determine the clay mineralogy suitability when laboratory testing is used. When using laboratory testing to determine clay mineralogy, the clay content of the soil shall be greater than 35 percent and the organic matter component shall be less than 0.5 percent.

Table VII. Clay mineralogy laboratory method results, mineralogy, and associated suitability classification

ACEC in cmol/kg	**Mineralogy**	**Classification**
≤ 16.3	Slightly expansive	suitable
> 16.3	Expansive	unsuitable

(b) When laboratory testing of clay mineralogy is proposed, the LHD shall be notified a minimum of 48 hours before samples are to be taken by the licensed professional, if required by G.S. 89C, 89E, or 89F. The authorized agent and the licensed professional shall be present when the samples are collected. Samples shall be representative of the soil horizon being evaluated for clay mineralogy. Split samples shall be made available to the LHD when requested. The licensed professional shall document chain of custody and seal, sign, and date the first page of the report.

(4) Organic Soils - Organic soils shall be considered unsuitable.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0504 is proposed for adoption as follows:

15A NCAC 18E .0504 SOIL WETNESS CONDITION

(a) SWC, such as those caused by a seasonal high-water table, a perched water table, tidal water, seasonally saturated soil, or by lateral water movement, shall be determined by field observations of soil wetness indicators as follows:

(1) the presence of colors with a value 4 or more and a chroma 2 or less using the Munsell Soil Color Book at greater than or equal to two percent of soil volume as redox depletions or as the matrix of a horizon. Colors of chroma 2 or less that are lithochromic features shall not be considered indicative of a SWC; or

(2) the observation or indication of saturated soils, a perched water table, or lateral water movement flowing into a bore hole, monitoring well, or open excavation above a less permeable horizon, that may occur without the presence of colors with a value 4 or more or chroma 2 or less at greater than or equal to two percent of soil volume as redox depletions or as the matrix of a horizon.

(3) The shallowest depth to SWC determined in this Paragraph shall be used.

(b) Initial site suitability as to SWC shall be determined by field observations of soil wetness indicators in accordance with Paragraph (a) of this Rule. Sites where the SWC is less than 12 inches below the naturally occurring soil surface, or less than 18 inches if more than six inches of Group I soils are present, shall be considered unsuitable with respect to SWC.

(c) Monitoring or modeling procedures as set forth in this Rule may be used to reclassify the site as suitable with respect to SWC.
(d) Monitoring or modeling procedures as set forth in this Rule shall be required when the owner proposes to use a wastewater system requiring a greater depth to a SWC than the depth observed by soil wetness indicators in accordance with Paragraph (a) of this Rule.
(e) Modeling procedures as set forth in this Rule shall be required when the owner proposes to use sites with Group III or IV soils within 36 inches of the naturally occurring soil surface with artificial drainage, or on sites when fill is proposed to be used in conjunction with an artificial drainage system.
(f) Monitoring or modeling procedures may include the following:

(1) direct monitoring procedure as set forth in Paragraph (g) of this Rule;
(2) modeling procedure as set forth in (h) of this Rule;
(3) monitoring and modeling procedure as set forth in Paragraph (i) of this Rule; or
(4) other modeling procedures as set forth in Paragraph (j) of this Rule.

(g) The direct monitoring procedure involves determining the SWC by observation of water surface elevations in wells during periods of high-water in accordance with the following:

(1) no later than 30 days prior to the start of the monitoring period, the owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal prepared by a licensed professional, if required in G.S. 89C, 89E, or 89F, that includes a site plan, well and soil profile at each monitoring site, and a monitoring plan as follows:
    (A) the site plan shall include the proposed sites for wastewater systems, the longitude and latitude of the site, the location of monitoring wells, and all drainage features that may influence the SWC. The site plan shall also specify any proposed fill and drainage modifications;
    (B) the monitoring plan shall include the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a DDF greater than 600 gpd shall have one additional well per 600 gpd increment. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil and site conditions. The monitoring plan shall also provide for monitoring of the water surface elevations in the wells and all precipitation at the site; and
    (C) notification of whether the owner or a licensed professional will perform the monitoring, including the name of the licensed professional, if applicable.
(2) prior to installation of the monitoring wells, the authorized agent shall approve the plan. Plan approval shall be based upon a site visit and compliance with this Rule. If the plan is denied, a signed, written report shall be provided to the owner that describes the reasons for denial and the changes necessary for approval of the plan;
(3) wells shall extend a minimum of five feet below the naturally occurring soil surface, or existing ground surface for existing fill determined in accordance with Rule .0909(d) of this Subchapter, except that wells that extend down only 40 inches from the ground surface may be used if a continuous record of the water table is provided for a minimum of half of the monitoring period. One or more shallower wells may be required on sites where shallow lateral water movement or a perched SWC is anticipated based on the site investigation;
(4) the water elevation in the monitoring wells shall be recorded daily from January 1 to April 30, taken at the same time during the day, plus or minus three hours. Rain gauges shall be located within two miles of the site. Daily rainfall measurements shall also be recorded from December 1 through April 30; and
(5) the most recent information available from the SCO shall be used to determine the recurrence frequency of the total amount of rainfall at the site for the 120-day period ending April 15 based upon the site's historic rainfall record. This shall be done when the 120-day cumulative rainfall for the monitoring period ending on April 15 equals or exceeds the site's historic rainfall for the same period with a 30 percent frequency. The recurrence frequency shall be determined with one of the following methods:
    (A) the owner's licensed professional shall determine the 120-day SPI for April 15 by using the Integrated Water Portal located on the SCO's website at: http://climate.ncsu.edu/water/map. The licensed professional shall click on the map pixel

that corresponds closest to the site's location. The Department will assist in obtaining this information upon request; or

(B) the recurrence frequency of the site's cumulative precipitation for the 120-day monitoring period ending on April 15 shall be determined for the site on a case-by-case basis from the most recent master grid provided to the Department by the SCO. The master grid contains probability distribution parameters that shall be used by the Department based upon guidance from the SCO. Based on the master grid, the Department shall derive the recurrence frequency values for the grid point that corresponds closest to the site's latitude and longitude.

(6) The SWC shall be determined by the shallowest level that is continuously saturated for the number of consecutive days during the January through April well monitoring period shown in Table VIII as follows:

TABLE VIII. Rainfall SPI and exceedance probability during monitoring season related to number of consecutive days of continuous saturation

April 15 SPI 120-day range	**Recurrence frequency range 120-day cumulative April 15 rainfall**	**Number of consecutive days of continuous saturation for SWC**
SPI -0.543 to 0	30% to 49.9% duration	3 days or 72 hours
SPI 0 to 0.545	50% to 69.9% duration	6 days or 144 hours
SPI 0.546 to 0.864	70% to 79.9% duration	9 days or 216 hours
SPI > 0.865	80% to 100% duration	14 days or 336 hours

(7) If monitoring well data is collected during monitoring periods that span multiple years, the year that yields the shallowest SWC shall apply.

(h) The modeling procedure may be used to determine SWC by using DRAINMOD, a groundwater simulation model, to predict daily water levels over a minimum 30-year period using site-specific input parameters as outlined in the DRAINMOD User's Guide. The SWC shall be determined as the shallowest level predicted by DRAINMOD to be saturated for a 14-day continuous period between January 1 and April 30 with a recurrence frequency of 30 percent, an average of a minimum of nine years in 30, and in accordance with the following:

(1) weather input files shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a minimum of a 30-year period from a measuring station site, such as the National Weather Service or SCO. The measuring station used shall be the station located closest to the owner's site;

(2) soil and site inputs for DRAINMOD shall include the following:

(A) soil input file with the soil moisture characteristic curve and data for the soil profile that is closest to the described soil profile that is present on the site;

(B) soil horizon depths determined on site;

(C) site measured or proposed drain depth and spacing, and drain outlet elevation;

(D) in-situ Ksat measurements for a minimum of three representative locations on the site and at each location for the three most representative soil horizons within five feet of the surface. In-situ Ksat measurements shall be for one representative soil horizon at or above redoximorphic depletion features and two representative soil horizons at and below redoximorphic concentration features at each location on the site;

(E) all other model parameters based upon the DRAINMOD User's Guide; and

(F) a sensitivity analysis shall be conducted for the following model parameters: soil input files for a minimum of two other most closely related soil profiles; in-situ Ksat of each horizon; drain depth and spacing; and surface storage and depth of surface flow inputs.

The sensitivity analysis shall be used to evaluate the range of soil and site characteristics for choosing input parameters related to the soil profiles, Ksat input values based upon the range of in-situ Ksat values measured on the site, and inputs for surface and subsurface drainage features based upon the range of possible elevations and distances that occur or may occur after installation of improvements. The sensitivity analysis shall establish which parameters are most critical for determination of the depth to SWC. Conservative values for the most critical parameters shall be used in applying the model to the site;

(3) for sites designed to receive over 600 gpd, the SWC determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface; and

(4) the groundwater simulation analysis shall be prepared and submitted to the LHD by licensed professionals, if required in G.S. 89C, 89E, or 89F, qualified to use DRAINMOD by training and experience. The LHD shall submit the groundwater simulation analysis to the Department for technical review prior to approval of the SWC determination.

(i) The monitoring and modeling procedure is a combination of the direct monitoring procedure and the modeling procedure. The SWC shall be determined as the shallowest level predicted by DRAINMOD to be saturated for a 14-day continuous period between January 1 and April 30 with a recurrence frequency of 30 percent, an average of a minimum of nine years in 30, and in accordance with the following:

(1) the procedures set forth in Paragraph (g) shall be used to monitor water surface elevation and precipitation. The rain gauges and monitoring wells required by Subparagraph (g)(4) shall use a recording device and a data file that is DRAINMOD compatible. The recording devices shall record rainfall hourly or daily and well water levels daily. The data file shall be submitted with the report to the LHD;

(2) DRAINMOD shall be used to predict daily water levels. The DRAINMOD modeling shall be in accordance with the following:

(A) weather input files shall be developed from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from a measuring station, such as the National Weather Service or SCO. The measuring station used shall be the station located closest to the site. Daily maximum and minimum temperature data for the December 1 through April 30 monitoring period shall be obtained from the closest available weather station;

(B) soil and site inputs for DRAINMOD, including a soils data file closest to the soil series identified, depths of soil horizons, in-situ Ksat of each horizon, depth and spacing of drainage features, and depression storage shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide;

(C) inputs shall be based upon site-specific soil profile descriptions. Soil and site input factors shall be adjusted during the model calibration process to achieve the best possible fit as indicated by the least squares analysis of the daily observations over the whole monitoring period and to achieve the best possible match between the shallowest water table depth during the monitoring period that is saturated for 14 consecutive days, measured vs. predicted. The mean absolute deviation between measured and predicted values shall be no greater than six inches during the monitoring period;

(D) for sites intended to receive greater than 1,500 gpd, the SWC determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface; and

(E) the DRAINMOD analysis shall be prepared and submitted to the LHD by licensed professionals, if required in G.S. 89C, 89E, or 89F, qualified to use DRAINMOD by training and experience. The LHD or owner may request a technical review by the Department prior to approval of the SWC determination.

The monitoring and modeling procedure may also be used to re-evaluate a SWC that was previously evaluated by the direct monitoring procedure.

(j) Modeling procedures other than those set forth in this Rule may be used to determine SWC upon approval by the Department. Other modeling procedures shall be approved if the following requirements are met:

(1) the modeling procedures use daily water levels or weather records over a 30-year period to predict future daily water levels;

(2) the proposed model and prediction are shown to be as accurate as the prediction from DRAINMOD, calculated in accordance with Paragraph (h) of this Rule; and

(3) documentation is provided in accordance with Rule .0509(c) of this Section.

(k) A report of the investigations made for the direct monitoring procedure, modeling procedure, or monitoring and modeling procedure in accordance with Paragraphs (g), (h), or (i) of this Rule shall be prepared prior to approval of the SWC determination. A request for technical review of the report by the Department shall include digital copies of monitoring data, model inputs, output data, and graphic results, as applicable.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0505 is proposed for adoption as follows:

15A NCAC 18E .0505 SOIL DEPTH

(a) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

(b) Soil depth to saprolite, rock, or parent material greater than or equal to 18 inches shall be suitable.

(c) Soil depth to saprolite, rock, or parent material less than 18 inches shall be unsuitable.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0506 is proposed for adoption as follows:

15A NCAC 18E .0506 SAPROLITE

(a) Sites classified unsuitable due to depth to saprolite or other LC may be reclassified suitable in accordance with this Rule.

(b) Sites with saprolite shall be classified as suitable if an investigation of the site using pits at locations approved by the authorized agent confirms that the following conditions are met:

(1) a 24-inch minimum vertical separation shall be maintained in saprolite from the infiltrative surface to an unsuitable LC, unless any of the vertical separation consists of a suitable soil horizon, in which case, the 24-inch separation may be calculated based on one inch of suitable soil being equivalent to two inches of saprolite; and

(2) the following physical properties and characteristics shall be present in the saprolite below the proposed infiltrative surface:

(A) the saprolite texture as determined in the field by hand texturing samples of each horizon shall be sand, loamy sand, sandy loam, loam, or silt loam;

(B) the clay mineralogy shall be suitable in accordance with Rule .0503(3) of this Section;

(C) greater than two-thirds of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

(D) the saprolite wet consistence shall be nonsticky or slightly sticky and nonplastic or slightly plastic;

(E) the saprolite shall be in an undisturbed, naturally occurring state;

(F) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock; and

(G) laboratory determinations may be used to supplement field determinations. Split samples shall be made available to the LHD.

History Note: Authority G.S. 130A-335(e); S.L. 2015-147, s.3;

15A NCAC 18E .0507 is proposed for adoption as follows:

15A NCAC 18E .0507 RESTRICTIVE HORIZONS

(a) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than or equal to 18 inches below the naturally occurring soil surface shall be suitable.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths less than 18 inches below the naturally occurring soil surface shall be unsuitable.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0508 is proposed for adoption as follows:

15A NCAC 18E .0508 AVAILABLE SPACE

(a) Sites shall have available space to allow for the installation of the initial wastewater system and repair area for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. The available space provided shall meet all required setbacks in Sections .0600 or .1200 of the Subchapter and provide access to the wastewater system for operation and maintenance activities. A site with sufficient available space shall be suitable.

(b) If the site does not have available space for both an initial wastewater system and repair area it shall be unsuitable.

(c) The repair area requirement of Paragraph (a) of this Rule shall not apply to a lot or tract of land which meets the following:

(1) described in a recorded deed or a recorded plat on January 1, 1983;

(2) insufficient size to satisfy the repair area requirement of Paragraph (a) of this Rule, as determined by the authorized agent;

(3) DDF is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(4) the proposed facility will generate DSE.

(d) Although a lot or tract of land may be exempt from the repair area requirement under Paragraph (c) of this Rule, the authorized agent shall determine if there is any available space for the repair area. The authorized agent shall determine the maximum feasible repair area available, and that repair area shall be specified on the IP, CA, and OP.

(e) If a site meets any of the following criteria, a repair area shall be required, even if the site is exempt from the repair area requirement of Paragraph (c) of this Rule:

(1) proposed increase in flow or wastewater strength to an existing facility permitted under the exemption of Paragraph (c) of this Rule; or

(2) any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Paragraph (c) of this Rule was previously utilized.

(f) Notwithstanding the criteria for when a repair area is required in accordance with Paragraph (e) of this Rule, a site shall remain exempt from the repair area requirements of Paragraph (a) of this Rule when all of the following conditions are met:

(1) an owner submits an application to the LHD for an increase in flow to an existing facility permitted in accordance with Paragraph (c) of this Rule and the facility DDF remains less than or equal to 480 gpd of DSE;

(2) there is sufficient available space for the existing system to be modified pursuant to the Rules of this Subchapter;

(3) the site for the existing system complies with the Rules of this Subchapter and the existing system is not malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter; and

(4) the conditions set forth in Paragraph (d) of this Rule are met.

(g) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to verify that initial and repair wastewater systems can be installed in the area delineated. The dispersal field may be installed level but off contour if an authorized agent has determined that there is sufficient vertical separation to a LC along the entire trench length in accordance with Rule .0901(g)(2) of this Subchapter.

(h) The initial and repair area shall not be altered so that the wastewater system specified on the IP, CA, and OP cannot be installed and function as permitted.

History Note: *Authority G.S. 130A-335(e) and (f); S.L. 2015-147, s.1;*

15A NCAC 18E .0509 is proposed for adoption as follows:

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) A site evaluated in accordance with Rules .0502 through .0508 of this Section with all parameters determined as suitable shall result in an overall site classification of suitable. Any parameter determined as unsuitable shall result in an overall site classification of unsuitable.

(b) Sites classified as unsuitable may be reclassified as suitable as follows:

(1) when site modifications are made that meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation to the SWC;

(2) if installation of an interceptor drain will intercept and divert lateral water to prevent saturation of the wastewater system;

(3) with the use of advanced pretreatment based on the modified siting and sizing criteria in Section .1200 of this Subchapter; or

(4) with the use of a wastewater system identified or approved in Sections .0900 or .1700 of this Subchapter

(c) For sites that are classified as unsuitable in accordance with this Rule, a special site evaluation in accordance with Rule .0510 of this Section may be provided that demonstrates that the proposed wastewater system can be expected to overcome the unsuitable site conditions and function in accordance with this Subchapter.

(d) An IP shall not be issued for a site which is classified unsuitable.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0510 is proposed for adoption as follows:

15A NCAC 18E .0510 SPECIAL SITE EVALUATIONS

(a) A special site evaluation shall demonstrate that the proposed use of the site with a specific wastewater system design and configuration will not result in effluent discharge to the ground surface or contravention of groundwater or surface water standards. Special site evaluations shall be performed by a licensed professional, if required in G.S. 89C, 89E, or 89F.

(b) The owner may submit a special site evaluation for a site classified as unsuitable as set forth in Rule .0509 of this Section to an authorized agent. The special site evaluation shall include written documentation and demonstrate that the proposed wastewater system can be expected to overcome the unsuitable site conditions and function in accordance with this Subchapter.

(c) Any site that is proposed with one or more of the following shall require a special site evaluation:

(1) proposal submitted in accordance with Rule .0509(c) of this Section;

(2) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the DDF is greater than 600 gpd, or when the texture of the receiving permeable horizon is silt loam;

(3) DSE drip dispersal systems meeting the following soil and site conditions:

(A) depth from the naturally occurring soil surface to any LC is greater than or equal to 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.35 gpd/ft^2 for Group II, or 0.2 gpd/ft^2 for Group III soils;

(B) depth from the naturally occurring soil surface to any SWC is less than 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.3 gpd/ft^2 for Group II, or 0.15 gpd/ft^2 for Group III soils;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.05 gpd/ft^2;

(D) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and the depth from the naturally occurring soil surface to any LC is less than 24 inches;

(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and the driplines are installed in new fill material;

(F) groundwater lowering system is used to comply with soil depth and vertical separation requirements to a SWC;

(G) proposed LTAR exceeds that assigned by the LHD; or

(H) DDF is greater than 1,500 gpd;

(4) advanced pretreatment systems meeting the following soil and site conditions:

(A) vertical separation to a LC is proposed to be reduced. The vertical separation to rock or tidal water shall not be reduced to less than 12 inches;

(B) less than 18 inches of naturally occurring soil to a LC, excluding SWC;

(C) increased LTAR is proposed for a site with Group III or IV soils within three feet of the infiltrative surface;

(D) increased LTAR is proposed for a site with Group II or III soils that requires a groundwater lowering system;

(E) proposed use of a groundwater lowering system to comply with vertical separation requirements to a SWC;

(F) bed systems located beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent except in Group I soils with a SWC greater than 36 inches;

(G) bed systems with a DDF greater than 1,500 gpd; or

(H) increased LTAR is proposed on a site with a DDF greater than 1,500 gpd;

(5) drip dispersal systems and Group IV soils are within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.1 gpd/ft^2 for NSF-40, 0.12 gpd/ft^2 for TS-I, or 0.15 gpd/ft^2 for TS-II;

(6) NSF-40 and drip dispersal systems when the LTAR is proposed to exceed 0.8 gpd/ft^2 for Group I soils, 0.5 gpd/ft^2 for Group II soils, 0.25 gpd/ft^2 for Group III soils, or 0.1 gpd/ft^2 for Group IV soils;

(7) TS-I and drip dispersal systems which meet the following criteria:

(A) site has less than 18 inches of naturally occurring soil to any unsuitable LC;

(B) Group III soils are present and a groundwater lowering system is used to comply with the vertical separation requirements to a SWC;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface, the LTAR is proposed to exceed 0.05 gpd/ft^2, and the system is proposed to be installed in new fill; or

(D) LTAR is proposed to exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.3 gpd/ft^2 for Group III soils, or 0.12 gpd/ft^2 for Group IV soils;

(8) TS-II and drip dispersal systems which meet the following criteria:

(A) Subparagraphs (7)(A), (B), or (C) of this Rule; or

(B) LTAR is proposed to exceed 1.2 gpd/ft^2 for Group I soils, 0.7 gpd/ft^2 for Group II soils, 0.4 gpd/ft^2 for Group III soils, or 0.15 gpd/ft^2 for Group IV soils;

(9) site-specific nitrogen migration analysis is required to verify that the nitrate-nitrogen concentration at the property line will not exceed groundwater standards;

(10) LHD or Department determines that the combination of soil conditions, site topography and landscape position, DDF, system layout, and proposed stormwater appurtenances will potentially result in hydraulic overload; or

(11) DDF greater than 3,000 gpd, unless the requirements of Rule .0302(f) of this Subchapter are met.

(d) The special site evaluation shall include hydrologic or hydraulic testing, as applicable, and analysis, in accordance with Rule .0304(2)(B) of this Subchapter.

(e) For wastewater systems with a DDF greater than 3,000 gpd, the special site evaluation shall include sufficient site-specific data to predict the height of the water table mound that will develop beneath the field on level sites and the rate of lateral and vertical flow away from the trenches on sloping sites, unless the conditions in Paragraph (f) of this Rule are met. The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the Department, such as the impact of projected wastewater constituents on the trench and receiving soil. The site shall be considered unsuitable if the data indicate any of the following:

(1) the groundwater mound that will develop beneath the site cannot be maintained two feet or more below the bottom of the trenches;

(2) effluent is likely to become exposed on the ground surface; or

(3) contaminant transport analysis indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

(f) For wastewater systems with a DDF greater than 3,000 gpd and dispersal fields designed for less than or equal to 1,500 gpd, in-situ Ksat measurements and groundwater mounding or lateral flow analysis shall not be required if a special site evaluation demonstrates that the dispersal fields are in separate lateral flow windows or are shown to not be hydraulically connected.

(g) The Department shall review the special site evaluation if requested by the LHD or if required in accordance with Rule .0302(h) of this Subchapter.

History Note: *Authority G.S. 89E; 89F; 130A-335(a1), (e), and (f);*

15A NCAC 18E .0601 is proposed for adoption as follows:

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured on the ground surface, unless otherwise specified in this Rule, from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA Approval.

TABLE IX. Minimum setbacks from all wastewater systems to site features

Site Features	Setback in feet
Any transient or non-transient non-community water supply well, community well, shared water supply well, well that complies with 15A NCAC 18A .1700, or water supply spring	100
A private drinking water well or upslope spring serving a single family dwelling unit	50
Any other well or source not listed in this table, excluding monitoring wells	50
Surface waters classified WS-I, from ordinary high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal water level	100
Lake or pond, from normal water level	50

Any other stream, non-water supply spring, or other surface waters, from the ordinary high-water mark	50
Tidal influenced waters, such as marshes and coastal waters, from mean high-water mark	50
Permanent stormwater retention basin, from normal water level	50
Any water line, unless the requirements of Paragraph (i) have been met	10
Closed loop geothermal wells	15
Building foundation and deck supports	5
Patio, porch, stoop, lighting fixtures, or signage, including supporting structures such as posts or pilings	1
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	10
Above ground swimming pool and appurtenances that require a building permit	5
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 50 percent	15
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 33 percent and less than or equal to 50 percent	15
	0, if the site has suitable soil depth that extends for a minimum horizontal distance of 15 feet from the edge of the dispersal field
Top of slope of embankment or cuts of two feet or more vertical height with a slope less than 33 percent	0
Groundwater lowering system, as measured on the ground surface from the edge of the feature	25
Downslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	15
Upslope and sideslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	10
A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	10
Bio-retention area, injection well, infiltration system, or dry pond	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	10
Above ground storage tank from dripline or foundation pad, whichever is more limiting	5
Utility transmission and distribution line poles and towers, including guy wires, unless a greater setback is required by the utility company	5
Utility transformer, ground-surface mounted	5
Underground utilities	5

(b) Wastewater systems may be located closer than 100 feet but never less than 50 feet from water supply wells or an upslope spring for repairs, space limitations, and other site-planning considerations when one of the following conditions is met:

(1) the well was constructed prior to July 1, 1993, in accordance with 15A NCAC 18A .1720; or

(2) a variance for a reduced well setback has been issued in accordance with one of the following:
(A) 15A NCAC 02C .0118 for a shared water supply well, a wastewater system permitted or installed in saprolite, or for a transient non-community public water supply well; or
(B) 15A NCAC 18C .0203(b) for a non-transient non-community public water system.

(c) Wastewater systems shall not be located closer than 100 feet to springs, uncased wells, and ungrouted wells used as a source of drinking water and located downslope from the dispersal field.

(d) Underground utilities maintain a five-foot setback and shall not encroach on the wastewater system and repair area.

(e) The reduced setbacks in Table X shall apply to septic tanks and pump tanks if a leak test has been performed at the job site on the septic tank and pump tank in accordance with Rule .0805 of this Subchapter that verifies the tank, pipe penetrations, and riser connections are watertight.

TABLE X. Reduced setbacks for tanks to some site features

Site Features	**Setback in feet**
Permanent stormwater retention basin, from normal water level	35
Bio-retention area, injection well, infiltration system, or dry pond	15
Groundwater lowering system, as measured on the ground surface from the edge of the feature	15
Any water line	5
A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	5

(f) No minimum setback shall be required from a well that has been permanently abandoned in accordance with 15A NCAC 02C .0113 and for which a record of abandonment has been submitted in accordance with 15A NCAC 02C .0114.

(g) Initial and repair dispersal field systems shall not be located under impervious surfaces or areas subject to vehicular traffic unless approved in accordance with G.S. 130A-343 and Section .1700 of this Subchapter.

(h) If a collection sewer is installed under areas subject to vehicular traffic or areas subject to soil disturbance or compaction, one of the following pipe materials shall be used:
(1) DIP;
(2) a minimum of Schedule 40 PVC, Polyethylene, or ABS pipe sleeved in DIP;
(3) a minimum of Schedule 40 PVC, Polyethylene, or ABS pipe sleeved in DOT traffic rated culvert pipe;
(4) a minimum of Schedule 40 PVC, Polyethylene, or ABS pipe with 30 inches of compacted material provided over the crown of the pipe; or
(5) other pipe materials may be proposed when designed, inspected, and certified by a PE and approved by the LHD.

(i) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed DDF greater than 3,000 gpd, as determined in Rule .0401 of this Subchapter, shall be located the minimum setbacks from the site features in Table XI.

TABLE XI. Minimum setbacks from wastewater systems greater than 3,000 gpd to site features

Feature	Setback in feet
Any Class I or II reservoir or any public water supply source utilizing a shallow, under 50 feet, groundwater aquifer, from feature or normal water level	500
Any other public water supply source, unless a confined aquifer	200
Any private drinking water well or upslope spring, unless a confined aquifer	100
Surface water classified WS- I, from ordinary high-water mark	200
Surface waters classified WS-II, WS-III, B, or SB, from mean high-water mark or ordinary high-water mark	100
Waters classified SA, from mean high-water mark	200
Any property line	25

(j) Wastewater systems with a DDF greater than 3,000 gpd that meet the requirements of Rule .0510(f) of this Subchapter may use the setbacks identified in Table IX of this Rule.

