# NORTH CAROLINA 18E RULES FOR DRIP SYSTEMS
# (EFFECTIVE JANUARY 1, 2024)

**15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS (Anaerobic Drip)**

(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 | 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 .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS (Aerobic Drip)**

(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/ANSI 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; 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 Subpart (B)(ii) of this Paragraph shall be met, except there shall be a minimum of nine inches of vertical separation to a LC, and a minimum of six inches of vertical separation to a SWC; or

(iii) for existing fill, the requirements of Subpart (B)(iii) of this Paragraph shall be met, except there shall be a minimum vertical separation of nine inches to a SWC.

(2) Site modifications for advanced pretreatment drip dispersal systems shall meet the following criteria based on effluent standards:

(A) NSF/ANSI 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 XXIX shall be used to determine the LTAR for advanced pretreatment drip dispersal systems based on Soil Group. Limitations in adjustment allowances for NSF/ANSI 40, TS-I, and TS-II systems are listed in Parts (E), (F), and (G) of this Subparagraph.

**TABLE XXIX.** LTAR for advanced pretreatment drip dispersal systems based on Soil Group

| **Soil Group** | **USDA Soil Textural Class** | | **LTAR in gpd/ft$^2$** | | |
|---|---|---|---|---|---|
| | | | **NSF/ANSI 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 – 1.0 |
| | | Loam | | | |
| III | Fine Loams | Sandy Clay Loam | 0.15 – 0.4 | 0.2 – 0.6 | 0.2 – 0.8 |
| | | Silt Loam | | | |
| | | Clay Loam | | | |
| | | Silty Clay Loam | | | |
| | | Silt | | | |

| | | | | | |
|---|---|---|---|---|---|
| IV | Clays | Sandy Clay<br>Silty Clay<br>Clay | 0.05 – 0.2 | 0.05 – 0.2 | 0.05 – 0.2 |

(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 XXIX 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 Part (B) of this Subparagraph 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 Part (B) of this Subparagraph 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/ANSI 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, 0.6 $gpd/ft^2$ for Group II soils, 0.4 $gpd/ft^2$ for Group III soils, or 0.1 $gpd/ft^2$ 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 1.2 gpd/ft$^2$ for Group I soils, 0.8 gpd/ft$^2$ for Group II soils, 0.5 gpd/ft$^2$ for Group III soils, or 0.12 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 0.12 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/ANSI 40** | **TS-I** | **TS-II** |
| I | Sand | 0.4 – 0.5 | 0.4 – 0.6 | 0.4 – 0.8 |
| | Loamy sand | 0.3 – 0.4 | 0.3 – 0.5 | 0.3 – 0.6 |
| II | Sandy loam | 0.25 – 0.35 | 0.25 – 0.4 | 0.25 – 0.5 |
| | Loam | 0.2 – 0.25 | 0.2 – 0.3 | 0.2 – 0.4 |
| | Silt loam | 0.05 – 0.1 | 0.05 – 0.15 | 0.05 – 0.2 |
| III | Sandy clay loam | 0.05 – 0.1 | 0.05 – 0.12 | 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/ANSI 40 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-I 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;

(C) for NSF/ANSI 40 and TS-I Systems, Table XXIX may be used to determine the LTAR when no other setback reductions are taken aside of those to artificial drainage systems; and

(D) for TS-II Systems, Table XXIX shall be used to determine the LTAR. The LTAR from Table XXIX and reduced setbacks for TS-II Systems from Table XXVIII of Rule .1202(d) of this Section may be taken concurrently.

(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.*

## 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, and 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 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/ANSI 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 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 emission rates greater than 20 percent of the emitter design flow rate 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.*