(k) Collection sewers shall be located the minimum setbacks to site features shown in Table IX, unless a different minimum setback is specified in Table XII. When a reduced setback to a collection sewer is utilized, the piping requirements for the reduced setback shall be extended to comply with the unreduced setback.

TABLE XII. Minimum setbacks from collection sewers to site features

Feature	Setback in feet
Any public water supply source, including wells, springs, and Class I or Class II reservoirs, from feature or normal water level	100
	50, if constructed of or sleeved in Schedule 80 PVC or DIP with mechanical joints equivalent to water main standards, and the collection sewer is leak tested and shown to be watertight*
Any water supply well excluding those regulated under 15A NCAC 18C	50
	25, if constructed of Schedule 40 pressure rated PVC or DIP with mechanical joints equivalent to water main standards, and the collection sewer is leak tested and shown to be watertight*
	15, if constructed of Schedule 80 PVC, sleeved in DIP or Schedule 80 PVC, and the collection sewer is leak tested and shown to be watertight*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from mean high-water mark or ordinary high-water mark	50
	10, if constructed of or sleeved in Schedule 80 PVC or DIP with mechanical joints equivalent to water main standards, and the collection sewer is leak tested and shown to be watertight*
Any other stream, non-water supply spring, or other surface waters, from the ordinary high-water mark	10
Tidal influenced waters, such as marshes and coastal waters, from mean high-water mark	10
Closed loop geothermal wells	5
Any service connection as defined in 15A NCAC 18C .0102(c)(21)	5

Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height with a slope greater than 50 percent	5
Interceptor drains and surface water diversions, with a vertical cut of more than two feet as measured on the ground surface from the edge of the diversion	5
Permanent stormwater retention basin, from normal water level	10
Bio-retention area, injection well, infiltration system, or dry pond	5
Any other dispersal field, except designated dispersal field repair area for project site	5
Any property line	5
Burial plot or graveyard boundary	5

*Pipe materials other than DIP, Schedule 40 pressure rated PVC, or Schedule 80 PVC shall be acceptable when the materials conform to materials, testing methods, and acceptability standards meeting water main standards and when the line has been designed, installed, inspected, and certified by a PE and approved by the LHD.

(l) The minimum setback from water lines to collection sewers shall be 10 feet, except as follows:

(1) the water line is laid in a separate trench with the elevation of the bottom of the water line 18 inches above the top of the collection sewer; or

(2) the water line is laid in the same trench as the collection sewer with the water line located on one side of the trench, on a bench of undisturbed earth and with the elevation of the bottom of the water line 18 inches above the top of the collection sewer. The collection sewer shall be located the width of the trench from the water line.

(m) Collection sewers and water lines shall not cross, except as follows:

(1) 18 inches clear vertical separation is maintained, with the collection sewer crossing under the water line; or

(2) the water line crosses under the collection sewer or 18 inches clear vertical separation is not maintained and the following criteria are met:

(A) the collection sewer is constructed of DIP with joints equivalent to water main standards and extends 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

(B) the water line is constructed of ferrous materials with joints equivalent to water main standards and extends a minimum of 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(n) Collection sewers shall not cross storm drains, except as follows:

(1) 12 inches clear vertical separation is maintained between the collection sewer and storm drain;

(2) the collection sewer is constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards; or

(3) the collection sewer is encased in concrete or DIP for a minimum of five feet on either side of the crossing.

(o) Collection sewers shall not cross under a stream, except as follows:

(1) a minimum of 36 inches of separation from the stream bottom is maintained;

(2) the collection sewer is constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards; or

(3) the collection sewer is encased in concrete or DIP for a minimum of 10 feet on either side of the crossing and protected against the normal range of high and low water conditions, including the 100-year flood or wave action.

(p) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards and freeze protected. Pipe shall be anchored for a minimum of 10 feet on either side of the crossing.
(q) If septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems are located in areas subject to flooding at a frequency greater than a 10-year storm, they shall be designed and installed to be watertight and to remain operable during all flooding events.

History Note: *Authority G.S. 130A-334; 130A-335(e) and (f); S.L. 2019-215, s.2;*

15A NCAC 18E .0602 is proposed for adoption as follows:

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS
(a) The minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, and cuts of two feet or more vertical height, shall not apply to the installation of a single wastewater system serving a single-family residence with a maximum DDF of 480 gpd on a lot or tract of land that meets the following requirements:

(1) on July 1, 1977, is described in a deed, contract, other instrument conveying fee title, or in a recorded plat;
(2) is of insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, and cuts of two feet or more vertical height of this Section on July 1, 1977; and
(3) cannot be served by a community or public sewerage system on the date system construction is proposed to begin.

(b) For those lots or tracts of land described in Paragraph (a) of this Rule, the maximum feasible setback shall be required, but shall not be less than the minimum setbacks in Table XIII.

TABLE XIII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	**Minimum setback in feet**
SA waters from mean high-water mark	50
Basement	8
Property line	5
Cuts of two feet or more vertical height	5

(c) For wastewater systems installed in Group I soils on lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, the wastewater system shall be located the maximum feasible distance but no less than 10 feet from any other wastewater system.
(d) For wastewater systems installed on lots or tracts of land which, on July 1, 1982, are specifically described in a deed or recorded plat, and the wastewater system cannot meet the minimum setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems, the wastewater system shall be located the maximum feasible horizontal distance but no less than 10 feet from the groundwater lowering system.
(e) Any local board of health ordinances in effect on June 30, 1977, which establish greater minimum setback requirements than those provided for in this Section, shall remain in effect and shall apply to a lot or tract of land to which Table IX of Rule .0601(a) of this Section does not apply.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .0701 is proposed for adoption as follows:

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, SEPTIC TANK EFFLUENT PUMP SYSTEMS, AND PIPE MATERIALS

15A NCAC 18E .0701 COLLECTION SEWERS

(a) Collection sewers shall be designed and constructed in accordance with the following criteria:

(1) Building drains and building sewers shall be in accordance with the North Carolina Plumbing Code and approved by the local building inspector.

(2) Pipe material shall be specified to comply with the applicable ASTM standards based on pipe material.

(3) Gravity sewers shall be designed to maintain minimum scour velocities of two feet per second with the pipe half full and one foot per second at the peak projected instantaneous flow rate. Force mains shall be sized to obtain a minimum two-foot per second scour velocity at the projected pump operating flow rate.

(4) Infiltration and exfiltration shall not exceed 100 gpd per inch diameter per mile of gravity sewer pipe or 20 gpd per inch diameter per mile of pressure pipe in force mains and supply lines.

(5) Collection sewers shall be buried three feet deep, except as provided for in Rule .0601(h)(4) of this Subchapter.

(6) Ferrous material pipe or other pipe designed and bedded for traffic-bearing loads shall be provided where collection sewers are subject to vehicular traffic.

(7) Manholes shall be used for gravity collection sewers at any bend, junction, and a maximum of every 425 feet along the collection sewer. Drop manholes shall be required where the inlet to outlet elevation difference exceeds two and one half feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water system source, or within 50 feet of any private water system source or any surface waters classified WS-I, WS-II, WS-III, SA, SB, or B.

(8) Cleanouts may be used instead of manholes for four-inch and six-inch sewers serving one or two design units, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts shall be required a maximum of every 100 feet for four or six-inch sewers and at all junctions and bends which exceed 45 degrees, unless otherwise allowed by the North Carolina Plumbing Code.

(9) Air relief valves shall be provided as needed for force mains when the length exceeds 1,000 feet or for intermediate high points that exceed five feet.

(10) Collection sewers may require additional ventilation provisions, such as a stand pipe, based on length, size, and location.

(b) STEP systems may be used as an alternative to gravity collection sewers.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0702 is proposed for adoption as follows:

15A NCAC 18E .0702 RAW SEWAGE LIFT STATIONS

(a) Raw sewage lift stations permitted by the LHD shall meet all setbacks for wastewater systems in accordance with Table IX of Rule .0601(a) of this Subchapter.

(b) Raw sewage lift stations shall meet the following design and construction standards:

(1) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;

(2) pumps shall be listed by a third-party electrical testing and listing agency, such as Underwriter's Laboratories;
(3) pumps shall be grinder pumps or solids-handling pumps capable of handling a minimum of three-inch spheres. If the raw sewage lift station serves no more than a single water closet, lavatory, and shower, two-inch solids handling pumps shall be acceptable;
(4) minimum pump capacity shall be two and one half times the average daily flow;
(5) raw sewage lift stations serving single buildings shall be designed for pump run times between three to 10 minutes at average daily flow;
(6) pump station emergency storage capacity and total liquid capacity shall be determined in accordance with Rule .0802 of this Subchapter except for a sealed, watertight chamber serving an individual building, in which case a minimum storage capacity of eight hours shall be required; and
(7) all applicable requirements for pump tanks and dosing systems as set forth in Rule .0802 and Section .1100 of this Subchapter shall apply to raw sewage lift stations.

(c) A raw sewage lift station that is a sealed, watertight chamber shall meet the setback requirements for collection sewers in Rule .0601(h) of this Subchapter. Sealed, watertight chambers shall be a single prefabricated unit with a sealed top lid, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0703 is proposed for adoption as follows:

15A NCAC 18E .0703 PIPE MATERIALS

(a) The gravity pipe between a septic tank, gravity distribution device, and the dispersal field shall be a minimum of three-inch Schedule 40 PVC, Schedule 40 polyethylene, or Schedule 40 ABS.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241, PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034, or alternative non-perforated pipe materials described in Paragraph (d) of this Rule, may be substituted for Schedule 40 between the distribution device and the dispersal field when the following minimum installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface free of indentations or clods at a uniform grade, and with an excavation width of one foot;
(2) the pipe is placed in the middle of the excavation with three inches of clearance between the pipe and the walls;
(3) a washed gravel or crushed stone envelope is placed in the excavation on both sides of the pipe and to a point two inches above the top of the pipe;
(4) six inches of soil is placed and compacted over the stone or gravel envelope; and
(5) earthen dams consisting of two feet of undisturbed or compacted soil are located at both ends of the excavation separating the trench from the distribution device.

(c) All pipe joints from the septic tank to the dispersal field shall be watertight. Solvent cement-joints shall be made in a two-step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D2564.

(d) Pipe used for gravity distribution laterals shall be corrugated plastic tubing complying with ASTM F667 or smooth-wall plastic pipe complying with ASTM D2729 or ASTM F810. The pipe shall be marked as complying with ASTM standards. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between one-half inch and three-fourths inches in diameter and spaced longitudinally approximately four inches on centers. The rows of holes may be equally spaced 120 degrees on centers around the pipe periphery, or three rows may be located in the lower portion of the tubing, the outside rows being approximately on 120-degree centers. The holes may be located in the same corrugation or staggered in adjacent corrugations. Other types of pipe may be used for laterals provided the pipe satisfies the requirements of this Rule and is approved by the Department.

(e) Pump discharge piping, including the force main to the next component in the wastewater system, shall be of Schedule 40 PVC or stronger material and pressure rated for water service at a minimum of 160 psi or two times the maximum operating pressure, whichever is greater. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(f) Pipe materials other than those identified in this Rule may be proposed when designed and certified by a PE, including any installation and testing procedures. Gravity pipe materials shall be shown to comply with the requirements of Paragraphs (a), (b), and (c) of this Rule. Alternative pressure rated pipe materials shall be constructed of PVC, polyethylene, or other pressure rated pipe and conform to applicable ASTM standards for pipe material and methods of joining. The proposed pipe shall be installed per ASTM D2774. Installation testing shall include a hydrostatic pressure test similar to pressure testing required for water mains for any line exceeding 500 feet in length and shall comply with the requirements of Rule .0701(a)(4) of this Section.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0801 is proposed for adoption as follows:

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 SEPTIC TANK CAPACITY REQUIREMENTS

(a) Minimum liquid capacities for septic tanks shall be in accordance with the following:

(1) The minimum capacity of any septic tank shall be 1,000 gallons unless otherwise provided for in this Rule.

(2) The minimum capacity of any septic tank serving an individual dwelling unit with five bedrooms or less shall be sized as set forth in Table XIV.

TABLE XIV. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	**Minimum liquid capacity in gallons**
4 or less	1,000
5	1,250

(3) Septic tanks for dwelling units greater than five bedrooms, multiple dwelling units, places of business, or places of public assembly shall be sized in accordance with Table XV.

(4) The minimum septic tank capacity serving two or more dwelling units shall be 1,500 gallons.

TABLE XV. Septic tank capacity for facilities not listed in Table XIV

Design daily flow in gpd (Q)	**Minimum septic tank liquid capacity (V) calculation in gallons**
$Q \leq 600$	$V = 2Q$
$600 < Q < 1,500$	$V = 1.17Q + 500$
$1,500 \leq Q \leq 4,500$	$V = 0.75Q + 1,125$
$Q > 4,500$	$V = Q$

(5) Septic tanks for RWTS and PIA Systems shall be sized in accordance with the RWTS or PIA Approval, pursuant to Sections .1500 and .1700 of this Subchapter.

(b) The minimum liquid capacity requirements of Paragraph (a) of this Rule shall be met by use of a single two compartment tank or by two tanks installed in series. The tanks in series may be constructed with or without a baffle wall. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity as set forth in this Rule shall be doubled. The minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments. The minimum liquid capacity of each tank shall be 1,000 gallons.

(d) The Department shall review other septic tanks designed to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE to ensure that effluent discharged from the septic tank meets DSE as set forth in Table III of Rule .0402(a) of this Subchapter.

(e) An effluent filter approved in accordance with Rule .1404 of this Subchapter shall be in the outlet of the final compartment of the septic tank.
(f) When two or more tanks are used in series in accordance with Paragraphs (b) or (c) of this Rule, the following conditions shall be met:

(1) the outlet of the initial tank shall consist of an outlet sanitary tee extending down 25 to 50 percent of the liquid depth; and
(2) an approved effluent filter shall be in the outlet of the final compartment.

History Note: *Authority G.S. 130A-334; 130A-335(e), (f), and (f1);*

15A NCAC 18E .0802 is proposed for adoption as follows:

15A NCAC 18E .0802 PUMP TANK CAPACITY REQUIREMENTS

(a) The minimum pump tank liquid capacity shall be greater than or equal to the required septic tank liquid capacity as set forth in Rule .0801 of this Section.
(b) For a flow equalization system, the minimum pump tank capacity shall be based upon the sum of the volumes of the parameters below:

(1) volume is sufficient to ensure pump submergence or as recommended by the pump manufacturer;
(2) minimum dose volume in accordance with Rule .1101(d) of this Subchapter;
(3) flow equalization storage; and
(4) emergency storage capacity in accordance with Paragraph (e) of this Rule.

(c) An alternate minimum pump tank liquid capacity may be proposed by the authorized designer or PE to the LHD based upon the sum of the volumes of the parameters below:

(1) volume is sufficient to ensure pump submergence or as recommended by the pump manufacturer;
(2) minimum dose volume in accordance with Rule .1101(d) of this Subchapter;
(3) flow equalization storage, if applicable; and
(4) emergency storage capacity in accordance with Paragraph (e) of this Rule.

(d) A PE may propose an alternative design to the LHD to calculate the minimum pump tank liquid capacity required. The alternative method shall provide documentation of pump submergence, dose volume capacity, emergency storage capacity, and flow equalization storage, as applicable. The LHD shall approve the alternative design upon a showing that all required storage capacity is accounted for in the wastewater system without reducing the required septic tank or grease tank capacities specified in Rules .0801 and .0803 of this Section.
(e) The pump tank emergency storage capacity requirement shall be determined based on the following criteria and Table XVI:

(1) type of facility served;
(2) classification of surface waters that would be impacted by a pump tank failure; and
(3) availability of standby power devices and emergency maintenance personnel.

TABLE XVI. Pump tank emergency storage capacity requirements

Facility Type	**Surface Water Classification of Watershed**	**Standby Power and Emergency Maintenance Personnel Provisions**	**Emergency Storage Capacity Period Requirement**
Residential systems and other systems in full time use	WS-I, WS-II, WS-III, SA, SB, and B waters	No standby power	24 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	12 hours
		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours
	All other surface waters or no surface waters	No standby power	12 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	8 hours

		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours
Non-residential systems not in full-time use and all other systems	All surface waters	No standby power	12 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	8 hours
		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours

(f) Telemetry shall be demonstrated to be operational to the authorized agent and the Management Entity prior to issuance of the OP.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0803 is proposed for adoption as follows:

15A NCAC 18E .0803 GREASE TANK CAPACITY REQUIREMENTS

(a) Grease tanks or grease tanks used with grease traps shall be required for food preparation facilities, food processing facilities, and meat markets; churches, institutions, and places of public assembly that include a full kitchen; and other facilities expected to generate FOG levels that are higher than DSE as defined in Table III of Rule .0402(a) of this Subchapter. The grease tank shall be plumbed to receive all wastes associated with food handling, preparation, and cleanup. No toilet wastes shall be discharged to a grease tank.

(b) The minimum grease tank liquid capacity shall be 1,000 gallons or as calculated by one of the following, whichever is greater:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity calculated in accordance with Rule .0801 of this Section; or

(3) equal to the capacity as determined in accordance with the following:

GLC = D x GL x ST x HR/2 x LF

Where GLC = grease tank liquid capacity, in gallons

D = number of seats in dining area

GL = gallons of wastewater per meal: 1.5 single-service or 2.5 multiuse

ST = storage capacity factor = 2.5

HR = number of hours open

LF = loading factor: 1.25 if along an interstate highway; 1.0 if along US Highway or recreational areas; or 0.8 if along other roads

(c) When the required minimum grease tank capacity for a facility is less than or equal to 1,500 gallons, the grease tank may be a single tank with two compartments and a minimum 2:1 length to width ratio.

(d) When the required minimum grease tank capacity for a facility is greater than 1,500 gallons, the grease tank shall have a minimum 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. When this requirement is met by having two or more tanks in series, each tank in the series shall have a minimum liquid capacity of 1,000 gallons and a minimum 2:1 length to width ratio.

(e) A grease rated effluent filter approved in accordance with Rule .1404 of this Subchapter shall be in the final compartment of the grease tank.

(f) When two or more grease tanks are used in series in accordance with Paragraph (d) of this Rule, the following conditions shall be met:

(1) an approved grease rated effluent filter shall be in the final compartment; and

(2) the outlet of the initial tank shall consist of a sanitary tee extending down 40 to 60 percent of the liquid depth.

(g) The grease tank liquid capacity requirements set forth in this Rule may be reduced by up to 50 percent when used in conjunction with a grease trap located inside the facility. The system shall be designed by a PE, if required by G.S. 89C, and approved by the Department when review of documentation provided by the PE and manufacturer demonstrate that the grease trap is projected to reduce FOG concentration by at least 50 percent.

(h) Grease traps and grease tanks shall be maintained by a septage management firm permitted in accordance with G.S. 130A-291.1, and the contents disposed of in accordance with 15A NCAC 13B .0800.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0804 is proposed for adoption as follows:

15A NCAC 18E .0804 SIPHON TANK CAPACITY REQUIREMENTS

Siphon tanks shall be sized to provide the minimum dose requirements of Rule .1101(d) of this Subchapter, plus three inches of freeboard above the siphon trip level.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0805 is proposed for adoption as follows:

15A NCAC 18E .0805 TANK LEAK TESTING AND INSTALLATION REQUIREMENTS

(a) All tanks installed under the following conditions shall be leak tested:

(1) when a SWC is present within four feet of the elevation of the top of a mid-seam pump tank;
(2) with advanced pretreatment when required in the RWTS or PIA Approval;
(3) when required in the approved plans and specifications for a wastewater system designed by a PE;
(4) when the tank is constructed in place; or
(5) as required by the authorized agent based upon site or system specific conditions, such as misaligned seams, exposed reinforcement, or damage observed that may have occurred during transport or installation.

(b) Tanks subject to leak testing in accordance with Paragraph (a) of this Rule shall be leak tested using either a hydrostatic test procedure or vacuum test procedure as follows:

(1) The operational procedures to be followed for the hydrostatic test are:

(A) Fill tank with water to the outlet invert or pipe, as applicable;

(B) Allow the tank to sit for one hour;

(C) Tank shall be approved if the water level drops less than or equal to one-eighth inch in one hour;

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions, refilled, and retested;

(E) Surface wetness or condensation shall not be considered an active water leak; and

(F) The tank manufacturer or installer is allowed one attempt to retest the tank before the authorized agent can turn down the tank for failure to pass the leak test.

(2) The operational procedures to be followed for the vacuum test are:

(A) Temporarily seal inlet and outlet pipes and access openings;

(B) Using calibrated equipment, draw a vacuum on the empty tank to a negative pressure of two and one half inches of mercury;

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank;

(D) No bracing or internal support that is not part of the approved tank shall be allowed;

(E) Tank shall be approved if the difference between the starting negative pressure and the ending negative pressure is less than or equal to one-fifth inch;

(F) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested;

(G) The tank manufacturer or installer is allowed one attempt to retest the tank before the authorized agent can turn down the tank for failure to pass the leak test; and

(H) All tank openings shall be un-sealed after the vacuum test is completed.

(c) Tanks unable to pass a leak test or be repaired to pass a leak test shall be removed from the site and the imprint described in Rule .1402(d)(15) or (e)(8) of this Subchapter marked over.

(d) The tank outlet pipe shall be inserted through the outlet pipe penetration boot, creating a watertight joint, and extending a minimum of two feet beyond the tank outlet.

(e) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703(b) of this Subchapter to prevent differential settling of the pipe. The pipe shall be level for a minimum of two feet after exiting the tank.

(f) The tank shall be installed level. A tank is considered level if the difference between the front and back is plus or minus one inch and the difference from side to side is plus or minus one inch. The tank excavation, bedding, backfill, and compaction shall be in accordance with the tank manufacturer's installation requirements and the tank approval.

(g) The tank excavation shall be separated from the dispersal system by at least two feet of undisturbed soil. Piping from the tank to the next component shall be placed on undisturbed soil, compacted soil, or bedded using sand, gravel, stone, or other aggregate.

(h) Effluent filters and risers shall be installed in accordance with the design and construction criteria of Rule .1402(b) and (c) of this Subchapter.

(i) Any system serving a facility with a DDF greater than 3,000 gpd shall have access manholes installed on the tank and extending at a minimum to finished grade. The access manholes shall be designed and maintained to prevent surface water inflow and sized to allow access for routine inspections, operation, and maintenance.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0901 is proposed for adoption as follows:

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 GENERAL DESIGN AND INSTALLATION CRITERIA FOR SUBSURFACE DISPERSAL SYSTEMS

(a) Wastewater systems shall be used on sites classified suitable in accordance with Rule .0509 of this Subchapter. The sizing and siting criteria in this Rule shall be based on soil receiving DSE. The site shall meet the following minimum criteria:

(1) 12 inches of naturally occurring soil between the infiltrative surface and any LC; and

(2) 18 inches of separation between the infiltrative surface and any SWC if more than six inches of separation consists of Group I soils.

(b) If any part of the trench or bed media extends above the naturally occurring soil surface, the system shall be a fill system and shall meet the requirements of Rule .0909 of this Section.

(c) The LTAR shall be determined in accordance with the following:

(1) Tables XVII and XVIII shall be used, as applicable;

(2) the LTAR shall be assigned based upon soil textural class or saprolite textural class, as applicable, structure, consistence, SWC, depth, percent coarse rock, landscape position, topography, and system type;

(3) LTARs determined from Table XVII shall be based on the soil textural class of the most limiting, naturally occurring soil horizon to a depth of 12 inches below the infiltrative surface or 18 inches to any SWC if more than six inches of the separation consists of Group I soils;

(4) LTARs determined from Table XVIII shall be based on the saprolite textural class of the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface, or less than 24 inches if combined with soil in accordance with Rule .0506(b) of this Subchapter; and

(5) for facilities that generate HSE as specified in Rule .0401(h) of this Subchapter or a facility with a full kitchen, the LTAR shall not exceed the mean rate for the applicable Soil Group.

TABLE XVII. LTAR for wastewater systems based on Soil Group and texture class

Soil Group	**USDA Soil Textural Class**		**LTAR in gpd/ft^2**
I	Sands	Sand	0.8 – 1.2
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.6 – 0.8
		Loam	
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.1 – 0.4
		Silty Clay	
		Clay	

TABLE XVIII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	**Saprolite Textural Class**		**LTAR in gpd/ft^2**
I	Sands	Sand	0.6 – 0.8
		Loamy Sand	0.5 – 0.7
II	Loams	Sandy Loam	0.4 – 0.6
		Loam	0.2 – 0.4
III	Fine Loams	Silt Loam	0.1 – 0.3
		Sandy Clay Loam*	0.05 – 0.15

* Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

(d) The minimum required infiltrative surface area and trench length shall be calculated in accordance with the following:

(1) the minimum required infiltrative surface area shall be calculated by dividing the DDF by the LTAR;

(2) the minimum trench length shall be calculated by dividing the minimum required infiltrative surface area by the equivalent trench width. The following equation shall be used to calculate the minimum trench length required:

TL = (DDF ÷ LTAR) ÷ ETW

Where TL = trench length, in feet
DDF = design daily flow, in gpd
LTAR = in gpd/ft^2
ETW = equivalent trench width, in feet;

(3) the area occupied by step-downs, drop boxes, and supply lines shall not be part of the minimum required infiltrative surface area;

(4) the total trench length required for trench products other than conventional gravel shall be as follows:

(A) for trench products identified in Section .0900 of this Subchapter, the minimum line length shall be calculated in accordance with this Section; or

(B) for trench products approved under Section .1700 of this Subchapter, the minimum line length shall be calculated in accordance with the PIA Approval; and

(5) when HSE is proposed to be discharged to a dispersal field with no advanced pretreatment or has not been reclassified as DSE in accordance with Rule .0402(c) of this Subchapter, a licensed professional, if required in G.S. 89C, 89E, or 89F, shall calculate the adjusted LTAR in accordance with Rule .0402(b)(2) of this Subchapter.

(e) Any dispersal field where cover is required above the naturally occurring soil surface shall not be installed on slopes greater than 30 percent.

(f) Soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches. On level sites, the final grade of the dispersal field shall be crowned at one-half percent grade as measured from the centerline of the dispersal field.

(g) Wastewater system installation shall be in accordance with the following criteria:

(1) a device that measures elevation, such as an engineer's level or laser level shall be used for the following:

(A) staking, flagging, or marking on the ground surface the location of trenches on site before installation begins;

(B) installation of the trenches; and

(C) verification of elevations, excavations, and installation of other system components;

(2) trenches shall be installed with 12 inches of naturally occurring suitable soil between the infiltrative surface and any unsuitable LC. If the vertical separation between the infiltrative surface and any SWC is less than 18 inches, and if more than six inches of the separation consists of Group I soils, a pressure dispersal system shall be required;

(3) the trenches shall follow the ground contour. Trenches may be installed level but off contour if an authorized agent has determined that there is sufficient vertical separation to a LC along the entire trench length in accordance with (g)(2) of this Paragraph;

(4) the lateral shall be centered horizontally in the trench;

(5) the type and placement of soil cover shall be approved by the authorized agent in accordance with this Subparagraph. The cover material shall be free of trash, debris, or large clods that do not break apart. The system can be installed utilizing native backfill unless otherwise specified in this Section or the PIA Approval:

(6) final soil cover over the dispersal field shall be a minimum of six inches deep after settling. The finished grade over the tanks and dispersal field shall be sloped to shed surface water;

(7) surface water runoff, including stormwater, gutter drains, or downspouts, shall be diverted away from the wastewater system. No depressions shall be allowed over the dispersal field area;

(8) Schedule 40 PVC or other pipe approved pursuant to Section .0700 of this Subchapter may be used as needed to connect sections of trench and overcome site limitations. The trench bottom area where solid piping is installed shall not be included as part of the minimum required infiltrative surface area;

(9) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be watertight, corrosion resistant, constructed to withstand active and passive loads, and their installation shall meet the following criteria:

(A) separated by a minimum of two feet of undisturbed soil from the septic tank and trench(es);

(B) placed level on a solid foundation of undisturbed soil, pea gravel, or concrete to prevent differential settling of the component; and

(C) backfilled by hand to minimize disturbance;

(10) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate to the authorized agent during the final inspection that the distribution devices perform as designed;

(11) serial and sequential distribution shall be approved by the authorized agent when the step-down or drop box in an individual trench is constructed to allow full utilization of the upstream trench prior to overflowing to the next downslope trench in accordance with the following criteria:

(A) step-downs shall be constructed of a minimum of two feet of undisturbed soil, bedding material, or concrete and the effluent shall be conveyed over the step-down through Schedule 40 PVC or other pipe approved in accordance with Rule .0703 of this Subchapter. The installer shall demonstrate that the step-downs perform as designed. The authorized agent shall approve the step-downs when the installation and elevations have been verified in accordance with the CA; or

(B) drop boxes shall be separated from the trench by a minimum of two feet of undisturbed soil and constructed to allow for full utilization of the upstream trench prior to overflowing to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed. The authorized agent shall approve the drop boxes when the installation and elevations have been verified in accordance with the CA; and

(12) trench products other than conventional gravel shall be installed as follows:

(A) for trench products identified in Section .0900, the trench products shall be installed in accordance with this Section; or

(B) for trench products approved under Section .1700 of this Subchapter, the trench products shall be installed in accordance with their PIA Approval.

(h) Alternating dual dispersal fields shall only be used with DSE in Soil Groups III and IV. Alternating dual dispersal fields shall be approved when designed and installed in accordance with Paragraph (g) of this Rule and the following:

(1) both initial and repair dispersal fields shall be installed at the same time;

(2) initial and repair dispersal fields of the same system type are each sized at a minimum of 75 percent of the total trench length required;

(3) the initial and repair dispersal fields shall be separated by an effluent flow diversion valve(s);

(4) diversion valve(s) shall be resistant to 500 pounds crushing strength and corrosion resistant;

(5) effluent flow diversion valves shall be installed below finished grade in a valve box and be accessible and operable from the ground surface; and

(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA Approval.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0902 is proposed for adoption as follows:

15A NCAC 18E .0902 CONVENTIONAL WASTEWATER SYSTEMS

(a) A conventional wastewater system shall consist of a septic tank and a gravity distribution dispersal field. In addition to the requirements set forth in Rule .0901 of this Section, this Rule shall apply to conventional wastewater systems as defined in G.S. 130A-343.

(b) In addition to the installation requirements set forth in Rule .0901(g) of this Section, the following shall apply:

(1) trenches shall be constructed level in all directions with a plus or minus one-half inch tolerance from side-to-side and the maximum fall in a single trench not to exceed one-fourth inch in 10 feet as determined by a device that measures elevation, such as an engineer's level or laser level;

(2) trenches shall be located not less than three times the trench width on centers. The minimum spacing for trenches is six feet on center;

(3) trench widths shall be at least two feet, but no more than three feet, and trench depth shall not exceed 36 inches on the downslope side of the trench, except as approved by an authorized agent;

(4) aggregate used in trenches shall be clean, washed gravel or crushed stone and graded or sized in accordance with size numbers 4, 5, or 6 of ASTM D448. The aggregate shall be distributed uniformly across the infiltrative surface and over the pipe and placed 12 inches deep with a minimum of six inches below the pipe and two inches over the pipe; and

(5) the laterals shall meet the requirements of Rule .0703(d) of this Subchapter.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .0903 is proposed for adoption as follows:

15A NCAC 18E .0903 BED SYSTEMS

(a) This Rule shall apply to bed systems receiving DSE.

(b) Bed systems shall be limited to 600 gpd unless approved for a greater DDF in accordance with a PIA Approval.

(c) Sites for bed systems shall meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) design options for the site are limited by topography or available space.

(d) The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a trench system as calculated in accordance with Rule .0901(d) of this Section.

(e) In addition to the installation requirements set forth in Rule .0901(g) of this Section, the following shall apply:

(1) the bottom of the bed shall be excavated level, plus or minus one-half inch, in all directions;

(2) laterals shall be one and one-half feet from the side of the bed;

(3) laterals shall be placed on three-foot centers;

(4) aggregate used shall comply with the requirements of Rule .0902(b)(4) of this Section;

(5) products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA Approval;

(6) the gravel surface shall be covered by an approved geo-textile fabric capable of preventing the downward movement of soil particles while allowing the movement of liquids and gases; and

(7) when pressure dispersal is used, the lateral design criteria shall meet the minimum requirements of Rules .0907(e) or .0908(d) of this Section or in accordance with a PIA Approval.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .0904 is proposed for adoption as follows:

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) LDP systems consist of laterals composed of corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. The laterals shall be one of the following:

(1) eight-inch inside diameter with a 10-inch outside diameter; or

(2) 10-inch inside diameter with a 12-inch outside diameter.

(b) LDP systems shall only be used with DSE.

(c) LDP pipe, filter wrap, and fittings shall meet the following criteria:

(1) pipe and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated pipe shall have two rows of holes, each hole between three-eighths inch and one-half inch in diameter, located 120 degrees apart along the bottom half of the pipe with each hole 60 degrees from the bottom center line, and staggered so that one hole is present in the valley of each corrugation;

(3) pipe shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated pipe shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend filter wrap meeting the minimum requirements in Table XIX; and

(6) the LDP with filter wrap shall be encased in a black polyethylene sleeve prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XIX. Minimum filter wrap requirements for LDP

Property	**Value**
Unit Weight	1.0 ounce per square yard
Sheet Grab Tensile Strength	Machine Direction: 23 pounds
Trapezoid Tear Strength	Machine Direction: 6.2 pounds Cross Direction: 5.1 pounds
Mullen Burst Strength	40 psi or 276 kilopascals

Frazier Air Permeability	500 cubic feet per minute per square foot at pressure differential of one-half inch of water

(d) The requirements of Rule .0901 of this Section shall apply to LDP systems except as follows:

(1) the LTAR determined in accordance with Rule .0901(c) of this Section shall not exceed 0.8 gpd/ft^2; and

(2) to calculate the minimum trench length in accordance with Rule .0901(d) of this Section, an equivalent trench width of two feet shall be used for eight-inch LDP and two and one-half feet shall be used for 10-inch LDP.

(e) In addition to the requirements set forth in Rule .0901(g) of this Section, LDP system installations shall comply with the following:

(1) trenches for eight-inch LDP shall be a minimum of 10 inches and a maximum of 18 inches wide. Trenches for ten-inch LDP shall be a minimum of 12 inches and a maximum of 24 inches wide;

(2) the infiltrative surface and pipe shall be level with a maximum fall of one inch in 100 feet;

(3) backfill shall have no more than 10 percent by volume of fibrous organics, building rubble, rocks, large clods, or other debris and shall be Soil Groups I, II, or III;

(4) the LDP shall be connected to the collection sewer or a stepdown pipe using an offset adapter to create a mechanical joint; and

(5) the minimum on center spacing for eight-inch LDP shall be five feet and for 10-inch LDP shall be six feet.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0905 is proposed for adoption as follows:

15A NCAC 18E .0905 PREFABRICATED PERMEABLE BLOCK PANEL SYSTEMS

(a) PPBPS utilize both horizontal and vertical air chambers in a 16-inch PPBPS and are constructed to promote downline and horizontal distribution of effluent. PPBPS systems shall only be used with DSE.

(b) The requirements of Rule .0901 of this Section shall apply to PPBPS systems except as follows:

(1) the LTAR determined in accordance with Rule .0901(c) of this Section shall not exceed 0.8 gpd/ft^2; and

(2) to calculate the minimum trench length in accordance with Rule .0901(d) of this Section, an equivalent trench width of six feet shall be used.

(c) In addition to the requirements set forth in Rule .0901(g) of this Section, PPBPS system installations shall comply with the following and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on center or three times the trench width, whichever is greater;

(2) trench sidewalls shall be raked in Group IV soils;

(3) pressure dosed gravity distribution or pressure dispersal shall be used when the individual trench lengths are greater than 50 feet and less than or equal to 70 feet; and

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0906 is proposed for adoption as follows:

15A NCAC 18E .0906 SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems receiving DSE may be used on sites originally classified unsuitable due to SWC, soil morphology, restrictive horizon, or soil depth that may be reclassified as suitable in accordance with this Rule when there is a DDF less than or equal to 1,500 gpd.

(b) Sand lined trench systems with advanced pretreatment shall comply with Rule .1205 of this Subchapter.

(c) The soil and site shall meet the following criteria:

(1) the texture of the receiving permeable horizon is sand, loamy sand, sandy loam, loam, or silt loam;

(2) the structure of the receiving permeable horizon is classified suitable;

(3) the moist consistence of the receiving permeable horizon is loose, very friable, friable, or firm;

(4) if the receiving permeable horizon has zones of heavier textured materials, these zones are discontinuous with an average thickness not exceeding one-third of the required thickness of the receiving permeable horizon;

(5) the naturally occurring receiving permeable horizon shall be less than or equal to 60 inches below the naturally occurring soil surface. If the receiving permeable horizon is greater than 60 inches below the naturally occurring soil surface, advanced pretreatment shall be used in accordance with Rule .1205 of this Subchapter;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum vertical separation from the infiltrative surface to a SWC:

(A) 18 inches with gravity or pressure dosed gravity distribution; or

(B) 12 inches with pressure dispersal; and

(7) the minimum required thickness of the receiving permeable horizon shall be determined by the texture of that horizon as follows:

(A) sand or loamy sand texture requires a minimum thickness of one foot;

(B) sandy loam or loam texture requires a minimum thickness of two feet; or

(C) silt loam texture requires a minimum thickness of three feet.

(d) If a groundwater lowering system is required to comply with the minimum vertical separation in Paragraph (c)(6) of this Rule to a SWC that is not related to lateral water movement, design plans and specifications shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F. The groundwater lowering system shall:

(1) extend into the receiving permeable horizon;

(2) have an outlet with location and elevation that allows for free discharge of groundwater as required for the groundwater lowering system to be functional. The outlet location and elevation shall be shown on the artificial drainage system plan with relative water level elevations and wastewater system site elevations labeled; and

(3) all groundwater lowering system components are integral to the wastewater system and subject to ownership and control requirements of Rule .0301(b) and (c) of this Subchapter.

(e) The LTAR shall be determined in accordance with Table XX for sand-lined trench systems. The minimum trench length shall be calculated in accordance with Rule .0901(d) of this Section, except that the ETW shall be equal to the installed trench width. The LTAR shall be based on the lesser of the following:

(1) LTAR set forth in Table XX based on the most hydraulically limiting, naturally occurring soils overlying the permeable receiving horizon; or

(2) 10 percent of the in-situ Ksat of the receiving permeable horizon.

TABLE XX. LTAR for sand lined trench systems based on the most hydraulically limiting, naturally occurring soils overlying the permeable receiving horizon

Soil Group	**Texture of Most Hydraulically Limiting Overlying Soil Horizon**	**Distribution Type**	**LTAR in gpd/ft^2**
I	Sands	Gravity or Pressure Dosed Gravity	0.7 – 0.9
		Pressure Dispersal	0.8 – 1.2
II	Coarse Loams	Gravity or Pressure Dosed Gravity	0.5 – 0.7
		Pressure Dispersal	0.6 – 0.8
III	Fine Loams	Gravity or Pressure Dosed Gravity	0.2 – 0.4
		Pressure Dispersal	0.3 – 0.6
IV	Clays	Gravity or Pressure Dosed Gravity	0.1 – 0.2
		Pressure Dispersal	0.15 – 0.3

(f) There shall be no reduction in trench length compared to a conventional wastewater system when Accepted or Innovative gravelless trench product is used.

(g) A special site evaluation in accordance with Rule .0510 of this Subchapter shall be required for the following conditions to field verify the LTAR:

(1) the texture of the receiving permeable horizon is sandy loam or loam and the system DDF is greater than 600 gpd; or

(2) the texture of the receiving permeable horizon is silt loam.

(h) In addition to the requirements set forth in Rule .0901(g) of this Section, sand lined trench system installations shall comply with the following:

(1) gravity trenches shall have a maximum width of three feet and a minimum width of one and a half feet;

(2) trenches shall be located not less than three times the trench width on center. The minimum spacing for trenches shall be five feet on center;

(3) the sand lined trenches shall be constructed to extend into the naturally occurring receiving permeable horizon;

(4) the infiltrative surface shall be no deeper than 24 inches below finished grade. The top of the trench media shall be at or below the naturally occurring soil surface. Drip tubing shall be installed a minimum of six inches below the natural grade;

(5) soil used to line the trench shall be sand in texture. The installer shall provide written laboratory verification of the media textural classification and quality when requested by the LHD based on a visual inspection of the sand used during installation. When laboratory analysis is required, the material shall be clean, uncoated fine, medium, or coarse sand with a minimum of 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.074 millimeters or a No. 200 Sieve;

(6) pressure dosed gravity distribution or pressure dispersal shall be used when the total dispersal field line length exceeds 750 linear feet in a single system;

(7) pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system;

(8) when pressure dispersal is used, the pressure dispersal network shall be designed in accordance with Rules .0907(e) or .0908(f) of this Section, except that the trench width shall comply with this Paragraph. The total line length shall be calculated based on infiltrative surface area;

(9) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters as follows:

(A) a minimum of two runs within a trench between one and one half and two feet wide; and

(B) a minimum of three runs within a trench between two and three feet wide.

The drip tubing shall be uniformly spaced across the trench with the tubing six inches from the trench sidewalls. Drip tubing shall be covered by a minimum of six inches of sand lined trench media meeting the requirements of Subparagraph (5) of this Paragraph. Drip dispersal systems shall comply with the requirements of Section .1600 of this Subchapter and this Rule;

(10) finished grade shall provide for positive surface drainage away from all system components, with the dispersal field crowned at one-half percent as measured from the centerline of the dispersal field. The finished grade requirements shall be made a condition of the CA; and

(11) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA Approval.

(i) Other sand lined trench systems may be approved on a site-specific basis in accordance with Rule .0509(c) of this Subchapter.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0907 is proposed for adoption as follows:

15A NCAC 18E .0907 LOW PRESSURE PIPE SYSTEMS

(a) LPP systems utilize a network of small diameter pipes with three feet to six feet pressure head to distribute effluent across the entire dispersal field. Any subsurface dispersal system listed in this Section may incorporate LPP dispersal.

(b) LPP systems with advanced pretreatment shall comply with Rules .1202, .1203, .1205, or .1206 of this Subchapter.

(c) The LTAR shall be determined as follows:

(1) Tables XXI and XXII shall be used to determine the LTAR for LPP systems, as applicable;

(2) the LTAR determined from Table XXI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon to a depth of 12 inches below the infiltrative surface;

(3) the LTAR determined from Table XXII shall be based on the saprolite textural class of the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface, or less than 24 inches if combined with soil in accordance with Rule .0506(b) of this Subchapter; and

(4) for facilities that generate HSE as specified in Rule .0401(h) of this Subchapter or a facility with a full kitchen, the LTAR shall not exceed the mean rate for the applicable Soil Group.

TABLE XXI. LTAR for LPP systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR in gpd/ft^2
I	Sands	Sand	0.4 – 0.6
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.3 – 0.4
		Loam	
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.05 – 0.2
		Silty Clay	
		Clay	

TABLE XXII. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR in gpd/ft^2
I	Sands	Sand	0.3 – 0.4
		Loamy Sand	0.25 – 0.35
II	Loams	Sandy Loam	0.2 – 0.3
		Loam	0.1 – 0.2
		Silt Loam	0.05 – 0.15

(d) The minimum required dispersal field area and trench length shall be calculated in accordance with the following:

(1) the minimum required dispersal field area shall be calculated by dividing the DDF by the LTAR; and

(2) the minimum trench length shall be calculated by dividing the required dispersal field area by a lateral spacing of five feet. The following equation shall be used to calculate the minimum line length required.

TL = (DDF ÷ LTAR) ÷ LS

Where TL = length of trench, in feet
DDF = design daily flow, in gpd
LTAR = in gpd/ft^2
LS = five-foot line spacing

(3) When HSE is proposed to be discharged to an LPP dispersal field with no advanced pretreatment or has not been reclassified as DSE in accordance with Rule .0402(c) of this Subchapter, a licensed professional, if required in G.S. 89C, 89E, or 89F, shall calculate the adjusted LTAR in accordance with Rule .0402(b) of this Subchapter.

(e) In addition to the requirements set forth in Rule .0901(g) of this Section, LPP system design and installation shall comply with the following, unless otherwise specified in a PIA Approval:

(1) the LPP distribution network shall be constructed of one to two-inch diameter pressure rated Schedule 40 PVC laterals placed in gravel that meets the requirements in Rule .0902(b)(4) of this Section or other approved media;

(2) the trench width shall be one to two feet;

(3) trenches shall be located not less than three times the trench width on center. The minimum spacing for trenches shall be five feet on center:

(4) trenches shall include a minimum of eight inches of gravel or other approved media, either from a PIA Approval or subsurface dispersal system listed in Section .0900 of this Subchapter. The lateral shall be installed a minimum of five inches above the infiltrative surface;

(5) laterals, manifolds and LPP fields shall comply with the following design criteria:

(A) the maximum lateral length shall yield no more than a 10 percent difference in orifice delivery rate between the first and last orifice along the lateral;

(B) no more than one-third of the total number of holes shall be less than 5/32 inches in diameter, with no orifices sized smaller than one-eighth inch in diameter in any lateral line;

(C) all orifices shall face upwards, except for two orifices, one-third of the way from the beginning and end of each lateral, which shall face downward; and

(D) maximum orifice spacing shall be as follows: Soil Group I - five feet; Soil Group II - six feet; Soil Group III - eight feet; and Soil Group IV - 10 feet;

(6) the orifices shall be protected by the following:

(A) lateral sleeved within a three or four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703(d) of this Subchapter; or

(B) specially designed and approved orifice shields;

(7) the following additional design provisions shall be required for sloping sites:

(A) separately valved manifolds shall be required for all subfield segments where the elevation difference between the highest and lowest laterals exceeds three feet;

(B) the orifice spacing, orifice size or both shall be adjusted to compensate for relative elevation differences between laterals branching off a common supply manifold and to compensate for the lines at the lowest elevation receiving more effluent at the beginning and end of a dosing cycle;

(C) the lateral network shall be designed to achieve a 10 to 30 percent higher steady state flow rate into the upper lines, relative to the lower lines, depending on the amount of elevation difference. The steady state flow rate is based on the pipe being full; and

(D) maximum elevation difference between the highest and lowest laterals in a field shall not exceed 10 feet unless the flow is uniformly divided using multiple pumps or split between subfield segments without requiring simultaneous adjustment of multiple pressure regulating valves in separate locations. Flow shall be uniformly divided such that the dose volumes to the subfields does not vary more than 10 percent on an area basis. The Department shall approve other designs based upon the authorized designer or PE providing documentation showing equivalent hydraulic performance to this Subparagraph;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and shall terminate at the ground surface and be installed in a valve box or equivalent that provides access for operation and maintenance;

(9) the supply manifold shall be constructed of solvent-welded pressure rated Schedule 40 PVC;

(10) the supply manifold shall be sized large enough based on the size and number of laterals served to prevent more than a 20 percent variation in pressure head between the first and last laterals due to losses within the manifold when feeding the manifold from a lower elevation;

(11) the supply manifold shall comply with the following design criteria:

(A) the ratio of the supply manifold inside cross-sectional area to the sum of the inside cross-sectional areas of the laterals served shall exceed 0.7:1 as measured from where the supply line connects to the manifold;

(B) the reduction between the manifold and connecting laterals shall be made off the manifold using reducing tees or fittings; and

(C) cleanouts shall be installed at the distal ends of the supply manifold and shall be enclosed in valve boxes accessible from the ground surface;

(12) pressure regulating valves shall be provided for pressure adjustment at the fields;

(13) valves shall be installed in an access device, such as a valve box, and be accessible and operable from the ground surface. Valves serving contiguous subfields shall be in a common valve box;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the pump operating flow rate shall be based upon delivering three feet to six feet of residual pressure head at the distal end of all laterals;

(B) the dose volume shall be between five and 10 times the liquid capacity of the lateral pipe dosed, plus the liquid capacity of the portions of manifold and supply lines which drain between doses; and

(C) when pumping downhill and the supply line volume exceeds 20 percent of the calculated dose volume, special design considerations shall be followed to prevent more than 20 percent of the dose volume from draining by gravity to the dispersal field between doses; and

(15) the trenches shall be covered to a minimum depth of four inches after settling.

(f) The authorized agent or Department may approve on a site-specific basis drip dispersal systems used in LPP trenches and other LPP designs based on documentation showing that the proposed design meets the performance requirements of this Rule.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0908 is proposed for adoption as follows:

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving DSE. Drip dispersal systems shall comply with the provisions of this Rule and Section .1600 of this Subchapter.

(b) Drip dispersal systems with advanced pretreatment shall comply with Rule .1204 of this Subchapter.

(c) Drip dispersal systems shall meet the following soil and site criteria:

(1) A minimum of 18 inches of naturally occurring suitable soil above a LC, 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation to any LC shall be 12 inches. A groundwater lowering system may be used to comply with the vertical separation to a SWC when only Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface.

(2) For new fill, the soil and site shall meet the following criteria:

(A) Rule .0909(b) and (c) of this Section, except as otherwise specified in this Subparagraph;

(B) no SWC shall exist within the first 12 inches below the naturally occurring soil surface. A groundwater lowering system shall not be used to comply with the initial site requirements for a new fill system; and

(C) minimum vertical separation to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any SWC.

(3) For existing fill, the soil and site shall meet the following criteria:

(A) Rule .0909(d) and (e) of this Section, except as otherwise specified in this Subparagraph; and

(B) minimum vertical separation to any LC shall be 24 inches.

(d) Tables XXIII and XXIV shall be used to determine the LTAR for all DSE drip dispersal systems:

(1) Table XXIII shall be used for systems utilizing soil. The LTAR shall be based on the most limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(2) Table XXIV shall be used for systems utilizing saprolite. The LTAR shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface;

(3) the LTAR for new fill systems shall not exceed 0.5 gpd/ft^2 for Group I, 0.3 for gpd/ft^2 Group II, 0.15 gpd/ft^2 for Group III or 0.05 gpd/ft^2 for Group IV soils, respectively;

(4) sections of blank tubing without emitters shall not count towards the minimum dripline length required; and

(5) the DDF shall be divided by the LTAR, determined from Table XXIII or XXIV, to determine the minimum dispersal field area required. The minimum dripline length shall be determined by dividing the required area by the maximum line spacing of two feet. The designer may recommend additional linear footage as soil and site conditions allow. The following equations shall be used to calculate the minimum dispersal field area and dripline length required:

MA = DDF ÷ LTAR

DL = MA ÷ LS

Where MA = minimum dispersal field area, in ft^2

DDF = design daily flow, in gpd

LTAR = in gpd/ft^2

DL = dripline length, in feet

LS = two-foot line spacing

TABLE XXIII. LTAR for DSE drip dispersal systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR in gpd/ft^2
I	Sands	Sand	0.4 – 0.6
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.3 – 0.4
		Loam	
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.05 – 0.2
		Silty Clay	
		Clay	

TABLE XXIV. LTAR for DSE drip dispersal systems based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class	LTAR in gpd/ft^2
I	Sand	0.3 – 0.4
	Loamy sand	0.25 – 0.35
II	Sandy loam	0.2 – 0.3
	Loam	0.1 – 0.2
	Silt Loam	0.05 – 0.1

(e) A special site evaluation shall be required in accordance with Rule .0510 of this Subchapter, as applicable.
(f) Drip dispersal installation shall be in accordance with the following criteria:

(1) dripline shall be installed in accordance with the approved design. The design shall specify installation depth, installation equipment, blanking, drainback prevention, and any other site-specific design requirements identified by the designer;
(2) dripline shall be installed a minimum of one inch into naturally occurring soil, except when installed in a fill system;
(3) driplines shall be installed level. A maximum variance of plus or minus two inches shall be allowed within any contiguous section of dripline containing drip emitters;
(4) a minimum of six inches of cover shall be maintained over the dripline. The six inches of cover may be met by the addition of up to six inches, after settling, of suitable Group II or III soil over the drip field;
(5) drip dispersal fields shall be sloped to shed surface water;
(6) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan shall be provided by a licensed professional if required in G.S. 89C, 89E, or 89F; and
(7) the drip dispersal system shall be field tested after installation in accordance with Rule .1603 of this Subchapter.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0909 is proposed for adoption as follows:

15A NCAC 18E .0909 FILL SYSTEMS

(a) Both new and existing fill systems are a system in which all or part of the dispersal field media is installed in fill material. The system includes both the basal area of dispersal field and the toe slope in all directions.
(b) New fill systems may be installed on sites that meet the following requirements:

(1) a minimum of the first 18 inches below the naturally occurring soil surface consists of suitable soil with the exception that no SWC exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;
(2) systems shall be installed only on sites with uniform slopes less than four percent;
(3) stormwater diversions, subsurface interceptor drains, or swales shall be required as needed upslope of the system to divert surface runoff or lateral flow from passing over or into the system; and
(4) the area of suitable soil shall be large enough to include the basal area of dispersal field and the toe slope in all directions.

(c) New fill system design and installation shall be in accordance with the following criteria:

(1) trenches shall be installed with a minimum of 24 inches separating the infiltrative surface and any LC for gravity distribution and pressure dosed gravity distribution, except for any SWC that requires 18 inches of separation. If pressure dispersal is used, the minimum separation distance shall be 18 inches between the infiltrative surface and any LC and 12 inches to a SWC. This separation requirement may be met with the use of a groundwater lowering system only in Soil Groups I and II with suitable structure;
(2) fill systems with a DDF greater than 480 gpd shall use pressure dispersal systems;
(3) fill material soil texture shall be classified as Group I up to the top of the trenches. The final six inches of fill used to cover the system shall have a finer texture, such as Group II or III soils, for the establishment of a vegetative cover;
(4) minimum cover shall be six inches after settling;
(5) additional fill may be added to facilitate drainage and accommodate final landscaping requirements at the site necessary to stabilize the fill, shed surface water, and establish a vegetative cover. The additional fill may be provided if the infiltrative surface is less than 30 inches below the finished grade;
(6) where fill material is added, the fill material and the existing soil shall be mixed to a depth of six inches below the interface. Vegetative cover, organic litter, and the O horizon shall be removed before the additional fill material is incorporated;

(7) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;
(8) the side slope of the fill system shall not exceed a rise to run ratio of 1:4. If the first 18 inches below the naturally occurring soil surface is Group I soil, the side slope of the fill shall not exceed a rise to run ratio of 1:3;
(9) the outside edge of the trench shall be located a minimum of five feet horizontally from the top of the side slope;
(10) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;
(11) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA Approval; and
(12) the setback requirements shall be measured from the projected toe of the slope. If this setback cannot be met, the setback requirements shall be measured five feet from the nearest edge of the trench if the following conditions are met:
(A) slope of the site does not exceed two percent;
(B) the first 18 inches of soil beneath the naturally occurring soil surface shall consist of Group I soils; and
(C) the lot or tract of land was recorded on or before December 31, 1989.

(d) An existing pre-July 1, 1977 fill site that does not meet the requirements of Paragraph (b) of this Rule may be utilized for a wastewater system if the following requirements are met:
(1) substantiating data are provided by the lot owner indicating that the fill material was placed on the site prior to July 1, 1977;
(2) the fill material shall have Group I soil texture for a minimum depth of 24 inches below the existing ground surface;
(3) the fill material shall have no more than 10 percent by volume of fibrous organics, building rubble, or other debris, and shall not have discreet layers containing greater than 35 percent of shell fragments;
(4) if a minimum of 24 inches of Group I fill material is present, additional fill with soil texture classified Group I may be added to comply with the separation requirements of Subparagraph (e)(5) of this Rule;
(5) SWC is 18 inches or greater below the ground surface of the fill. This requirement shall be met without the use of a groundwater lowering system; and
(6) the area of suitable soil shall be large enough to include the basal area of dispersal field and the toe slopes in all directions.

(e) Existing fill system design and installation shall be in accordance with Paragraph (c) of this Rule and the following criteria:
(1) the DDF shall not exceed 480 gpd;
(2) pressure dispersal shall be used. LPP systems shall meet the requirements of Rule .0907(d) and (e) of this Section. Drip dispersal systems shall meet the requirements of Rule .0908(d) and (f) of this Section;
(3) the LTAR shall not exceed 0.5 gpd/ft^2;
(4) existing fill sites with 48 inches of Group I soils may use conventional trenches with a maximum LTAR of 1.0 gpd/ft^2 in lieu of a pressure dispersal system;
(5) the minimum vertical separation to any LC shall be 24 inches for pressure dispersal systems and 48 inches for conventional systems. This vertical separation requirement may be met by adding additional Group I soil, but shall not be met with the use of a groundwater lowering system;
(6) where additional Group I fill is to be added, the side slope of the fill shall not exceed a side slope ratio of 1:3; and
(7) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA Approval.

(f) The LTAR for new and existing fill systems shall be determined in accordance with Rule .0901(c) of this Section and the following:
(1) the LTAR shall be based on the most limiting, naturally occurring soil horizon within 18 inches of the ground surface or to a depth 12 inches below the infiltrative surface, whichever is deeper;

(2) the lowest LTAR for the applicable Soil Group shall be used for systems installed in accordance with this Rule; and

(3) for sites with a minimum of 18 inches of Group I soils below the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface, whichever is deeper, the LTAR shall not exceed 1.0 gpd/ft^2 for gravity or pressure dosed gravity distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) The authorized agent or Department may approve other fill system designs on a site-specific basis in accordance with a PIA Approval or Rule .0509(c) of this Subchapter.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0910 is proposed for adoption as follows:

15A NCAC 18E .0910 ARTIFICIAL DRAINAGE SYSTEMS

(a) Artificial drainage systems are a site modification and may be proposed to reclassify sites as suitable that were originally classified unsuitable due to a SWC, lateral water movement, saturated soils, a perched water table, or other oxyaquic conditions. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Groundwater lowering systems may be used when the following criteria are met:

(1) the site has Group I or II soils with suitable structure and clay mineralogy; and

(2) the groundwater lowering system shall be designed to maintain the vertical separation to a SWC as specified in Rule .0901(g)(2) of this Section.

(c) Plans and specifications for the use of a groundwater lowering system to comply with the vertical separation to a SWC shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F in accordance with Rule .0303 of this Subchapter. The plans and specifications shall meet the following design criteria:

(1) Gravity groundwater lowering systems shall be designed in accordance with the following:

(A) substantiating information, calculations, and data shall be provided justifying the effectiveness of the proposed drainage system design;

(B) design and devices shall comply with accepted standards of practice as set forth in the USDA-NRCS National Engineering Handbook, Part 624 - Drainage, Chapter 10 - Water Table Control, and Part 650 - Engineering Field Handbook, Chapter 14 - Water Management, Drainage;

(C) the effectiveness of groundwater lowering systems shall be determined by use of the Ellipse, Hooghoudt, or equivalent drainage equations for sites with Group I or II soils. Justification for use of a specific drainage equation shall be provided;

(D) drainage equation input parameters shall be based upon field descriptions of soil profiles and in-situ Ksat measurements. The drainage coefficient used in these equations shall be calculated from the highest monthly rainfall value with a 30-percent exceedance probability from the closest available National Weather Service or SCO. A source of these data is the WETS tables published in the Natural Resource Conservation Service Field Office Technical Guides available online at: efotg.sc.egov.usda.gov/efotg_locator.aspx. This monthly value shall be divided by 14 to give the drainage coefficient in inches per day. For systems with a DDF greater than 1,500 gpd, the projected contribution of wastewater application shall be added to the drainage coefficient used in the equations;

(E) DRAINMOD shall be used to determine the groundwater lowering system effectiveness at sites with three or more effective soil layers, Group III or IV soils within 36 inches of the

naturally occurring soil surface, or sites requiring a groundwater lowering system using pumps; and

(F) the modeling procedure set forth in Rule .0504(h) of this Subchapter shall be followed.

(2) Groundwater lowering systems using pumps shall be designed in accordance with the following:

(A) plan and profile detail drawings of pump tank, showing all dimensions, pumps, discharge piping, floats, and float and alarm activation levels;

(B) calculations and supporting information shall be provided as the basis for sizing the pumps, dose volume, emergency storage capacity, and overall tank capacity;

(C) the high-water alarm in the control panel shall automatically contact a 24-hour maintenance service;

(D) information on discharge pipe line, line location, materials, and provisions for erosion control at the discharge point;

(E) except as otherwise provided in this Paragraph, the requirements of Section .1100 of this Subchapter shall apply to artificial drainage systems using pumps; and

(F) dual alternating pumps shall be required when serving two or more design units. Each pump shall be sized at a capacity of two and one half times the projected peak inflow rate to the pump tank.

(3) Plans and specifications for all groundwater lowering systems shall include the following:

(A) location of existing and proposed drainage systems in relation to all facilities and wastewater system components. Plans shall indicate flow direction, slope and drain outlet location;

(B) profile drawings showing drainage trench dimensions, depth, pipe size, aggregate envelope, and filter fabric detail, cover, and cleanout detail;

(C) elevations with reference to an established benchmark;

(D) specifications for all groundwater lowering system materials and installation procedures;

(E) the entire groundwater lowering system, including the outlet, shall be on property owned or controlled by the person owning or controlling the system. Necessary legal agreements shall be provided in accordance with Rule .0301(c) of this Subchapter; and

(F) easements for egress, ingress, and regress for maintenance of groundwater lowering systems serving two or more lots shall be at least 20 feet wide plus the width of the groundwater lowering system.

(d) Interceptor drains shall be used on sites where a SWC results from laterally flowing groundwater that can be diverted away from the dispersal field.

(e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance documents.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .0911 is proposed for adoption as follows:

15A NCAC 18E .0911 PRIVIES

(a) A privy shall be approved when it consists of a pit, floor slab, and seat assembly housed in a building that affords privacy and protection from the weather and meets the following criteria:

(1) the pit shall consist of an excavation with a minimum bottom surface area of three and one half feet square;

(2) the maximum depth of the pit shall not exceed 36 inches;

(3) the pit bottom shall not be located closer than 12 inches to a LC;

(4) the pit shall be curbed to prevent caving. In sandy or loose soil, the curb shall extend the full depth of the pit. In clay soils, partial curbing may be acceptable if soils have sufficient cohesion to not collapse;

(5) the floor shall be constructed of concrete, wood, or other approved materials. The following criteria shall be met, as applicable:

(A) for wood construction, rot resistant joists are used covered with tight tongue-and-groove rot resistant flooring;

(B) wood floors shall be anchored to the sills. The minimum sill size shall be four-inch by four-inch; and

(C) when other materials are used the material shall be shown to provide strength, durability and prevent entrance of flies and mosquitoes to the privy pit;

(6) the pit shall be vented through screened PVC Schedule 40 pipe or other pipe approved in accordance with Rule .0703 of this Subchapter, six inches in diameter, and extending above the roofline. The vent pipe shall be:

(A) located on a south side wall of the building;

(B) covered to prevent rainfall from entering, but still allow gases to escape;

(C) straight without any bends in the pipe; and

(D) black colored pipe; and

(7) privies shall not be used for the disposal of water-carried sewage.

(b) Any person owning or controlling the property upon which a privy is located shall be responsible for the following requirements:

(1) when the pit becomes filled to within 18 inches of the top of the ground, the privy building shall be moved to a new pit and the old pit covered with soil; and

(2) if the pit caves in, a new pit shall be provided.

(c) The person owning or controlling the system shall be responsible for the following requirements:

(1) the privy and grounds adjacent shall be kept free of debris and excess vegetation;

(2) a hinged seat cover and hinged door shall be provided and kept closed when the privy is not in use;

(3) flies shall be excluded from the pit by the privy building door fitting in the frame and no unscreened openings in the building;

(4) garbage and trash shall be kept out of the pit; and

(5) the privy building shall not be used for storage.

(d) When a new pit is required, a CA and OP shall be obtained.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .1001 is proposed for adoption as follows:

SECTION .1000 – NON-GROUND ABSORPTION WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Use of alternative toilets, such as incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code and this Rule.

(b) Use of chemical or portable toilets is governed by G.S. 130A-335(h).

(c) When an alternative toilet or chemical toilet is used, all wastewater generated in the facility shall be discharged to a wastewater system that is approved under this Subchapter.
(d) Removal of residuals from incinerating toilets, composting toilets, mechanical toilets, vault privies, chemical toilets, or portable toilets shall be performed only by a person that holds a current NC Septage Management Firm permit in accordance with Rule 15A NCAC 13B .0832(a)(1). All waste shall be taken to an approved disposal site per G.S. 130A-291.1(d).

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .1002 is proposed for adoption as follows:

15A NCAC 18E .1002 RECLAIMED WATER SYSTEMS
(a) An RCW system shall be one of the following:
(1) an alternate management option as identified in 15A NCAC 02U .0401(c) for use with a system permitted in accordance with 15A NCAC 02U;
(2) a conjunctive wastewater system, as defined in 15A NCAC 02U .0103(4), permitted under the Rules of this Subchapter that:
(A) incorporates a beneficial use component, such as toilet flushing or landscape irrigation; and
(B) the beneficial use component is not necessary to meet the wastewater disposal needs of the facility;
(3) a conjunctive wastewater system permitted under the Rules of this Subchapter when there is a non-conjunctive use wastewater system permitted and approved in accordance with 15A NCAC 02H or 15A NCAC 02T for the facility;
(4) a wastewater system designed for the complete recycle or reuse of DSE; or
(5) a wastewater system designed to meet the wastewater disposal needs of a facility that serves a beneficial reuse, as defined in 15A NCAC 02U .0103(2), which incorporates a subsurface wastewater dispersal system.
(b) An RCW system shall be designed to produce effluent prior to discharge that complies with the effluent standards for a Type 1 treatment process in accordance with 15A NCAC 02U .0301(b) or a TS-II system in accordance with Table XXV of Rule .1201(a) of this Subchapter, whichever is more restrictive. The wastewater system shall be approved in accordance with Section .1700 of this Subchapter or designed by a PE and approved by the Department when it has been determined to comply with this Rule.
(c) When utilizing an RCW system, the dispersal field and repair area shall comply with the siting and sizing requirements of Section .1200 of this Subchapter for a TS-II system except as follows:
(1) setback reductions may be concurrently taken with either of the following:
(A) LTAR increase; or
(B) vertical separation reduction;
(2) for systems designed to comply with a TN standard of 10 mg/L one of the following siting and sizing criteria may be utilized:
(A) the property line setback may be reduced to five feet and the SA waters setback may be reduced to 50 feet for wastewater systems with a DDF less than or equal to 3,000 gpd;
(B) the property line setback may be reduced to 10 feet, the SA waters setback may be reduced to 100 feet, and the other surface waters setback may be reduced to 50 feet for systems with a DDF greater than 3,000 gpd; or
(C) the vertical separation to a SWC may be reduced to 12 inches for wastewater systems with a DDF greater than 3,000 gpd that use pressure dispersal;
(3) the LTAR may be increased up to a factor of four compared to that assigned by the LHD for a system using DSE in Group I soils with a wastewater system that uses pressure dispersal when the following site conditions are met:
(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a SWC below the naturally occurring soil surface; and

(4) requirements to comply with an effluent TN standard set forth in this paragraph may be waived when a site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels demonstrates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

(d) Conjunctive uses may include toilet and urinal flushing and landscape irrigation by drip dispersal. Wastewater from a system designed for complete recycling of DSE shall be used only for flushing of toilets and urinals. RCW shall not be used for body contact or human consumption. An RCW system that includes conjunctive use shall meet the following:

(1) Toilet and urinal flushing components shall be approved by the local building inspections department and be in compliance with the North Carolina Plumbing Code, including pipe marking requirements and back-siphon protection provisions for proximate potable water supplies.

(2) Siting, sizing, setbacks, and installation requirements of this Subchapter may be modified for the landscape irrigation component if they comply with the requirements for conjunctive use irrigation systems in 15A NCAC 02U, based upon information provided by the licensed professionals, if required in G.S. 89C, 89E, or 89F.

(3) System design, operation, and management requirements shall comply with requirements for comparable systems in 15A NCAC 02U, including provisions for continuous on-line monitoring and recording for turbidity and a mechanism to prevent effluent utilization if the turbidity exceeds 10 NTUs, if the E. Coli or fecal coliform levels are not being met, or the disinfection unit is not operable.

(4) Requirements to comply with an effluent TN standard may be waived on a project specific basis when documentation is provided showing that the proposed design will not result in an exceedance of the groundwater standards in accordance with 15A NCAC 02L.

(e) All RCW systems approved in accordance with this rule shall be designed by a PE and the plans approved by the Department prior to LHD permit issuance.

History Note: *Authority G.S. 130A-335(e);*

15A NCAC 18E .1101 is proposed for adoption as follows:

SECTION .1100 – SYSTEM DOSING AND CONTROLS

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) Dosing systems with a single pump or siphon shall be required to be used to deliver effluent into laterals when:

(1) gravity distribution cannot be achieved between the septic tank and dispersal field;

(2) the total lateral length exceeds 750 linear feet in a single system; or

(3) a pressure dosed gravity distribution or pressure dispersal system is used.

(b) Dosing systems with multiple alternating or sequencing pumps or siphons shall be used to discharge to separate dispersal fields when:

(1) DDF from a single system exceeds 3,000 gpd; or

(2) the total line length exceeds 2,000 linear feet in a single trench system or 5,000 linear feet in a drip dispersal system.

(c) If alternating pumps or siphons are not required in accordance with Paragraph (b) of this Rule, but used, then the alternating pumps or siphons may discharge to a single dispersal field.

(d) The dose volume to a dispersal field shall be calculated as follows:

(1) 66 to 75 percent of the volume of the installed linear lateral footage for pressure dosed gravity distribution systems;

(2) 66 to 75 percent of the volume of the installed linear lateral footage for LDP systems and trench products with a PIA approval based on lateral capacity equivalent to the capacity of a four-inch corrugated pipe;

(3) LPP systems in accordance with Rule .0907(e)(14)(B) of this Subchapter; and

(4) drip dispersal systems in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from a dosing system shall be designed to achieve scour velocity in the supply line and to distribute effluent in accordance with the dispersal field design.
(f) The pump operating flow rate or average pump run time shall be within 25 percent of the initial measurements collected during the final inspection.
(g) All dosing systems shall be tested using clean water prior to issuance of an OP. The test shall be conducted by the installer, LSS, authorized designer, and PE, as applicable, witnessed by the LHD, and include a demonstration and documentation of the following:

(1) pump or siphon operating flow rate and dose volume delivered;
(2) float control levels;
(3) high-water alarm, including sound;
(4) operating pressure head, if applicable; and
(5) delivery of water to the dispersal field.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1102 is proposed for adoption as follows:

15A NCAC 18E .1102 PUMP DOSING
(a) The effluent pump shall be:

(1) capable of handling a minimum of one-half inch solids or be a screened, high head pump designed for effluent;
(2) designed to meet the pump operating flow rate and total dynamic head specified for the effluent distribution system;
(3) removable without requiring entrance into the tank; and
(4) listed by a third-party electrical testing and listing agency, such as Underwriter's Laboratory. A PE may propose a pump model not listed by a third-party electrical testing and listing agency. The Department shall approve the pump when review of documentation provided by the PE demonstrates that the pump model meets the performance requirements for the dispersal field design.

(b) A vent or anti-siphon hole of a 3/16-inch minimum diameter shall be used to prevent air locking of the pump and siphoning from the pump tank when pumping downhill. When a check valve is provided, the anti-siphon hole or vent shall be located between the pump and the check valve. Additional venting may be required at the high point in the pump force main to prevent siphoning.
(c) Each pump discharge line in a pump tank shall have a disconnect device, such as a pressure-rated threaded union, flange, or camlock.
(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line into the pump tank. A system may be designed and approved for the supply line to drain back to the pump tank based on site-specific considerations, such as freeze protection.
(e) An isolation valve shall be provided on the field side of the disconnect device when pumping uphill.
(f) The pump discharge piping shall be accessible within the tank or riser from finished grade.
(g) Fittings and valves shall be of compatible non-corrodible material. Isolation valves and disconnects shall be located within 18 inches of the top of the access riser opening.
(h) All submersible pumps shall be provided with a non-corrodible rope or chain attached to each pump enabling pump removal from the ground surface without requiring dewatering or entrance into the tank.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1103 is proposed for adoption as follows:

15A NCAC 18E .1103 CONTROL PANELS
(a) A control panel shall be provided for all systems that use a pump. The control panel enclosure shall be rated NEMA 4X at a minimum. A third-party electrical testing and listing agency shall list the control panel. The control panel shall include for each pump:

(1) an independent overload protection, if not integral with the pump motor;
(2) circuit breaker(s);

(3) a motor contactor that disconnects all current to the pump or a solid-state relay that controls current to the pump;
(4) a hand-off-automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be deactivated manually;
(5) a pump run light;
(6) an elapsed time meter; and
(7) an event counter.

(b) An automatic pump sequencer shall be included in systems requiring multiple pumps in accordance with Rule .1101(b) of this Section and shall remain operable whenever any pump is inoperable.

(c) When telemetry is required in accordance with Sections .0800, .1500, .1600, and .1700 of this Subchapter, the control panel shall be connected to an active phone line, wireless internet router, dedicated cellular line, or another form of telemetry that allows the Management Entity to be notified and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel bottom shall be mounted a minimum of 24 inches above finished grade, within 50 feet of and in the line of sight of the pump tank. The Management Entity and LHD shall be able to access the control panel and operate the pumps when the owner is not present.

(e) A NEMA 4X junction box shall be installed above grade or adjacent to the pump tank riser when the control panel is located more than 10 feet from the pump tank access riser and one or more electrical splices are used. Electrical splices shall not be used within the conduit piping.

(f) Wiring shall be conveyed to the control panel or outside junction box through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes inside the tank. Wire and wire conduit openings inside the pump tank and disconnect enclosure shall be sealed.

(g) Dual and multiple fields shall be dosed by separate pumps that shall automatically alternate or sequence. The supply lines shall be "H" connected to permit manual alternation between fields dosed by each pump. "H" connection valving shall be accessible from the ground surface, either from the pump tank access manhole or in a separate valve chamber outside the pump tank. The Department shall approve other methods of dosing dual or multiple fields when the authorized designer or PE provides documentation of equivalent performance to this Paragraph.

(h) Liquid level detection devices, such as floats, shall be provided in the pump tank to control pump cycles and trigger notification of alarm conditions. The liquid level detection device configuration shall meet the following requirements:

(1) a minimum of 12 inches of effluent shall be maintained in the bottom of the pump tank;
(2) pump-off level shall be set to keep the pump submerged or in accordance with the manufacturer's written specifications;
(3) a separate control float shall be provided to activate the high-water alarm;
(4) the high-water alarm float shall be set to activate within six inches of the pump-on level or higher, if applicable, if providing design equalization capacity in a timed dosing system;
(5) the lag pump float switch, where provided, shall be located at or above the high-water alarm activation level; and
(6) floats shall be supported utilizing durable, corrosion resistant material, and designed to be adjustable, removable, and replaceable from the ground surface without requiring dewatering, entrance into the tank, or pump removal.

(i) The pump tank shall have a high-water alarm that shall:

(1) be audible and visible to the system users and the Management Entity;
(2) have a silencer button or silencer device that is located on the outside of the panel enclosure;
(3) provide for manual testing;
(4) automatically reset after testing and when an alarm condition has cleared;
(5) remain operable whenever the pump is inoperable;
(6) have an enclosure that is watertight, corrosion resistant, and shall be rated NEMA 4X at a minimum; and
(7) be mounted outside the facility and accessible.

(j) For systems designed, inspected, and certified by a PE, alternative panel construction and location criteria may be used if the alternative panel construction and location criteria meet the panel performance criteria, comply with local electrical codes, and are approved by the local electrical inspector.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1104 is proposed for adoption as follows:

15A NCAC 18E .1104 SIPHON DOSING

Siphons and siphon tanks may be used when a minimum of two feet of elevation drop is maintained between the siphon outlet invert and the inlet invert in the dispersal field distribution system. Siphons and siphon tanks shall meet the following criteria:

(1) Slope and size of the siphon discharge line shall be sufficient to handle the peak siphon discharge by gravity flow without the discharge line flowing full. Vents for the discharge lines shall be located outside of the siphon tank and shall not serve as an overflow for the tank.

(2) All siphon parts shall be installed in accordance with the manufacturer's specifications. All materials shall be corrosion-resistant, of cast iron, high-density plastic, fiberglass, stainless steel, or equal as approved by the Department when documentation is provided which shows the materials meet the requirements of this Rule.

(3) Siphon tanks shall have a functioning trip counter and high-water alarm. The high-water alarm shall be audible and visible by system users and weatherproof if installed outdoors in an enclosure rated as NEMA 4X at a minimum. The high-water alarm shall be set to activate within two inches of the siphon trip level.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1105 is proposed for adoption as follows:

15A NCAC 18E .1105 TIMED DOSING

(a) Timed dosing systems shall be used with the following:

(1) when a dosing system is required in accordance with Rule .1101 of this Section in conjunction with an adjusted DDF granted in accordance with Rule .0403 of this Subchapter;

(2) flow equalization systems;

(3) advanced pretreatment or dispersal systems, if required by the manufacturer; or

(4) when specified by the authorized designer.

(b) The timed dosing system shall be integrated with the pump tank control sensors to ensure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section is present prior to the start of any scheduled dose event and to provide that a full dose is delivered.

(c) The float configuration of a flow equalization system using timed dosing shall be adjusted by the LHD, authorized designer, or PE, to provide for equalization capacity in the system.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1106 is proposed for adoption as follows:

15A NCAC 18E .1106 PRESSURE DOSED GRAVITY DISTRIBUTION DEVICES

(a) Pressure manifolds for pressure dosed gravity distribution shall meet the following minimum design and performance requirements:

(1) uniform distribution of flow proportional to lateral length with a minimum of two feet of residual pressure head;

(2) a pressure regulating valve incorporated in the supply line just prior to the pressure manifold to control pressure to the manifold;

(3) a mechanism or device for measuring residual pressure head in the manifold;

(4) a mechanism to stop flow to individual laterals;

(5) a method to visually verify the flow to each individual lateral;
(6) the feeder lines from the pressure manifold shall be of sufficient size and slope for effluent to flow by gravity to each lateral; and
(7) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A distribution box or a drop box may be used to dissipate or distribute flow in a pressure dosed gravity dispersal system for parallel, serial, or sequential distribution. Such devices shall be watertight, corrosion resistant, constructed to withstand active and passive loads, and the volume of the device shall be such that when the dose volume is delivered, the box shall not overflow. The authorized agent shall approve the distribution device when it has been determined to be in accordance with Rule .0901(g)(9) through (11) of this Subchapter.

History Note: Authority G.S. 130A-335(e), (f), and (f1);

15A NCAC 18E .1201 is proposed for adoption as follows:

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a DDF less than or equal to 3,000 gpd shall meet the following conditions:
(1) have an RWTS or PIA Approval;
(2) be designed to comply with the effluent standard specified in the OP and defined in Table XXV prior to effluent dispersal to the soil;
(3) comply with the siting and sizing requirements of this Section; and
(4) comply with Rules .1302(f) and .1710 of this Subchapter.

TABLE XXV. Effluent standards for advanced pretreatment systems

Constituent	Effluent Standards		
	NSF-40	TS-I	TS-II
CBOD	≤ 25 mg/L	≤ 15 mg/L	≤ 10 mg/L
TSS	≤ 30 mg/L	≤ 15 mg/L	≤10 mg/L
NH_3		≤ 10 mg/L or 80% removal of NH_3 if influent TKN exceeds 50 mg/L	≤ 10 mg/L
TN			≤ 20 mg/L
Fecal Coliform		≤ 10,000 colonies/100 mL	≤ 1,000 colonies/100 mL

(b) The effluent applied to advanced pretreatment systems shall not exceed DSE as specified in Table III of Rule .0402(a) of this Subchapter, unless the system is designed to treat HSE and approved by the Department on a product or project-specific basis in accordance with the Rules of this Subchapter and engineering practices.

History Note: Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;

15A NCAC 18E .1202 is proposed for adoption as follows:

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) Wastewater systems utilizing advanced pretreatment with a DDF less than or equal to 1,500 gpd may only use one of the following modifications to system siting and sizing criteria, unless otherwise identified in this Rule:
(1) reduction in depth to LC or vertical separation to LC in accordance with Paragraph (b) of this Rule;
(2) LTAR increase in accordance with Paragraph (c) of this Rule; or

(3) setback reductions in accordance with Paragraph (d) of this Rule.

(b) The minimum required vertical separation to a LC in natural soil may be reduced with the use of advanced pretreatment in accordance with Table XXVI. Table XXVII provides the minimum depths and vertical separation for new and existing fill. A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when a reduction in vertical separation to a LC is proposed in accordance with this Rule.

Table XXVI. Minimum vertical separation to LC based on effluent standards for wastewater systems with a DDF less than or equal to 1,500 gpd

Minimum vertical separation in inches from infiltrative surface to LC					
Soil Group	**Distribution Method**	**Effluent Standard****			
		DSE*	**NSF-40**	**TS-I**	**TS-II**
I	Gravity	18	12	12	12
	LPP	12	12	9	6
	Drip	12	12	9	6
II-IV	Gravity	12	12	9	9
	LPP	12	12	9	6
	Drip	12	12	9	6

*For comparison

**12-inch vertical separation shall always be maintained to rock or tidal water

Table XXVII. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent standards for wastewater systems with a DDF less than or equal to 1,500 gpd for new fill and less than or equal to 480 gpd for existing fill

Minimum depth in inches from naturally occurring soil surface to LC					
Type of Fill	**Distribution Method**	**Effluent Standard**			
		DSE**	**NSF-40**	**TS-I**	**TS-II**
New Fill	Gravity	18 to LC 12 to SWC	18 to LC 12 to SWC	14 to LC 12 to SWC	14 to LC 12 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12	12
	Drip	18 to LC 12 to SWC	18 to LC 12 to SWC	12	12
Existing Fill	Gravity	36 of Group I Fill or Soil			
	LPP	24 of Group I Fill or Soil			
	Drip	24 of Group I Fill or Soil			
Minimum vertical separation in inches from infiltrative surface to LC*					
Type of Fill	**Distribution Method**	**Effluent Standard**			
		DSE**	**NSF-40**	**TS-I**	**TS-II**
New Fill	Gravity	24 to LC 18 to SWC	18 to LC 18 to SWC	18 to LC 14 to SWC	18 to LC 14 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	12 to LC 9 to SWC
	Drip	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	12 to LC 9 to SWC
Existing Fill	Gravity	36	36	36	36
	LPP	18	18	12	12
	Drip	18	18	12	12

*Minimum depth after adjustment for slope correction

**For comparison

(c) The LTAR shall be based on the effluent standard and dispersal field type proposed in accordance with the following:

(1) The LTAR may be increased by the following factors when compared to the rate assigned by the authorized agent for a new system using DSE:

(A) up to 1.33 for NSF-40 effluent standards in soils which are Group I or II with suitable structure;

(B) up to 2.0 for TS-I or TS-II effluent standards when pressure dispersal is utilized; or

(C) up to 2.5 for TS-II effluent standards when all the following conditions are met: minimum of 36 inches of Group I soils from the naturally occurring soil surface; minimum depth to a SWC below the naturally occurring soil surface is 24 inches; space shall be available for an equivalently sized dispersal field repair area; and pressure dispersal shall be utilized.

(2) A special site evaluation, if required in accordance with Rule .0510 of this Subchapter, shall be submitted and approved.

(3) The LTAR for an aerobic drip system shall be determined in accordance with Rule .1204 of this Section.

(4) Trench dispersal products approved for a specific dispersal field reduction in area or trench length when receiving DSE in accordance with this Subchapter or a PIA Approval shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule.

(5) The DDF shall not be increased by the addition of advanced pretreatment to an existing wastewater system by more than 33 and one-third percent on a site without repair area or by more than 50% on a site with 100 percent repair area.

(d) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter shall be met, except as shown in Table XXVIII; and

(2) when any other siting or sizing modifications are applied, such as reduced depth to LC, vertical separation, or increased LTAR, for a TS-I or TS-II system in accordance with Paragraphs (b) and (c) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVIII.

Table XXVIII: Setbacks for wastewater systems meeting NSF-40, TS-I, or TS-II effluent standards

Site Features	**Setback in feet according to Effluent Standard****			
	DSE*	**NSF-40**	**TS-I**	**TS-II**
Surface waters classified WS-I, from ordinary high-water mark	100	70	70	50
Waters classified SA, from mean high-water mark	100	70	70	50
Any Class I or Class II reservoir, from normal water level	100	70	70	50
Any other stream, non-water supply spring, or other surface water, from the ordinary high-water mark	50	35	35	25
Tidal influenced waters, such as marshes and coastal water, from mean high-water mark	50	35	35	25
Lake or pond, from normal water level	50	35	35	25
Groundwater lowering system, as measured on the ground surface from the edge of the feature	25	25	20	15
Downslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	15	15	10	10
Upslope and side slope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	10	10	7	7

A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	10	10	7	7
Permanent stormwater retention basin, from normal water level	50	50	35	25
Any other dispersal field, except designated dispersal field repair area for project site	20	20	10	10

*For comparison
**May require a variance from DEQ based on local buffer rules.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;*

15A NCAC 18E .1203 is proposed for adoption as follows:

15A NCAC 18E .1203 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS WITH A DESIGN DAILY FLOW GREATER THAN 1,500 GALLONS/DAY AND LESS THAN OR EQUAL TO 3,000 GALLONS/DAY

(a) Wastewater systems utilizing advanced pretreatment with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd may use utilize the system siting and sizing in this Rule.

(b) The LTAR shall be based on the effluent standard and dispersal field type proposed in accordance with the following:

(1) The LTAR may be increased by the following factors when compared to the rate assigned by the authorized agent for a new system using DSE:

(A) up to 2.0 for TS-I or TS-II effluent standards; or

(B) up to 2.5 for TS-II effluent standards when there is a minimum of 48 inches of Group I soils from the naturally occurring soil surface and a minimum of 30 inches to a SWC below the naturally occurring soil surface.

(2) The LTAR for an aerobic drip system shall be determined in accordance with Rule .1204 of this Section.

(c) When the LTAR for a system is proposed to be increased in accordance with Paragraph (b) of this Rule, the following conditions shall be met:

(1) a special site evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(2) pressure dispersal shall be utilized;

(3) space shall be available for an equivalently sized dispersal field repair area; and

(4) 25-foot setback shall be maintained to all property lines unless a site-specific nitrogen migration analysis for a TS-I system indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L or a TS-II system is used.

(d) Trench dispersal products approved for a specific dispersal field reduction in area or trench length when receiving DSE in accordance with this Subchapter or a PIA Approval shall not be reduced by more than 50 percent as a result of increased LTAR in accordance with this Rule.

(e) The DDF shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;*

15A NCAC 18E .1204 is proposed for adoption as follows:

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving advanced pretreatment effluent with a DDF less than or equal to 3,000 gpd. Drip dispersal systems shall comply with the provisions of this Rule and Section .1600 of this Subchapter.

(b) Drip dispersal systems with a DDF less than or equal to 1,500 gpd shall utilize the siting and sizing criteria in this Paragraph when used with advanced pretreatment.

(1) The soil and site characteristics shall meet the following criteria based on effluent standards:

(A) NSF-40 Systems

(i) a minimum of 18 inches of naturally occurring suitable soil above a LC and 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation to any LC shall be 12 inches;

(ii) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except there shall be a minimum of 18 inches of naturally occurring suitable soil above a LC and a minimum of 12 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation shall be 18 inches to a LC and 12 inches to a SWC; or

(iii) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation to any LC shall be 18 inches;

(B) TS-I Systems

(i) a minimum of 15 inches of naturally occurring suitable soil above a LC and a minimum of 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation to any LC shall be nine inches;

(ii) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except there shall be a minimum of 12 inches of naturally occurring suitable soil above a LC, a minimum of nine inches vertical separation to a SWC, and a minimum of 12 inches vertical separation to a LC; or

(iii) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation to any LC shall be 12 inches; or

(C) TS-II Systems

(i) a minimum of 13 inches of naturally occurring suitable soil above a LC and the minimum vertical separation to any LC shall be six inches;

(ii) for new fill, the requirements of Part (B)(ii) of this Paragraph shall be met; or

(iii) for existing fill, the requirements of Part (B)(iii) of this Paragraph shall be met.

(2) Site modifications for advanced pretreatment drip dispersal systems shall meet the following criteria based on effluent standards:

(A) NSF-40 Systems may utilize a groundwater lowering system to comply with the vertical separation requirements to a SWC only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface. The minimum vertical separation to the projected, or drained, SWC shall be 12 inches. The addition of fill material shall not be used to comply with this requirement; and

(B) TS-I and TS-II Systems may utilize a groundwater lowering system to comply with the vertical separation requirements to a SWC. The minimum vertical separation to the projected, or drained, SWC shall be 12 inches. The groundwater lowering system may be

used with the following: Group III soils are present at any depth above the invert elevation of the highest point of the artificial drainage system or within 36 inches of the naturally occurring soil surface, whichever is deeper; or on new fill sites.

(3) Table XXVIX shall be used to determine the LTAR for advanced pretreatment drip dispersal systems based on Soil Group. Limitations in adjustment allowances for NSF-40, TS-I, and TS-II systems are listed in Subparagraphs (b)(3)(E), (b)(3)(F), and (b)(3)(G) of this Rule.

TABLE XXVIX. LTAR for advanced pretreatment drip dispersal systems based on Soil Group

Soil Group	**USDA Soil Textural Class**		**LTAR in gpd/ft^2**		
			NSF-40	**TS-I**	**TS-II**
I	Sands	Sand	0.6 – 1.0	0.8 – 1.2	0.8 – 1.5
		Loamy Sand			
II	Coarse Loams	Sandy Loam	0.4 – 0.6	0.5 – 0.8	0.6 – 0.8
		Loam			
III	Fine Loams	Sandy Clay Loam	0.15 – 0.4	0.2 – 0.6	0.2 – 0.6
		Silt Loam			
		Clay Loam			
		Silty Clay Loam			
		Silt			
IV	Clays	Sandy Clay	0.05 – 0.2	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(A) The LTAR shall be based on the most limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface.

(B) The DDF shall be divided by the LTAR, determined from Table XXVIX or XXX, to calculate the minimum dispersal field area required. The minimum dripline length shall be calculated by dividing the required area by the maximum line spacing of two feet. The following equations shall be used to calculate the minimum dispersal field area and dripline length required:

MA = DDF ÷ LTAR

DL = MA ÷ LS

Where MA = minimum dispersal field area, in ft^2

DDF = design daily flow, in gpd

LTAR = in gpd/ft^2

DL = dripline length, in feet

LS = two-foot line spacing

(C) The minimum dripline length calculated in Subparagraph (b)(3)(B) of this Rule shall not be less than 0.5 x DDF for Group I soils, 0.83 x DDF for Group II soils, 1.25 x DDF for Group III soils, or 3.33 x DDF for Group IV soils. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA Approval so that the minimum required dispersal field area calculated in Subparagraph (b)(3)(B) of this Rule does not need to be increased.

(D) Sections of blank tubing without emitters required to comply with site-specific conditions shall not count towards the minimum length of dripline needed when laying out the system or when calculating the linear footage of dripline needed.

(E) LTAR adjustment limitations for NSF-40 Systems

(i) the LTAR for new fill shall not exceed 0.6 gpd/ft^2 for Group I soils, 0.4 gpd/ft^2 for Group II soils, 0.15 gpd/ft^2 for Group III soils, or 0.05 gpd/ft^2 for Group IV soils; and

(ii) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(F) LTAR adjustment limitations for TS-I Systems

(i) the LTAR for new fill shall not exceed 1.0 gpd/ft^2 for Group I soils, 0.5 gpd/ft^2 for Group II soils, 0.2 gpd/ft^2 for Group III soils, or 0.07 gpd/ft^2 for Group IV soils;

(ii) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(iii) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable LC shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(G) LTAR adjustment limitations for TS-II Systems

(i) the LTAR for new fill shall not exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.2 gpd/ft^2 for Group III soils, or 0.07 gpd/ft^2 for Group IV soils;

(ii) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(iii) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable LC shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(4) Table XXX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

TABLE XXX. LTAR for advanced pretreatment drip dispersal systems based on Saprolite Group

Saprolite Group	**Saprolite Textural Class**	**LTAR, area basis, in gpd/ft^2**	
		NSF-40	**TS-I and TS-II**
I	Sand	0.4 – 0.5	0.4 – 0.6
	Loamy sand	0.3 – 0.4	0.3 – 0.5
II	Sandy loam	0.25 – 0.35	0.25 – 0.4
	Loam	0.2 – 0.25	0.2 – 0.3
	Silt loam	0.05 – 0.1	0.05 – 0.15
III	Sandy clay loam	0.05 – 0.1	0.05 – 0.15

(5) A special site evaluation shall be required in accordance with Rule .0510 of this Subchapter, as applicable.

(6) Setbacks allowed in Table XXVIII of Rule .1202(d) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the depth to a LC or vertical separation reduction is proposed compared to the requirements for DSE in Table XXVI or Table XXVII of Rule .1202(b) of this Section. A minimum of 18 inches of naturally occurring soil to an unsuitable LC shall be required to take setback reductions. The following LTAR limitations shall be applicable:

(A) for NSF-40 and TS-I systems, with the exception of the setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soil;

(B) for TS-II Systems, with the exception of setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the mid-range LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils; and

(C) for NSF-40, TS-I, and TS-II Systems, Table XXVIX may be used to determine the LTAR when no other setback reductions are taken aside of those to artificial drainage systems.

(c) Drip dispersal systems with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd used with advanced pretreatment may propose an adjusted LTAR if the following criteria are met:

(1) no reduction in the depth to a LC, vertical separation, or setback reduction is proposed;

(2) proposed LTAR is supported by a special site evaluation in accordance with Rule .0510 of this Subchapter; and

(3) 25-foot setback shall be maintained to all property lines, unless one of the following criteria is met:

(A) site-specific nitrogen migration analysis for a TS-I system indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

(d) Drip dispersal installation shall be in accordance with Rule .0908(f) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;*

15A NCAC 18E .1205 is proposed for adoption as follows:

15A NCAC 18E .1205 ADVANCED PRETREATMENT SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems with a DDF less than or equal to 1,500 gpd receiving TS-I or TS-II effluent shall meet the requirements of this Rule.

(b) The site meets the criteria in Rule .0906(c) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If a groundwater lowering system is used to comply with the vertical separation to a SWC, the following conditions shall apply:

(1) the site shall comply with the requirements of Rule .0906(d) of this Subchapter; and

(2) the vertical separation requirement to a SWC shall be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXXI shall be used to determine the LTAR for a sand-lined trench system and shall be based on the most limiting, naturally occurring soils overlying the permeable receiving layer. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(d) of this Subchapter. The LTAR shall be one of the following:

(1) the rate set forth in Table XXXI; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

TABLE XXXI. LTAR for advanced pretreatment sand lined systems based on texture of the most hydraulically limiting overlying soil horizon

Soil Group	Texture of Most Hydraulically Limiting Overlying Soil Horizon	LTAR in gpd/ft^{2*}
I	Sand	0.9 – 1.4
II	Coarse Loams	0.7 – 1.0
III	Fine Loams	0.4 – 0.8
IV	Clays	0.2 – 0.4

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench product is used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter shall be required for the following conditions to field verify the LTAR:

(1) when the texture of the receiving permeable horizon is sandy loam or loam, and the system DDF is greater than 600 gpd; or

(2) when the texture of the receiving permeable horizon is silt loam.

(f) Setbacks in accordance with Table XXVIII of Rule .1202(d) of this Section shall be applied to sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(h) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;*

15A NCAC 18E .1206 is proposed for adoption as follows:

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) This Rule shall apply to bed systems receiving advanced pretreatment.

(b) Bed systems receiving NSF-40 effluent, or better, on sites with a DDF less than or equal to 600 gpd shall meet the following requirements:

(1) the soil and site shall meet the following criteria:

(A) the vertical separation requirements of Rule .0901(g)(2) of this Subchapter;

(B) soil texture is Group I, II, or III; and

(C) design options for the site are limited by topography or available space;

(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the initial LTAR shall be increased by a factor of 1.125 with no further reduction in bed size allowed;

(3) setbacks allowed in Table XXVIII of Rule .1202(d) of this Section shall be used; and

(4) bed system installation shall be in accordance with Rule .0903(e) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent on sites with a DDF less than or equal to 1,500 gpd shall meet the following requirements:

(1) The soil and site meet the following criteria:

(A) there is a minimum of 30 inches of suitable Group I or II soils below the naturally occurring soil surface and no SWC within the first 36 inches below the naturally occurring soil surface or 36 inches of Group I soils below the naturally occurring soil surface and no SWC exists within the first 12 inches below the naturally occurring soil surface;

(B) the requirement for 30 inches of Group I or II soils or 36 inches of Group I soils in Part (c)(1)(A) of this Rule may be reduced to 18 inches when a special site evaluation in accordance with Rule .0510 of this Subchapter is provided;

(C) sites shall have a uniform slope not exceeding two percent, unless a special site evaluation submitted and approved in accordance with Rule .0510 of this Subchapter is provided; and

(D) the bed system shall be considered to be a fill system if the infiltrative surface is installed less than six inches below the naturally occurring soil surface. For bed systems in fill, the requirements of Paragraph (e) of this Rule shall also be met.

(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36 inches of the naturally occurring soil surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:

(A) the minimum amount of bottom area square feet shall be determined by dividing the DDF by the LTAR;

(B) when the bed is a fill system, the lowest LTAR for the applicable Soil Group shall be used. The LTAR shall not exceed 1.0 gpd/ft^2;

(C) fill shall not be added to the naturally occurring soil surface in order to increase the LTAR of a bed system;

(D) the minimum bed size shall be reduced by up to 25 percent when the system is designed to comply with TS-I or TS-II effluent and is not installed in existing fill; and

(E) the minimum bed size may be reduced by up to 40 percent when the following criteria are met: the system is designed to comply with TS-II effluent; Group I Soil is present in the first 36 inches of naturally occurring soil; no SWC exists within the first 30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom; the bed or beds are not located beneath the advanced pretreatment components, and pressure dispersal is used; effluent is distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there is 100 percent dispersal field repair area.

(3) A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when the vertical separation to a LC is reduced and on sites with slopes greater than two percent.

(4) Setbacks as set forth in Table XXVIII of Rule .1202(d) of this Section shall apply as follows:

(A) the setbacks shall be measured from the nearest edge of the bed;

(B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the bed sidewall, or from the projected toe of the slope that is required to comply with the soil and site limitations, whichever is greater;

(C) the minimum separation between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soils shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land; and

(D) whenever the bed size is reduced in accordance with this Rule, only reduced setbacks to artificial drainage systems in accordance with Table XXVIII of Rule .1202(d) of this Section shall be allowed.

(5) Bed system installation shall be in accordance with Rule .0903(e) of this Subchapter and the following:

(A) pressure dispersal shall be used whenever effluent is distributed to a bed not located beneath the advanced pretreatment component; and

(B) when new fill is required for the installation of a bed system, suitable Group I fill material shall be used to comply with the vertical separation requirements from the bed bottom to a LC, when all of the following conditions are met: a groundwater lowering system is not used to comply with the vertical separation requirements; new fill material is sand or loamy sand, containing not more than 10 percent by volume fibrous organics, building rubble, or other debris and does not have discreet layers containing greater than 35 percent of shell fragments by volume; and the requirements of Rule .0909(c)(8) of this Subchapter, for the

projected side slope of the fill are met, as determined beginning at a point six inches above the top edge of the bed.

(d) Bed systems receiving TS-I or TS-II effluent on sites with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd shall meet the following requirements:

(1) The soil and site shall meet the minimum following criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no SWC exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation of 24 inches to any SWC is maintained below the bed bottom, unless a site-specific groundwater mounding analysis is performed and demonstrates a 12-inch separation or 18-inch minimum for a fill system in accordance with Rule .0909(c) of this Subchapter shall be maintained.

(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36 inches of the naturally occurring soil surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:

(A) the minimum number of square feet of bed bottom area shall be calculated by dividing the DDF by the LTAR;

(B) the minimum bed size shall be reduced by up to 25 percent when the system is designed and approved to comply with TS-I or TS-II effluent standards and will be installed in naturally occurring soil; and

(C) the minimum bed size may be reduced by up to 40 percent when all of the following criteria are met: the system is designed and approved to comply with TS-II effluent standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation to a SWC is maintained after accounting for projected groundwater mounding; and there is 100 percent dispersal field repair area.

(3) A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter.

(4) No setback reductions shall be allowed in accordance with Table XXVIII of Rule .1202(d) of this Section. The following horizontal setbacks shall be met:

(A) the minimum setback between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soil shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land;

(B) when two beds are used, the minimum separation between two beds shall be 20 feet. When three or more beds are used, the minimum separation between beds shall be 10 feet; and

(C) a 25-foot setback shall be maintained from edge of the bed to the property line unless a site-specific nitrogen migration analysis indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L or TS-II or better effluent is produced by the approved system.

(5) Bed system installation shall be in accordance with Rule .0903(e) of this Subchapter and the following criteria:

(A) two or more equally sized beds shall be used and the beds shall not be located beneath the advanced pretreatment components; and

(B) effluent shall be distributed to the beds by a pressure dispersal system. A timed dosed system shall be used to distribute flow evenly to the beds over a 24-hour period.

(e) Bed systems receiving TS-I or TS-II quality effluent may be proposed for a site with existing fill that meets the requirements of Rule .0909(d) of this Subchapter under the following conditions:

(1) no SWC exists within 18 inches of the existing fill surface;
(2) 18 inches of vertical separation exists to the SWC;
(3) the DDF does not exceed 480 gpd; and
(4) pressure dispersal is used. The requirement for pressure dispersal shall not be required if the advanced pretreatment system PIA Approval allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, when the advanced pretreatment units are spaced at equal intervals across the entire bed area.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343;*

15A NCAC 18E .1301 is proposed for adoption as follows:

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems shall be operated and maintained in accordance with the conditions of the OP, PIA Approval, and the Rules of this Section, including maintaining setbacks as required in Section .0600 of this Subchapter and the manufacturer's operation and maintenance instructions, as applicable. Dispersal field repair areas shall be maintained in accordance with the Rules of this Subchapter.

(b) System management in accordance with Table XXXII shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXII shall also be required for all Type V and VI systems installed on or before July 1, 1992.

TABLE XXXII. Management responsibilities based on wastewater system classification type and description

System Classification Type and Description	LHD Compliance Inspection Frequency	Management Entity	Management Entity Minimum Maintenance Inspection Frequency
Ia – Privy or vault privy*	N/A	Owner	N/A
Ib – Chemical toilet*	N/A	Owner	N/A
Ic – Incinerating toilet*	N/A	Owner	N/A
Id – Composing toilet system*	N/A	Owner	N/A
Ie – Other toilet system*	N/A	Owner	N/A
IIa – Conventional system for a single family or 480 gpd or less	N/A	Owner	N/A
IIb – Accepted wastewater gravity system	N/A	Owner	N/A
IIIa – Conventional wastewater system greater than 480 gpd excluding single family residences	N/A	Owner	N/A
IIIb – Wastewater system with a single pump or siphon	5 years N/A	Owner or Certified Operator	N/A 5 years
IIIc – Gravity fill system	N/A	Owner	N/A
IIId – Alternating dual fields with gravity distribution	N/A	Owner	N/A
IIIe – PPBPS gravity system	N/A	Owner	N/A
IIIf – LDP gravity system	N/A	Owner	N/A

IIIg – Other non-conventional systems	N/A	Owner	N/A
IIIh – Gravity groundwater lowering system	5 years	Owner	N/A
IVa – LPP distribution	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	2/year
IVc – Off-site system serving two or more facilities with any components under common or joint control	5 years	Private Certified Operator or Public Management Entity with a Certified Operator	1/year
IVd –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	1/year
Va – Advanced pretreatment meeting NSF-40, TS-I, or TS-II, approved under Section .1700 of this Subchapter, DDF ≤ 3,000 gpd	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	≤ 1,500 gpd - 2/year* > 1,500 gpd and ≤ 3,000 gpd - 4/year
Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	> 3,000 and ≤ 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS, approved under Section .1500 of this Subchapter, meeting NSF-40, DDF ≤ 1,500 gpd	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	≤ 1,500 gpd - 2year*
Vd – Anaerobic drip dispersal systems	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	≤ 1,500 gpd - 2/year* > 1,500 gpd and ≤ 3,000 gpd - 4/year > 3,000 gpd and ≤ 10,000 gpd – 12/year > 10,000 gpd – 1/week
Ve - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	Private Certified Operator or Public Management Entity with a Certified Operator	Based on equalized flow ≤ 1,500 gpd - 2/year > 1,500 and ≤ 3,000 gpd - 4/year > 3,000 gpd and ≤ 10,000 gpd – 12/year >10,000 gpd – 1/week
Vf – Sand lined trench system with no advanced pretreatment or drip dispersal	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	1/year
Vg – Wastewater system with pump groundwater lowering systems	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	2/year with one visit during the wet season

Vh – IPWW designed by a PE and reviewed by the Department and determined to be IPWW	1/year	Private Certified Operator or Public Management Entity with a Certified Operator	≤ 1,500 gpd - 2/year* > 1,500 gpd and ≤ 3,000 gpd - 4/year > 3,000 gpd and ≤ 10,000 gpd – 12/year > 10,000 gpd – 1/week
Vi – Permanent pump and haul	1/year	Private Certified Operator	1/month
VIa – Advanced pretreatment > 3,000 gpd meeting NSF-40, TS-I, or TS-II	6 months	Private Certified Operator or Public Management Entity with a Certified Operator	Media filters > 3,000 gpd and ≤ 10,000 gpd - 12/year >10,000 gpd – 1/week All other advanced pretreatment > 3,000 gpd and ≤ 10,000 gpd - 12/year > 10,000 and ≤ 25,000 gpd - 2/week > 25,000 and ≤ 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Any system using RCW	6 months	Private Certified Operator or Public Management Entity with a Certified Operator	≤ 3,000 gpd - 12/year > 3,000 and ≤ 10,000 gpd - 1/week > 10,000 and ≤ 25,000 gpd - 2/week > 25,000 and ≤ 50,000 gpd - 3/week > 50,000 gpd - 5/week

*Quarterly Management Entity inspections shall be required for the first year. The quarterly inspections may be reduced to twice a year if the wastewater system is in compliance with all OP conditions after the first year.

(c) Wastewater systems with multiple components shall be classified by their highest or most complex system classification type in accordance with Table XXXII to determine LHD and Management Entity responsibilities.
(d) The Department shall classify wastewater systems not identified in Table XXXII after consultation with the Water Pollution Control Systems Operators Certification Commission.
(e) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.
(f) The system shall be maintained to comply with the effluent standards specified in Table XXV of Rule .1201(a) or Rule .1002 of this Subchapter and the OP, as applicable. Influent and effluent sampling may be required for food preparation or processing facilities, IPWW, and other systems as specified in the PIA Approval or OP.
(g) The owner may submit a written request to the LHD and Department to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency. The written request shall include documentation showing that the wastewater system is compliant with its OP and Rule .1302(f) of this Section.
(h) The replacement of a specific component by an identical replacement component, including pipes, blowers, pumps, disinfection components, effluent filters, and control panels and appurtenances, shall be considered maintenance. When the replacement is performed as maintenance by the Management Entity, this activity shall be reported to the owner and LHD within 30 days of when the activity occurs.
(i) All residuals shall be removed as specified in the OP, the RWTS or PIA Approval, Rule .1303 of this Section, or as otherwise determined to be needed by the Management Entity. Residuals from the wastewater system shall be transported and disposed of in accordance with G.S. 130A, Article 9, and 15A NCAC 13B.

History Note: Authority G.S. 130A-335(e) and (f); S.L. 2015-147, s.2;

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS

(a) This Rule shall apply to all advanced pretreatment systems approved in accordance with Sections .1500 and .1700 of this Subchapter.

(b) System management in accordance with Table XXXII of Rule .1301(b) of this Section shall be required for advanced pretreatment systems.

(c) Prior to the issuance or re-issuance of an OP for an advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place with a Management Entity. For proprietary advanced pretreatment systems, the contract shall be with either the manufacturer, manufacturer's representative, or a Management Entity authorized in writing by the manufacturer or manufacturer's representative to operate the system. For non-proprietary advanced pretreatment systems, the contract shall be with an operator certified in accordance with Rule .0303(e) of this Subchapter for the classification indicated on the OP.

(d) Operation and maintenance for advanced pretreatment shall be in accordance with the following:

(1) the Management Entity shall evaluate the performance of each system;

(2) minimum inspection, sampling, and reporting frequency shall be in accordance with this Section, the RWTS or PIA Approval, and conditions of the OP;

(3) the Management Entity shall inspect each system during one or more of the required Management Entity inspections while the system is in operation using a VIP specified by the manufacturer and included in the RWTS or PIA Approval. The VIP shall include the following:

(A) a visual inspection and evaluation of all critical treatment components and of the effluent in the field for solids, clarity, color, and odor. The VIP shall also include field tests of pH, turbidity, and dissolved oxygen content and, for TS-II systems, alkalinity, and any other tests proposed by the manufacturer and specified in the RWTS or PIA Approval;

(B) compliance criteria to determine system compliance status and proposed responses to conditions observed; and

(C) for systems serving vacation rentals subject to the North Carolina Vacation Rental Act, G.S. 42A, this visit shall be scheduled during the seasonal high use period and shall coincide with a water quality sampling event if required in accordance with Rule .1709 of this Subchapter;

(4) the actual flow shall be recorded in accordance with the RWTS or PIA Approval by the Management Entity prior to the visual inspection of the system in accordance with Subparagraph (d)(3) of this Rule and prior to any effluent sampling event required in accordance with Rule .1709 of this Subchapter; and

(5) sampling and resampling for an approved RWTS or PIA System shall be undertaken as required in accordance with Rule .1709 of this Subchapter and the following:

(A) all samples shall be collected, preserved, transported, and analyzed in compliance with 40 CFR 136;

(B) samples shall be taken to a certified laboratory, as defined in G.S. 130A-313(2), for analysis;

(C) documented chain of custody for each sample collected shall be maintained; and

(D) re-sampling at any site shall be performed as required in the RWTS or PIA Approval, Rule .1709 of this Subchapter, or as otherwise directed by the LHD or Department as part of an enforcement action. The owner, manufacturer, or manufacturer's representative may also re-sample a system to verify or refute sample results. A new complete data set for re-sampling conducted within 30 days of receipt of a non-compliant data set may be substituted to demonstrate compliance with the designed effluent quality standard in accordance with Table XXV of Rule .1201(a) of this Subchapter. All sample results collected shall be reported.

(e) The results of all sampling shall be reported by the Management Entity to the owner, LHD, Department, and the proprietary advanced pretreatment manufacturer.

(f) An individual advanced pretreatment system at a single site shall be considered compliant when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA Approval indicates that the results of the VIP meet the requirements specified in the RWTS or PIA Approval; and

(2) the arithmetic mean for BOD_5, TSS, TKN, and TN and the geometric mean for Fecal Coliform from three or more consecutive sampling dates does not exceed the designated effluent standard in Table XXV in Rule .1201(a) of this Subchapter. A new complete data set for re-sampling conducted within 30 days of receipt of a non-compliant data set may be substituted to demonstrate compliance with the designed effluent quality standard in accordance with Table XXV of Rule .1201(a) of this Subchapter.

(g) Mass loading for BOD_5, TSS, or TN may be used to demonstrate site compliance with Subparagraph (f)(2) of this Rule for a wastewater system with a DDF less than or equal to 3,000 gpd. The mass loading to the wastewater system shall be based on site-specific water use data and effluent sampling results. At least one year of water use data shall be used in this calculation. The mass loading to the wastewater system shall be calculated as follows:

EML = Flow x EFF

AML = 0.6 x DDF x TS

If EML ≤ AML, the site is compliant

Where EML = effective mass loading

AML = allowable mass loading

Flow = average daily flow during the peak water use month or the average of the peak 30 consecutive day period during the prior year, in gpd

EFF = average of the results for the constituent from at least the two most recent complete data sets, in mg/L

TS = the effluent limit based on the constituent and effluent standard in mg/L, from Table XXV in Rule .1201(a) of this Subchapter

(h) The Management Entity may record daily wastewater flow and may sample influent to the advanced pretreatment system as needed to determine compliance with this Rule and OP conditions.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .1303 is proposed for adoption as follows:

15A NCAC 18E .1303 OWNER RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) Any person owning or controlling the property upon which a wastewater system is installed shall be responsible for the following items regarding the operation and maintenance of the system:

(1) the wastewater system shall be operated and maintained to protect North Carolina ground and surface water quality standards and to prevent the following conditions:

(A) discharge of sewage or effluent to the surface of the ground, surface waters, or into groundwater at any time;

(B) back-up of sewage or effluent into the facility, building drains, collection system, freeboard volume of the tanks, or distribution system; or

(C) effluent within three inches of finished grade over one or more trenches based on two or more observations made not less than 24 hours apart, and greater than 24 hours after a rainfall event;

(2) the system shall be considered to be malfunctioning when one or more of the conditions of Subparagraph (a)(1) of this Rule occur or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to prevent one or more of the conditions of Subparagraph (a)(1). The owner shall contact the LHD when the wastewater system is

malfunctioning and implement remedies as directed by the LHD in accordance with Rule .1306 of this Section;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed whenever the depth of both the scum and sludge is found to be more than one-third of the liquid depth in any compartment. The effluent filter shall be rinsed to remove accumulated solids that can cause the wastewater to back up into the facility or clog the system, or replaced as needed;

(4) residuals from the wastewater system shall be transported and disposed of in accordance with G.S. 130A, Article 9, and 15A NCAC 13B;

(5) grease traps and grease tanks shall be pumped as needed to prevent discharge of FOG from the trap or tank to the next treatment component, but no less than yearly. Grease traps and grease tanks shall be maintained in accordance with Rule .0803(h) of this Subchapter and the owner shall maintain a contract with a septage management firm. All pumping records shall be maintained on-site;

(6) site-specific vegetation shall be established and maintained over the wastewater system and repair area to stabilize slope and control erosion; and

(7) activities that result in soil disturbance or soil compaction shall not occur over the initial and repair dispersal field areas.

(b) A contract for operation and maintenance of a wastewater system required to be maintained by a Management Entity, as specified in Table XXXII of Rule .1301(b) of this Section, shall be in effect for as long as the system is in use. A contract shall be executed between the system owner and a Management Entity prior to the issuance of an OP, unless the system owner and Management Entity are the same. The contract shall include:

(1) specific requirements for operation, maintenance, and associated reporting;

(2) responsibilities of the owner;

(3) responsibilities of the Management Entity;

(4) provisions for notification to the LHD by the owner and Management Entity upon termination of the contract; and

(5) other requirements for the continued performance of the system, as determined by the Management Entity, LHD, and Department, as applicable.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .1304 is proposed for adoption as follows:

15A NCAC 18E .1304 MANAGEMENT ENTITY RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) When a Management Entity is required to be or to employ a certified operator as specified in Table XXXII in Rule .1301(b) of this Section, the operator shall, at a minimum, be certified as a subsurface operator in accordance with G.S. 90A, Article 3, and 15A NCAC 08G. Operators of systems classified as Type V or VI in Table XXXII in Rule .1301(b) of this Section may be required to have additional certifications by the Department in accordance with Rule .1301(e) of this Section and upon consultation with the Water Pollution Control Systems Operator Certification Commission, if required by G.S. 90A, Article 3.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXII in Rule .1301(b) of this Section or in accordance with the RWTS or PIA Approval.

(c) The Management Entity shall provide a copy of the inspection report, including results of the VIP with respect to compliance criteria as specified in the RWTS or PIA Approval and effluent sampling, to the owner, LHD, and manufacturer within 30 days of the system inspection.

(d) When inspections indicate the need for system repairs, the Management Entity shall notify the LHD within 48 hours.

(e) The Management Entity shall be responsible for conducting routine maintenance procedures and monitoring requirements in accordance with the conditions of the OP and the contract.

(f) The Management Entity shall notify the LHD and the proprietary advanced pretreatment manufacturer, as applicable, when the owner or the Management Entity chooses not to renew an operation and maintenance contract executed in accordance with this Rule.

(g) The Management Entity shall submit the inspection report to the Department centralized data management system.

History Note: *Authority G.S. 130A-335(e) and (f);*

15A NCAC 18E .1305 is proposed for adoption as follows:

15A NCAC 18E .1305 LOCAL HEALTH DEPARTMENT RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) No IP, CA, or OP shall be issued for Type IV, V, or VI systems, unless a Management Entity of the type specified in Table XXXII in Rule .1301(b) of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system as set forth in these Rules and the OP.

(b) An LHD may be the Management Entity only for systems classified Type IV, Va, Vb, Vc, Vd, Ve, Vf, and Vg and only when authorized by the local board of health.

(c) An authorized agent shall review the performance and inspection reports submitted in accordance with Rule .1304(c) of this Section and perform an on-site compliance inspection of the systems as required in Table XXXII in Rule .1301(b) of this Section. More frequent inspections may be performed by an authorized agent if requested by the system owner or the Management Entity, or specified in the PIA approval or OP.

(d) The LHD may provide the owner with the option for a private Management Entity, who is not the owner, to perform the on-site compliance inspection for Type IIIb and IIIh systems in accordance with Table XXXII in Rule .1301(b) of this Section instead of the LHD. The Management Entity shall provide to the owner and LHD a written compliance inspection report every five years. The report shall document that the wastewater system is compliant with this Subchapter, the performance standards in the OP or ATO, and conditions in the OP or the ATO.

(e) The authorized agent shall issue a written notice of non-compliance to the owner when the wastewater system is non-compliant with this Subchapter, the performance standards in the OP or ATO, or conditions in the OP or the ATO.

(f) The LHD shall investigate malfunctions in accordance with Rule .1306 of this Section.

History Note: Authority G.S. 130A-335(e) and (f);

15A NCAC 18E .1306 is proposed for adoption as follows:

15A NCAC 18E .1306 SYSTEM MALFUNCTION AND REPAIR

(a) This Rule identifies the responsibilities of the LHD and the owner when a system is malfunctioning or otherwise determined to require repair.

(b) The LHD or Department shall issue a written NOV to the wastewater system owner in accordance with Rule .0302(c) of this Subchapter.

(c) The wastewater system shall be repaired within 30 days of the date on the NOV issued by the Department or LHD unless the NOV specifies a different time frame for the repair based on site-specific factors, such as the severity of the repair, wastewater backing up into a restaurant or discharging into SA waters, or adverse weather that delays construction of the repair. The following steps shall be followed to remedy a malfunctioning wastewater system:

(1) The owner shall apply for a repair in accordance with Section .0200 of this Subchapter, unless only maintenance is required to bring the wastewater system into compliance.

(2) After investigating the malfunction, the Department or LHD shall require that the wastewater system be repaired to correct the malfunction and eliminate any public health hazard. The wastewater system shall be repaired so that it meets G.S. 130A, Article 11 and this Subchapter. When it is not possible to bring the wastewater system into compliance with G.S. 130A, Article 11 and this Subchapter, the authorized agent shall use their best professional judgement, based on education and experience, to require a repair that should enable the wastewater system to function in a manner that complies with Rule .1303(a)(1) of this Section. The LHD shall document the repair using best professional judgement on the CA and OP.

(3) When necessary to protect the public health, the Department or LHD shall require the owner of a malfunctioning system to pump and haul sewage to an approved wastewater system during the time needed to repair the wastewater system. This requirement shall be included in the NOV issued to the owner.

(d) If no repair options are available for the wastewater system in accordance with Paragraph (c), the LHD may issue a CA for a permanent pump and haul system. The owner shall submit an application to the LHD for the permanent pump and haul system. The application and permanent pump and haul system shall meet the following conditions:

(1) The owner shall provide the following information as part of the application:

(A) documentation that the system cannot be repaired by connection to a system approved under this Section or Rules adopted by the Environmental Management Commission;
(B) a contract with a septage management firm permitted in accordance with G.S. 130A-291.1 to pump and haul the sewage;
(C) documentation that the wastewater system has been approved under this Subchapter or in accordance with 15A NCAC 02H or 15A NCAC 02T to accept sewage; and
(D) documentation from the facility receiving the sewage confirming that the facility has the capacity for the additional sewage and agrees to accept it.

(2) The LHD shall design the pump and haul system based on the following criteria:
(A) tankage with a minimum of five days storage capacity and two days emergency storage capacity;
(B) high-water alarm set to go off with two days of emergency storage capacity left in the tankage; and
(C) telemetry unit that contacts the septage management firm.

(3) The owner of a non-residential facility may request a reduction in the five day storage requirement, if the owner can document the ability to have the tanks pumped out with only 24 hours' notice. The total tank capacity shall never be less than the minimum required septic tank and pump tank capacity required by Section .0800 of this Subchapter.

(4) Tanks shall be approved by the LHD for permanent pump and haul if shown to be structurally sound, watertight, and of a capacity needed based on the DDF and projected pumping frequency. Existing tanks may be used for permanent pump and haul if the tanks meet the requirements in this Subparagraph.

(5) Prior to issuing the OP, the LHD shall receive from the owner a contract with a Management Entity for inspection and maintenance of the system.

(6) A non-transferrable OP, valid for a period not to exceed five years, shall be issued to the pump and haul system owner.

(e) A malfunctioning wastewater system that has been disconnected from the facility for any reason shall be repaired prior to reuse.

(f) If a malfunctioning wastewater system is found to be nonrepairable the dispersal system shall not be used. The system owner shall be required to abandon the system to protect the public health and safety as specified in Rule .1307 of this Section.

(g) For facilities with a malfunctioning wastewater system installed prior to July 1, 1977, the authorized agent shall use their best professional judgement, based on education and experience, to repair the system.

(h) For facilities with a straight pipe installed prior to July 1, 1977, which has been in continual use and acts as the sole source of wastewater disposal, the authorized agent shall use their best professional judgement, based on education and experience, to repair the straight pipe.

(i) Legal remedies may be pursued, in accordance with G.S. 130A, Article 1, Part 2, after an authorized agent has observed and documented one or more malfunctioning conditions and issued an NOV.

History Note: *Authority G.S. 130A-291.1; 130A-291.2; 130A-335(e) and (f);*

15A NCAC 18E .1307 is proposed for adoption as follows:

15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is abandoned or is otherwise no longer in use, the tanks shall:

(1) have the contents removed by a septage management firm permitted in accordance with G.S. 130A-291.1;

(2) be removed, collapsed, or otherwise rendered unable to retain liquid, and backfilled; and

(3) have the electrical components de-energized and above ground components removed.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .1401 is proposed for adoption as follows:

SECTION .1400 – APPROVAL OF TANKS, RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION BOOTS

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks proposed for use in a wastewater system described in this Subchapter shall be approved by the Department. Tanks shall be approved as follows:

(1) The tank design shall be approved based on the plans and specifications submitted in accordance with Subparagraphs (c)(1) through (c)(8) of this Rule. After the tank design has been approved, a temporary identification number shall be assigned for tracking purposes.

(2) The tank shall pass a structural load test as described in Subparagraph (c)(9) of this Rule. The test shall be performed and certified by a third-party. The test shall be observed in person by the Department, LHD, PE, or a credentialled testing organization. If the tank passes the structural load test, then the tank shall be assigned a permanent identification number. Tanks shall not be sold for use in a wastewater system without a permanent identification number.

(3) The structural design verification shall be required for new tanks, modifications to tank design, and when tank forms are sold to a different tank manufacturer.

(4) Pump tanks may be tested and approved with a baffle wall, without a baffle wall, or with a partial baffle wall. The most limiting design produced by the manufacturer shall be tested.

(b) The tank manufacturer shall submit three copies of the plans and specifications for the initial design of each tank to the Department for approval.

(c) Plans and specifications for tanks with a total liquid capacity less than or equal to 4,000 gallons shall include the following:

(1) all tank dimensions in inches, including:

(A) top, bottom, and sidewall thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall location and minimum and maximum thickness and variations;

(D) location and dimension of all openings in baffle wall for gas and liquid movement; and

(E) dimensions of all compartments;

(2) material type and strength, including reinforcement material and location, as applicable, specified by the manufacturer;

(3) method for fastening the baffle wall to the tank interior;

(4) liquid depth and operating capacity in gallons;

(5) pipe penetration boot locations and pipe penetration boots approved in accordance with Rule .1404 of this Section;

(6) methods and material for sealing sections and forming watertight joints in tanks with multiple sections;

(7) drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank;

(8) tank manufacturer and PE requirements for installation, including bedding, additional sealing methods, and leak testing procedures; and

(9) documentation of proof of design. The tank shall withstand a minimum uniform live load of 150 pounds per square foot in addition to the dead weight of the material and all geostatic and hydrostatic loads to which an underground tank is normally subjected, such as active soil pressure on tank walls and the uplifting force of groundwater. The documentation shall be one of the following:

(A) a vacuum test of 4.24 inches of mercury held for five minutes meeting the following criteria:

(i) no loss in vacuum greater than two-fifths of an inch of mercury during the test;

(ii) no deformation or deflection greater than two percent along any dimension unless shown by measurement or calculation to result in a reduction in volume no greater than two percent;

(iii) no distortion of the access openings occurs during the testing that prevents removal and replacement of the access opening lids at the conclusion of the test; and

(iv) for tanks constructed with integral risers, no distortion of the riser during the testing and the riser lid can be removed and replaced at the conclusion of the test;

(B) calculations from a PE that the tank can withstand the loading requirements of this Subparagraph and the performance requirements of Part (A) of this Subparagraph shall be met; or

(C) the tank shall be either IAPMO/ANSI Z1000 or CSA B66 certified and the tank manufacturer enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual manufacturing facility audits.

(d) Plans and specifications for tanks with a total liquid capacity greater than 4,000 gallons and all tanks designed for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design, including all the information listed in Paragraph (c) of this Rule and engineering calculations showing the minimum and maximum soil burial depth, water table, and traffic load the tank is designed to support.

(e) Plans for tanks not proposed for general use and issued an identification number under this Section shall meet the minimum requirements of this Section and shall be approved by the Department.

(f) The Department or LHD may inspect approved tanks at the place of manufacture, the inventoried sites of the distributors, or at the installation of the tank in a wastewater system for compliance with the approved plans and specifications.

(g) Tanks found to be out of compliance shall be brought back into compliance by the tank manufacturer or the installer as directed by the Department or LHD. Tanks that are not or cannot be brought into compliance shall not be used in a wastewater system and the imprints identified in Rule .1402(d)(15) or (e)(8) of this Section shall be permanently marked over by the authorized agent.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1402 is proposed for adoption as follows:

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight, structurally sound, and not subject to corrosion or decay.

(b) Septic tanks and grease tanks shall have effluent filters and access devices approved in accordance with Rule .1404 of this Section. An effluent filter and support case shall be installed level in the outlet end of the septic tank or grease tank and shall meet the following criteria:

(1) solvent welded to a minimum of three-inch PVC Schedule 40 outlet pipe;

(2) be installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) be accessible and removable without entering the septic tank or grease tank.

(c) Septic tanks installed where the access openings on the top of the tank are deeper than six inches below finished grade shall have an access riser over each compartment with a cover that extends to within six inches of the finished grade. The opening of the access riser shall be large enough to accommodate the removal of the septic tank lid. When the top of the septic tank or access riser is below the finished grade, the location of the tank shall be visible at finished grade. When access risers are used they shall be installed in accordance with the Rules of this Subchapter, the manufacturer's specifications, and the Department’s approval.

(d) Septic tanks shall meet the following minimum design standards:

(1) a minimum liquid depth of 36 inches;

(2) a minimum of nine inches freeboard, measured as the air space between the top of the liquid and the bottom of the tank top. Venting of the tank shall be provided to prevent the buildup of gases;

(3) the approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) the length of the tank shall be a minimum of twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) there shall be three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

(6) outlet openings shall have a cast or manufactured penetration point and include a watertight, sealed, non-corrodible, and flexible connective sleeve. A flexible connective sleeve shall be able to bend

without breaking. The connective sleeve shall meet ASTM C1644 for precast concrete tanks or ASTM C1644, C923, or C564 for thermoplastic or glass-fiber-reinforced polyester tanks and be approved by the Department if it meets the requirements of this Subparagraph and Rule .1404 of this Section;

(7) inlet penetrations shall be greater than or equal to four inches in diameter and outlet penetrations shall be greater than or equal to three inches in diameter;

(8) there shall be no openings below the septic tank operating liquid level;

(9) the outlet shall be through an effluent filter approved in accordance with Rule .1404 of this Section, and secured in place in an effluent filter support case. The effluent filter case inlet shall extend down to between 25 and 50 percent of the liquid depth measured from the top of the liquid level. Other methods of supporting the effluent filter case and for making pipe penetrations shall be approved by the Department on a case-by-case basis upon a showing that the performance is identical to those designed in accordance with this Rule;

(10) the invert of the outlet shall be a minimum of two inches lower in elevation than the invert of the inlet;

(11) all septic tanks shall be designed with a partition so that the tank contains two compartments. The following conditions shall be met:

(A) the partition shall be located at a point not less than two-thirds or more than three-fourths the length of the tank from the inlet end;

(B) the partition shall be designed, manufactured, installed, and maintained to remain in position when subjected to a liquid capacity in one compartment that corresponds with the lowermost elevation of the water passage slot or holes;

(C) the partition shall be designed to create a gas passage, not less than the area of the inlet pipe, and the passage shall not extend lower than seven inches from the bottom side of the tank top;

(D) the top and bottom sections of the partition shall be designed to create a water passage slot four inches high for the full interior width of the tank, or a minimum of two four- or five-inch openings, or one four- or five-inch opening per 30 horizontal linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;

(E) the partition shall be designed, manufactured, and installed to create an average opening not greater than one-half inch between the partition and the tank wall below the liquid level, with a tolerance of one-half inch;

(F) the entire liquid passage in the partition wall shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level; and

(G) other methods for designing partition shall be approved by the Department on a case-by-case basis upon a showing that the performance is identical to those designed in accordance with this Rule;

(12) access openings shall be provided in the top of the tank, located over each compartment, and have a minimum opening of 15 inches by 15 inches or 17 inches in diameter. The opening shall allow for maintenance and removal of internal devices of the septic tank;

(13) access risers and covers shall be designed and manufactured to prevent surface water infiltration;

(14) tank lids and riser covers shall be locked, secured with fasteners, or weigh a minimum of 40 pounds, but no more than 80 pounds; and

(15) all septic tanks shall bear an imprint or embossment identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the Department,

and the liquid or working capacity of the tanks. The imprint or embossment shall be located to the right of the blockout made for the outlet pipe on the top or end of outlet end of the tank.

(e) Pump tanks shall meet the design requirements of Paragraph (d) of this Rule with the following modifications:

(1) a watertight access riser with removable cover shall be located over the pump. The access riser shall extend to a minimum of six inches above finished grade and shall be designed and maintained to prevent surface water infiltration;

(2) the access opening over the pump shall have a minimum opening of 24 inches in diameter or equidimensional opening;

(3) when two or more pumps are required in accordance with Rule .1101(b) of this Subchapter the access openings shall be sized to allow for pump removal, operation, and maintenance;

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain a minimum of two four-inch diameter circular openings, or openings with an equivalent area, located no more than 12 inches above the tank bottom;

(5) there shall be no requirement as to tank length, width, or shape, provided the tank satisfies all other requirements of the Rules of this Section;

(6) the invert of the inlet openings shall be located within 12 inches of the tank top. No freeboard shall be required in the pump tank;

(7) tanks shall be vented if located more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint or embossment identifying the manufacturer, the pump tank serial number assigned to the manufacturer's plans and specifications by the Department, and the liquid or working capacity of the tank. The imprint or embossment shall be located to the left of the blockout made for the outlet pipe on the top or end of outlet end of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be septic tanks approved in accordance with Paragraph (d) of this Rule with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth measured from the top of the liquid level. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth measured from the top of the liquid level;

(2) when sanitary tees are used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tees shall be provided for servicing and routine maintenance;

(3) when two or more tanks are used in series, a sanitary tee shall be provided in the outlet end of each interconnected tank extending down between 40 and 60 percent of the liquid depth;

(4) the final chamber shall contain an effluent filter and support case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the Department for use in grease tanks. The grease rated effluent filter shall be sized for the DDF and have openings of 1/32-inch or less; and

(5) access risers shall extend to finished grade and be capped with cast iron manhole rings and covers. Lockable aluminum hatches may be substituted for cast iron manhole rings and covers in non-traffic areas. Aluminum hatches or manhole rings and covers shall be designed and maintained to prevent surface water infiltration. Locks shall be the responsibility of the person owning or controlling the system.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule and shall:

(1) be designed in accordance with the construction requirements of this Rule and Rule .0804 of this Section;

(2) provide three inches of freeboard;

(3) have the invert of the inlet pipe three inches above the siphon trip level; and

(4) have a watertight access opening over each siphon with an opening of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

History Note: *Authority G.S. 130A-335(e), (f), and (f1); 130A-335.1;*

15A NCAC 18E .1403 is proposed for adoption as follows:

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks approved in accordance with this Section shall be constructed of materials capable of resisting corrosion from sewage and sewage gases, structurally sound, and watertight.

(b) Reinforced precast concrete tanks shall meet the following minimum material and construction requirements:

(1) the ends and sides of the tank shall have a minimum thickness of two and one-half inches. The top and bottom of the tanks shall be a minimum of three inches thick;

(2) the top, bottom, end and sides of the concrete tank and tank lid shall be reinforced by using a minimum reinforcing of six-inch by six-inch No. 10 gage welded steel reinforcing wire. Reinforcement shall be placed to maximize the structural integrity of the tank;

(3) alternative reinforcement designs may be used when they perform in a manner equal to or more effective than the reinforcement design described in Subparagraph (2) of this Paragraph;

(4) when the concrete tank, tank lid, riser, or riser cover are subjected to vehicular traffic, the tank shall be designed by a PE to handle the traffic load in accordance with ASTM C890;

(5) any tank installed deeper than three feet shall be designed by a PE for the proposed tank burial depth. The tank design shall be submitted to the Department for review. The design shall be approved when documentation is provided to show that the proposed tank design can withstand all active and passive loads on the tank, including the additional soil weight from a deeper burial depth.

(6) the concrete shall achieve a minimum 28-day compressive strength of 4,000 psi. The concrete shall meet a compressive strength of 3,500 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that the tank meets this condition;

(7) tanks manufactured in multiple sections shall be joined and sealed at the joint by using butyl rubber or other pliable sealant meeting ASTM C990 or other material that has been approved by the Department when documentation has been provided to show that the material meets all performance requirements of ASTM C990. Documentation shall also be provided to the Department to show that the material is waterproof and corrosion resistant; and

(8) tank lids and riser covers shall have a durable handle made of corrosion-resistant materials and capable of pull capacity sufficient for the weight of the lid or cover.

(c) Thermoplastic tank materials shall conform with IAPMO/ANSI Z1000 or CSA B66 requirements.

(d) Glass-fiber-reinforced polyester tanks shall meet the following requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of one-fifth inches. The baffle wall shall be a minimum of 3/16-inches thick;

(2) material and laminate requirements specified in IAPMO/ANSI Z1000 or CSA B66 for glass-fiber-reinforced polyester tanks; and

(3) enrolled in a third-party quality assurance and quality control program, which include material testing and unannounced annual audits.

(e) Cast or manufactured in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the Department when the tank design, construction, and materials meet the criteria set forth in this Rule and Rule .1402 of this Section.

History Note: Authority G.S. 130A-335(e), (f), and (f1);

15A NCAC 18E .1404 is proposed for adoption as follows:

15A NCAC 18E .1404 PLANS AND SPECIFICATIONS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION BOOTS

(a) All risers, effluent filters, and pipe penetration boots proposed for use in a wastewater system shall be approved by the Department prior to being offered for sale or use in North Carolina.

(b) Three copies of the plans and specifications for the initial design of each riser, effluent filter, or pipe penetration boot shall be submitted to the Department. Plans for risers, effluent filters, and pipe penetration boots shall be approved by the Department and an approval letter issued when the design is found to comply with this Section. All changes or modifications to risers, effluent filters, or pipe penetration boots shall be approved by the Department when the changes or modifications comply with the requirements of this Rule.

(c) Risers and riser lids shall be able to withstand a minimum uniform live loading of 300 pounds per square foot or a minimum 1,500 pound load applied in a 10 inch by 10 inch area centered on the lid, in addition to all loads to which a riser is normally subjected, such as dead weight of the material and soil cover and active soil pressure on riser walls.
(d) Riser plans and specifications submitted to the Department for review and approval shall show the design of the riser and include the following information:

(1) manufacturer's name, mailing address, phone and fax numbers, email address, and name of manufacturer's point of contact;
(2) physical dimensions of the riser and riser cover, including wall thickness, internal diameter, proposed casting or installation details and methods, and pipe penetrations;
(3) material type and strength, including reinforcement material and location as required;
(4) documentation from a third-party showing that the riser meets the load requirements specified in Paragraph (c) of this Rule;
(5) plans for septic tank risers of a secondary lid, concrete plug, or other safety device that shall be provided inside the riser for security and to prevent accidental entry;
(6) plans for pump tank risers of primary and secondary safety mechanisms that shall be provided with the riser. The primary safety mechanism shall be a locking riser lid, ring and lock, or other riser lid locking or tamper-resistant mechanism. The secondary safety mechanism shall be a secondary lid, concrete plug, or other safety device to be provided inside the pump tank riser; and
(7) specifications for application, installation, operation, and maintenance for both new and retrofit applications for single and multiple riser sections.

(e) Effluent filter plans and specifications submitted to the Department for review and approval shall show the design of the effluent filter and include the following information:

(1) manufacturer's name, address, phone and fax numbers, and contact name;
(2) documentation and a written statement from the manufacturer that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);
(3) capacity and wastewater strength for all models of proposed filters to be approved; and
(4) specifications for application, installation, operation, and maintenance.

(f) Pipe penetration boot plans and specifications submitted to the Department for review and approval shall show the design of the pipe penetration boot and include the following information:

(1) manufacturer's name, address, phone and fax numbers, and contact name;
(2) design specifications and materials used in the manufacture of pipe penetration boot components;
(3) applicable testing results from third-party verification showing pull and flexibility testing;
(4) documentation of a watertight seal around the piping and any component or device needed to ensure the seal, such as non-corrodible adjustable bands;
(5) documentation that the pipe penetration boot meets the requirements of ASTM C1644 for precast concrete tanks or ASTM C1644, C923, or C564 for thermoplastic or glass-fiber-reinforced polyester tanks; and
(6) specifications for application, installation, operation, and maintenance of the pipe penetration boot.

(g) Plans for prefabricated risers, effluent filters, and pipe penetration boots, other than those approved for general use and issued an approval letter under this Rule, shall be considered for approval on a case-by-case basis. The riser, effluent filter, or pipe penetration boot shall be approved if it is determined that it meets the requirements of this Rule based on information provided by the manufacturer to the Department.

History Note: *Authority G.S. 130A-335(e), (f), and (f1); 130A-335.1;*

15A NCAC 18E .1405 is proposed for adoption as follows:

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION BOOTS APPROVAL RENEWAL

(a) All riser, effluent filter, and pipe penetration boot approvals shall expire on December 31 of each year. Riser, effluent filter, and pipe penetration boot manufacturers who wish to continue product approval shall submit annually a proprietary product renewal form provided by the Department no later than November 30 of each year.
(b) The approval renewal form shall include the following elements:

(1) manufacturer's name, mailing address, phone and fax numbers, email address, , and manufacturer's point of contact;

(2) model number(s) approved; and
(3) a notarized statement that the product has not changed from the previous year without prior approval from the Department.

(c) The Department shall notify the manufacturer of the pending riser, effluent filter, and pipe penetration boot Approval expiration in writing no later than September 30 of each year. The notification shall include information on how to request riser, effluent filter, and pipe penetration boot renewal.

(d) The riser, effluent filter, and pipe penetration boot approval shall be deemed renewed upon receipt of a renewal form that contains all of the elements set out in Paragraph (b) of this Rule.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1406 is proposed for adoption as follows:

15A NCAC 18E .1406 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

The Department shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, or pipe penetration boots upon a finding that:

(1) the approval is determined to be based on false, incomplete, or misleading information;

(2) the product has been altered;

(3) the product fails to perform in compliance with performance standards established for the product in accordance with the Rules of this Section; or

(4) the product fails to meet conditions of its approval or comply with G.S. 130A, Article 11, Rule .1405 of this Section, this Subchapter, or conditions of the approval.

History Note: *Authority G.S. 130A-335(e), (f), and (f1);*

15A NCAC 18E .1501 is proposed for adoption as follows:

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1501 GENERAL

(a) RWTS that comply with NSF International Standard 40 for Class I residential wastewater treatment systems shall be designed, constructed, and installed in accordance with this Section to serve facilities with a DDF less than or equal to 1,500 gpd.

(b) RWTS shall only be used with DSE.

(c) RWTS shall bear one of the following to certify that the product is in accordance with NSF Standard 40:

(1) the NSF mark and the NSF listed model number; or
(2) the certification mark and listed model number of a third-party certification program accredited by ANSI to certify RWTS in accordance with NSF Standard 40.

(d) For approval of an RWTS as a PIA System, a manufacturer shall apply in accordance with Section .1700 of this Subchapter.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1502 is proposed for adoption as follows:

15A NCAC 18E .1502 APPLICATION

An application shall be submitted for RWTS approval in writing to the Department and shall include the following:

(1) manufacturer's name, mailing address, phone number, email address, plant location(s), and contact information for distributors;

(2) verification of NSF Standard 40 Class I system approval and listing by NSF International or other ANSI-accredited third-party certification program;

(3) manufacturer's identifying name or logo, listed model number(s) and treatment capacity in gpd to be imprinted on unit;

(4) three copies of plans and specifications, including information required to evaluate any tanks as required in accordance with Rule .1401 of this Subchapter; and

(5) fee payment as required by G.S. 130A-343(k)(6), by corporate check, money order or cashier's check made payable to: North Carolina On-Site Water Protection Account or North Carolina OSWW System Account, and mailed to the Department.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1503 is proposed for adoption as follows:

15A NCAC 18E .1503 DESIGN AND CONSTRUCTION STANDARDS

RWTS shall meet the following design and construction standards:

(1) No blockouts or openings shall be permitted below the liquid level of the RWTS.

(2) RWTS shall be watertight, corrosion resistant structures, with all components requiring maintenance accessible to the Management Entity. Access openings shall be provided in the RWTS top. Access shall be provided for:

(a) cleaning or rodding out the inlet pipe;

(b) cleaning or clearing the air or gas passage space above any partition;

(c) pumping of each compartment required to be pumped;

(d) sampling the effluent; and

(e) repairing and maintaining any system components.

(3) Tanks used in RWTS designed to hold sewage or effluent shall comply with all tank requirements in accordance with Section .1400 of this Subchapter.

(4) RWTS shall bear an imprint identifying the manufacturer, the RWTS serial number assigned to the manufacturer's model approved by the Department, and the liquid or working capacity of the unit. The imprint shall be located on the outlet end of the tank within 24 inches of the top of the tank.

(5) The design, construction, and operation of RWTS shall prevent bypass of wastewater.

(6) The manufacturer shall ensure that the system can be sampled in compliance with 40 CFR 136 and shall specify the recommended method for effluent sampling.

(7) Control panels provided by the manufacturer shall comply with the requirements for control panels in accordance with Rule .1103 of this Subchapter.

(8) The RWTS shall have an alarm device or devices to warn the user or Management Entity of a unit malfunction or a high-water condition in accordance with Rule .1103 of this Subchapter.

(9) The control panel shall include a method to automatically measure and record daily wastewater flow dispersed to the dispersal field in accordance with Rule .1702(a)(2)(I) of this Subchapter.

(10) The blower location shall be shown on the plans and detail proposed corrosion-resistant blower enclosures, if applicable.

(11) A settling tank shall be required prior to or as an integral part of the design of the RWTS. The liquid capacity of the settling tank shall be a minimum of half of the DDF of the RWTS, or as otherwise specified by the manufacturer, whichever is larger. The settling tank may either be an integral chamber of the RWTS tank, a septic tank approved in accordance with Section .1400 of this Subchapter, or another tank designed for an individual system and approved by the Department as a part of the plans for the RWTS.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1504 is proposed for adoption as follows:

15A NCAC 18E .1504 SAMPLING REQUIREMENTS FOR RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

Effluent from an approved RWTS shall be grab or 24-hour composite sampled annually for all effluent standards listed in Table XXV of Rule .1201(a) of this Subchapter for NSF-40 systems, unless adjusted sampling requirements have been requested and granted in accordance with Rules .1301 and .1709 of this Subchapter.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1505 is proposed for adoption as follows:

15A NCAC 18E .1505 RESIDENTIAL WASTEWATER TREATMENT SYSTEM APPROVAL RENEWAL

(a) All RWTS Approvals shall expire on December 31 of each year. RWTS manufacturers who wish to continue product approval shall submit annually a proprietary product renewal form provided by the Department no later than November 30 of each year.

(b) The renewal form shall include the following updated elements:

(1) manufacturers's name, mailing address, phone and fax numbers, email address, and manufacturer's point of contact;

(2) model number(s) approved;

(3) a notarized statement that the product has not changed from the previous year without prior approval from the Department; and

(4) verification of the manufacturer's continued certification and listing by a nationally recognized certification body, including compliance with NSF Standard 40.

(c) The Department shall notify the manufacturer of the pending RWTS Approval expiration in writing no later than September 30 of each year. The notification shall include information on how to request RWTS Approval renewal.

(d) The RWTS approval shall be deemed renewed upon receipt of a renewal form that contains all of the elements set out in Paragraph (b) of this Rule.

(e) The Department shall suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent standards in Table XXV of Rule .1201(a) of this Subchapter or as provided for in Rule .1708(b) of this Subchapter.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1601 is proposed for adoption as follows:

SECTION .1600 – APPROVAL OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for DDF less than or equal to 3,000 gpd shall be configured as a package and approved as a PIA System in accordance with Section .1700 of this Subchapter.

(b) The integrated system package shall be provided from a single source manufacturer or system integrator, comprised of catalogued standardized design components that have been coordinated and tested by the manufacturer or integrator. Components shall include:

(1) dispersal field pump(s) and floats;
(2) headworks assemblies;
(3) dispersal field piping network, drip tubing, and appurtenances; and
(4) system controls that provide for automatic filter cleaning, timed field dosing, field flushing, alarm notification, and recording of system operation.

(c) All components shall be integrated and designed to operate together. The system manufacturer or integrator shall provide system design information including:

(1) head loss charts, tables, or formulas for various drip tubing lateral lengths during a dosing and flushing cycle;
(2) minimum and maximum zone size and design;
(3) design plans and specifications for all components;
(4) installation specifications; and
(5) operation and maintenance manuals.

(d) The system manufacturer shall provide support to train and authorize designers, installers, Management Entities, regulators, and users.

(e) Drip dispersal system performance, siting, sizing, installation, operation, monitoring, maintenance and reporting requirements shall comply with Rules .0908, .1204, and Section .1300 of this Subchapter, as applicable, and the Rules of this Section.

(f) Drip dispersal systems that are not pre-engineered packages approved in accordance with Section .1700 of this Subchapter shall be designed on a project specific basis by a PE and shall comply with Rules .0908, .1204, Section .1300 of this Subchapter, as applicable, and the Rules of this Section.

(g) Drip dispersal systems for DDF greater than 3,000 gpd shall comply with the design and performance requirements of this Section and shall be designed on a project specific basis by a PE. The system design shall be reviewed and approved by the Department in accordance with Rule .0302 of this Subchapter, unless the system is permitted in accordance with Rule .0207 of this Subchapter.

History Note: Authority G.S. 130A-343;

15A NCAC 18E .1602 is proposed for adoption as follows:

15A NCAC 18E .1602 DESIGN AND CONSTRUCTION STANDARDS

(a) Drip dispersal systems shall be preceded by pretreatment designed to comply with one of the following effluent standards: DSE, NSF-40, TS-I, TS-II, or RCW as specified in Table III of Rule .0402(a), Table XXV of Rule .1201(a), or Rule .1002, of this Subchapter, as applicable.

(b) The pump tank shall meet one of the following conditions:

(1) a separate pump tank sized in accordance with Rule .0802 of this Subchapter; or
(2) a pump tank or compartment that is part of an advanced pretreatment system approved in accordance with Section .1700 of this Subchapter.

Pump tank operating levels shall not result in effluent backing up into a part of any pretreatment component designed for free gravity flow drainage. All pump submergence, dose volume, flow equalization, and emergency storage capacity requirements for the dosing system shall be met without interfering in the performance of the pretreatment components.

(c) Pumps shall meet the following conditions:

(1) have sufficient capacity to accommodate projected flow and total dynamic head conditions;
(2) deliver 15 to 60 psi of pressure during dosing events;
(3) provide minimum flow and pressure as required to backwash or forward flush headworks filter;
(4) maintain velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(5) maintain velocities of one foot per second at the distal end of each drip lateral line during automatic field flushing for advanced pretreatment effluent. Valving shall be provided to achieve flushing velocities of two feet per second at the distal end of each dripline with manual flushing.

Pump manufacturer requirements shall be followed to protect the pump intake from solids that may accumulate in the pump tank and for pump cooling during operation.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, provisions for filter cleaning, and field flushing valves. Zone and isolation valves may be located in the headworks assembly or in the drip dispersal field. The headworks assemblies shall meet the following conditions:

(1) filters shall remove particles greater than 115 microns at the peak operating flow rate, during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a pump operating flow rate within the filter manufacturer's specified acceptable operating range;

(2) filters for drip dispersal systems receiving DSE shall be configured with two independently backwashed disk filters;

(3) for drip dispersal systems receiving advanced pretreatment effluent, single or multiple screens or disc filters may be used, designed to be cleaned by either backwashing or forward washing;

(4) filter cleaning and field flushing residuals shall be returned to the head of the septic tank or settling tank prior to being returned to the pretreatment unit;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also be used to monitor pump operating flow rates during dosing and flushing events; and

(6) the headworks and associated components shall be in a separate enclosure that is freeze protected, UV and corrosion resistant, and accessible for routine operation, maintenance, monitoring and servicing. Design shall facilitate access to all internal components.

(e) The drip dispersal field shall consist of one or more separately dosed zones comprised of a supply and return manifold, manifold to lateral connections, laterals containing drip tubing with emitters, blank sections of tubing, and associated field appurtenances. Drip emitter and associated field appurtenances design shall meet the following:

(1) drip emitters shall be designed and demonstrated to uniformly distribute wastewater effluent at a pre-determined rate when operated in accordance with manufacturer's specified pressure range for emitter operation. Emitter design coefficient of variation, Cv, shall be five percent or less. Emitters shall be designed to be self-cleaning and to resist root intrusion. Hydraulic design of a drip dispersal zone shall be based upon achieving no more than a 10 percent variation in flow from any emitter over the entire zone, regardless of emitter elevation or position along the lateral including any effluent redistribution due to drainback;

(2) drip emitters shall be pressure compensating unless the manufacturer and designer provide documentation and calculations that a maximum 10 percent flow variance allowance can otherwise be achieved with non-pressure compensating emitters in a PIA Approval or on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be spaced at uniform intervals along the tubing on 24-inch centers or less, and drip tubing with emitters shall be spaced an average of 24 inches on centers or less, in accordance with the proposed system design. Spacing shall be chosen as needed to ensure a sufficient number and density of emitters are present to achieve uniform distribution and instantaneous emitter loading rates that do not exceed the hydraulic capacity of the receiving infiltrative surfaces;

(4) connections between supply and return manifolds, and between runs or drip lateral sections installed at varying elevations or locations shall be made with solvent welded solid Schedule 40 PVC or flexible PVC;

(5) blanking sections of tubing without drip emitters shall be used where unfavorable site conditions, such as rocks, trees, or roots, are encountered along a drip run. Blanking tubing shall be a different color from the drip tubing or marked tubing of the same material, specification, and diameter as the connecting dripline, or flexible PVC;

(6) the manufacturer shall specify methods for drainback prevention; and

(7) field appurtenances shall include the following:

(A) air or vacuum relief valve at the highest elevation of each zone;

(B) cleanout at both ends of the supply and return manifolds;

(C) pressure monitoring fittings at the zone inlet and outlet points;

(D) pressure regulating valve where needed;

(E) for two or more zones: solenoid valves for each zone in the headworks or at the field, with an isolation valve on the supply line side; and a check valve with an isolation valve for each zone between the return manifold and the common return line; and

(F) valves, vents, cleanouts, and pressure monitoring fittings shall be provided with protective vaults or boxes that are decay resistant, ultraviolet rated, and accessible to the Management Entity from the ground surface.

(f) An integrated controller shall be provided that meets the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at equal intervals throughout the day, at a projected average flow, and to accommodate the DDF. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to comply with system design and the projected range of operating conditions;

(3) provide a minimum dose volume per zone that is a minimum of five times the liquid capacity of the drip laterals or so 80 percent of each dose is delivered when the minimum pressure in the field network is 10 psi;

(4) provide for automatic cleaning of headworks filter(s);

(5) provide for adjustable automatic forward flushing, or field flushing, of the drip laterals with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) provide for monitoring of pump cycles and run times;

(7) include telemetry, in accordance with Rule .1103(c) of this Subchapter, for systems with a DDF greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system;

(8) for systems with a DDF greater than 3,000 gpd the controller shall monitor flow volume to each zone and provide a flow variance indication when flow is plus or minus 20 percent of design. The telemetry system and alarm shall be designed to be functional during power outages;

(9) for multi-zone systems, the system controller shall provide for a zone to be rested or taken out of service manually. The controller shall have the capability to bypass zones and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats are to be configured to ensure the minimum dose is available prior to initiating a dosing cycle and to ensure that a full dose is delivered.

(g) Alternatives to the design criteria in this Rule may be proposed by the manufacturer during the PIA approval process or by a PE on a project-specific basis. These alternatives shall be reviewed and approved by the Department on a case-by-case basis when documentation is provided that the system will meet the performance standards of this Section.

History Note: *Authority G.S. 130A-343;*

15A NCAC 18E .1603 is proposed for adoption as follows:

15A NCAC 18E .1603 DRIP DISPERSAL SYSTEM TESTING

(a) The drip dispersal system field testing shall include system designer requirements and the following items:

(1) all leaks in the pipe network or from emitters exhibiting excessive emission rates shall be repaired; and

(2) after the system is pressurized, dosing and flushing flow rates and pressures for each zone shall be measured and confirmed to be in accordance with the design parameters as follows:

(A) dosing pressure shall be measured at the lowest point in the supply manifold and highest point in the return manifold;

(B) minimum and maximum emitter pressure shall be verified to be within emitter design parameters;

(C) flushing pressures shall be measured at the ends of each supply and return manifold within each zone;

(D) dosing and flushing flow rates shall be measured with the flow meter after the system is pressurized; and

(E) all dosing and flushing flow rates and pressures shall be recorded.

(b) All components shall be demonstrated to be operable and in accordance with their design during the inspection by the LHD.

History Note: *Authority G.S. 130A-343;*

15A NCAC 18E .1701 is proposed for adoption as follows:

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

15A NCAC 18E .1701 GENERAL

PIA Systems are any wastewater systems, system components, or devices as defined by G.S 130-343(a) that are not described in other Sections of this Subchapter and systems for which any of the following are proposed:

(1) reduced setbacks;

(2) reduced depth to LC or vertical separation requirements; or

(3) increased LTAR.

This Section shall provide for the approval and permitting of PIA Systems.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1702 is proposed for adoption as follows:

15A NCAC 18E .1702 APPLICATION

(a) An application shall be submitted in writing to the Department for a PIA System. All applications shall include the information required by G.S. 130A-343(d), (f), (g), (g1), and (h), and the following, as applicable:

(1) identification of the type of PIA Approval requested:

(A) Provisional;

(B) Innovative;

(C) Functionally Equivalent;

(D) Accepted; or

(E) a combination of any of the above;

(2) plans and specifications for the system, including the following:

(A) description of the system;

(B) materials used in construction;

(C) proposed use of system;

(D) system design criteria;

(E) system design and drawings;

(F) installation manual;

(G) operation and maintenance manual, including a checklist for documentation of inspection and maintenance activities and the VIP;

(H) influent and effluent sampling locations for advanced pretreatment systems while the system remains in operation;

(I) method for automatically measuring and recording daily wastewater flow dispersed to the dispersal field for advanced pretreatment systems; and

(J) start-up requirements and information;

(3) the following information:

(A) product specific literature;

(B) published research; and

(C) previous experience and performance with the system;

(4) results of any available testing, research or monitoring of pilot systems or full-scale operational systems including:

(A) identification of the third-party research or testing organization that conducted the testing, research, or monitoring provided;

(B) documentation that the protocol or evaluation used in the testing, research, or monitoring is:

(i) established by a nationally recognized certification body;

(ii) a listed protocol that has been approved by the Department in accordance with G.S. 130A-343(d);

(iii) a comparable evaluation protocol used for system approval in other states. The comparable evaluation protocol shall include information on relevant conditions such as wastewater system design, soil types, climate, and hydrology and be reviewed by the Department; or

(iv) in accordance with an alternative performance evaluation protocol proposed by the manufacturer for approval;

(C) documentation that the system is tested, certified, and listed by a nationally recognized certification body and complies with an ongoing verification program administered by that certification body, as applicable; and

(D) documentation that the system can be sampled in compliance with 40 CFR 136 and that the method for system sampling monitors system compliance with effluent standards;

(5) verification that the product submitted for PIA Approval is the same as the certified, listed, or tested product, and if not, identification of any modifications made to the submitted product;

(6) notification of any proprietary or trade secret information, system, component, or device. All documents received are considered Public Records in accordance with G.S. 132-1, unless they meet the criteria for classification as a trade secret as defined in G.S. 66-152(3);

(7) draft written PIA Approval that includes criteria for site selection, installation requirements, operation and maintenance procedures including a VIP protocol with compliance criteria, system classification, frequency of system inspection and monitoring in accordance with Table XXXII of Rule .1301(b) of this Subchapter, and minimum certification or licensing requirements as set forth in applicable certification and licensing rules and statutes for designers, installers, and Management Entities; and

(8) fee payment as required by G.S. 130A-343(k), by corporate check, money order or cashier's check made payable to: North Carolina On-Site Water Protection System Account or North Carolina OSWW System Account, and mailed to the Department. Fees received are non-refundable.

(b) Innovative System applications shall include the information listed in Paragraph (a) of this Rule.

(c) Provisional System applications shall include the information listed in Paragraph (a) of this Rule and an evaluation protocol containing all information set forth in G.S. 130-343(f), including:

(1) identity and qualifications of the proposed third-party evaluator, including documentation of their third-party status;
(2) description of the evaluation protocol, including any proposed laboratory and field testing;
(3) number of systems to be installed;
(4) site selection criteria;
(5) system monitoring and reporting procedures, and proposed duration of evaluation; and
(6) any other information needed for the system to be able to achieve Innovative status upon completion of the Provisional System evaluation protocol.

(d) Functionally Equivalent Trench System Innovative applications shall include the information listed in Paragraph (a) of this Rule and documentation that the manufacturer has petitioned the Commission for Public Health in accordance with G.S. 130A-343(g1).

(e) Accepted System applications shall include the information listed in Paragraph (a) of this Rule and documentation that the manufacturer has petitioned the Commission for Public Health in accordance with G.S. 130A-343(h).

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1703 is proposed for adoption as follows:

15A NCAC 18E .1703 DEPARTMENT AND COMMISSION APPLICATION REVIEW

(a) The Department shall review all applications submitted to determine if the information listed in Rule .1702 of this Section is included and determine whether additional information is needed to continue the review.

(b) Within 30 days of receipt of the initial application, the Department shall notify the manufacturer of any items necessary to complete the application or notify the manufacturer that the application is complete. This determination shall not constitute a qualitative review of the information provided, nor the approval or denial of the proposed system designation. Specified additional information shall be received within 180 days or the application file shall be closed.

(c) Upon receipt of a complete application, the Department shall conduct a qualitative review in accordance with PIA Approval criteria identified in Rules .1704, .1705, and .1706 of this Section, as applicable.

(d) For systems that are certified and listed by a nationally recognized certification body, the Department shall complete its review and determine whether to approve or deny Provisional System applications within 90 days of receipt of a complete application.

(e) The Department shall complete its review and determine whether to approve or deny Innovative System applications within 90 days of publication in the North Carolina Register of the notice of receipt of a complete application.

(f) The Department shall prepare and submit its findings and recommendations for a Functionally Equivalent Trench System or an Accepted System to the Commission within 120 days of receipt of a complete application.

(g) Upon request by the petitioner, the Commission may modify the 180-day time frame for receipt of additional information specified by the Department for a Functionally Equivalent Trench System or Accepted System petition based on a determination that a petition is incomplete and additional information is needed. The petitioner may also request Commission review of the Department's determination that a petition is incomplete or additional information request.

(h) The Department shall notify the applicant and LHDs of the approval or denial of a PIA System. The PIA Approval shall include conditions for permitting, siting, installation, use, monitoring, operation and maintenance, and number of systems that can be installed. When an application is denied, the Department shall inform the applicant in writing of the reason for denial. The Department shall assign a unique code to the approved products for tracking purposes.

(i) An applicant may reapply in accordance with this Section. When reapplying, a new application shall be required and the applicant shall make a new fee payment as required by G.S. 130A-343(k).

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1704 is proposed for adoption as follows:

15A NCAC 18E .1704 APPROVAL CRITERIA FOR PROVISIONAL SYSTEMS

(a) A dispersal system shall be approved for use as a Provisional System when the following criteria have been met:

(1) documentation of one of the following is provided:

(A) a minimum of 50 installations that have been in use for a minimum of 12 months, with available information indicating comparable hydraulic performance and rate of malfunction to a conventional trench system;

(B) the system's design is functionally similar to another approved system described elsewhere in this Subchapter, or to a PIA System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the approved comparable system for the following: material physical properties and chemical durability; field installed permeable sidewall area and bottom infiltrative area; method and manner of function for conveyance and application of effluent; structural integrity; and field installed storage volume;

(C) the system has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), for a period that exceeds one year; or

(D) the system has complied with a comparable evaluation protocol used for system approval in other states. The comparable evaluation protocol shall include information on relevant conditions such as wastewater system design, soil and site conditions, climate, and hydrology and be reviewed by the Department;

(2) documentation of load testing is provided that demonstrates the structural integrity to be comparable to a conventional trench system, including subjecting the trench system to the following without collapsing, fracturing, or breaking when installed in a trench with the proposed product configuration and width:

(A) an axle load of 16,000 pounds when covered with 12 inches of compacted soil; and

(B) an axle load of 4,000 pounds when covered with six inches of compacted soil; and

(3) a proposed evaluation protocol to be overseen by a third-party evaluator is submitted to the Department for review. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative Approval, as specified in G.S. 130A-343(f) and Rule .1705 of this Section, is collected. The protocol shall include the following:

(A) a minimum of 100 installations operational and in use for a minimum of 12 months; and

(B) sufficient information collected to evaluate the system's hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system.

(b) Advanced pretreatment systems shall be approved for use as a Provisional System when the following criteria have been met:

(1) documentation of one of the following is provided for designs complying with TS-I, TS-II, or RCW effluent standards:

(A) a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites that have been in use for six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1710 of this Section;

(B) the system's design is functionally similar to another approved system described elsewhere in this Subchapter, or to a Provisional or Innovative System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for all of the following: material physical properties and chemical durability; structural integrity; biological, chemical, or physical treatment processes; method and manner of function for conveyance and application of effluent through the system; and number and size of system compartments;

(C) the system has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), for a period that exceeds one year; or

(D) the system has complied with a comparable evaluation protocol used for system approval in other states. The comparable evaluation protocol shall include information on relevant conditions such as wastewater system design, soil types, climate, and hydrology and be reviewed by the Department; and

(2) a proposed evaluation protocol to be overseen by a third-party evaluator is submitted to the Department for review. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative Approval, as specified in G.S. 130A-343(f) and Rule .1705 of this Section, is collected. The protocol shall include one of the following:

(A) for a system that has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6) for a period that exceeds two consecutive years, a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall show compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1710 of this Subchapter, as applicable; or

(B) a minimum of 150 complete third-party field verification data sets from a minimum of 50 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1710 of this Section, as applicable.

(c) Manufacturers requesting Provisional Approval as both an advanced pretreatment and dispersal system shall meet the requirements for advanced pretreatment and dispersal as described in this Rule.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1705 is proposed for adoption as follows:

15A NCAC 18E .1705 APPROVAL CRITERIA FOR INNOVATIVE SYSTEMS

(a) A dispersal system shall be approved for use as an Innovative System when the following criteria have been met:

(1) the performance requirements for an Innovative System identified in G.S. 130A-343(a)(5) and (g) have been met;

(2) materials used in construction are equal or superior in physical properties, chemical durability, and structural integrity compared to materials used for similar proposed systems described in other Sections of this Subchapter;

(3) the system has been demonstrated to perform equal or superior to a system that is described in other Sections of this Subchapter or to an Innovative or Accepted System previously approved in accordance with this Section, based upon controlled pilot-scale research studies or statistically valid monitoring of full-scale operational systems;

(4) the system has met one of the following criteria:

(A) the system has completed an evaluation protocol as a Provisional System in accordance with Rule .1704 of this Section;

(B) the manufacturer has provided comparable third-party research and testing conducted in other states, with the data and findings of all evaluations of the system performance, that support the proposed use of the system. The comparable research shall include information on relevant conditions, such as wastewater system design, soil and site conditions, climate, and hydrology; or

(C) the system has been evaluated in accordance with G.S. 130A-343(g)(3); and

(5) the following documentation is provided:

(A) load testing that demonstrates the structural integrity to be comparable to a conventional trench system, including subjecting the trench system to an axle load of 16,000 pounds when covered with 12 inches of compacted soil and an axle load of 4,000 pounds when covered with six inches of compacted soil without collapsing, fracturing, or breaking;

(B) a minimum of 100 installations operational and in use for a minimum of one year. The 100 installations sites may include any combination of systems installed in conjunction with an approved Provisional System evaluation completed in North Carolina and systems in other states; and

(C) system hydraulic performance and rate of malfunction is equal or superior to the demonstrated performance of a conventional trench system.

(b) Advanced pretreatment systems complying with TS-I, TS-II, or RCW effluent standards shall be approved for use as an Innovative System when the following information is provided:

(1) information required in Paragraphs (a)(1) through (a)(4) of this Rule; and

(2) documentation of one of the following:

(A) for a system that has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6) for a period that exceeds two consecutive years, a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1710 of this Section; or

(B) a minimum of 150 complete third-party field verification data sets from a minimum of 50 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The 50 sites may include a combination of sites monitored in conjunction with an approved Provisional System evaluation completed in North Carolina and sites in other states. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1710 of this Section.

(c) Manufacturers requesting Innovative Approval as both an advanced pretreatment and dispersal system shall ~~also~~ meet the requirements for advanced pretreatment and dispersal as described in this Rule.

History Note *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1706 is proposed for adoption as follows:

15A NCAC 18E .1706 APPROVAL CRITERIA FOR ACCEPTED SYSTEMS

(a) The Commission shall designate a wastewater dispersal system as an Accepted System when it finds based on the information provided in accordance with this Rule that the standards set forth by G.S. 130A-343(a)(1) and G.S. l30A-343(h) have been met.

(b) The following information shall be provided by the petitioner and reviewed by the Commission prior to granting Accepted System status:

(1) documentation of a minimum of 300 systems installed statewide and in use for more than five years as an approved Innovative System or a wastewater dispersal system identified in the Rules of this Subchapter;

(2) data and findings of all prior evaluations of the system performance as provided by the manufacturer;

(3) results of prior performance surveys of the systems in use in North Carolina for at least the five-year period immediately preceding the petition, including any information available to the manufacturer pertinent to the accuracy and validity of performance surveys not completed under their control;

(4) review(s) of records on system use and performance reported by LHDs, authorized designers, installers, and Management Entities documenting the experiences with performance of the system in North Carolina, including information collected and reported in accordance with Rules .1711 and.1713 of this Section. The Department, in consultation with the manufacturer, shall evaluate the accuracy and validity of performance data and surveys considered for inclusion in the review. LHDs and other stakeholders shall be invited to participate in the discussion; and

(5) the results of a statistically valid survey of system performance in North Carolina in accordance with Paragraphs (d) or (g).

(c) The manufacturer shall propose a plan for the statistically valid survey. The Department shall concur with the proposed survey plan prior to the survey being performed. The plan shall specify the following information:

(1) number of systems to be evaluated;

(2) period of evaluation;

(3) method to randomly select systems to be evaluated;

(4) methods of field and data evaluation; and

(5) proposed survey team members, including proposed cooperative arrangements to be made with Department and LHD staff.

(d) The proposed survey shall meet one of the following survey protocols:

(1) a field survey of test and control systems that compares the failure rates between the systems. Statistical analysis of the survey results using a one-sided test shall document at the 95 percent confidence level that there is a five percent or less chance that a difference in failure rates of five percentage points or more would occur by chance. The field survey shall meet the following criteria:

(A) a minimum of 250 randomly selected test and control systems that have been in operation for at least two years and are currently in use, for a total of at least 500 systems that are surveyed;
(B) a minimum of 40 percent of both test and control systems shall have been in operation for at least five years;
(C) systems surveyed shall be distributed among the Soil Groups in the Coastal, Piedmont, and Mountain regions of the State in approximate proportion to their use across the State;
(D) systems shall be evaluated from February 1 through April 15; and
(E) similar numbers of test and control systems of similar ages shall be surveyed during similar time periods across the State; or

(2) a field survey of test systems only. The failure rate determined by the field survey shall not exceed seven percent at the 95 percent confidence level. The field survey for test systems only shall meet the following criteria:
(A) the system is identified in the Rules of this Subchapter and the manufacturer provides documentation that there have been at least 3,000 operational systems installed in the state in more than one county. The systems shall have been installed over at least an eight-year period with a total reported failure rate statewide of less than two percent. The statewide failure rate is based on records provided by the manufacturer and monthly activity reports from the LHD;
(B) a minimum of 250 randomly selected systems that are currently in operation are surveyed; and
(C) the survey criteria in Subparagraph (d)(1) are met

(e) The Department shall facilitate LHD participation with any performance review or survey.
(f) The Department shall utilize the Division of Public Health's State Center for Health Statistics for assistance in evaluating the statistical validity of the proposed evaluation protocols.
(g) Other criteria for determining whether the test system has been in general use and other survey protocols, which evaluate different numbers of test and control systems or test systems only, may be approved by the Department. The survey protocol shall be designed to verify equal or superior performance of the test system when compared to the control system under actual field conditions in North Carolina. The alternative survey protocol shall be demonstrated to have comparable statistical validity as described in Subparagraph (d) of this Rule. The Department's review and approval of proposed alternate criteria for determining whether the system has been in general use or alternative survey protocols are subject to review and concurrence by the Commission.
(h) The Commission shall impose any use, design, installation, operation, maintenance, monitoring, and management conditions in accordance with G.S. 130A-343.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343; S.L. 2014-120, s.47; S.L. 2019-151, s.13;*

15A NCAC 18E .1707 is proposed for adoption as follows:

15A NCAC 18E .1707 DESIGN AND INSTALLATION CRITERIA FOR PROVISIONAL, INNOVATIVE, AND ACCEPTED APPROVALS

All products approved under this Section shall be designed and installed in accordance with the requirements of the PIA Approval.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1708 is proposed for adoption as follows:

15A NCAC 18E .1708 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

(a) The Department may modify the PIA Approval of a system as provided for in G.S. 130A-343(c) and as follows:
(1) to comply with subsequent changes in laws or rules which affect their approval;
(2) based upon a written application from the manufacturer of an approved Provisional or Innovative System that seeks to modify their system or its conditions of approval, including siting or sizing criteria. If the manufacturer demonstrates that the modified system will perform in a manner equal or superior to the approved system in terms of structural integrity, chemical durability, hydraulic

performance, and wastewater treatment, the Department shall approve the modified system with the same status as the previously approved system; or

(3) based upon a written application from the manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria. The manufacturer shall demonstrate that the modified system will perform in a manner equal or superior to the approved system in terms of structural integrity, chemical durability, hydraulic performance, and wastewater treatment. The Commission shall approve proposed modifications to Accepted Systems when it finds based on the information provided in accordance with this Rule that the standards set forth by G.S. 130A-343(a)(1) and G.S. 130A-343(h) have been met.

(b) The Department shall suspend or revoke the PIA Approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) the advanced pretreatment system fails to comply with the compliance criteria in Rule .1710 of this Section;

(2) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

(3) the system fails to comply with the conditions of its PIA Approval or comply with applicable laws and rules; or

(4) the manufacturer loses their approval or discontinues their listing by any nationally recognized certification body, if applicable. The manufacturer shall notify the Department in writing within 30 days of any changes in their approval status with a nationally recognized certification body.

(c) The Commission shall modify, suspend, or revoke its approval of a modified Accepted System if the modified system or component fails to perform in a manner equal or superior to the previously approved system. The Department shall notify the Commission of any action required for Commission approval of any modifications to the status of an Accepted System.

(d) Modification, suspension, or revocation of a PIA Approval shall not affect systems previously installed in accordance with the approval.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1709 is proposed for adoption as follows:

15A NCAC 18E .1709 WASTEWATER SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS

(a) Wastewater sampling requirements shall vary in accordance with wastewater system classification, designated effluent standard, DDF, and performance history.

(1) Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent constituents listed in Table XXV of Rule .1201(a) of this Subchapter until the system receives Innovative Approval.

(2) When the DDF is less than or equal to 1,500 gpd, Innovative Systems shall be grab or composite sampled annually for all applicable influent and effluent constituents from Table XXV of Rule .1201(a) of this Subchapter.

(3) When the DDF is greater than 1,500 gpd and less than or equal to 3,000 gpd, Innovative Systems shall be grab or composite sampled twice a year for all applicable influent and effluent constituents listed in Table XXV of Rule .1201(a) of this Subchapter.

(4) Sampling for Fecal Coliforms shall not be required for Innovative Systems at any site that is found to be compliant with all other constituents in Table XXV of Rule .1201(a) of this Subchapter.

(5) Innovative Systems serving vacation rentals subject to the North Carolina Vacation Rental Act, G.S. 42A, shall be sampled during the seasonal high use period.

(6) Effluent may be re-sampled within 30 days of receipt of laboratory results indicating non-compliance with Table XXV of Rule .1201(a) of this Subchapter if requested by the owner, manufacturer, or manufacturer's representative, or required in a PIA Approval. Complete data sets from resampling may be substituted to comply with the minimum number of compliant data sets required for PIA Approval. Data sets from resampling may be used by a manufacturer as part of a reduced effluent sampling request in accordance with Paragraph (d) of this Rule.

(7) The Management Entity may record daily wastewater flow and sample influent to the advanced pretreatment system as needed to determine compliance with Rule .1302(f) of this Subchapter.

(8) A manufacturer of a Provisional or Innovative System may apply for adjusted sampling requirements in accordance with this Rule.

(b) The manufacturer of a Provisional System may apply to the Department in accordance with Rule .1701 of this Section to request adjusted effluent sampling requirements for Fecal Coliforms. The Department shall approve the request when the documentation submitted to the Department includes the following information:

(1) data from a minimum of five separate North Carolina sites in operation for a minimum of six months after the Provisional Approval has been issued;

(2) a minimum of 25 data sets, including results for Fecal Coliforms. No data sets shall be excluded. Data sets may be from the same site if collected a minimum of three months apart; and

(3) analysis indicating compliant system performance in accordance with Rule .1710 of this Section.

(c) If an effluent sample for a Provisional or Innovative System that is not required to sample for Fecal Coliforms is determined to be non-compliant with Table XXV of Rule .1201(a) of this Subchapter, the effluent may be re-sampled in accordance with Rule .1302(f)(2) of this Subchapter. If re-sampled, the effluent shall also be sampled for Fecal Coliforms in addition to all other applicable constituents. If re-sampling indicates compliance with Table XXV of Rule .1201(a) of this Subchapter, no further Fecal Coliform sampling is required from that site, unless an effluent sample is again determined to be non-compliant for one or more constituents.

(d) The manufacturer of an Innovative System may apply to the Department in accordance with Rule .1701 of this Section to request an adjustment in sampling requirements for constituents or frequency, including reducing to field parameters only. The Department shall approve the request when one of the following conditions are met:

(1) documentation submitted to the Department includes the following information:

(A) data from a minimum of 25 separate North Carolina sites in operation for a minimum of six months after the Innovative Approval has been issued;

(B) written reports summarizing results of the VIP inspections for all North Carolina sites submitted as part of this Rule;

(C) a minimum of 50 complete data sets, with no data excluded. Data sets may be from the same site if collected a minimum of three months apart;

(D) analysis indicating compliant system performance in accordance with Rule .1710 of this Section; and

(E) identification of the constituents for which the manufacturer requests a reduced sampling frequency;

(2) the proprietary advanced pretreatment system is also certified and listed by a nationally recognized certification body and is in compliance with the ongoing verification program of such body, and the manufacturer is requesting a reduction in data set requirements set forth in Rule .1705 of this Section by up to 50 percent only; or

(3) the manufacturer has demonstrated compliant system performance in accordance with Rule .1710 of this Section and is only requesting to replace the requirement for routine effluent sampling as set forth in Rule .1705 of this Section for all individual sites with routine field constituent testing that is included as part of the VIP.

(e) Systems approved for field parameters shall only be required to sample the field parameters listed in Table XXXIII at the site during a VIP Management Entity inspection. The PIA Approval may specify other field parameters or alternative field parameter effluent criteria. The results shall be recorded in the written report. If the field parameters fall outside the range specified in the PIA Approval, an effluent sample shall be collected and analyzed for all parameters as necessary to demonstrate system compliance with the site's applicable effluent standard specified in Table XXV of Rule .1201(a) of this Subchapter

TABLE XXXIII. Field parameters advanced pretreatment systems

Field Parameter	**Effluent Criteria**
pH	5 - 9
Turbidity	≤ 10
DO	≥ 2

(f) While routine sampling of individual sites may no longer be required in accordance with Paragraph (d) of this Rule, effluent sampling may still be determined to be necessary during the visual inspection of the system in

accordance with Rule .1302(d) of this Subchapter or if required as part of an enforcement action by the LHD or the Department.

(g) Alternative sampling requirements may be proposed by the manufacturer for a Provisional or Innovative System and approved by the Department when determined to provide an equal or more reliable indication of system compliance with effluent standards.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1710 is proposed for adoption as follows:

15A NCAC 18E .1710 COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent standards of Rule .1002 or Table XXV of Rule .1201(a) of this Subchapter when all the following conditions are met:

(1) the arithmetic mean for BOD_5, TSS, TKN, and TN and the geometric mean for Fecal Coliform for all data collected from all sites does not exceed the designated effluent standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent standard for any applicable constituent. A new complete data set for re-sampling conducted within 30 days of receipt of a non-compliant data set may be substituted to demonstrate compliance with the designed effluent quality standard in accordance with Table XXV of Rule .1201(a) of this Subchapter;

(3) fifty percent of all complete data sets from all sites shall comply with the designated effluent standard for all applicable constituents;

(4) when determining compliance with system effluent standards in Items (1), (2), and (3) of this Rule, no data sets shall be excluded from individual advanced pretreatment systems except at single sites found to be out of compliance in accordance with Rule .1302(f) of this Subchapter and that have been documented to have been subjected to abuse, such as hydraulic or organic overloading, physical damage to the system, or discharge of deleterious substances; and

(5) results of influent samples from all sites shall be provided to demonstrate compliance with percent reduction effluent criteria in accordance with Table XXV in Rule .1201(a) of this Subchapter.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1711 is proposed for adoption as follows:

15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL

(a) All PIA Approvals shall expire on December 31 of each year. PIA manufacturers or other parties who wish to continue product approval shall submit annually a product renewal form provided by the Department no later than November 30 of each year.

(b) The renewal form shall include the following updated elements:

(1) company or organization's name, mailing address, phone and fax numbers, email address, and manufacturer's point of contact;

(2) model number(s) approved; and

(3) a notarized statement that the product(s) has not changed from the previous year without prior approval from the Department.

(c) The Department shall notify the manufacturer of the pending PIA Approval expiration in writing no later than September 30 of each year. The notification shall include information on how to request PIA Approval renewal.

(d) Manufacturers of proprietary products with Provisional Approvals shall additionally submit with its renewal form an annual report to the Department with the following information:

(1) list of all systems installed under the Provisional Approval;
(2) results of all effluent samples collected, as applicable;
(3) copies of all Management Entity inspection reports, as applicable;
(4) assessment of system performance in relation to this Subchapter;
(5) summary of progress made to complete installations, research, and testing as outlined in the approved evaluation protocol;
(6) any conditions and limitations related to the use of the system; and
(7) a list of all authorized designers, installers, and management entities.

(e) A PIA Approval shall be deemed to be renewed upon receipt of a renewal form that contains all of the elements set out in Paragraph (b) of this Rule and annual report in accordance with Paragraph (d) of this Rule. (f) The Department shall review all annual reports for Provisional Approvals for compliance with its PIA approval conditions, including its approved evaluation protocol, and determine whether any action to modify, suspend, or revoke the approval is warranted in accordance with Rule .1708 of this Section.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1712 is proposed for adoption as follows:

15A NCAC 18E .1712 AUTHORIZED DESIGNERS, INSTALLERS, AND MANAGEMENT ENTITIES

(a) Designers, installers, and Management Entities shall be authorized in writing by the manufacturer when required in the PIA Approval based on product specific factors, such as wastewater system classification, designated effluent standard, DDF, wastewater strength, complexity, and operation and maintenance.

(b) Manufacturers of proprietary systems approved under this Section shall provide a list of manufacturer's authorized designers, installers, and Management Entities, as specified in the PIA Approval, to the Department and LHDs. The manufacturers shall update this list annually and include it with the product renewal form required in accordance with Rule .1711(a) of this Section.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1713 is proposed for adoption as follows:

15A NCAC 18E .1713 LOCAL HEALTH DEPARTMENT RESPONSIBILITIES

To implement this Section the LHD shall:

(1) When a Provisional System is proposed, confirm that the designated repair system complies with the provisions of Rule .0508 of this Subchapter and with individual PIA Approval requirements, except:
   (a) when an existing wastewater system is available for immediate use, including connection to a public or community wastewater system;
   (b) when the Provisional System is used as a repair to an existing malfunctioning system when there are no other approved Innovative or Accepted repair options; or
   (c) as provided in G.S. 130A-343(f) for Provisional Systems.
(2) Notify the Department of all IPs, CAs, and OPs issued for Provisional Systems.
(3) Notify the Department of all OPs issued for Innovative Systems.
(4) Permit systems designated as Accepted Systems in an equivalent manner to a conventional system at the owner's request. The Accepted System shall be sited and sized in accordance with Section .0900 of this Subchapter or PIA Approval. The type of Accepted System installed shall be indicated on the OP. The owner shall re-apply to the LHD and receive a new or revised IP or CA for any of the following before system installation:

(a) location of any part of the dispersal field outside of the approved initial dispersal field area;

(b) changes to the trench depth, and slope correction if applicable, specified on the IP or CA;

(c) changes to the effluent distribution method; or

(d) changes to the DDF or wastewater strength.

(5) Grant permit reductions in total trench length less than or equal to 25 percent for Innovative or Accepted Systems only to dispersal fields receiving DSE or better quality. A facility with a full kitchen shall not be granted a permit reduction in total trench length.

(6) Grant facilities generating HSE the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to ensure effluent strength equal to or better than DSE.

(7) Prohibit issuance of an OP for a proprietary system installed by a person not authorized by the manufacturer, unless the manufacturer of the proprietary system approves the installation in writing.

(8) Inform the Department, as well as the manufacturer or their authorized representative, of any system determined to be malfunctioning. If the system has been permitted in accordance with G.S. 130A-336.1 or G.S. 130A-336.2 and Rule .0207 of this Subchapter, the LHD shall instruct the owner to contact the PE or AOWE for determination of the reason and the malfunction and development of an NOI for repairs.

(9) Issue a NOV to the owner when the system is determined to be malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter or when an individual advanced pretreatment system at a single site is out of compliance in accordance with Rule .1302(f) of this Subchapter. The notice shall identify the violations and steps necessary to remedy the problems, including modification of the system, established time frame to achieve compliance, other follow-up requirements, and specify further enforcement possibilities if compliance is not achieved.

(10) Include in its monthly activity report submitted to the Department the following information identified by unique codes:

(a) number of new system OPs issued for PIA Systems;

(b) number of new system OPs issued for Accepted Systems;

(c) number of CAs issued for Provisional Systems, including system type;

(d) number of CAs issued for repairs of PIA Systems, including system type being repaired;

(e) number of CAs issued for repairs of Accepted Systems, including system type being repaired; and

(f) repair system type.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

APPENDIX C: Proposed Repeals (15A NCAC 18A Section .1900)

15A NCAC 18A .1934 - .1971 are proposed for repeal as follows:

15A NCAC 18A .1934 SCOPE

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. December 1, 1990.

15A NCAC 18A .1935 DEFINITIONS

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. July 1, 1995; January 1, 1990; August 1, 1988; April 1, 1985;
Temporary Amendment Eff. June 24, 2003;
Amended Eff. June 1, 2006; May 1, 2004.

15A NCAC 18A .1936 REQUIREMENTS FOR SEWAGE TREATMENT AND DISPOSAL

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Repealed Eff. January 1, 1990.

15A NCAC 18A .1937 PERMITS

History Note: *Authority G.S. 130A-335(e),(f);*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990; January 1, 1984;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. August 1, 1998.

15A NCAC 18A .1938 RESPONSIBILITIES

History Note: *Authority G.S. 89C; 89E; 89F; 90A; 130A-335(e),(f);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; April 1, 1985;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. November 1, 1999; August 1, 1998.

15A NCAC 18A .1939 SITE EVALUATION

History Note: *Authority G.S. 130A-335(e);*

Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1940 TOPOGRAPHY AND LANDSCAPE POSITION

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1941 SOIL CHARACTERISTICS (MORPHOLOGY)

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1942 SOIL WETNESS CONDITIONS

History Note: *Authority G.S. 130A-335(e):*
Eff. July 1, 1982;
Amended Eff. January 1, 1990;
Temporary Amendment Eff. June 24, 2003; April 17, 2002;
Amended Eff. May 1, 2004.

15A NCAC 18A .1943 SOIL DEPTH

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. August 1, 1988.

15A NCAC 18A .1944 RESTRICTIVE HORIZONS

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; October 1, 1983.

15A NCAC 18A .1945 AVAILABLE SPACE

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. February 1, 1992; July 1, 1983; January 1, 1983.

15A NCAC 18A .1946 OTHER APPLICABLE FACTORS

History Note: *Authority G.S. 130A-335(e);*

Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1947 DETERMINATION OF OVERALL SITE SUITABILITY

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1948 SITE CLASSIFICATION

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. April 1, 1993; January 1, 1990.

15A NCAC 18A .1949 SEWAGE FLOW RATES FOR DESIGN UNITS

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; January 1, 1984.

15A NCAC 18A .1950 LOCATION OF SANITARY SEWAGE SYSTEMS

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990; October 1, 1982.

15A NCAC 18A .1951 APPLICABILITY OF RULES

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1952 SEPTIC TANK, EFFLUENT FILTER, DOSING TANK AND LIFT STATION DESIGN

History Note: *Authority G.S. 130A-335 (e)(f)(f1)[2nd];*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1953 PREFABRICATED SEPTIC TANKS AND PUMP TANKS

History Note: *Authority G.S. 130A-335 (e)(f)f1)[2nd];*
Eff. July 1, 1982;
Amended Eff. January 1, 1990;
Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1954 MINIMUM STANDARDS FOR PRECAST REINFORCED CONCRETE TANKS

History Note: *Authority G.S. 130A-335 (e)(f)f1)[2nd];*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1955 DESIGN INSTALLATION CRITERIA FOR CONVENTIONAL SEWAGE SYSTEMS

History Note: *Authority G.S. 130A-335 (e)(f)(f1)[2nd];*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990; August 1, 1988; February 1, 1987;
Temporary Amendment Eff. January 1, 1999;
Amended Eff. August 1, 2000.

15A NCAC 18A .1956 MODIFICATIONS TO SEPTIC TANK SYSTEMS

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. August 1, 2007; November 1, 1999; July 1, 1995; April 1, 1993; January 1, 1990; August 1, 1988.

15A NCAC 18A .1957 CRITERIA FOR DESIGN OF ALTERNATIVE SEWAGE SYSTEMS

History Note: *Authority G.S. 130A-335(e),(f); 130A-342;*
Eff. July 1, 1982;
Amended Eff. June 1, 2006; April 1, 1993; May 1, 1991; December 1, 1990; January 1, 1990.

15A NCAC 18A .1958 NON-GROUND ABSORPTION SEWAGE TREATMENT SYSTEMS

History Note: *Authority G.S. 89C; 89E; 89F; 90A; 130A-335;*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 20, 1997;

Amended Eff. August 1, 1998.

15A NCAC 18A .1959 PRIVY CONSTRUCTION

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. December 1, 1990.

15A NCAC 18A .1960 MAINTENANCE OF PRIVIES

History Note: *Authority G.S. 130A-335(e) and (f);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1961 MAINTENANCE OF SEWAGE SYSTEMS

History Note: *Filed as a Temporary Amendment Eff. July 3, 1991, for a period of 180 days to expire on December 30, 1991;*
Filed as a Temporary Amendment Eff. June 30, 1990, for a period of 180 days to expire on December 27, 1990;
Authority G.S. 130A-335(e),(f);
Eff. July 1, 1982;
Amended Eff. August 1, 1991; October 1, 1990; January 1, 1990; August 1, 1988;
Temporary Amendment Eff. January 20, 1997;
Amended Eff. August 1, 1998.

15A NCAC 18A .1962 APPLICABILITY

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. August 1, 1991; December 1, 1990.

15A NCAC 18A .1964 INTERPRETATION AND TECHNICAL ASSISTANCE

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1990.

15A NCAC 18A .1965 APPEALS PROCEDURE

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. February 1, 1987.

15A NCAC 18A .1966 SEVERABILITY

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982.

15A NCAC 18A .1967 INJUNCTIONS

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1985.

15A NCAC 18A .1968 PENALTIES

History Note: *Authority G.S. 130A-335(e);*
Eff. July 1, 1982;
Amended Eff. January 1, 1985.

15A NCAC 18A .1969 APPROVAL AND PERMITTING OF ON-SITE SUBSURFACE WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

History Note: *Authority G.S. 130A-335(e),(f); 130A-343;*
Eff. April 1, 1993;
Temporary Amendment Eff. June 24, 2003; February 1, 2003;
Amended Eff. June 1, 2006; February 1, 2005; May 1, 2004.

15A NCAC 18A .1970 ADVANCED WASTEWATER PRETREATMENT SYSTEM

History Note: *Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;*
Eff. June 1, 2006;
Amended Eff. October 1, 2011.

15A NCAC 18A .1971 ENGINEERED OPTION PERMIT

History Note: *Authority G.S. 130A-335; 130A-336.1;*
Temporary Adoption Eff. July 1, 2016;
Eff. April 1, 2017.